APPENDIX C – GEOTECHNICAL ENGINEERING REPORT

HALEY ALDRICH

www.haleyaldrich.com

GEOTECHNICAL ENGINEERING REPORT
KILLINGLY ENERGY CENTER
KILLINGLY, CONNECTICUT

by Haley & Aldrich, Inc.
Rocky Hill, Connecticut

for NTE Connecticut, LLC
St Augustine, Florida

File No. 43434-000
July 2016

Executive Summary

This geotechnical report:

- Describes the existing site conditions and proposed conditions as they relate to earthwork and foundation engineering. The power island will be located on Tract One and the utility switch yard will be located on Tract Two.

- Describes the subsurface exploration program and laboratory testing program. A subsurface exploration program was performed at the site to sample and describe soil and rock.

- Provides an interpretation of the subsurface conditions. Subsurface conditions consist of glacial deposits overlying bedrock. Bedrock outcrops are present in the central part of Tract One.

- Provides engineering recommendations for foundations (buildings and retaining walls). Structures may be supported on spread footings, ring foundations, or mat foundations bearing on glacial till, weathered bedrock, and bedrock.

- Provides engineering recommendation for site development. Stable cut slopes into the native soil and rock can be engineered to lower the site grade. Stable fill slopes can be engineered using excavated soil and rock to raise the site grade. Retaining walls will be used where slopes are not feasible.

- Recommendations are provided for storm water management, flexible and rigid pavement, subgrade preparation, dewatering, and material specifications.

- Provides construction recommendations for earthwork. Native soil and rock may be reused to attempt to balance earthwork. Controlled blasting will be required to excavate bedrock. During construction, monitoring earthwork, subgrade preparation, and fill placement and compaction is recommended.

- Provides recommendations for future geotechnical investigations and engineering for final design. Additional field investigation and engineering evaluation are recommended for estimating rock excavation and balancing earthwork cuts and fills, for retaining wall foundation design, and for design of high cut and fill slopes.

Refer to Geotechnical Report for additional details.

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

List of Tables

List of Figures

1. Introduction

1.1 GENERAL

This report provides our geotechnical engineering recommendations for the proposed Killingly Energy Center located in Killingly, Connecticut. The site location is shown on the Project Locus, Figure 1.

1.2 PURPOSE AND SCOPE

This investigation was undertaken to obtain information on subsurface soil, rock, and groundwater conditions, and to provide recommendations for foundation design for the proposed power plant and ancillary equipment. The scope of geotechnical engineering services included:

- Visiting the site to observe existing conditions.
- Reviewing existing information on subsurface soil and rock conditions and groundwater levels.
- Staking exploration locations.
- Monitoring a subsurface exploration program.
- Installing groundwater observation wells.
- Performing field soil resistivity testing.
- Performing field permeability testing.
- Performing geotechnical laboratory testing.
- Performing geochemical (for corrosion potential) laboratory testing.
- Preparing a Preliminary Geotechnical Engineering Report (dated 10 June 2016).
- Performing geotechnical analyses and preparing this report.

1.3 ELEVATION DATUM

Elevations in this report are in feet and refer to the North American Vertical Datum of 1988 (NAVD88).

1.4 SITE CONDITIONS

The site is located at 180 and 189 Lake Road. The 73-acre site is comprised of about 63 acres west of Lake Road (189 Lake Road – Tract One) and 10 acres east of Lake Road (180 Lake Road – Tract Two).

Tract One is wooded except for a 2-story house, shed, and 160-ft deep water supply well that was installed circa 2010 located in the eastern portion of the tract (along Lake Road). The tract includes a pond, an abandoned artesian well, and bedrock outcrops in the central portion of the tract, and wetlands in the northern portion of the tract. Grades slope down from about El. 360 in the southern portion and about El. 340 in the northeastern portion of the tract to about El. 250 in the western portion and about El. 310 in the eastern portion of the tract. Several stone walls are located on the tract.

Tract Two is wooded, except for the northern portion which contains a field and a dilapidated barn (along Lake Road). The tract includes a cemetery with about a dozen head stones located in the western portion of the tract and wetlands in the southern portion of the tract. Grades slope down from about El. 350 in the southern portion of the tract to about El. 310 in the northern portion of the tract.

1.5 PROPOSED CONSTRUCTION

The power plant and ancillary equipment (power island) are planned on Tract One. The finished grade will generally range from El. 313 to El. 317 (average about El. 315), except the administrative building (Area 15), plant switchyard (Area 23), and fuel gas metering (Area 20), which will be constructed at about El. 320. Cuts up to 27 ft are planned in the southern portion of the tract, and fills up to 38 ft are planned in the northern and western portion of the tract with transitions in grades planned using slopes generally ranging from 3H:1V to 4H:1V (portions of slope north and west of the power island to reduce impact to wetlands). A 165-ft-long retaining wall with maximum height of 20-ft is proposed east of the power island along wetlands (to reduce impact to wetlands). A storm water basin (Area 30) with three basins (bottom of basin near existing grade) is proposed north of the power island near wetlands. Mott MacDonald plans to support structures on ring foundations (tanks) and mat foundations or concrete pedestals bearing on foundations. A summary of proposed construction on Tract One is included in Appendix A.

A utility switchyard is planned on Tract Two. The switchyard will connect to the existing electric transmission lines to the east. The finished grade will generally range from about El. 325 to about El. 335 (average about El. 330). Cuts up to 25 ft are planned in the western portion of the switchyard, and fills up to 5 ft are planned in the eastern portion of the switchyard. A 275-ft-long retaining wall with a maximum height of 25-ft is proposed southwestern portion of the utility switchyard.

Proposed construction is shown on Figure 2 and on an untitled drawing prepared by Killingly engineering Associates, dated 30 July 2016, which is also provided in Appendix A.

1.6 LIMITATIONS

This report has been prepared for specific application to the project as it is planned at this time for the exclusive use of the project design team in connection with the geotechnical aspects of the project. In the event that changes in the nature, design, or location of structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing. The analyses and recommendations are based in part upon data obtained from referenced explorations. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

The planned construction will be supported on or in the soil or rock. Recommendations presented in this report for foundation and floor drainage, moisture protection, and waterproofing address only the conventional geotechnical engineering related aspects of design and construction and are not intended to provide an environment that would prohibit growth of mold or other biological pollutants. Our work scope did not include the development of criteria or procedures to minimize the risk of mold or other biological pollutant growth in or near structures. Additionally, evaluation of dynamic loads on foundations was beyond the scope of our services.

2. Subsurface Exploration and Laboratory Testing Programs

2.1 SITE GEOLOGY

Surficial geology maps describe the overburden soils as ground-moraine (glacial till) consisting of poorly sorted, poorly stratified deposits generally composed of glacial debris ranging from clay-size particles to boulders. Boulders were observed at the ground surface.

The Bedrock Geological Map of Connecticut identified the bedrock as Quinebaug Formation consisting of medium- to dark-gray, medium-grained, well-layered gneiss. Bedrock outcrops were observed in the central portion of Tract One (see Figure 2). Bedrock structure was mapped in the field on bedrock outcrops on Tract One. Strike ranged from 20 to 30 degrees and dip ranged from 315 to 335 degrees (25 to 45 degrees northwest).

2.2 OTHER SITE SUBSURFACE DATA

LaFramboise Well Drilling, Thompson, Connecticut, installed a 160-ft deep water well on Tract One circa 2010. The well drilling completion report indicates 10 ft of overburden soil and 150 ft of bedrock was encountered in the well. The well completion report is included in Appendix B.

2.3 LAYOUT FOR FIELDWORK

GM2 Associates Inc. (GM2), Glastonbury Connecticut, staked the test boring locations and soil resistivity locations on 16 and 17 May 2016 using RTK GPS methods. Staked boring and soil resistivity locations are shown on Figure 2. Borings B-04, B-08, and B-15 were offset in the field for access and boring B-11 was offset in the field per Mott MacDonald. Field offsets are noted on the boring logs.

Based on the site topographic (aerial) survey provided by NTE Connecticut, LLC (prepared by Killingly Engineering Associates) and the boring and soil resistivity locations staked by our surveyor (GM2), most ground surface elevations correlate well (within a few feet). However, ground surface elevations at B-07, B-08, and B-09 (located in the western portion of Tract One) do not correlate well (staked location is about 5 ft, 7.5 ft, and 10 ft higher than elevations on the topographic survey). The source of the localized discrepancy is obscured ground in aerial survey.

2.4 SUBSURFACE EXPLORATIONS

Haley & Aldrich monitored a test boring program consisting of eighteen test borings (B-01 through B-18). Mott MacDonald selected the boring locations and depths. Mott MacDonald removed boring B-09 from the program. Borings B-01 through B-15 were located west of Lake Road on Tract One and borings B-16 through B-18 were located east of Lake Road on Tract Two.

NYEG Drilling LLC, Brewerton New York, drilled the test borings on 23 May through 2 June 2016. The borings were advanced using hollow stem augers, wash rotary, air rotary, and down-the-hole hammer methods. Standard penetration tests were performed typically at 5-ft intervals using an automatic hammer. Bedrock was cored in each exploration, except B-01 and B-14 where bedrock was not encountered above the specified termination depth (20 ft).

Groundwater observation wells were installed in borings B-01, B-03, B-07, B-10, and B-12 (selected by Mott MacDonald). Wells were constructed using 2-in. diameter PVC, 10-ft long screen with a sand pack and riser to the ground surface with a surface seal.

Boring locations relative to existing site conditions and proposed construction are shown on Figure 2. Subsurface sections beneath the power island are shown on Figures 3 and 4. Boring logs and observation well installation reports are included in Appendix C. Subsurface data is summarized on Table 1.

2.5 IN-SITU HYDRAULIC CONDUCTIVITY TESTING PROGRAM

Haley & Aldrich performed in-situ falling-head hydraulic conductivity testing at five test boring locations (B-01, B-04, B-06, B-10, and B-11) selected by Mott MacDonald using a Guelph permeameter on 25 May 2016. Each test was run until steady-state flow conditions were established under 5 cm and 10 cm of hydraulic head. Testing was performed at a depth of about 3 ft below ground surface in native glacial till soil (typically silty sand). Field hydraulic conductivity test method was coordinated with Mott MacDonald. Field test results indicated the un-factored hydraulic conductivity of the glacial till soil ranged from 0.01 to 0.06 in/hr. Field test locations are shown on Figure 2. Results of this testing are summarized in Appendix D.

2.6 IN-SITU SOIL RESISTIVITY TESTING

Consulting Engineers Group, Inc., Hopedale Massachusetts, performed three Wenner Four-Electrode soil resistivity arrays using an AEMC model 6470 ground tester on 25 May 2016. Soil resistivity testing was performed at E-01 and E-02 located west of Lake Road on Tract One and E-03 located east of Lake Road on Tract Two. Array lengths ranged from 12 to 150 ft using an a-spacing of 4, 8, 12, 16, 20, 30, 40, and 50 ft. Pipes, pipelines, conduits, fences, or other long metal structures (which can interfere with soil resistivity measurements) were not located near the arrays. High voltage electric transmission lines (energized during testing) are located east of Tract Two and E-03. Soil resistivity array locations are shown on Figure 2. Soil resistivity test results are provided in Appendix E.

2.7 GEOTECHNICAL LABORATORY TESTING

Haley & Aldrich performed four grain size analyses on soil samples recovered from the explorations in general conformance with ASTM D422. Testing was performed to assist with visual classification of soils and help determine engineering properties. Test results are summarized on Table 2. Test data is provided in Appendix F.

2.8 GEOCHEMICAL LABORATORY TESTING

SoilCor, Inc., Murrieta California, performed corrosion tests consisting of pH, soluble sulfates, chloride ion, electrical resistivity, sulfides, and redox potential testing to evaluate corrosion potential on two soil samples recovered from the borings. One sample (glacial till composite) was obtained west of Lake Road on Tract One and one sample (glacial till composite) east of Lake Road on Tract Two. Testing was performed to assist with grounding grid design and selection of Portland cement type. Test results are summarized on Table 3. Test data is provided in Appendix G.

3. Subsurface Conditions

3.1 SOIL AND BEDROCK

Generalized descriptions of soil encountered in the test borings are presented below in order of increasing depth below ground surface. Strata thicknesses observed in the test borings are summarized on Table 1. Refer to logs of test borings in Appendix C for detailed information regarding subsurface conditions.

Approximate Range in Thickness, ft.	**Generalized Description**
1 to 5	TOPSOIL/SUBSOIL – Very lose to loose dark organic soil with silt and sand. Up to 2 ft of topsoil was encountered overlying 1 to 4 ft of subsoil. Cobbles and boulders were observed at the ground surface.
2 to >28	GLACIAL TILL – Dense to very dense gray-brown silty SAND (SM) consisting of fine to coarse sand with 20 to 45 percent silt and 10 to 30 percent fine to coarse gravel. Stratum includes numerous cobbles and boulders based on drill rig response and coring. Hydraulic conductivity ranged from 0.01 to 0.6 in/hr. Soil resistivity ranged from 100,000 to 500,000 ohm-centimeters based on field measurements (may be influenced by underlying bedrock) and 12,000 to 15,000 ohm-centimeters when saturated in the laboratory. Sulfate concentration was less than 150 mg/kg. Total unit weight of glacial till is anticipated to range from 125 pcf to 145 pcf. Natural moisture content ranged from about 6 to 12 percent.
--	BEDROCK – Hard gray gneiss to white quartzite with a low foliation angle. Bedrock was encountered in each exploration except B-01 and B-14, which were terminated at a depth of 20 ft. Locally, the bedrock surface is weathered. About 3 ft of weathered bedrock was encountered in borings B-10 and B-14. Where bedrock was encountered, top of bedrock elevation ranged from El. 280 to 340, about 3 to 24 ft below ground surface. Bedrock was not encountered in boring B-01 above El. 257.5. Bedrock outcrops were observed in the central portion of Tract One. Unit weight of bedrock is anticipated to range from 150 pcf to 160 pcf.

We did not observe oily, stained, or odorous soils in the explorations. Note that chemical screening or laboratory chemical testing was not performed, nor was historic research performed to try to locate borings in areas with potential environmental impacts as part of our scope.

Fill was not encountered in the explorations; however, fill may be encountered locally, particularly in the developed portions of the tracts.

3.2 GROUNDWATER

Groundwater levels measured in test borings (during and after drilling) and observation wells ranged from about El. 270 to 322, corresponding to 5 to 20 ft below ground surface. Water levels observed in the borings shortly after drilling are typically influenced by drilling operations (water used for and rock coring), thus may not represent stabilized conditions. Groundwater levels will fluctuate with season, precipitation, and nearby construction activity. The piezometric level in the artesian-spring-fed pond is near El. 289.

4. Geotechnical Engineering Recommendations

4.1 GENERAL

This section provides recommendations for design of proposed structure foundations. Foundations should be designed and constructed in accordance with the Connecticut State Building Code, latest edition, applicable laws, regulations and ordinances, and the recommendations herein.

Expansive, dispersive, liquefiable, or collapsing soil and karst conditions were not encountered.

4.2 FOUNDATION DESIGN RECOMMENDATIONS

4.2.1 Foundation Types

Design structures to be supported on spread footings, ring foundations, or mat foundations bearing on glacial till, weathered bedrock, bedrock, or on Compacted Granular Fill placed following removal of the above-referenced materials. A summary of proposed structures, estimated existing and proposed grades, anticipated subgrade conditions, and recommended foundation type is provided on Table 4. Recommendations assume that earthwork related aspects of foundation construction (e.g., soil and bedrock excavation, proof-compaction, backfilling, and subgrade preparation) are conducted in accordance with the Construction Considerations section herein.

4.2.2 Spread Footing and Ring Foundation Design Criteria

- Design footings for the following maximum net allowable bearing pressures:
  - Compacted Granular Fill Subgrades: 2.5 tons per sq. ft (tsf).
  - Glacial Till (and Weathered Bedrock) Subgrades: 4 tsf.
  - Bedrock Subgrades: 10 tsf.
- For footings less than 3 ft in least lateral dimension, design for an allowable bearing pressure in tsf equal to the above values multiplied by B/3, where B is the footing width in ft.
- Allowable bearing pressures may be increased by 1/3 for transient loading conditions.
- Design for a minimum footing width of 18 in.
- Design footings to bear a minimum 3.5 ft below proposed exterior grade for frost protection.
- Locate footings to bear below a 1.5H:1V slope from the bottom of new or existing utility pipes, pits or other planned localized excavations.

4.2.3 Floor Slab Design Criteria

- Design lowest floor slabs as soil-supported slabs-on-grade bearing on a 12 in. thickness of Compacted Granular Fill or ¾ in. Crushed Stone separated from underlying soils using a geotextile filter fabric (6 oz/sy minimum).

- Design for an un-factored modulus of subgrade reaction (i.e., 1 ft by 1 ft plate modulus) of 125 lbs. per cu. in.
- Underslab drains should be provided for the Turbine Building (Area 14), Administration / Warehouse / Water Treatment Building (Area 15), Central Control Room (area 40), and other large floor slab or floor slabs that are sensitive to moisture. Underslab drains should consist of a 6-in. diameter perforated pipe surrounded by crushed stone and wrapped in a geotextile fabric.

4.2.4 Mat Foundation Design Criteria

- Design mats for the following maximum net allowable bearing pressures:
  - Compacted Granular Fill Subgrades: 2.5 tsf.
  - Glacial Till Subgrades: 4 tsf.
  - Bedrock Subgrades: 10 tsf.
- Design mats for the following moduli of subgrade reaction:
  - Compacted Granular Fill Subgrades: 35 pci.
  - Glacial Till (and Weathered Bedrock) Subgrades: 55 pci.
  - Bedrock Subgrades: 300 pci.
- Design mats to bear a minimum 3.5 ft below proposed exterior grade for frost protection.
- Position new mats to bear below a reference line drawn upward and outward on a 1.5H:1V slope from the bottom of adjacent exterior utilities or other underground structures.

4.2.5 Equipment Pad Design Criteria

Equipment pads should be designed using the recommendations for floor slabs with the exception that the thickness of the slab base course layer (Compacted Granular Fill or Crushed Stone) should be increased to 24 in. for partial frost protection or to 36 in. if full frost protection is required (assuming a 6 in. minimum pad thickness).

4.2.6 Structures Bearing on Multiple Subgrades

Structures which bear on more than one subgrade material type (i.e., Compacted Granular Fill and bedrock, Compacted Granular Fill and glacial till, glacial till and bedrock, or all three) should be designed using the lowest bearing pressure to reduce the potential for differential settlement.

Alternatively, a structural break could be provided at the change in subgrade. However, this would likely require additional explorations to refine the understanding of subsurface conditions at the structure of interest.

4.2.7 Foundation Concrete

Results of sulfate testing (sulfate concentration less than 150 mg/kg) indicate that sulfate resistant concrete is not required for concrete features (footings/foundations, ducts, etc.) in contact with the glacial till stratum.

4.3 SETTLEMENT

For the recommended allowable bearing pressures for soil bearing conditions, we estimate total settlement of footings and mats will be less than 1 in., and differential settlement between adjacent footings and within the mat will be less than ½ in. over a 30-ft distance where they bear on similar materials and less than ¾ in. over a 30-ft distance where they bear on different materials.

For the recommended allowable bearing pressures for the bedrock bearing condition, we estimate total and differential settlements will be less than ½ in. for footings and mats where they bear entirely on bedrock. Differential settlements of up to ¾ in. are possible where they bear on different materials.

These settlements will largely occur as load is applied (short term settlement).

4.4 SEISMIC DESIGN

The soils at the site are not considered liquefaction susceptible and seismically-induced settlement will not be significant during the design earthquake (less than ½ in.). In accordance with the Building Code, the seismic soil design criteria are as follows:

Site Class = D
S_S=0.229g
S_1=0.062g

Shear wave velocity measurements in the field may permit use of site Class C for structures which bear entirely on glacial till or site Class B or A for structures which bear entirely on bedrock.

4.5 LATERAL PRESSURES

Building foundation walls should be designed in accordance with the applicable below-listed lateral pressures. These recommendations assume the height of the wall (H) is defined as the distance in feet between the top of the slab and the top of adjacent finished floor level (or exterior site grade) on the retained earth side of the wall, the wall is drained full height, and grade is level within a lateral distance H of the backside of wall.

- Static Earth: 55 pounds per cubic foot (pcf) equivalent fluid unit weight (EFUW) for restrained walls (designed to be pinned at top and bottom of wall); and 35 pcf EFUW for unrestrained walls (designed as a cantilevered retaining wall).

- Seismic Earth: 9.1H pounds per square foot (psf) at the top of the wall (distributed as an inverted triangle).

- Surcharge: 0.5 or 0.3 times the vertical surcharge pressure (psf), uniformly distributed over the height of the wall for restrained and unrestrained walls, respectively. It may be feasible to reduce surcharge pressures depending on the geometry of the surcharge relative to the geometry of the wall (particularly for footings behind the wall). Such reductions would be evaluated on a case by case basis.

For seismic loading conditions, walls should be designed to resist static plus seismic earth pressures. Surcharge loading does not need to be considered for seismic design unless the surcharge will be applied over an extended time.

For walls with upward sloping conditions on the retained earth side of the wall, static earth and seismic pressures should be increased by the following factors:

- 3H:1V backslope: Multiply static earth and seismic values by 1.1.
- 2H:1V backslope: Multiply static earth and seismic values by 1.4.

For example, for unrestrained walls with a 3H:1V backslope condition, the EFUW for calculating the static earth pressure would be 38.5 psf per foot depth (i.e., 35 times 1.1), and the magnitude of the top of the inverted triangle for calculating seismic lateral pressures would be 10.0H (i.e., 9.1H times 1.1).

Foundation walls designed as retaining walls should be designed for a factor of safety of 1.5 against sliding and overturning under static loading conditions and 1.2 under seismic loading conditions. Passive soil pressure should not be included as a resisting force.

For restrained walls, we recommend that the structural drawings in the construction contract document package include a note indicating the sequence of wall construction (and more importantly restrictions on its backfilling). Additionally, notes should be provided that indicate the section(s) of floor slab(s) and framing required to be in-place prior to placement of backfill above a certain elevation behind the wall, and that cautions against future penetrations in floor slabs or framing that may compromise the lateral stability of the wall without appropriate engineering.

4.6 RESISTANCE TO LATERAL LOADS

Lateral loads may be resisted using a combination of friction between bases of mats and footings and underlying bearing materials, and passive restraint on the sides of mats, footings, walls, and grade beams.

The resistance to lateral loads provided by friction should be calculated using a coefficient of friction (ultimate) equal to 0.5 for soil bearing conditions and 0.6 for bedrock bearing conditions.

The static net (passive minus active) lateral resistance provided by the soil surrounding mats, footings walls, and grade beams can be calculated using an equivalent fluid unit weight of 200 pcf. If the horizontal distance between adjacent elements is less than twice the height of the subject structural element, reduce the passive pressure proportionately to the distance (i.e., full pressure at twice the height away) to accommodate interaction of the elements.

4.7 RESISTANCE TO UPLIFT LOADS

Resistance to uplift loads may be provided by the weight of the structure plus the wedge of soil above the footing or mat rising outward and upward on a 2V:1H slope to ground surface. The unit weight of the soil should be assumed as 120 pounds per cubic foot (pcf) for Compacted Granular Fill and 125 pcf for glacial till. If additional uplift resistance is required, rock anchors could be considered.

4.8 VAPOR RETARDERS, WATERPROOFING, DAMPPROOFING, AND INSULATION

Where finished floor elevations for proposed buildings will be at or above planned adjacent site grades (and not near adjacent cut slopes), permanent foundation or underslab drainage systems are not necessary, and waterproofing of ground floor slabs is also not considered necessary. Foundation walls should be insulated and damp-proofed in accordance with the Building Code.

We recommend that a moisture vapor retarder membrane be provided directly beneath ground floor slabs in occupied and finished spaces of the new structures, in accordance with ACI 302.2R-06, especially if humidity control is desired or relatively vapor-tight coverings will be used on the floor. Water vapor pressures, that can adversely impact highly vapor-tight or vapor-sensitive floor coverings, or adversely affect interior space humidity, can be present even when groundwater is at significant depths. An example retarder would be a 10-mil virgin HDPE membrane having a water permeance of 0.3 perms or lower (this recommendation does not consider requirements for protection of occupied spaces from radon or other environmental vapors or contaminants). The slab concrete design and construction procedures should consider impacts of the presence of the vapor retarder.

Walls and slabs for below-grade pits or similar structures where located in structures that will be underdrained should be waterproofed and designed for full hydrostatic pressure.

4.9 RADON MITIGATION

The “Indoor Radon Potential Map of Connecticut”, prepared by the CT DEEP, dated 1997, indicates the site is located within a “moderate-high” area of radon potential. Moderate-High zones are defined as areas where 33% of the tested homes in that area have basement air radon levels greater than or equal to 4.0 picocuries per liter of air (pCi/l), respectively. Given the radon potential, we recommend the project team assess if a radon protection system is warranted (considering occupancy, ventilation, risk, etc.).

4.10 EXTERIOR GRADING

Where possible, surface runoff should be directed away from structures by sloping grades downward away from the structures and providing low permeability surface finish within 10 ft of exterior walls. Low permeability surface finishes may include bituminous pavements, concrete sidewalks, or a 6-in. minimum thickness of low-permeability Fill.

4.11 UTILITES

Utility invert elevations are not available at this time.

Utilities beneath and adjacent to slabs and pads should be located above foundation bearing levels or above a reference line drawn downward and away from the lower edge of the soil-supported foundation element at a 1.5H:1V slope. For mats, utilities should be installed in conduits or corridors within the mat.

Utilities may be soil-supported (with suitable bedding) bearing on Glacial Till or on Compacted Granular Fill. Where encountered, bedrock should be removed to at least 12 in. below utility invert elevations to limit "hard" spots and potential cracking of utilities. Subgrades should be proof-compacted prior to placement of bedding materials. Soft or weaving soils observed during proof-compaction should be replaced with compacted Granular Fill.

The glacial till is not corrosive to metal based on the corrosion potential laboratory test results.

5. SITE DEVELOPMENT RECOMMENDATIONS

5.1 RETAINING WALLS

Foundation design criteria apply to the site retaining walls, with the exception that walls should be designed with no passive resistance.

A mechanically stabilized earth wall appears feasible for the utility switchyard retaining wall. If bedrock is encountered in the cut, a rock slope may be feasible for the lower portion of the retaining wall. Due to limited space behind the wall, temporary earth retaining systems (i.e., temporary soil nail wall) may be required for construction of an MSE wall near the existing cemetery (behind the north-south segment of the wall) and the property line. Alternatively, a permanent soil nail wall or a soldier pile and lagging wall appear feasible, and would have the added benefit of requiring less working area behind the wall.

A mechanically stabilized earth wall appears feasible for the power island retaining wall. The wall will need to be designed to include the 15 to 35-ft-high earth slope behind the wall and traffic on the perimeter road behind the wall.

We recommend that swales constructed using low permeability materials be provided behind retaining walls to divert surface water runoff laterally away from the walls.

5.2 SLOPES

Cut slopes up to 20 ft and fill slopes up to 35 ft are proposed. The preliminary site grading plan indicates slopes constructed at 3H:1V or flatter.

Seepage breakout should be anticipated in cut slopes (and possibly in some fill slopes), and may require mitigation using drains installed at the top, bottom, and/or mid-height of the slope depending on the height of the slope. These slopes may also require surficial stabilization using turf mats or armoring. Final selection of the stabilization approach would be handled on a case by case basis. Additionally, flatter slopes may be warranted, particularly for north facing slopes, to reduce the potential for sloughing due freeze-thaw effects. Slopes should be vegetated when possible for erosion protection.

Slopes steeper than 3H:1V should be assessed by a geotechnical engineer, and may require design by a geotechnical engineer. Such slopes may require geogrid reinforcement, drainage, or armoring with moderate to heavy rip rap materials depending on slope height, slope inclination, slope type (cut or fill), orientation of slope face, potential for seepage, and proximity of improvements (i.e. structures, roadways, etc.) behind slope.

The perimeter road located at the top of the fill slopes along the northwestern and northeastern side of the power island includes storm water structures. We recommend that storm water structures and pipes at the top of the slope (CB-9 through CB-14 [northeastern side] and CB-6 to CB-8 and CB-14 [northwestern side]) be watertight (such as fused HDPE) to prevent storm water from infiltrating into the earth slopes. Storm water system is shown on the drawing in Appendix A.

5.3 IMPOUNDMENT EARTH STRUCTURES

Earth impoundments are planned for the fuel oil berm (Area 46) around the fuel oil tank (Area 45) and for the sedimentation pond (Area 30). Slopes should be:

- 2.5H:1V or flatter for dry slopes (fuel oil berm); or
- 3H:1V or flatter for wet slopes (sedimentation pond).

The top of the impoundment should be a minimum of 5 ft wide, or wider if vehicular access is needed. Impoundments may be constructed using low-permeable fill. Penetrations through earth structures should be sealed with clay.

5.4 STORM WATER INFILTRATION

Hydraulic conductivity of fill that is comprised of glacial till (excavated from the site) is expected to be similar to the hydraulic conductivity measured in the glacial till.

In-situ hydraulic conductivity will vary in the field with variation in soil gradation, fabric, density, saturation, and other factors. For design, a factor of safety should be applied to account for variation in subsurface conditions, changes in hydraulic conductivity over time, engineering application, etc. The Connecticut Department of Energy and Environmental Protection (CT DEEP) recommends a factor of safety of 2 be used for storm water infiltration.

5.5 PAVEMENT RECOMMENDATIONS

Pavement recommendations are based upon our local experience, subsurface conditions, HS-20 loading, and reference CONNDOT Form 816. Secondary roads will be unpaved. The recommendations assume a 20-year design life; that a stable, firm subgrade is achieved beneath the base and subbase courses; subgrades are prepared as recommended in the Construction Considerations section of this report; and that standard CONNDOT Form 816 materials are used.

Pavement maintenance (crack sealing, etc.) will be required. Design assumes some risk of misalignment over time due to frost effects, as is normal local practice. To eliminate frost heave, a 3.5 ft thickness of non-frost susceptible material would be required, which is not commonly provided and would result in additional cost.

5.5.1 Flexible Pavement Design

We recommend flexible pavement for roadways and parking lots.

Material	Thickness (in.)			Specification (CONNDOT Form 816)
	Parking Lot	Standard Roads	Heavy Duty Roads	
Bituminous Top Course	1.5 in.	1.5 in.	1.5 in.	M.04.02 Class 2
Bituminous Binder Course	1.5 in.	2.5 in.	3.5 in.	M.04.02 Class 1
Processed Aggregate Base	4 in.	6 in.	8 in.	M.05.01
Compacted Gravel Subbase	8 in.	8 in.	8 in.	M.02.06 Grading B

5.5.2 Rigid Pavement Design

We recommend rigid pavement in the Ammonia Unloading Area (Area 24), Fuel Oil Unloading Area (Area 44) and other chemical unloading areas.

Material	Thickness (in.)	Specification (CONNDOT Form 816)
	Unloading Area	
Reinforced Concrete	8 in.	
Processed Aggregate Base	8 in.	M.05.01
Compacted Gravel Subbase	8 in.	M.02.06 Grading B

5.5.3 Pavement Drainage

Pavement design should consider that some of the on-site glacial till soils contain 20 to 45 percent fines, which would be frost susceptible. To reduce the potential for freezing of trapped water within the aggregate base course, the pavement subgrade should have a minimum transverse slope of at least 2 percent to provide drainage and pavement drains located along the outer edges of roadways and spaced at 50 ft intervals for parking lots.

6. Construction Considerations

This section provides comments related to foundation construction, earthwork and other geotechnical aspects of the project. It will aid those responsible for the preparation of contract plans and specifications and those involved with construction monitoring. Contractors must evaluate potential construction problems on the basis of their own knowledge and experience in the area and on the basis of similar localities, taking into account their own proposed construction methods and procedures.

6.1 EXCAVATION

Excavations up to 25 to 30 ft deep are proposed to reach subgrade. Excavation will be in glacial till and bedrock.

6.1.1 Soil Excavation

Conventional heavy construction equipment appears practical for excavation of overburden soils, and portions of the weathered rock. Cobbles and boulders will be encountered at the ground surface and in the glacial till.

Open cuts appear feasible. Excavation geometry should conform to OSHA excavation regulations contained in 29 CFR Part 1926, latest revision. Temporary soil slopes of 1.5H:1V, or flatter, appear suitable but should be confirmed during construction based on conditions at the time of excavation. Near-vertical temporary cuts in bedrock may be planned.

Depending on staging/sequencing construction, excavation support systems may be needed.

In areas where significant fill slopes are planned and existing grades slope steeper than 2.5H:1V, excavation subgrades should be prepared in “steps” for slope stability purposes. The step geometry should be assessed on a case by case basis.

6.1.2 Bedrock excavation

Hoe ramming and ripping may be feasible for shallow rock cuts but will not be feasible for mass rock excavation.

Blasting to remove bedrock will be required to establish proposed subgrades, and will need to be conducted in a controlled manner consistent with industry standards to limit over blasting, fly rock, and vibrations.

Pre-blast condition surveys should be conducted on structures of concern and structures located within 250 ft of the blast locations or as otherwise required under local ordinances/permits, if more stringent.

Perimeter control measures (e.g., line drilling, pre-splitting, or cushion blasting) are required where permanent rock slopes and steepened temporary rock slopes are planned. The purpose of these measures is to protect the integrity of the rock mass to remain.

To protect bearing surfaces and to reduce loss of integrity and unnecessary rock excavation caused by over blasting, we recommend that the maximum drill hole depth be limited to 2 ft below foundation and equipment pad bearing levels and 4 ft below slab and utilities subgrades.

Conventional blasting mats should be used during blasting to prevent fly rock. The Blasting Contractor should also be required to obtain all necessary local, state, and federal permits prior to blasting and should have a current license in the State of Connecticut.

Bedrock should be fractured or removed to a depth of at least:

- 12 in below bottom of foundations (to facilitate crushed stone placement) and utilities;
- 18 in. below pavement subgrade elevations to reduce the potential for reflective cracking of pavements;
- 18 in. below bottom of floor slabs; and
- 24 in. below the bottom of equipment pads.

Vibration monitoring during blasting should be conducted at and adjacent to structures of concern or between the blast and structure of concern (i.e. property line). We recommend that the Blasting Contractor be required to design blast rounds to maintain vibrations measured on the ground surface adjacent to structures of concern below the industry standards for vibrations as a function of frequency set forth in the United States Bureau of Mines Report of Investigation 8507. We further recommend that Threshold Values equal to 75% of the Limiting Value be adopted. The Blasting Contractor should be required to revisit its blasting plan with the Geotechnical Engineer should vibrations exceed the Threshold Values.

Rock excavation should be observed by a qualified representative of the Owner to assess if bedrock excavation is being conducted in accordance with the contract documents and the contractor's approved submittals.

To measure rock removal quantities for payment, we recommend performing a top of rock survey before rock removal commences, and using predetermined limits and methods to calculate the volume.

6.2 SUBGRADE PREPARATION

This section provides recommendations for preparation of subgrades for foundations, slabs, pavements, and general site. Subgrades should be observed in the field by the geotechnical engineer to confirm bearing conditions. Use of the recommended allowable bearing pressures is contingent upon observation to confirm and document that field conditions are consistent with the assumptions and design concept herein.

6.2.1 Site Preparation

Site preparation within the footprint of the proposed development should broadly include removal of the following:

- Vegetation, roots, and stumps;
- Stone walls;

- Topsoil;
- Subsoil (at a minimum in building, structure, retaining wall, and slope areas; may be feasible to leave in-place below mass fills in pavement areas and landscaped areas);
- Fill soil;
- Unsuitable materials;
- Structures and foundations; and
- Subsurface utilities.

Upon removal of the above materials, subgrades should be re-compacted, and excavations backfilled and compacted in engineered lifts to subgrades using the materials indicated herein.

6.2.2 Bedrock Bearing Foundations

Bedrock bearing foundations should be constructed on a 12-in. thick layer of ¾ in. crushed stone placed over the underlying bedrock. Excavation of rock should be controlled to reduce overbreak at bearing surfaces, such as can occur when blast holes are loaded too deeply. Where overbreak extends deeper than 2 ft below the bearing surface or overburden soils are present, disturbed and fractured rock and overburden soils should be removed and replaced with lean concrete up to the bottom of the crushed stone layer. Rock bearing surfaces should be inclined flatter than 4H:1V.

Survey elevation control will be required during blast hole drilling and during rock excavation to avoid overblasting the rock or excavating too deep below footings. Test sections should be blasted and excavated at the beginning of construction to aid in determining blast design and excavation methods and evaluate overbreak effects.

6.2.3 Soil Bearing (and Weathered Bedrock) Bearing Foundations

Subgrades that consist of soil or weathered bedrock should be proof-compacted with a vibratory plate compactor with a minimum 5,000 lbs. centrifugal force. Soft or yielding materials observed during proof-compaction should be replaced with Compacted Granular Fill. Following proof-compaction, subgrades should be protected by placing a 6 in. minimum thickness of ¾ in. size crushed stone (fully wrapped in geotextile) or a 3-in. thick concrete mudmat. Boulders that project above subgrades will need to be removed, and backfilled with Compacted Granular Fill. Large boulders may be partially removed using a hoe ram. Partial removals should extend a minimum of 6 in. below subgrades.

Unsuitable materials, where present below the bearing elevation, require excavation and replacement with suitable backfill within the Zone of Influence (ZOI) of the foundation element. The ZOI is defined by lines extending 2 ft laterally from the outside lower edges of the foundation element and down a 1H:1V slope to the top of suitable bearing materials (i.e., Glacial Till, weathered Bedrock). Alternatively, the footings can be lowered to bear on the exposed suitable bearing materials or can be supported on lean concrete placed following excavation of unsuitable materials. Where the lean concrete block approach is used, the block should: 1) be formed near-vertically, and 2) extend a minimum of 1 ft beyond the edges of the footing.

6.2.4 Floor Slabs and Equipment Pads

Topsoil, fill, and other unsuitable materials should be removed beneath the slabs prior to placing Compacted Granular Fill. The subgrade should be proof-compacted with at least four passes of a minimum 10-ton vibratory roller until firm. If soft or unsuitable material is encountered at the exposed subgrade, remove the unsuitable material and then backfill with Compacted Granular Fill until a firm and stable surface is achieved. Boulders that project above subgrades will need to be removed, and backfilled with Compacted Granular Fill. Large boulders may be partially removed using a hoe ram. Partial removals should extend a minimum of 12 in. below subgrades. Bedrock and/or over-blasted rock may remain in-place below a depth of 12 in. beneath the slab. Up to 2 ft of over-blasted rock may be left in-place beneath the slab subgrade provided the surface is re-compacted with several passes of a 10-ton vibratory roller, and then choked with suitable material.

6.2.5 Pavements

If a cut is necessary to reach the subbase subgrade elevation, the exposed subgrade should be proof-rolled with at least six passes of a heavy drum vibratory roller (25,000 lbs dynamic force). Soft or weaving areas exposed by the proof-rolling should be excavated to firm material or to a maximum depth of 18 in. below the pavement subbase elevation, and replaced with compacted layers of Common Fill or Compacted Granular Fill. In fill areas, unsuitable materials should be removed and the subgrade should be proof-rolled as noted above. Common Fill or Compacted Granular Fill should then be used as fill to reach the proposed subbase elevation.

6.3 DEWATERING

Final excavation, subgrade preparation, filling, foundation construction, and utility construction should be conducted "in the dry". Since most excavations will be in low permeability soils and bedrock, we anticipate that temporary construction dewatering activities will likely be minor, and largely related to control of precipitation that falls on excavations and surface water runoff into excavations. Seepage of groundwater through fissures in the bedrock should also be anticipated.

We anticipate that dewatering can be accomplished by open pumping from sumps, temporary ditches, and trenches within and around excavations. Dewatering systems should be designed and operated to prevent pumping of fines, disturbance to subgrades and undermining of previous construction. Excavations should be performed to direct accumulated water away from work areas to sump locations and away from the excavation itself. Subgrades which become disturbed due to the presence of water should be re-excavated and stabilized. Stabilization methods may include placement of crushed stone with filter fabric with approval of the Geotechnical Engineer.

6.4 BACKFILL MATERIALS

6.4.1 Compacted Granular Fill

Compacted Granular Fill is recommended for the following areas:

- to replace unsuitable soil under footings, floor slabs, mats, and utilities; and
- to provide drainage against foundation walls or retaining walls.

Compacted Granular Fill should be placed in maximum 12-in. thick lifts and compacted to at least 95 percent of the maximum dry density determined by ASTM D1557. In confined areas, the lift thickness should be reduced to 6-in. maximum. Compaction equipment in confined areas may consist of hand-guided vibratory equipment or mechanical tampers.

Compacted Granular Fill should consist of sandy gravel or gravelly sand, free of organic material, environmental contaminants, snow, ice, frozen soil, or other unsuitable material, and be well-graded within the following limits:

U.S. Standard Sieve Size	Percent Finer by Weight
6 in. (1)	100
No. 4	30-80
No. 40	10-50
No. 200 (2)	0-8

(1) Use a maximum 3-in. size for fill placed within 6 in. of concrete slabs or footings, and within 3 ft of foundation walls.
(2) For Compacted Granular Fill placed as part of perimeter drainage systems behind foundation walls or retaining walls, the maximum percent passing the No. 200 sieve should be 5% unless otherwise approved by the Geotechnical Engineer.

6.4.2 Crushed Stone Fill

Crushed stone is recommended for the following areas:

- surrounding the drain pipes for foundation walls and retaining walls;
- surrounding the drain pipes for pavement drains;
- to provide drainage against foundation walls or retaining walls; and
- footing bearing surface protection below groundwater level (6 in. thick on geotextile).

Crushed stone should consist of No. 6 crushed stone (3/4-in. size) in accordance with Connecticut Department of Transportation Form 816, M.01.01.

6.4.3 Common Fill

Common fill may be used for raising grades below pavement sections and landscaped areas. Common Fill should consist of mineral sandy soil, free from organic matter, plastic, metal, wood, ice, snow, debris, recycled materials, or other deleterious material and should have the characteristic that it can be readily placed and compacted. Common Fill imported to the site should have a maximum of 80 percent passing the No. 4 sieve and a maximum of 30 percent finer than the No. 200 sieve. The maximum particle size should be the smaller of 2/3 the lift thickness or 6 in. Silty common fill soils will require moisture control during placement and compaction.

6.4.4 Low-Permeable Fill

Low permeable fill is recommended as the final 12 in. thickness of fill at ground surface above foundation wall backfill except in areas where pavements or other structures are constructed at ground surface. Low-permeable fill should consist of common fill with a minimum 20 percent passing a No. 200 sieve.

6.4.5 Geotextile

A filtration-type geotextile is recommended between crushed stone and surrounding soil. Geotextile should consist of Tencate Mirafi 160N or equivalent.

6.4.6 Compaction

Recommended compaction requirements are as follow:

Location	Minimum Compaction Requirements
Beneath and around footings, under slabs	95%
Parking, roadways	92% up to 3 ft below finished grade 95% in the upper 3 ft
Landscaped areas	90%

Minimum compaction requirements refer to percentages of the maximum dry density determined in accordance with ASTM D1557C.

6.5 USE OF ON-SITE EXCAVATED SOIL AND ROCK

6.5.1 Soils

Excavation will be in topsoil, subsoil, potentially fill soils locally, glacial till, or bedrock. Topsoil may be reused as topsoil, subject to meeting nutrient requirements, and as Common Fill in landscaped areas.

The subsoil is not suitable for re-use as Compacted Granular Fill due to its high silt content. Subsoil may be reused in landscaped areas as Common Fill or where at least 3 ft below pavements.

Fill soils, if encountered, will need to be evaluated on a case by case basis for reuse.

Although the Glacial Till may not meet the specifications for Compacted Granular Fill, it may be technically feasible from a geotechnical perspective to use it as such during favorable weather and where free-draining material is not required, provided it can be placed to the specified degree of compaction and cobbles and boulders are removed prior to reuse. The Glacial Till will be difficult to impossible to reuse if it becomes wet. As such, careful moisture control will be

required to achieve satisfactory compaction. Wet materials will need to be dried, blended with other materials, or amended with lime stabilization prior to placement and compaction, which can result in delays particularly during relatively cold or wet weather. Rainfall or melting snow can readily saturate stockpiled soils. Providing drainage away from and/or covering a stockpile can help limit this potential problem. The Glacial Till will require considerable drying time if left in an unprotected stockpile for an extended period of time. Screening and removal of oversized materials (i.e., 2/3 the lift thickness or 6-in.) will be necessary. Where Glacial Till is placed in fills exceeding 5 ft, the material will require placement dry of its optimum moisture content to limit the potential for post-placement settlement.

6.5.2 Bedrock, Cobbles, and Boulders

Blast rock, cobbles, and boulders may be reused as compacted rock fill below footings and slabs or for general site grade raises. Blast Rock Fill may be placed and compacted above the prepared excavation subgrade to within 5 ft of footing subgrades, utility inverts, and finished site grades. Above the Blast Rock Fill, Processed Rock Fill may be placed and compacted to footing and slab bearing levels. Geotextile filter fabric is required to be placed over the Processed Blast Rock Fill prior to placing other soil fill materials. Suitable choking material(s) are required to be placed over Blast Rock Fill prior to placing other soil fill materials.

Blast Rock Fill could consist of well-graded unprocessed or processed on-site, angular blast rock. Individual rocks in Blast Rock Fill should have a largest dimension not exceeding approximately 15 in. Blast Rock Fill must be substantially free of soil-sized material. Blast Rock Fill should be placed in layers not exceeding 20 in. in loose lift measure and compacted by a minimum of four passes of heavy self-propelled vibratory equipment imparting a dynamic force of at least 40,000 lbs. The development of proper construction specifications and monitoring of the fill placement will be important to the satisfactory performance of compacted Blast Rock Fill.

Blast rock may be used on-site as Blast Rock Fill, provide the blasting program (i.e., blast hole diameter, spacing and loading) is carefully planned to obtain the specified gradation. Rocks larger than 15 in. must be segregated and removed prior to use as Blast Rock Fill.

Processed Rock Fill should consist of well-graded rock with a largest particle size of 1.5 in. It is anticipated that the Processed Rock Fill will consist of blast rock processed by crushing on-site.

Processed rock fill may also be mixed with excavated Glacial Till soil to reduce the fines fraction and increase the coarse fraction (of the Glacial Till) to facilitate ease of placement and compaction and increase reuse of the silty Glacial Till.

6.6 EARTHWORK DURING FREEZING WEATHER

Precautions should be taken if work takes place while temperatures are below freezing. Frozen soil or soil containing snow or ice should not be used as compacted fill. Placement of fill should not be conducted when air temperatures are below freezing. Soil bearing surfaces below slabs and foundations must be protected against freezing, before and after placement of concrete. Frost protection should be provided as soon as possible after foundations are constructed.

Fill should not be placed on snow, ice or frozen subgrades. At the end of each day's operations, the last lift of placed fill should be rolled by a smooth-wheeled roller to eliminate ridges of uncompacted soil to aid runoff and drainage. Silty site soils are susceptible to disturbance by freezing, especially in the presence of water and traffic.

6.7 ABANDONING WELLS

The five ground water observation wells installed during the subsurface explorations and the 160-ft deep water well installed circa 2010 should be abandoned in accordance with CT DEEP requirements. Abandonment per CTDEP requirements is intended to protect groundwater.

7. Recommendations for Future Geotechnical Services

7.1 ADDITIONAL SUBSURFACE EXPLORATIONS FOR ESTIMATING ROCK EXCAVATION

Rock excavation is expected; we recommend additional borings be performed in cut areas (central portion of power island) to better define rock excavation quantities and attempt to balance earthwork cut and fill. Current boring spacing is too large to accurately estimate rock excavation quantity. We recommend borings be spaced about 100 ft apart and advanced to a depth of 5 feet below the proposed finished grade and core a minimum of 5 ft of rock where rock is encountered (to determine if the rock is bedrock or a boulder).

7.2 ADDITIONAL SUBSURFACE EXPLORATIONS FOR FOUNDATION DESIGN

Borings were generally widely spaced and no borings were performed along the proposed retaining walls on Tract One and Tract Two. We recommend additional borings be performed along retaining walls and in the footprint of the power island and switchyards, to assist with defining the limits of glacial till and bedrock subgrade for each structure (and determine location of subgrade changes). In cut areas (foundations likely to bear on rock), borings should be advanced to a depth of 5 feet below the proposed finished grade and core a minimum of 5 ft of rock where rock is encountered (to determine if the rock is bedrock or a boulder). In fill areas (foundations likely to bear on soil), borings should be advanced to a depth of 15 to 20 ft below the existing grade and core a minimum of 5 ft of rock where rock is encountered (to determine if the rock is bedrock or a boulder).

7.3 ADDITIONAL SUBSURFACE INVESTIGATIONS AND SLOPE STABILITY ANALYSIS

We recommend additional borings be performed along proposed permanent soil cut slopes to evaluate slope stability, drainage, safety measures, and construction considerations. Currently, no borings are located at the proposed soil cut slope in the southern portion of Tract One (south of power island) or southwest of the utility switchyard (on Tract Two). For soil cut slopes greater than 10 ft high, we recommend that borings be performed along the slope at about 100 ft spacing and the borings extend to a depth of about twice the cut height (below existing grade) and core a minimum of 5 ft of rock where rock is encountered (to determine if the rock is bedrock or a boulder).

We recommend additional borings be performed along proposed permanent soil fill slopes to evaluate slope stability (considering structures and earth structures near the crest of the slope), drainage, safety measures, and construction considerations. Currently, no borings are located at the proposed soil fill slopes in the northern and western portions of Tract One (north and west of the power island). For soil fill slopes greater than 10 ft high, we recommend that borings be performed along the slope at about 100 ft spacing and the borings extend to a depth of about the fill height (below existing grade) and core a minimum of 5 ft of rock where rock is encountered (to determine if the rock is bedrock or a boulder).

Where rock cuts are planned, we recommend additional borings be performed along proposed permanent rock cut slopes to evaluate slope stability, the need for fall zones and other safety measures, and construction considerations. Where rock cut slopes are planned, we recommend that borings be performed along the slope at about 100 ft spacing and the borings extend to a depth of the rock cut plus a minimum of 5 ft. Laboratory testing on rock specimens may also be recommend.

7.4 SHEAR WAVE VELOCITY MEASUREMENTS

Shear wave velocity measurements were beyond the scope of our work. Shear wave velocity measurements in the field may permit use of site Class C for structures which bear entirely on glacial till or site Class B or A for structures which bear entirely on bedrock. Use of alternate Site Class may reduce the seismic demand of the structure and reduce the cost of construction for those structures.

7.5 COMPRESSION WAVE VELOCITY MEASUREMENTS

Compression wave velocity measurements were beyond the scope of our work. Compression wave velocity measurements in the field can provide data to assist with determining if the rock is rippable or if blasting will be required.

7.6 ALTERNATE FOUNDATION RECOMMENDATIONS

Should other foundations (piles, caissons, rock anchor, etc.) be required, we can provide recommendations for alternate foundation types once the load is available. Additional borings may be recommended for alternate foundations.

7.7 CONTRACT DOCUMENTS

We recommend that Haley & Aldrich prepare specifications for geotechnical aspects of the proposed construction including earthwork, dewatering, controlled blasting and review geotechnical aspects of the final plans and specifications prepared by others in order to confirm that our recommendations were interpreted and implemented as intended.

7.8 SUBMITTAL, SPECIFICATION, AND PLAN REVIEW

We recommend that Haley & Aldrich review submittals and design documents prepared by the earthwork and blasting contractors for general compliance with industry procedures and project requirements.

7.9 CONSTRUCTION MONITORING

The recommendations contained in this report are based on known and predictable behavior of properly engineered and constructed foundations and other facilities. We recommend that personnel qualified by training and experience perform full-time field observations of the geotechnical aspects of construction, including:

- removal of unsuitable materials;
- mass earthwork excavation and filling;
- processing and preparation of excavated soil and rock for reuse;
- construction of temporary and permanent soil and bedrock slopes;
- preparation of foundation bearing surfaces;
- preparation of pavement subgrades;
- installation of foundation and pavement drainage systems;
- placement and compaction of crushed stone and granular fill (including field compaction control testing);

- well abandonment; and
- blasting and associated vibration monitoring.

It is recommended that Haley & Aldrich be retained to perform field observations of the geotechnical aspects of construction based on familiarity with the subsurface conditions, design concepts, and specifications. Field observations are intended to confirm compliance with the design concepts and specifications and to allow design changes in the event that subsurface conditions differ from those anticipated prior to construction.

Table 1
Summary of Subsurface Explorations
Killingly Energy Center
Killingly, Connecticut
Project Number: 43434-000

BORING NO.	GROUND SURFACE ELEVATION	NORTHING	EASTING	EXPLORATION TYPE	TOTAL DEPTH (FT)	THICKNESS OF STRATA (FT)				BEDROCK LEVEL (FT)		WATER LEVEL (FT)		NOTES
						TOPSOIL	SUBSOIL	GLACIAL TILL	WEATHERED BEDROCK	DEPTH	ELEVATION	DEPTH	ELEVATION	
B-01(OW)	277.5	876663.3	1227059.1	boring, well, permeability	20.0	1.5	1.0	17.5	--	--	< 257.5	7.3	270.3	Terminated at planned depth (20 feet).
B-02	301.4	876440.6	1227007.8	boring	21.0	0.8	0.6	14.6	--	16.0	285.4	11.0	290.4	
B-03(OW)	299.6	876278.6	1226824.1	boring, well	26.0	0.4	2.6	17.5	--	20.5	279.1	20.3	279.3	
B-04[6]	317.9	876250.7	1227065.6	boring, permeability	16.0	0.5	1.5	9.0	--	11.0	306.9	8.4	309.5	
B-05	308.9	876214.3	1227178.0	boring	28.5	0.5	1.5	21.5	--	23.5	285.4	8.0	300.9	
B-06	324.4	876135.9	1226980.6	boring, permeability	8.0	0.5	0.5	2.0	--	3.0	321.4	--	--	
B-07(OW)	345.3	875991.4	1227082.8	boring, well	10.5	0.4	0.6	4.5	--	5.5	339.8	--	--	
B-08[6]	299.5	876108.5	1226670.1	boring	20.5	0.7	3.8	11.0	--	15.5	284.0	--	--	
B-09	320.9	875968.8	1226776.7	boring	--	--	--	--	--	--	--	--	--	Omitted per Mott MacDonald.
B-10(OW)	322.8	875909.5	1226821.1	boring, well, permeability	22.4	0.5	1.5	13.0	3.0	18.0	304.8	14.6	308.2	
B-011[6]	312.3	876073.5	1227369.9	boring, permeability	28.0	1.5	2.0	18.5	--	22.0	290.3	NR	NR	Offset 26' north and 83' east per Mott MacDonald.
B-12(OW)	330.5	875928.2	1227230.1	boring, well	29.0	0.6	1.0	22.4	--	24.0	306.5	9.0	321.5	
B-13	343.8	875733.8	1227120.0	boring	28.0	0.6	1.4	16.0	--	18.0	325.8	NR	NR	
B-14	343.4	875647.1	1227443.2	boring	22.0	0.7	0.5	17.8	3.0	--	<321.4	--	--	Terminated beyond planned depth (20 feet).
B-15[6]	321.4	876020.5	1227764.4	boring	21.0	1.2	1.3	3.3	--	--	<300.4	--	--	Offset 65' northwest to avoid house. Cored 15 feet (cobbles and boulders).
B-16	310.9	875521.0	1227859.9	boring	25.0	0.6	4.4	15.0	--	20.0	290.9	4.5	306.4	
B-17	325.7	875296.1	1227766.5	boring	30.0	2.0	--	28.0	--	--	<295.7	--	--	Cored 4.5 feet (cobbles and boulders).
B-18	310.8	875720.5	1227885.2	boring	30.0	0.7	3.0	14.3	--	18.0	292.8	7.4	303.4	
E-01	323.9	876206.3	1227019.1	soil resistivity										
E-02	318.7	876022.7	1227309.9	soil resistivity										
E-03	314.2	875431.9	1227820.2	soil resistivity										

NOTES:

1. ">" indicates greater than
   "<" indicates less than
   "--" indicates not encountered
   "NR" indicates data not reported
2. Elevations are in feet and reference North American Vertical Datum of 1988 (NAVD88).
3. Refer to test boring logs for detailed soil descriptions.
4. Fill thickness includes topsoil.
5. Exploration locations staked by GM2 Associates on 16 and 17 May.
6. Offset noted on boring log

Table 2
Summary of Geotechnical Laboratory Test Results
Killingly Energy Center
Killingly, Connecticut
Project Number: 43434-000

Boring Identification	Sample Identification	Depth (feet)	Sample Type	Strata	Moisture Content (percent)	USCS Symbol	Sieve Analysis		
							Gravel (percent)	Sand (percent)	Fines (percent)
B-4	S2	2-4	SPT	Glacial Till	6.1	SM	37.3	40.7	22.0
B-10	S2	2-4	SPT	Glacial Till	11.1	SM	7.5	48.8	43.7
B-12	S4	7-9	SPT	Glacial Till	11.2	SM	10.4	46.7	42.9
B-13	S4	7-9	SPT	Glacial Till	8.8	SM	29.3	41.3	29.4
		Method (general accordance) -->			ASTM D2216		ASTM D422		

NOTES:

1. Refer to laboratory test results in Appendix for additional information.

Table 3
Summary of Corrosion Potential Laboratory Test Results
Killingly Energy Center
Killingly, Connecticut
Project Number: 43434-000

Boring Identification	Sample Identification	Depth (feet)	Sample Type	Soil Strata	pH	Electrical Resistivity[1] (ohm-cm)	Electrical Resistivity[2] (ohm-cm)	Sulfate Concentration (mg/kg)	Chloride Concentration (mg/kg)	Sulfides Concentration (mg/kg)	Redox Potential (mv)
B-16/B-17/B-18	East	1-5	Bulk	Glacial Till	7.1	16,000	12,000	80	10	0.67	73
B-02/B-04/B-06/B-08/B-10/B-12	West	1-5	Bulk	Glacial Till	6.1	42,000	15,000	50	10	0.35	284
Method (general accordance) -->					ASTM G51	ASTM G57	ASTM G57	ASTM D516	ASTM D512	SM 4500-S2-D	SM 2580 B

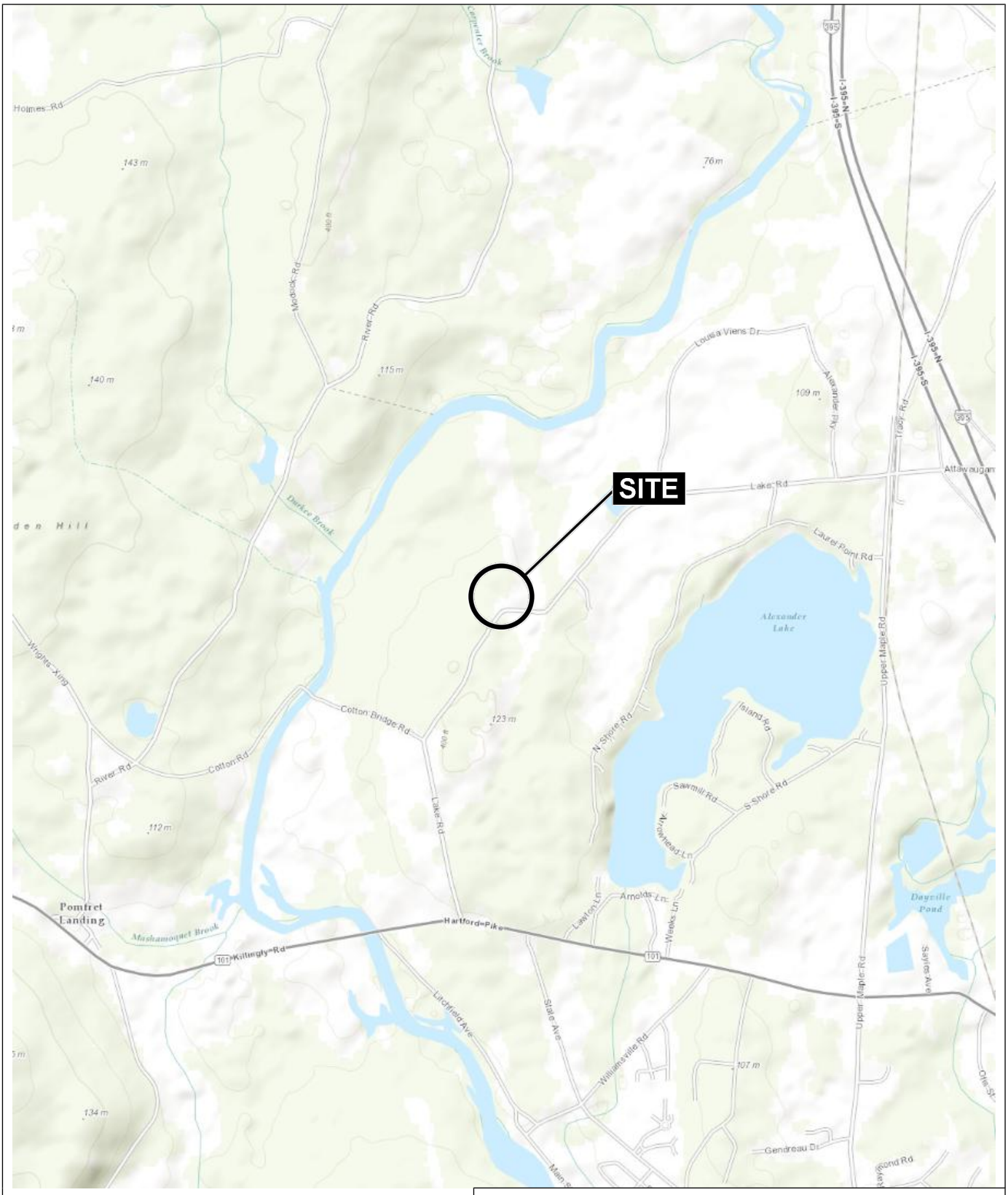
NOTES:

1. Electrical resistivity at moisture content received by laboratory.
2. Saturated electrical resistivity.
3. Refer to laboratory test results in Appendix for additional information.

Table 4
Summary of Geotechnical Recommendations
Killingly Energy Center
Killingly, Connecticut
Project Number: 43434-000

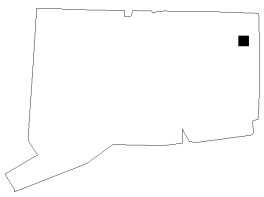
Structure[1]	Nearest Boring	Existing Grade	Proposed Grade	Grade Change (feet)	Expected Subgrade Material[2]	Estimated Load: Weight (pounds) or Pressure (psf)[1]	Planned Support[1]	Recommended Foundation Type	Comments[1]
1. Combustion Turbine (CT)	B-06	320 to 330	315	cut 5 to cut 15	bedrock	---	---	mat foundation	---
2. Combustion Turbine Generator (GTG)	B-07	326 to 336	315	cut 11 to cut 21	bedrock	1,700,000	mat foundation	mat foundation	dynamic loads (sensitive to settlement)
3. Heat Recovery Steam Generator (HRSG)	B-03	298 to 310	315	fill 17 to fill 5	granular fill	8,000,000	mat foundation	mat foundation	static loads
4. Closed Cooling Water	B-03	290 to 296	315	fill 25 to fill 19	granular fill	---	---	ring or mat foundation	---
5. Steam Turbine (ST)	B-04	318	315	fill 3	granular fill	---	---	mat foundation	---
6. Exhaust Stack	B-03	296 to 300	315	fill 19 to fill 15	granular fill	---	---	mat foundation	21' diameter by 175' tall
7. Steam Turbine Generator (STG)	B-04	306 to 314	315	fill 9 to fill 1	granular fill	1,900,000	concrete pedestal	mat foundation	dynamic loads (sensitive to settlement)
8. Generator Step-Up Transformer (GSU)	B-07	338 to 342	315	cut 23 to cut 27	bedrock	410,000	concrete pedestal	mat foundation	---
9. STG Step-Up Transformer	B-05	306 to 314	315	fill 9 to fill 1	granular fill	---	---	equipment pad	
10. Air Inlet Filter House	---	---	---	---	---	---	---	spread foundation	Not shown on plan
11. Auxiliary Boiler	B-03	296 to 302	315	fill 19 to fill 13	granular fill	---	---	spread foundation	---
12. Auxiliary Transformer	B-07	336 to 340	315	cut 21 to cut 25	bedrock	120,000	concrete pedestal	mat foundation	---
13. Air Cooled Condenser (ACC) & Collector Enclosure	B-02	288 to 310	315	fill 27 to fill 5	granular fill	---	---	spread foundation	15 cells
14. Turbine Building	B-04/B-05/B-06/B-07	306 to 336	315	fill 9 to cut 21	granular fill / glacial till / bedrock	---	---	spread foundation	---
15. Admin/Warehouse/Water Treatment Building	B-11	300 to 310	320	fill 20 to fill 10	granular fill	500 office / 1000 warehouse	---	spread foundation	65' by 175' prefabricated steel structure
16. Raw/Fire Water Storage Tank & RW Pumps (at-grade tank)	B-08	294 to 296	315	fill 21 to fill 19	granular fill	---	ring or mat foundation	ring foundation	45' diameter by 45' tall (450,000 gallons)
17. Fire Pumps Enclosure	B-08	288 to 292	315	fill 27 to fill 23	granular fill	---	---	spread foundation	---
18. Demineralized Water Storage Tank and Pumps (at-grade tank)	B-08	284 to 290	315	fill 31 to fill 25	granular fill	---	ring or mat foundation	ring foundation	45' diameter by 45' tall (450,000 gallons)
19. Demineralized Water Trailers Area	B-08	290 to 296	315	fill 25 to fill 19	granular fill	---	---	equipment pad	---
20. Fuel Gas Metering	B-15	330 to 332	320	cut 10 to cut 12	bedrock	---	---	equipment pad	---
21. Fuel Gas Heater	B-06	308 to 312	315	fill 7 to fill 3	granular fill	---	---	equipment pad	---
22. Diesel Generator	B-05	322 to 326	315	cut 7 to cut 11	glacial till	---	---	equipment pad	---
23. Plant Switchyard	B-11/B-12	310 to 340	320	fill 10 to cut 20	glacial till	---	---	equipment pad	---
24. Ammonia Storage Tank, Pumps & Unloading Area (at-grade tank	B-03	296 to 300	315	fill 19 to fill 15	granular fill	---	---	ring or mat foundation	---
25. Boiler Feed Pumps	B-03	302 to 306	315	fill 13 to fill 9	granular fill	---	---	equipment pad	---
26. STG Lube Oil Skid	B-04	316 to 320	315	cut 1 to cut 5	glacial till	20,000	---	mat foundation	---
27. Air Compressors, Receivers & Dryers Skid	B-04	326 to 328	315	cut 11 to cut 13	bedrock	---	---	equipment pad	---
28. Fuel Gas Final Filter	B-06	308	315	fill 7	granular fill	---	---	equipment pad	---
29. Duct Burner Skid	B-04	308 to 310	315	fill 7 to fill 5	granular fill	---	---	equipment pad	---
30. Detention Pond (earth structure)	B-01	272 to 280	310	fill 38 to fill 30	granular fill	---	---	earth structure	---
31. STG Drains Tank & Sump	B-04	314	315	fill 1	glacial till	---	---	equipment pad	---
32. HRSG Blow Off Tank & Drain Pumps	B-03	298	315	fill 17	granular fill	---	---	equipment pad	---
33. HRSG Blowdown Sump	B-03	302 to 304	315	fill 13 to fill 11	granular fill	---	---	equipment pad	---
34. Storm Water Retention Pond (earth structure)	---	---	---	---	---	---	---	earth structure	Not shown on plan
35. Civil Oil Water Separator	---	---	---	---	---	---	---	spread foundation	Not shown on plan
36. BOP Motor Control Center (MCC)	B-04	308 to 310	315	fill 7 to fill 5	granular fill	---	---	spread foundation	---
37. Plant Gate	---	---	---	---	---	---	---	spread foundation	Not shown on plan
39. CTG Electrical Package	B-07	326 to 332	315	cut 11 to cut 17	bedrock	---	---	equipment pad	---
40. Central Control Room/Electrical	B-07	324 to 338	315	cut 9 to cut 23	bedrock	---	---	spread foundation	---
41. Ammonia Injection Skid	B-03	302 to 304	315	fill 13 to fill 11	granular fill	---	---	equipment pad	---
42. Continuous Emissions Monitoring System (CEMS)	B-03	298	315	fill 17	granular fill	---	---	spread foundation	---
43. Pipe Rack	B-03	300 to 320	315	fill 15 to cut 5	granular fill / glacial till	---	---	pier/spread foundation	---
44. Fuel Oil Unloading	B-07	324 to 334	315	cut 9 to cut 19	bedrock	---	---	equipment pad	---
45. Fuel Oil Tank (at-grade tank)	B-10	316 to 324	315	cut 1 to cut 9	glacial till	---	ring or mat foundation	ring foundation	75' diameter by 45' tall (1,000,000 gallons)
46. Fuel Oil Berm (earth structure)	B-10	300 to 324	315	fill 15 to cut 9	glacial till	---	---	earth structure	---
47. GT Lube Oil Skid	B-07	324 to 326	315	cut 9 to cut 11	bedrock	---	---	equipment pad	---
48. Fuel Gas Compressors	B-05	294 to 300	315	fill 21 to fill 15	granular fill	---	---	equipment pad	---
A. Power Control Modules (PCM)	---	---	---	---	---	750 dead	---	mat foundation	Not shown on plan (6' to 8' above grade)
B. Plant Road	B-14	---	---	---	---	---	---	not applicable	---
C. Utility Switchyard	B-16/B-17/B-18	320 to 350	325	fill 5 to cut 25	granular fill / glacial till / bedrock	---	---	---	---
D. Utility Switchyard - Retaining Wall	B-17	330 to 350	325	cut 5 to cut 25	glacial till / bedrock	---	---	spread foundation	---

NOTES: "--" data not available
1 Appendix A (provided by NTE Energy)
2 Recommendations are preliminary for structures not shown on plan or no data provided



MAP SOURCE: ESRI

SITE COORDINATES: 41°51'45"N, 71°54'50"W



HALEY ALDRICH

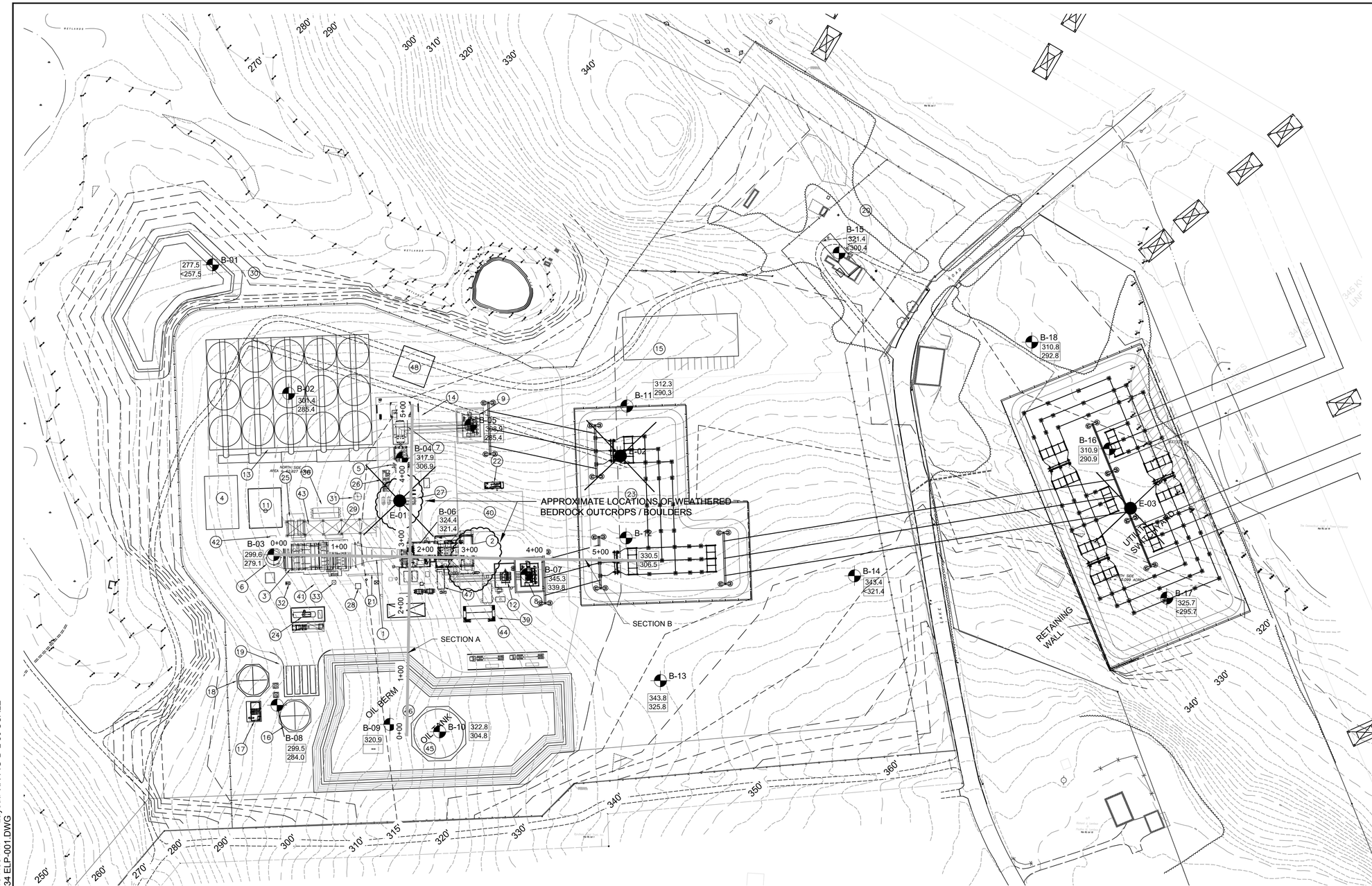
NTE ENERGY
KILLINGLY ENERGY CENTER
180 & 189 LAKE ROAD
KILLINGLY, CONNECTICUT

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
MAY 2016

FIGURE 1

43434-000_1_LOCUS.PDF



STRUCTURE IDENTIFICATION LEGEND:

1. COMBUSTION TURBINE (GT)
2. COMBUSTION TURBINE GENERATOR (GTG)
3. HEAT RECOVERY STEAM GENERATOR (HRSG)
4. CLOSED COOLING WATER
5. STEAM TURBINE (ST)
6. EXHAUST STACK
7. STEAM TURBINE GENERATOR (STG)
8. GENERATOR STEP-UP TRANSFORMER (GSU)
9. STG STEP-UP TRANSFORMER
10. AIR INLET FILTER HOUSE (NOT SHOWN)
11. AUXILARY BOILER
12. UNIT AUXILARY TRANSFORMER
13. AIR COOLED CONDENSER (ACC) & CONDENSATE COLLECTION ENCLOSURE
14. TURBINE BUILDING
15. ADMIN/ WAREHOUSE/ WATER TREATMENT BUILDING
16. RAW / FIRE WATER STORAGE TANK & RW PUMPS
17. FIRE PUMPS ENCLOSURE
18. DEMINERALIZED WATER STORAGE TANK & PUMPS
19. DEMINERALIZED WATER TRAILERS AREA
20. FUEL GAS METERING
21. FUEL GAS HEATER
22. DIESEL GENERATOR
23. PLANT SWITCHYARD
24. AMMONIA STORAGE TANK, PUMPS, & UNLOADING AREA
25. BOILER FEED PUMPS
26. STG LUBE OIL SKID
27. AIR COMPRESSORS, RECEIVERS & DRYERS SKID
28. FUEL GAS FINAL FILTER
29. DUCT BURNER SKID
30. DETENTION POND
31. STG DRAINS TANK & SUMP
32. HRSG BLOW OFF TANK & DRAINS PUMPS
33. HRSG BLOWDOWN SUMP
34. STORM WATER RETENTION POND
35. CIVIL OIL WATER SEPARATOR (NOT SHOWN)
36. BOP MOTOR CONTROL CENTER (MCC)
37. PLANT GATE (NOT SHOWN)
38. NOT USED
39. CTG ELECTRICAL PACKAGE
40. CENTRAL CONTROL ROOM / ELECTRICAL
41. AMMONIA INJECTION SKID
42. CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS)
43. PIPE RACK
44. FUEL OIL UNLOADING
45. FUEL OIL TANK
46. FUEL OIL BERM
47. GT LUBE OIL SKID
48. FUEL GAS COMPRESSORS

LEGEND

B-01 / E-01 — APPROXIMATE LOCATION OF HALEY & ALDRICH TEST BORING DRILLED BY NYEG DRILLING BETWEEN 23 MAY AND 2 JUNE 2016.

APPROXIMATE LOCATION OF FIELD ELECTRICAL RESISTIVITY TEST BY CONSULTING ENGINEERING GROUP ON 25 MAY 2016.

EXISTING GRADE

PROPOSED GRADE

301.4 — APPROXIMATE GROUND SURFACE ELEVATION

285.4 — APPROXIMATE TOP OF BEDROCK ELEVATION

NOTES

1. BASEPLAN IS DRAWING "16042_OVERALL.DWG" PROVIDED BY MOTT MACDONALD ON 19 MAY 2016.
2. PROPOSED STRUCTURE LOCATIONS AND DESIGNATIONS ARE FROM DRAWINGS "334954CT-BOUND_5.20.16_2010.DWG" AND "334954CT-ELECBOUND_2010.DWG" PROVIDED BY MOTT MACDONALD ON 7 JUNE 2016.

HALEY ALDRICH

NTE ENERGY
KILLINGLY ENERGY CENTER
180 & 189 LAKE ROAD
KILLINGLY, CONNECTICUT

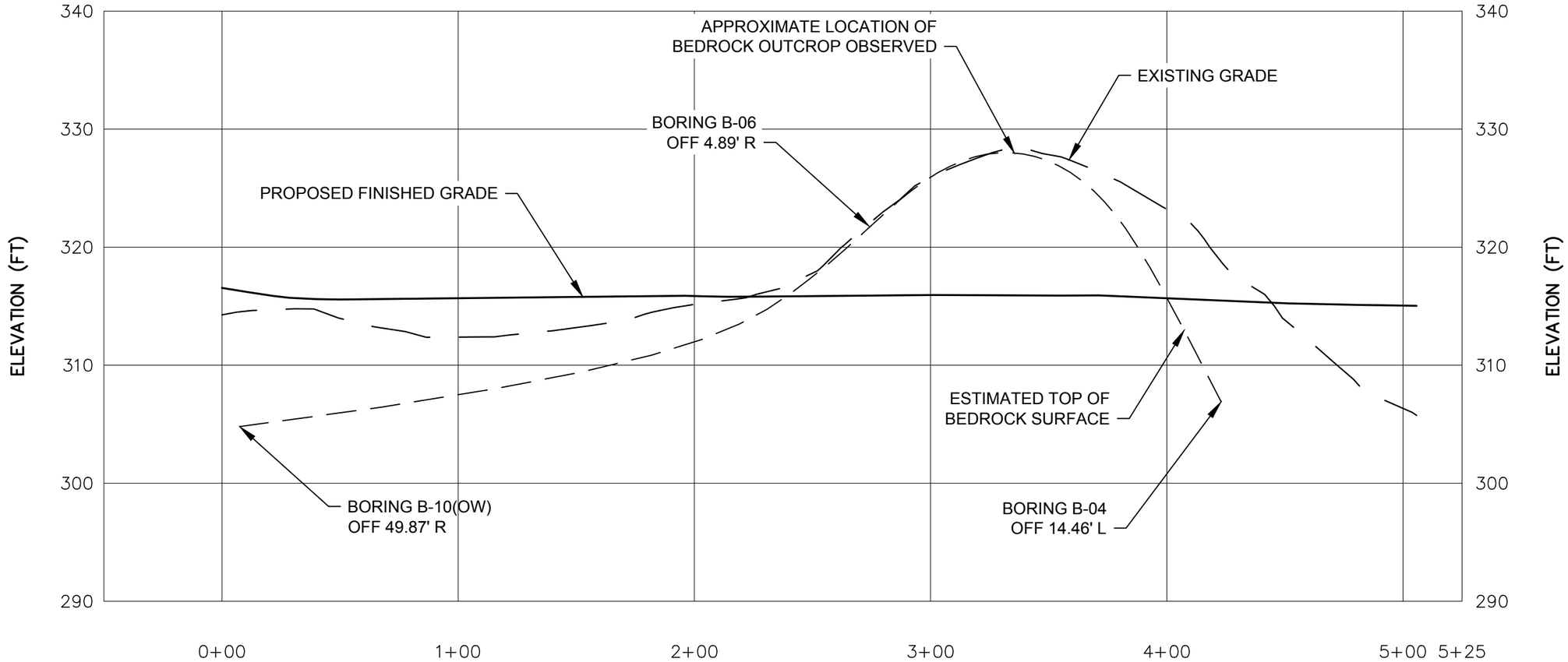
EXPLORATION LOCATION PLAN

SCALE: AS SHOWN
JUNE 2016

FIGURE 2

ACOSTA, JOSE Printed:6/27/2016 7:08 PM Layout: HA-FIG-D-L 80 SCALE
G:\PROJECTS\43434-000\2016-0627_43434 ELP-001.DWG

SECTION - A



NOTES

1. BASED ON THE SITE TOPOGRAPHIC (AERIAL) SURVEY PROVIDED BY NTE ENERGY (PREPARED BY KILLINGLY ENGINEERING ASSOCIATES) AND THE BORING AND SOIL RESISTIVITY LOCATIONS STAKED BY GM2 ASSOCIATES, MOST GROUND SURFACE ELEVATIONS CORRELATE WELL(WITHIN A FEW FEET). HOWEVER, GROUND SURFACE ELEVATIONS AT B-07, B-08, AND B-09 DO NOT CORRELATE WELL (STAKED LOCATION IS ABOUT 5 FT. 7.5 FT AND 10 FT HIGHER THAN ELEVATIONS ON THE TOPOGRAPHIC SURVEY). THE SOURCE OF THE LOCALIZED DISCREPANCY IS LIKELY BASED ON OBSCURED GROUND IN AERIAL SURVEY.
2. SEE FIGURE 2 FOR SECTION LOCATION AND NOTES.

HORIZ. 0 50 100
VERT. 0 10 20
SCALE IN FEET

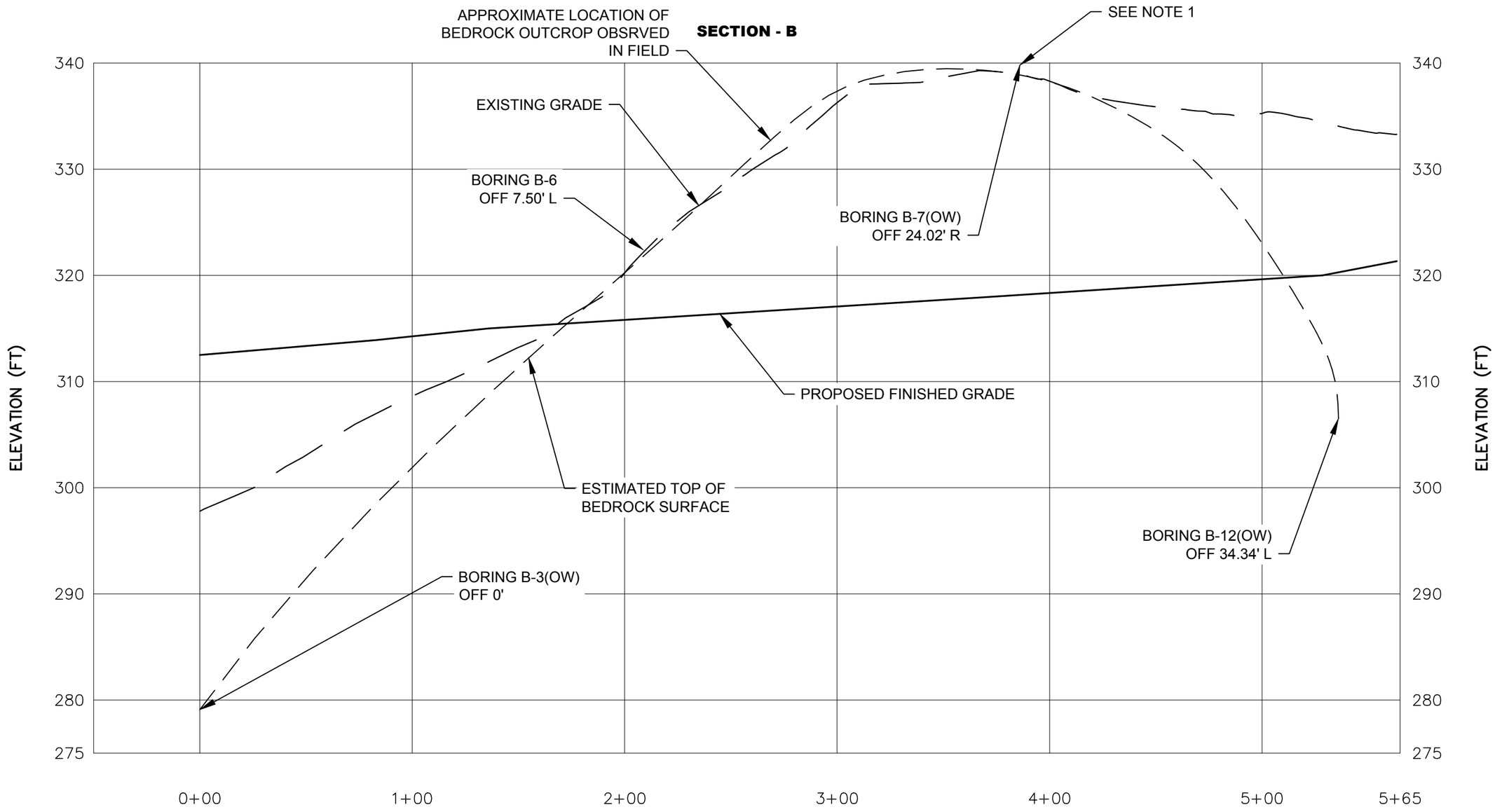
HALEY ALDRICH

NTE ENERGY
KILLINGLY ENERGY CENTER
180 AND 189 LAKE ROAD
KILLINGLY CONNECTICUT

SECTION A

SCALE: AS SHOWN
JUNE 2016

FIGURE 3



NOTES

1. BASED ON THE SITE TOPOGRAPHIC (AERIAL) SURVEY PROVIDED BY NTE ENERGY (PREPARED BY KILLINGLY ENGINEERING ASSOCIATES) AND THE BORING AND SOIL RESISTIVITY LOCATIONS STAKED BY GM2 ASSOCIATES, MOST GROUND SURFACE ELEVATIONS CORRELATE WELL(WITHIN A FEW FEET). HOWEVER, GROUND SURFACE ELEVATIONS AT B-07, B-08, AND B-09 DO NOT CORRELATE WELL (STAKED LOCATION IS ABOUT 5 FT. 7.5 FT AND 10 FT HIGHER THAN ELEVATIONS ON THE TOPOGRAPHIC SURVEY). THE SOURCE OF THE LOCALIZED DISCREPANCY IS LIKELY BASED ON OBSCURED GROUND IN AERIAL SURVEY.

2. SEE FIGURE 2 FOR SECTION LOCATION AND NOTES.

HORIZ. 0 50 100
VERT. 0 10 20
SCALE IN FEET

HALEY ALDRICH

NTE ENERGY
KILLINGLY ENERGY CENTER
180 AND 189 LAKE ROAD
KILLINGLY CONNECTICUT

SECTION B

SCALE: AS SHOWN
JUNE 2016

FIGURE 4

ACOSTA, JOSE
Printed: 6/27/2016 7:12 PM
Layout: FIGURE 4
G:\PROJECTS\143434-000\FIGURE 4.DWG

APPENDIX A

Project Description

APPENDIX "A"

A-1.0 PROJECT DESCRIPTION

The proposed Killingly Energy Center project is to be located in Killingly, Connecticut. The partially wooded site is located north of Route 101, on the north side of Lake Road.

This project is located on a sloping site, which ranges in existing grade elevation from El. 340 feet down to El 290 within the areas of new equipment, excluding the switchyard areas. To balance the cut and fill soil quantity, a preliminary site grade elevation for the power island has been established at El 315 feet for estimating purposes only, which results in maximum fill depth of 30 feet.

A-2.0 EQUIPMENT INFORMATION

The following is a preliminary list of the major equipment as shown on Boring Location Plan 334954CT–BR-101 Boring Plan for use in evaluating foundation systems:

- Steam Turbine Generator [STG] – The STG will be mounted on a steel skid. The STG unit may be supported on a raised concrete pedestal. The STG unit is a rotating equipment type, subject to dynamic loads during operation, and is sensitive to settlement. The estimated weight of the STG unit is 1,900,000 pounds. Ancillary STG equipment includes a Lube Oil Skid, with an approximate weight of 20,000 pounds. A Steam Condenser, with an estimated weight of 500,000 pounds, will be located in close proximity to the STG, which may be also supported on a raised concrete pedestal.

- Gas Turbine Generator – The CTG unit will be mounted on a steel skid, and may be supplied with pre-fabricated sound enclosures, complete with intake air system, exhaust ducts, and ancillary equipment. The estimated weight of the CTG unit is 1,700,000 pounds. The CTG Units shall be supported at grade on mat foundations. The CTG Units are rotating equipment, subject to dynamic loads during operation, and are sensitive to settlement.

- Heat Steam Recovery Generator [HRSG] – The HRSG unit shall be constructed of pre-fabricated steel bents, field assembled, complete with an SCR, steam drums, platforms, stairs, and ladders. The HRSG Units shall be supported at grade on mat foundations. The estimated weight of the HRSG unit is 8,000,000 pounds. The HRSG Units are subject to static operational loads, thermal expansion, and are sensitive to differential settlement between the bents.

- Stack – The HRSG exhaust stack is to be constructed of lined steel. The Stack will likely be 22 feet in diameter and 150' in height.

- Air Cooled Condenser – The air cooled condenser unit will consist of up to 15 cells, each cell consisting of a center stanchion support, elevated heat exchanger surface, structural cross bracing and a 200 hp motor.

- Tanks – Steel tanks will be supported on ring or mat foundations at grade. Preliminary sizes for the larger tanks are a Fuel Oil Storage tank, 75 foot diameter x 45 feet tall, 1,000,000 gallons, a Raw Water tank, 45 foot diameter x 45 feet tall, 450,000 gallons and a Demineralized Water tank45 foot diameter x 45 feet tall, 450,000 gallons. Additional tanks and vessels will be constructed to contain process related materials and founded at grade.

- Yard Equipment - Ancillary yard equipment, including pumps, totes, will be supported on reinforced concrete foundations, founded at grade.

- Administration/Warehouse Building – The administration building will be an occupied, single story, pre-fabricated steel structure, 65 feet x 175 feet. The building will enclose control room, offices, conference room, break room, toilets, sampling laboratory, maintenance shop, parts storage, and a warehouse. The design floor live load at grade is 500 psf, with 1,000 psf in the storage and warehouse areas. The warehouse portion of the building will have a two story interior height.

- Power Control Modules [PCM] – The PCM units are pre-fabricated modules, single story units, which range is sizes from approximately 12 feet x 40 feet to 20 feet x 60 feet. The modules will enclose electrical equipment and switchgear for each of the equipment islands. The modules may be elevated 6 to 8 feet above finish grade for the entry of electrical tray. These modules typically have a dead weight of 750 psf, including enclosed equipment.

- Transformers – The oil filled transformers will be supported on reinforced concrete pedestals, within concrete containments. The estimated weights of the GSU Transformers and the Auxiliary Transformer are 410,000 pounds and 120,000 pounds respectively.

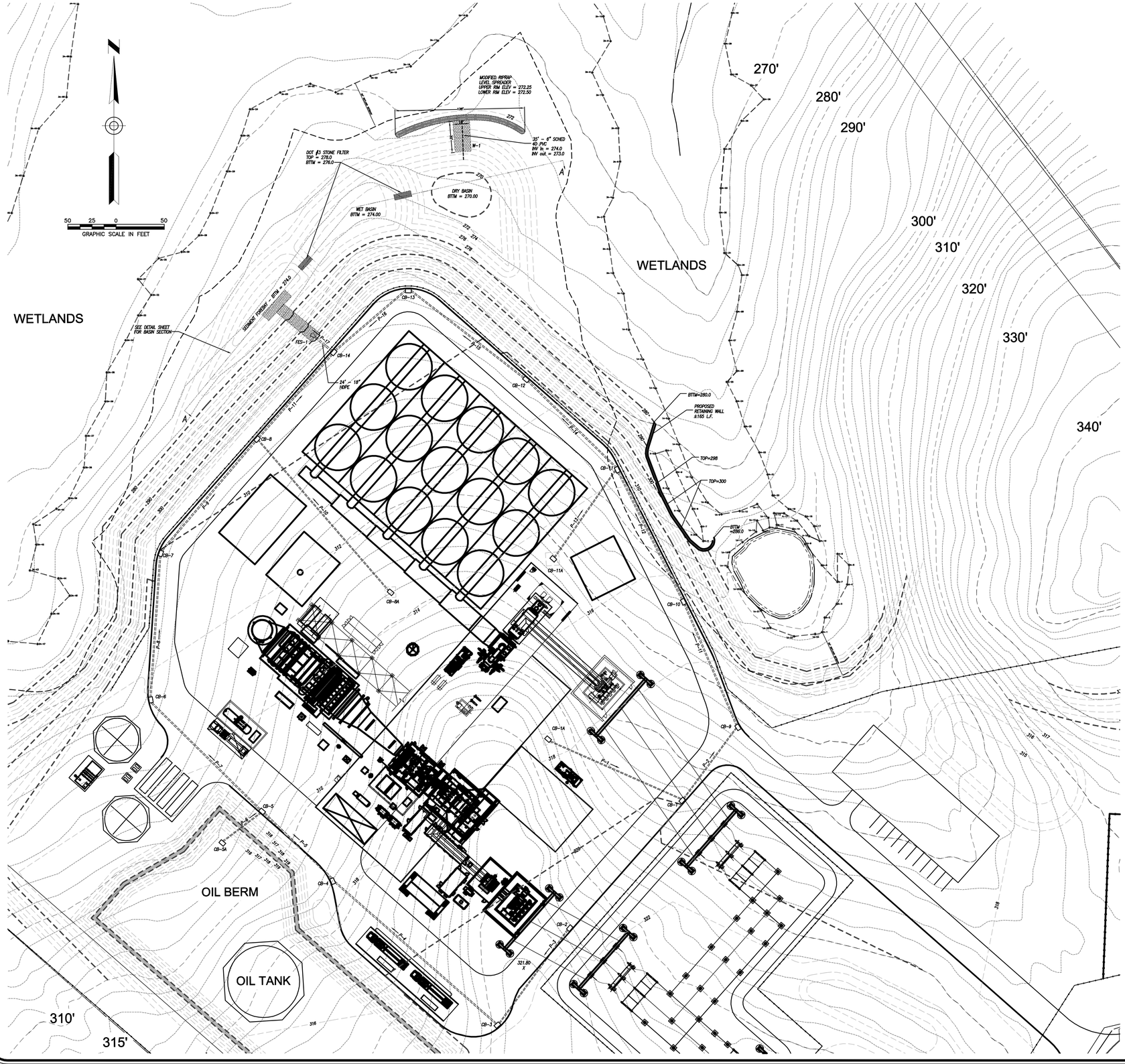
- Switchyard – The switchyard will consist of transformers, a pre-fabricated control house, circuit breakers, disconnect switches, and dead-end structures.

- Pipe Racks – Multiple tiered, structural steel racks shall run between major equipment and ancillary components to support services including piping, electrical conduit and communication. Where the racks cross roads, the services shall be either supported on pipe bridges above road or run in covered trenches below the road elevation.

- Plant Roads – The plant roads are to be bituminous or concrete aggregate paved, medium to heavy duty, designed for AASHTO HS-20 wheel loads. Ammonia and chemical unloading areas located in the roads shall be reinforced concrete with containment. Secondary roads within the switchyard and around the perimeter of the Cooling Tower will be unpaved.

A-3.0 ADDITIONAL INFORMATION

The Owner may provide additional facility and/or equipment information, preliminary equipment studies, and equipment procurement for geotechnical consideration.



STORM DRAINAGE STRUCTURE SCHEDULE

STRUCTURE ID	STRUCTURE TYPE	FRAME ELEV.	PIPE INVERT ELEVATION				SUMP
			N	S	E	W	
CB-1A	TYPE C-L	317.75		OUT: 313.25 (SE)			309.25
CB-1	TYPE C	319.80	IN: 311.71 (NW)		OUT: 311.61 (NE)		307.61
CB-2	TYPE C	321.00		OUT: 316.50 (SW)			312.50
CB-3	TYPE C	321.00			IN: 315.22 (NE)	OUT: 315.12 (NW)	311.12
CB-4	TYPE C	315.34			IN: 310.58 (SE)	OUT: 310.48 (NW)	306.48
CB-5A	TYPE C-L	315.00			OUT: 311.48 (NE)		307.48
CB-5	TYPE C	315.36		IN: 310.00 (SW)		OUT: 309.90 (NW)	305.90
CB-6	TYPE C	312.25	OUT: 307.30		IN: 307.40 (SE)		303.30
CB-7	TYPE C	310.00		IN: 305.50	OUT: 305.40 (NE)		301.40
CB-8A	TYPE C-L	313.00				OUT: 309.00 (NW)	305.00
CB-8	TYPE C	309.20		IN: 303.50 (SW)	IN: 303.50 (SE)	OUT: 303.40 (NW)	299.40
CB-9	TYPE C	319.00		IN: 310.69 (SW)		OUT: 310.59 (NW)	306.59
CB-10	TYPE C	316.64	OUT: 308.63	IN: 308.73			304.63
CB-11A	TYPE C-L	316.80			OUT: 312.80 (NE)		308.80
CB-11	TYPE C	313.60	OUT: 307.00	IN: 307.10		IN: 307.10	303.00
CB-12	TYPE C-L	311.20	OUT: 305.59	IN: 305.69			301.59
CB-13	TYPE C	308.20	OUT: 303.50 (NW)	IN: 303.60			299.50
CB-14	TYPE C	309.20		IN: 301.00 (SW)	IN: 301.00 (NE)	OUT: 300.90 (NW)	296.90

PIPE SCHEDULE

PIPE ID	OUTLET DIA. (IN.)	MATERIAL	LENGTH (FT.)	SLOPE (%)
P-1	12	HDPE	154	1.0%
P-2	12	HDPE	92	1.0%
P-3	12	HDPE	128	1.0%
P-4	15	HDPE	227	2.0%
P-5	15	HDPE	102	1.0%
P-6	12	HDPE	50	1.0%
P-7	15	HDPE	165	1.52%
P-8	15	HDPE	153	1.17%
P-9	15	HDPE	156	1.22%
P-10	12	HDPE	211	2.6%
P-11	15	HDPE	141	1.5%
P-12	15	HDPE	153	1.0%
P-13	12	HDPE	114	5.0%
P-14	15	HDPE	131	1.0%
P-15	15	HDPE	152	1.3%
P-16	15	HDPE	100	2.5%
P-17	18	HDPE	24	4.2%

STRUCTURE ID	TYPE	INVERT ELEVATION
FES-1	FLARED END	300.00
W-1	OVERFLOW WEIR	277.00

DATE	DESCRIPTION

REVISIONS

Killingly Engineering Associates
Civil Engineering & Surveying
114 Westcott Road
P.O. Box 421
Killingly, Connecticut 06241
(860) 779-7299
www.killinglyengineering.com

DATE: 06/30/2016	DRAWN: NET
SCALE: 1"=50'	DESIGN: NET
SHEET: 1 OF X	CHK BY: ---
DWG. No: CLIENT FILE	JOB No: 16042

APPENDIX B

Water Well Completion Report

795

STATE OF CONNECTICUT
DEPARTMENT OF CONSUMER PROTECTION
REAL ESTATE & PROFESSIONAL TRADES DIVISION
WELL DRILLING COMPLETION REPORT
165 Capitol Avenue, Hartford, Connecticut 06106

Do NOT fill in
STATE WELL NO.
OTHER NO.

OWNER — NAME: Geoffrey Sarro — ADDRESS: 199 Lake Rd Dayville CT

LOCATION OF WELL — (No. & Street): 199 Lake Rd — (Town): Killingly — (Lot Number): Owner

PROPOSED USE OF WELL
- [x] DOMESTIC
- [ ] BUSINESS ESTABLISHMENT
- [ ] FARM
- [ ] TEST WELL
- [ ] PUBLIC SUPPLY
- [ ] INDUSTRIAL
- [ ] AIR CONDITIONING
- [ ] OTHER (Specify)

DRILLING EQUIPMENT
- [ ] ROTARY
- [x] COMPRESSED AIR PERCUSSION
- [ ] CABLE PERCUSSION
- [ ] OTHER (Specify)

CASING DETAILS

LENGTH (feet)	DIAMETER (inches)	WEIGHT PER FOOT			DRIVE SHOE	WAS CASING GROUTED?
20	6	17	[x] THREADED	[ ] WELDED	[x] YES [ ] NO	[x] YES [ ] NO

YIELD TEST — [ ] BAILED [ ] PUMPED [x] COMPRESSED AIR — HOURS: 1 — YIELD (GPM): 20

WATER LEVEL

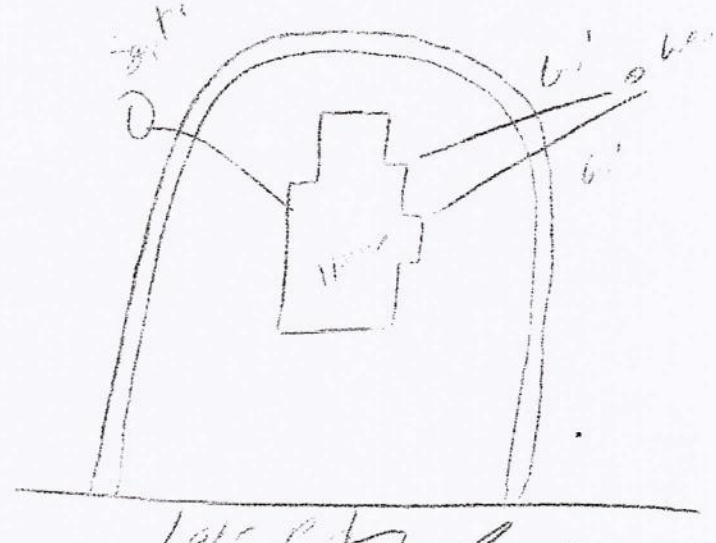
MEASURE FROM LAND SURFACE - STATIC (Specify feet)	DURING YIELD TEST (feet)	Depth of Completed Well in feet
10	100	160

SCREEN DETAILS

MAKE					LENGTH OPEN TO AQUIFER (feet)	
SLOT SIZE	DIAMETER (inches)	IF GRAVEL PACKED	Diameter of well including gravel pack (inches)	GRAVEL SIZE (inches)	FROM (feet)	TO (feet)

DEPTH FROM LAND TO SURFACE FEET TO FEET		FORMATION DESCRIPTION
0	10	Gravel Topsoil
10	160	Bedrock

Sketch exact location of well with distances, to at least two permanent landmarks



If yield was tested at different depths during drilling, list below

FEET	GALLONS PER MINUTE

DATE WELL COMPLETED	PERMIT NO	REGISTRATION NO	DATE OF REPORT	WELL DRILLER (Signature)
4/5/10	241577	13	1/10/11	

APPENDIX C

Logs of Test Borings

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-01 (OW)

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 24, 2016
Finish May 24, 2016
Driller J. Rauscher
H&A Rep. S. Poff
Elevation 277.5 (est.)
Datum NAVD88
Location See Plan
N 876663.3
E 1227059.1

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	--	Rig Make & Model: Track mounted Diedrich D120
Inside Diameter (in.)	4 1/4	1 3/8	--	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	WOH 2 2 4	S1 6	0.0 2.0		277.3 0.2	ML/ OL	-FOREST LITTER- Very loose dark brown SILT and ORGANIC SILT, little gravel, sand, with roots, topsoil odor, moist
					276.0 1.5		-TOPSOIL/LOAM-
	4 11 16 17	S2 12	2.0 4.0		275.0 2.5	SM	Loose yellow-brown silty medium to fine SAND, some coarse to fine gravel, trace coarse sand, no odor, dry -SUBSOIL-
						SM	Medium dense light brown coarse to fine gravelly coarse to fine SAND, little silt, no odor, dry, seam of yellow medium to fine sand from 3.8 to 4.0 ft, no mottling
5	4 8 14 18	S3 14	5.0 7.0		272.5 5.0	SM	Medium dense light brown to gray-brown coarse to fine gravelly coarse to fine SAND, some silt, no odor, dry, no mottling
	17 10 8 8	S4 16	7.0 9.0			SM	Similar to S3
10	9 12 15 57	S5 22	10.0 12.0			SM	Similar to S4, no odor, moist
							Note: Drill action indicates occasional cobbles.
15	8 9 16 24	S6 12	15.0 17.0			SM	Similar to S5, split-spoon wet
	8 11 16 20	S7 14	18.0 20.0			SM	Similar to S6
20							-GLACIAL TILL-

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/24/2016	10:00	0.5	--	--	11.5
5/27/2016	14:20	77.0	--	--	7.25

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 20.0
Rock Cored (ft) --
Samples 7S

Boring No. B-01 (OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-01 (OW)
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
					257.5 20.0		BOTTOM OF EXPLORATION 20.0 FT Note: Installed temporary groundwater observation well in completed borehole.

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. B-01 (OW)

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. B-01 (OW)

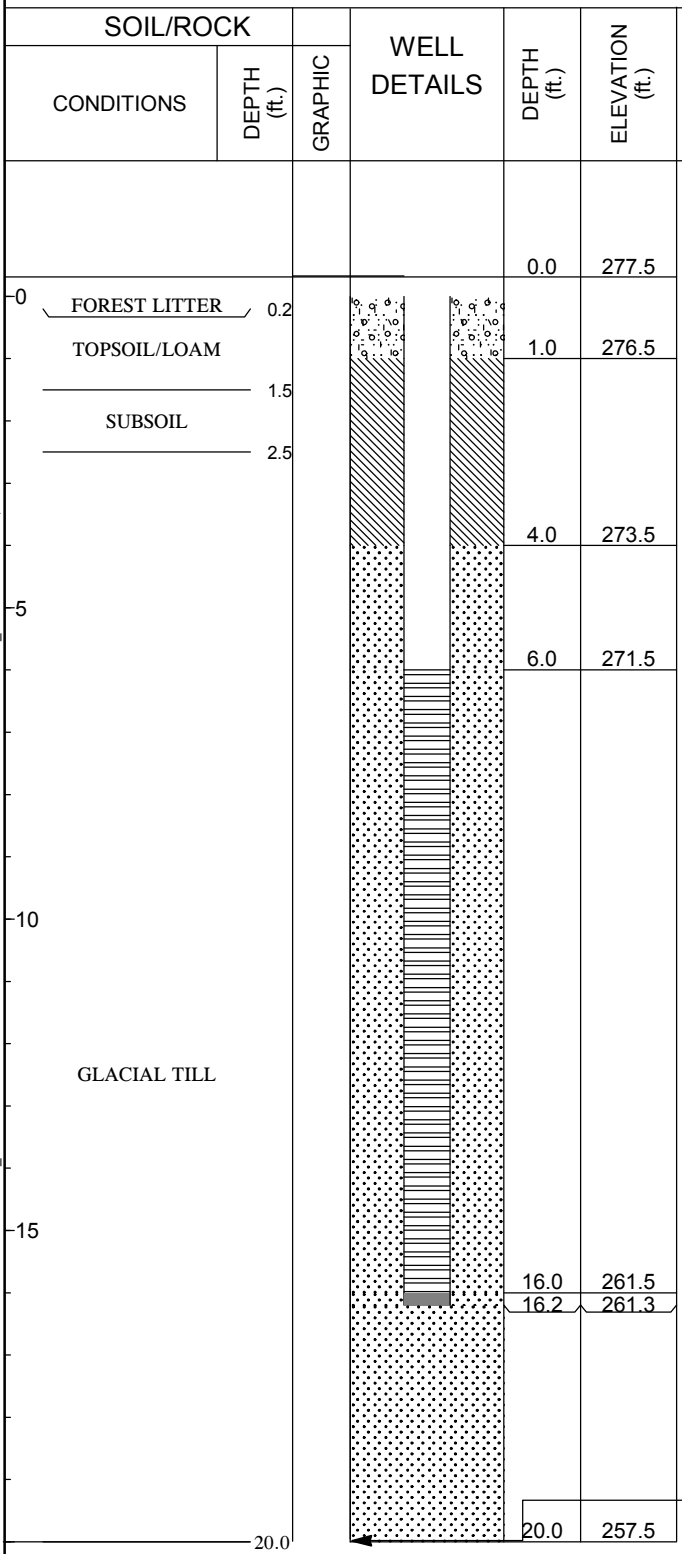
Project Killingly Energy Center
Location Killingly, Connecticut
Client NTE Energy
Contractor NYEG Drilling
Driller J. Rauscher

Initial Water Level (depth bgs) 11.5 ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 43434-000
Date Installed 24 May 2016
H&A Rep. S. Poff
Location N 876663.3
E 1227059.1

Ground El. 277.5 (est.)
Datum NAVD88



WELL CONSTRUCTION DETAILS

Type of protective cover: None
Height of NA above ground surface: NA
Height of top of riser above ground surface: 3.5 ft
Type of protective casing: NA
- Length: --
- Inside diameter: --
- Depth of bottom of NA: -

Type of riser pipe: Schedule 40 PVC
- Inside diameter of riser pipe: 2.0 in.
- Depth of bottom of riser pipe: 6.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite	1.0	3.0
	-	-
	-	-

Diameter of borehole: 6.0 in.
Depth to top of well screen: 6.0 ft
- Type of screen: Machine slotted Sch 40 PVC
- Screen gauge or size of openings: 0.010 in.
- Diameter of screen: 2.0 in.

Type of Backfill around Screen: Filter Sand
- Depth to bottom of well screen: 16.0 ft

Bottom of silt trap: 16.2 ft
Depth of bottom of borehole: 20.0 ft

COMMENTS:

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-02

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 26, 2016
Finish May 26, 2016
Driller J. Rauscher
H&A Rep. S. Poff
Elevation 301.4 (est.)
Datum NAVD88
Location See Plan
N 876440.6
E 1227007.8

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted Diedrich D120
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	2 4 4 7	S1 12	0.0 2.0	301.2 0.2	ML/ OL	-FOREST LITTER- -TOPSOIL/LOAM-
				300.6 0.8		
				300.0 1.4	SM	Loose orange-brown silty coarse to fine SAND, some coarse to fine gravel, trace roots, no odor, dry -SUBSOIL-
	19 28 20 38	S2 16	2.0 4.0		GM GM	Light brown coarse to fine sandy coarse to fine GRAVEL, little silt, with cobbles, no odor, dry Similar to S1 below 1.4 ft
5	13 29 50/2"	S3 6	5.0 6.2	296.4 5.0	SM	Very dense light brown coarse to fine gravelly SAND, some silt, with cobbles, no odor, dry
	19 39 50/3"	S4 12	7.0 8.3		SM	Similar to S3
10	18 16 17 29	S5 16	10.0 12.0		SM	Similar to S4, except dense
				290.4 11.0	SM	Dense light brown to tan coarse to fine gravelly SAND, some silt, occasional poorly-defined layering/stratification, no odor, dry
15	17 50/4"	S6 7	15.0 15.8	285.4	SM	Similar to S5 below 11.0 ft
				16.0		Note: Auger and roller bit refusal at 16.0 ft. Begin rock coring at 16.0 ft. -GLACIAL TILL- SEE CORE BORING REPORT FOR ROCK DETAILS
20						

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/27/2016	--	24.0	--	13.0	11.0

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft) 16.0
Rock Cored (ft) 5.0
Samples 6S, 1C

Boring No. B-02

Field Tests:

Dilatancy: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

CORE BORING REPORT

Boring No. **B-02**
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
	3.5	C1	16.0	54	90	Slight to High	285.4	Hard slightly weathered gray and white medium to fine grained muscovite-biotite-quartz GNEISS; Foliation low angle, extremely thin, planar to slightly undulating; Primary (foliation) joints low angle, close to moderately spaced, smooth to rough, planar to slightly undulating, discolored to slightly decomposed, tight to open; Secondary joints moderately dipping across foliation, widely spaced, rough, planar to stepped, discolored, open to tight
	3.5		21.0	17	28		16.0	
	3.5							
	3.5							
20	1.5							
							280.9	
							20.5	Similar to above except soft to medium hard, completely to highly weathered
							280.4	-QUINEBAUG FORMATION-
							21.0	-BEDROCK-
								BOTTOM OF EXPLORATION 21.0 FT
								Note: Borehole left open for 24 hours for groundwater measurement. Backfilled with cuttings after measurement.
25								
30								
35								
40								
45								
50								

TEST BORING REPORT

Boring No. B-03 (OW)

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 3
Start May 24, 2016
Finish May 25, 2016
Driller J. Rauscher
H&A Rep. S. Poff
Elevation 299.6 (est.)
Datum NAVD88
Location See Plan
N 876278.6
E 1226824.1

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted Diedrich D120
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	WOH/12"	S1	0.0		299.4		-FOREST LITTER-
	--	17	2.0		0.2		
	1				299.2	SM	-TOPSOIL/LOAM-
	1				0.4		Very loose orange-brown to yellow-brown silty fine SAND, trace coarse to medium sand, no structure, no odor, dry, no mottling
					297.6		
	2	S2	2.0		2.0	SM	Loose yellow-brown to tan fine SAND, some silt, trace coarse to medium sand, no structure, no odor, dry, no mottling
	4	20	4.0		296.6		
	12				3.0	SM	-SUBSOIL-
	22					SM	Dense light brown coarse to fine SAND, some coarse to fine gravel, silt, frequent cobbles, no structure, no odor, dry
5	13	S3	5.0			SM	Similar to S2 below 3.0 ft
	20	22	7.0				
	24						
	19						
	15	S4	7.0			SM	Similar to S3
	20	19	9.0		291.8		
	17				7.8	ML	Dense tan fine sandy SILT, little fine gravel, trace coarse to medium sand, no odor, dry, blocky structure, occasional poorly-defined layering/stratification
	19						
10					289.6		
	11	S5	10.0		10.0	SM	Dense tan to light gray-brown silty fine SAND, little coarse to medium sand, fine gravel, no odor, dry
	17	18	12.0				
	25						
	24						
							Note: Occasional cobbles from 10.0 to 15.0 ft.
15	23	S6	15.0				Dense tan silty fine SAND, trace coarse to fine gravel, coarse to medium sand, blocky structure, no odor, dry to moist
	14	20	17.0				
	20						
	17						Note: Drill action suggests gravel and cobbles common from approximately 17.5 to 20 ft.
20							

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/27/2016	15:35	52.0	--	--	20.3

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 20.5
Rock Cored (ft) 5.5
Samples 7S, 2C

Boring No. B-03 (OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-03 (OW)
File No. 43434-000
Sheet No. 2 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
20	50/0"	S7	20.0		19.1		Note: Split spoon refusal at 20.0 ft. Auger refused at 20.5 ft, begin rock coring.
	--	0	20.5		20.5		-GLACIAL TILL-
							SEE CORE BORING REPORT FOR ROCK DETAILS
25							

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. B-03 (OW)

HALEY ALDRICH

CORE BORING REPORT

Boring No. B-03 (OW)
File No. 43434-000
Sheet No. 3 of 3

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Well Dia-gram	Elev./ Depth (ft)	Visual Description and Remarks
									SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
25	3	C1	20.5	6	100	Fresh to Slight		279.1 20.5	Note: Core barrel blocked up at 21.0 ft. Emptied core barrel, continue coring.
	3.5	C2	21.0	0	0				Hard fresh with slightly weathered zone from approximately 23.7 to 25 ft, gray and white fine grained muscovite-biotite-quartz GNEISS; Foliation low angle, extremely thin, planar to slightly undulating; Primary (foliation) joints low angle, close to moderately spaced, rough, planar to slightly undulating, discolored (brown), open to tight; Secondary joints moderately dipping to high angle across foliation, moderately spaced, rough, planar, discolored to decomposed, open to tight
	3.5		21.0	59	98				
	4.5		26.0	46	77				Note: Completely weathered seam from approximately 23.9 to 24.2 ft. Loss of drill water through seam. Missing 1.0 in. of recovery likely washed out from this zone.
	3								-QUINEBAUG FORMATION-
	3							273.6 26.0	-BEDROCK-
									BOTTOM OF EXPLORATION 26.0 FT
									Note: Installed temporary groundwater observation well in completed borehole.
30									
35									
40									
45									
50									
55									

H+A_CORE+WELL07-1 HA-LIB09-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\43434-000_TB.GPJ Jun 27, 16

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. B-03 (OW)

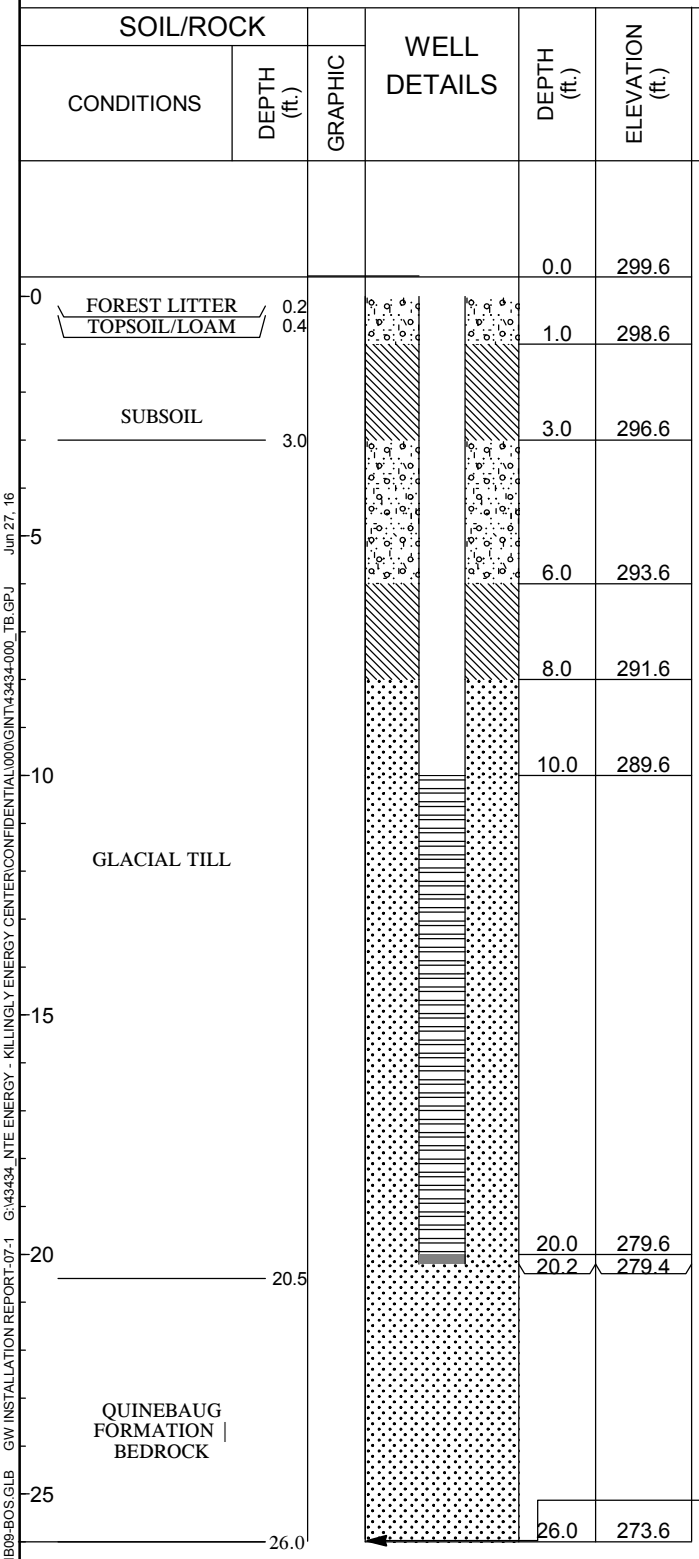
Project Killingly Energy Center
Location Killingly, Connecticut
Client NTE Energy
Contractor NYEG Drilling
Driller J. Rauscher

Initial Water Level (depth bgs) 20.3 ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 43434-000
Date Installed 25 May 2016
H&A Rep. S. Poff
Location N 876278.6
E 1226824.1

Ground El. 299.6 (est.)
Datum NAVD88



WELL CONSTRUCTION DETAILS

Type of protective cover: None
Height of NA above ground surface: NA
Height of top of riser above ground surface: 2.5 ft
Type of protective casing: NA
- Length: --
- Inside diameter: --
- Depth of bottom of NA: -

Type of riser pipe: Schedule 40 PVC
- Inside diameter of riser pipe: 2.0 in.
- Depth of bottom of riser pipe: 10.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite	1.0	2.0
Bentonite	6.0	2.0
	-	-

Diameter of borehole: 6.0 in.
Depth to top of well screen: 10.0 ft
- Type of screen: Machine slotted Sch 40 PVC
- Screen gauge or size of openings: 0.010 in.
- Diameter of screen: 2.0 in.
- Type of Backfill around Screen: Filter Sand
- Depth to bottom of well screen: 20.0 ft

Bottom of silt trap: 20.2 ft
Depth of bottom of borehole: 26.0 ft

COMMENTS:

HA-LIB09-BOS.GLB GW INSTALLATION REPORT-07-1 G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\43434-000_TB.GPJ Jun 27, 16

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-04

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 25, 2016
Finish May 25, 2016
Driller J. Rauscher
H&A Rep. S. Poff
Elevation 317.9 (est.)
Datum NAVD88
Location Offset 33.0 ft S
N 876250.7
E 1227065.6

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted Diedrich D120
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	1 2 3 3	S1 15	0.0 2.0	317.7 0.2		-FOREST LITTER-
				317.4 0.5	ML	-TOPSOIL/LOAM- Loose orange-brown fine sandy SILT, trace fine gravel, coarse to medium sand, no odor, dry
				315.9		-SUBSOIL-
	10 18 28 36	S2 20	2.0 4.0	2.0	SM	Dense brown silty SAND, some gravel, no structure, no odor, dry
5	16 27 24 22	S3 18	5.0 7.0		SM	Similar to S2, except very dense, frequent cobbles
	26 50/5"	S4 9	7.0 7.9		SM	Similar to S3, split spoon refusal at 7.9 ft on cobbles
10	15 50/2"	S5 7	10.0 10.7	306.9 11.0	SM	Similar to S4 Note: Auger and roller bit refusal at 11.0 ft. Begin rock coring at 11.0 ft. -GLACIAL TILL- SEE CORE BORING REPORT FOR ROCK DETAILS
15						

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/27/2016	--	42.0 *COLLAPSED	--	8.6*	8.4

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 11.0
Rock Cored (ft) 5.0
Samples 5S, 1C

Boring No. B-04

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

CORE BORING REPORT

Boring No. **B-04**
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
15	4 3.5 3.5 4 4	C1	11.0 16.0	49 14	82 23	High to Slight	306.9 11.0	Hard highly weathered from approximately 11 to 11.4 ft, slightly weathered from approximately 11.4 to 16 ft, dark gray and white medium to fine grained biotite-quartz GNEISS; Foliation low angle, extremely thin, planar to slightly undulating; Primary (foliation) joints low angle, extremely close to close, smooth to rough, planar to undulating, decomposed to discolored, open to tight; Secondary joints moderately dipping to high angle across foliation, rough, planar to undulating, discolored to decomposed (fine sand, silt), open to tight; Pitted from approximately 14.7 to 14.8 ft, pits approximately 0.25 to 0.75 in. diameter. -QUINEBAUG FORMATION- -BEDROCK-
							301.9 16.0	BOTTOM OF EXPLORATION 16.0 FT

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-05

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 3
Start May 26, 2016
Finish May 26, 2016
Driller J. Rauscher
H&A Rep. S. Poff
Elevation 308.9 (est.)
Datum NAVD88
Location Offset 7.0 ft east
N 876214.3
E 1227178

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted Diedrich D120
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	PID Readings (ppm) (sample/bkgd)
0	2 3 3 5	S1 6	0.0 2.0	308.4 0.5	ML	-TOPSOIL/LOAM- Loose orange-brown fine sandy SILT, little coarse to fine gravel, trace corase to medium sand, with roots, no odor, dry	
				306.9		-SUBSOIL-	
	10 20 35 25	S2 16	2.0 4.0	2.0	SM	Very dense light brown coarse to fine gravelly coarse to fine SAND, little silt, no odor, dry	
				303.9			
5	16 16 19 32	S3 18	5.0 7.0	5.0	SM	Similar to S2, except dense, some silt	
	24 24 24 23	S4 16	7.0 9.0		SM	Similar to S3	
						Note: Frequent cobbles from 2.0 to 10.0 ft.	
10	9 27 22 19	S5 9	10.0 12.0		SM	Similar to S4	
						Note: Auger grinding through cobbles/boulders from approximately 13 to 14 ft.	
15	11 17 50/3"	S6 10	15.0 16.3		SM	Similar to S5, except very dense, wet	
						Note: Auger refusal at 17.0 ft. Core barrel advanced from 17.0 to 22.0 ft, recovered 10.0 in. of boulder pieces and 8.0 in. of Glacial Till.	
20							

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/27/2016	--	-- *COLLAPSED	--	8.0*	8.0

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 23.5
Rock Cored (ft) 5.0
Samples 6S, 1C

Boring No. B-05

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	PID Readings (ppm) (sample/bkgd)
20						Note: Roller bit advanced to 23.5 ft and began rock coring.	
				285.4		-GLACIAL TILL-	
				23.5		SEE CORE BORING REPORT FOR ROCK DETAILS	
25							

HALEY ALDRICH

CORE BORING REPORT

Boring No. **B-05**
File No. 43434-000
Sheet No. 3 of 3

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
25	4 4 4 4 4	C1	23.5 28.5	59 22.5	98 38	Slight to Moderate	285.4 23.5	Hard to very hard slightly weathered with moderately weathered zones from approximately 24.2 to 24.7 ft and 26.1 to 26.8 ft light gray and white (with yellow-brown discoloration) fine grained QUARTZITE; Foliation low angle, extremely thin, planar to slightly undulating; Primary (foliation) joints low angle, very close to moderately spaced, rough, planar to undulating, decomposed to discolored, open to tight; Secondary joints moderately dipping to high angle, close to moderately spaced, rough, planar to slightly undulating, decomposed to discolored, open; Completely weathered seam from approximately 26.8 to 27 ft
								-QUINEBAUG FORMATION-
							280.4	-BEDROCK-
30							28.5	BOTTOM OF EXPLORATION 28.5 FT
35								
40								
45								
50								
55								

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-06

Project Killingly Energy Center, Killingly, Connecticut
Client NTE Energy
Contractor NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 31, 2016
Finish June 1, 2016
Driller J. Rauscher
H&A Rep. S. Poff/ C. Snow
Elevation 324.4 (est.)
Datum NAVD88
Location See Plan
N 876135.9
E 1226980.6

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted Diedrich D120
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	2 3 3 5	S1 18	0.0 2.0	324.2 0.2 323.9 0.5 323.4 1.0	ML/ OL SM SM	-FOREST LITTER- -TOPSOIL/LOAM- Loose orange-brown silty coarse to fine SAND, little coarse to fine gravel, trace roots, no odor, dry -SUBSOIL- Loose light brown silty fine SAND, some coarse to fine gravel, little coarse to medium sand, no odor, dry
	6 26 36 50/2"	S2 12	2.0 3.0	321.9 321.4 3.0	SM GP	Similar to S1 below 1.0 ft -GLACIAL TILL- Very dense gray coarse to fine sandy fine GRAVEL, little silt, no odor, dry, resembles weathered floiated rock Note: Split spoon refusal at 2.7 ft. Advance core barrel to 3.0 ft to begin core run.
5						SEE CORE BORING REPORT FOR ROCK DETAILS

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
NOT ENCOUNTERED					

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	3.0
Rock Cored (ft)	4.0
Samples	2S

Boring No. B-06

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

CORE BORING REPORT

Boring No. **B-06**
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
	2.5	C1	3.0	16	38	High	321.4	Very hard highly weathered gray to white (with orange to yellow discoloration) fine grained QUARTZITE; Foliation low angle to moderately dipping, very thin, planar to slightly undulating; Primary (foliation) joints low angle to moderately dipping, likely very close to close (indiscernible in core recovered); Secondary joints high angle to vertical (otherwise indiscernible in core recovered)
	3		6.5	0	0		3.0	
5	5							
	9							Note: Core barrel jammed at 6.5 ft, core run terminated. Roller bit advanced to 8.0 ft through probable weathered rock.
							316.4	-PROBABLE BEDROCK-
							8.0	BOTTOM OF EXPLORATION 8.0 FT
10								
15								
20								
25								
30								
35								

TEST BORING REPORT

Boring No. B-07(OW)

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 31, 2016
Finish May 31, 2016
Driller J. Rauscher
H&A Rep. S. Poff
Elevation 345.3 (est.)
Datum NAVD88
Location Offset 24.0 ft
N 875991.4
E 1227082.8

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted Diedrich D120
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	3 11 24 10	S1 19	0.0 2.0		345.2 0.1 344.9 0.4 344.3 1.0	ML/ OL ML SP- SM SM	-FOREST LITTER- -TOPSOIL/LOAM- Medium dense orange-brown fine sandy SILT, trace fine gravel, coarse to medium sand, roots, no odor, dry -SUBSOIL- Dense gray coarse to fine SAND, some fine gravel, little silt, no odor, dry, angular particles (weathered boulder fragments) Medium dense orange-brown to light brown silty fine SAND, some coarse to fine gravel, little coarse to medium sand, with cobbles, no odor, dry
	8 9 10 9	S2 14	2.0 4.0				
5	50/4" --	S3 3	5.0 5.5		339.8 5.5	SM	Similar to S2, except very dense, split spoon refusal at 5.3 ft Note: Auger refusal at 5.5 ft, began rock coring. -GLACIAL TILL- SEE CORE BORING REPORT FOR ROCK DETAILS
10							

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
NOT ENCOUNTERED					

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 5.5
Rock Cored (ft) 5.0
Samples 3S, 1C

Boring No. B-07(OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

CORE BORING REPORT

Boring No. B-07(OW)
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weathering	Well Diagram	Elev./ Depth (ft)	Visual Description and Remarks
									SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
	3.5	C1	5.5	53	88	Slight		339.8 5.5	Hard slightly weathered dark gray to light gray, medium to fine grained muscovite-biotite-quartz GNEISS; Foliation low angle, extremely to very thin, planar to slightly undulating; Primary (foliation) joints low angle, very close to close, smooth to rough, planar to slightly undulating, slightly decomposed to discolored, open; Secondary joints high angle across foliation, widely spaced, rough, undulating, discolored, open
	5		10.5	6	10				
	4								
	5							336.6 8.7	Similar to above, except light gray to white fine grained QUARTZITE with orange-brown discoloring throughout
10	4								-QUINEBAUG FORMATION-
									-BEDROCK-
								334.8 10.5	BOTTOM OF EXPLORATION 10.5 FT
									Note: Installed temporary groundwater observation well in completed borehole.
15									
20									
25									
30									
35									
40									

H+A_CORE+WELL07-1 HA-LIB09-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\43434-000_TB.GPJ Jun 27, 16

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. B-07(OW)

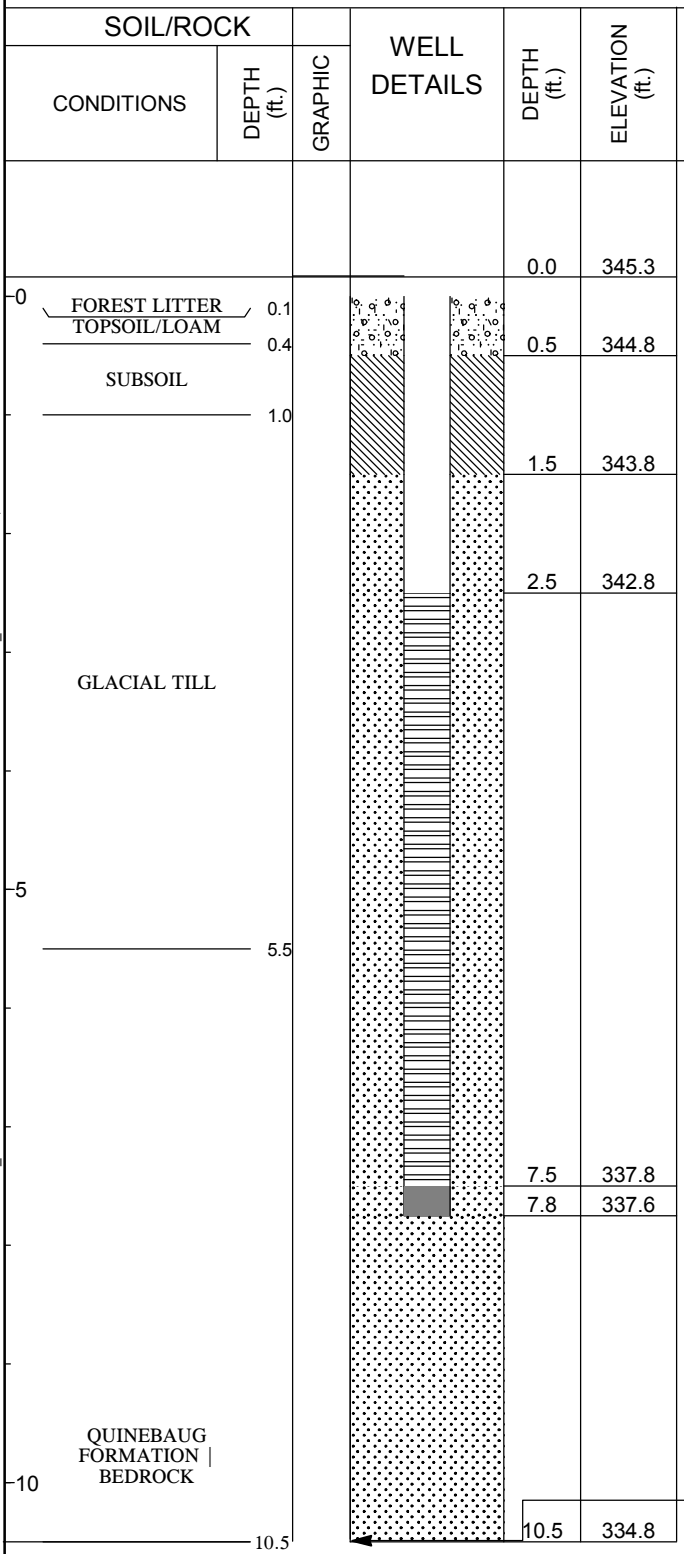
Project Killingly Energy Center
Location Killingly, Connecticut
Client NTE Energy
Contractor NYEG Drilling
Driller J. Rauscher

Initial Water Level (depth bgs) ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 43434-000
Date Installed 31 May 2016
H&A Rep. S. Poff
Location N 875991.4
E 1227082.8

Ground El. 345.3 (est.)
Datum NAVD88



WELL CONSTRUCTION DETAILS

Type of protective cover: None

Height of NA above ground surface: NA

Height of top of riser above ground surface: 2.5 ft

Type of protective casing: NA

Length: --

Inside diameter: --

Depth of bottom of NA: -

Type of riser pipe: Schedule 40 PVC

Inside diameter of riser pipe: 2.0 in.

Depth of bottom of riser pipe: 2.5 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite	0.5	1.0
	-	-
	-	-

Diameter of borehole: 4.3 in.

Depth to top of well screen: 2.5 ft

Type of screen: Machine slotted Sch 40 PVC

Screen gauge or size of openings: 0.010 in.

Diameter of screen: 2.0 in.

Type of Backfill around Screen: Filter Sand

Depth to bottom of well screen: 7.5 ft

Bottom of silt trap: 7.8 ft

Depth of bottom of borehole: 10.5 ft

COMMENTS:

TEST BORING REPORT

Boring No. B-08

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 24, 2016
Finish May 24, 2016
Driller J. Rauscher
H&A Rep. S. Poff
Elevation 299.5 (est.)
Datum NAVD88
Location Offset 34.0 ft SE
N 876108.5
E 1226670.1

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted Diedrich D120
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: Nonw

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	WOH/18"	S1	0.0	299.3	ML/	-FOREST LITTER-
	--	18	2.0	0.2	OL	-TOPSOIL/LOAM-
	--			298.8	ML	Very loose brown to yellow-brown fine sandy SILT, trace fine gravel, coarse to medium sand, roots, no odor, moist
	1			0.7		
	1	S2	2.0	297.0	ML	Similar to S1
	1	24	4.0	2.5	SM	Very loose light brown to tan fine SAND, some silt, no odor, dry
	2					
				295.0		-SUBSOIL-
5				4.5		
	6	S3	5.0		SM	Medium dense yellow-brown to light brown coarse to fine SAND, some coarse to fine gravel, little silt, no odor, dry
	8	19	7.0			
	13					
	15					
	24	S4	7.0		SP-SM	Very dense light brown coarse to fine gravelly SAND, little silt, no odor, dry, boulder fragments from 7.9 to 9.0 ft
	31	14	8.3			
	50/4"					Note: Grind auger through boulder from approximately 7.9 to 9.0 ft.
10						
	22	S5	10.0		SM	Very dense light brown to gray-brown coarse to fine gravelly fine SAND, some silt, little coarse to medium sand, no structure, no odor, dry
	25	18	11.8			
	36					
	50/4"					Note: Auger grinding from 11.5 to 12.0 ft on cobble.
15	50/4"	S6	15.0	284.0		Similar to S5
	--	3	15.5	15.5		Note: Auger refusal at 15.5 ft, began rock coring.
						-GLACIAL TILL-
						SEE CORE BORING REPORT FOR ROCK DETAILS
20						

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/27/2016	9:40	66.0	--	14.0	DRY

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.5
Rock Cored (ft) 5.0
Samples 6S, 1C

Boring No. B-08

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

CORE BORING REPORT

Boring No. **B-08**
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
20	4 4 3.5 1.5 2.5	C1	15.5 20.5	53 7.5	88 13	Slight to Moderate	284.0 15.5 279.0 20.5	Very hard slightly weatered (15.5 to 17.6 ft, 17.9 to 18.7 ft) to moderately weatherd (17.6 to 17.9 ft, 18.7 to 20.5 ft) gray and white fine grained muscovite-biotite-quartz GNEISS; Foliation low angle, extremely thin, planar to slightly undulating; Primary (foliation) joints low angle, very close to close, smooth to rough, planar to slightly undulating, discolored (orange-brown), open to tight Note: Moderately weathered zone from 18.7 to 20.5 ft includes completely weathered seams from approximately 18.8 to 18.9 ft, 19 to 19.2 ft, and 19.3 to 19.4 ft. Continuous loss of drill water below 18.7 ft. -QUINEBAUG FORMATION- -BEDROCK- BOTTOM OF EXPLORATION 20.5 FT

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-09

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 1
Start
Finish
Driller
H&A Rep.

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type		--	--	Rig Make & Model:
Inside Diameter (in.)		--	--	Bit Type: / Drill Mud:
Hammer Weight (lb)	--	--	-	Casing:
Hammer Fall (in.)	--	--	-	Hoist/Hammer:
				PID Make & Model:

Elevation 320.9 (est.)
Datum NAVD88
Location See Plan
N 875968.8
E 1226776.7

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
						Note: B-09 was omitted from exploration program by Mott MacDonald.

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft)
Rock Cored (ft)
Samples

Boring No. B-09

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-10 (OW)

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 27, 2016
Finish May 27, 2016
Driller J. Rauscher
H&A Rep. S. Poff
Elevation 322.8 (est.)
Datum NAVD88
Location Offset 6.5 ft south
N 875909.5
E 1226821.1

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted Diedrich D120
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	1 2 3 5	S1 10	0.0 2.0		322.6 0.2	ML/ OL	-FOREST LITTER-
					322.3 0.5	SM	-TOPSOIL/LOAM- Loose orange-brown silty fine SAND, little coarse to fine gravel, coarse to medium sand, no odor, dry
					320.8		-SUBSOIL-
	7 10 15 19	S2 21	2.0 4.0		2.0	SM	Medium dense brown silty SAND, trace gravel, no odor, dry
5	12 14 21 29	S3 19	5.0 7.0				Similar to S2, except dense, some gravel
	30 25 25 28	S4 20	7.0 9.0		315.8 7.0	SM	Very dense brown to light brown to tan coarse to fine gravelly coarse to fine SAND, some silt, occasional poorly-defined layering/stratification
10	11 15 18 22	S5 18	10.0 12.0			SM	Similar to S4, except dense
15					307.8		-GLACIAL TILL-
	10 18 15 25	S6 12	15.0 17.0		15.0	SM	Dense brown to orange-brown fine gravelly coarse to fine SAND, little silt, laminated/foliated (relict structure), no odor, wet
							Note: Auger refusal at 18.0 ft, began rock coring.
					304.8		-WEATHERED BEDROCK-
					18.0		SEE CORE BORING REPORT FOR ROCK DETAILS
20							

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/27/2016	--	--	15.0	17.0	14.6

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 18.0
Rock Cored (ft) 4.4
Samples 6S, 1C

Boring No. B-10 (OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

CORE BORING REPORT

Boring No. **B-10 (OW)**
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Well Dia-gram	Elev./ Depth (ft)	Visual Description and Remarks
									SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
20	3.5 3.5 3.5 3 4	C1	18.0 22.4	51 17.5	97 33	Slight to Fresh		304.8 18.0 300.4 22.4	Hard slightly weathered to fresh gray and white medium to fine grained muscovite-biotite-quartz GNEISS; Foliation low angle, extremely thin, planar to slightly undulating; Primary (foliation) joints low angle, very close to close, smooth to rough, planar to slightly undulating, discolored to fresh, open to tight; Secondary joints moderately dipping across foliation, widely spaced, rough, planar to stepped, discolored, open Note: Core barrel jammed at 22.4 ft, core run terminated. -QUINEBAUG FORMATION- -BEDROCK- BOTTOM OF EXPLORATION 22.4 FT Note: Installed temporary groundwater observation well in completed borehole.
25									
30									
35									
40									
45									
50									

H+A_CORE+WELL07-1 HA-LIB09-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\43434-000_TB.GPJ Jun 27, 16

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. B-10 (OW)

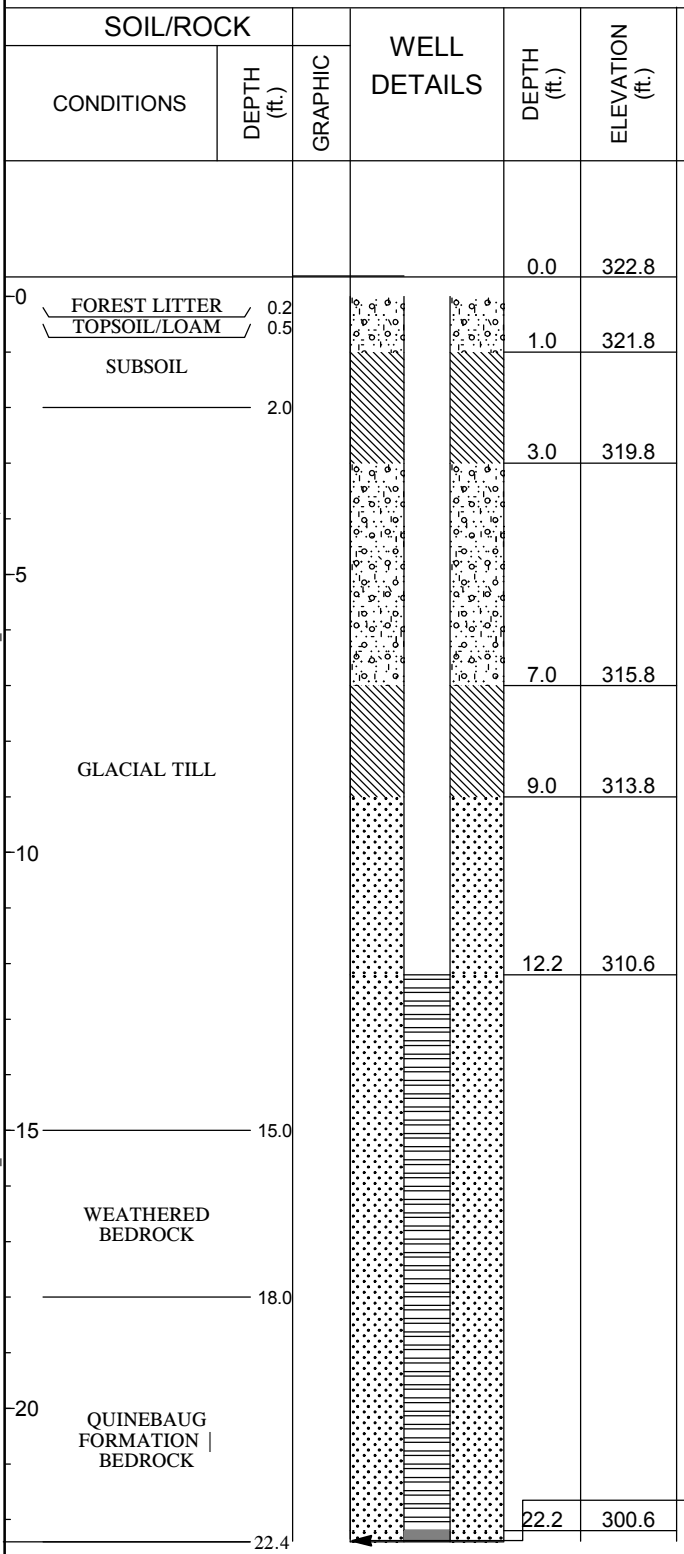
Project Killingly Energy Center
Location Killingly, Connecticut
Client NTE Energy
Contractor NYEG Drilling
Driller J. Rauscher

Initial Water Level (depth bgs) 14.6 ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 43434-000
Date Installed 27 May 2016
H&A Rep. S. Poff
Location N 875909.5
E 1226821.1

Ground El. 322.8 (est.)
Datum NAVD88



WELL CONSTRUCTION DETAILS

Type of protective cover: None
Height of NA above ground surface: NA
Height of top of riser above ground surface: 2.3 ft
Type of protective casing: NA
Length: --
Inside diameter: --
Depth of bottom of NA: -
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 12.2 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite	1.0	2.0
Bentonite	7.0	2.0
	-	-

Diameter of borehole: 6.0 in.
Depth to top of well screen: 12.2 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Sand
Depth to bottom of well screen: 22.4 ft
Bottom of silt trap: 22.4 ft
Depth of bottom of borehole: 22.4 ft

COMMENTS:

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-11

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 3
Start June 1, 2016
Finish June 1, 2016
Driller J. Rauscher
H&A Rep. C. Snow
Elevation 312.3 (est.)
Datum NAVD88
Location See Plan
N 876073.5
E 1227369.9

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted Diedrich D120
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	2 3 3 3	S1 12	0.0 2.0	312.1 0.2	ML/ OL	-FOREST LITTER- Loose dark brown SILT and ORGANIC SILT, little coarse to fine gravel, coarse to fine sand, trace roots, topsoil-like odor, moist
				310.8 1.5	SM	-TOPSOIL- Loose light brown to orange-brown medium to fine SAND, some silt, trace coarse sand, gravel, no odor, dry
	2 3 4 13	S2 19	2.0 4.0	308.8 3.5	SP	-SUBSOIL- Tan coarse to fine SAND, little gravel, trace silt, no odor, dry
	12 24 25 21	S3 15	4.0 6.0		SP	Similar to above, except dense, some cobbles, well-bonded, no odor, moist
5	18 27 24 15	S4 9	6.0 8.0		SP	Very dense tan coarse to fine SAND, some gravel, trace silt, no odor, wet, poorly stratified
	2 6 10 10	S5 11	8.0 10.0	304.3 8.0	SM	Medium dense tan coarse to fine SAND, little gravel, silt, no odor, wet
10	10 11 11 14	S6 16	10.0 12.0		SM	Similar to S5
15	2 6 10 10	S7 12	15.0 17.0	297.3 15.0	SM	Medium dense tan to gray sandy GRAVEL, coarse to fine sand, little silt, no odor, wet
20						

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
		NOT MEASURED			

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 22.0
Rock Cored (ft) 6.0
Samples 8S, 2C

Boring No. B-11

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-09 HA-LIB09-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\43434-000_TB.GPJ Jun 27, 16

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-11
File No. 43434-000
Sheet No. 2 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
20	36 37 48 21	S8 17	20.0 22.0	291.3 21.0 290.3 22.0	SM GM	Very dense gray coarse to medium SAND, stratified, coarser with depth, little gravel, no odor, wet Very dense gray sandy GRAVEL, no odor, wet -GLACIAL TILL- Note: Auger refusal at 22.0 ft, began rock coring. SEE CORE BORING REPORT FOR ROCK DETAILS
25						

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. B-11

HALEY ALDRICH

CORE BORING REPORT

Boring No. B-11
File No. 43434-000
Sheet No. 3 of 3

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
	4	C1	22.0	39	81	Moderate	290.3	Hard to very hard gray and white (with orange and red discoloring) medium to fine grained
			26.0	21	44	to Slight	22.0	muscovite-biotite-quartz GNEISS; Foliation low angle, extremely thin, planar to slightly
	3.5							undulating; Primary (foliation) joints low angle, extremely close to moderately spaced,
	3.5							smooth to rough, planar to slightly undulating to stepped, decomposed to discolored, open
25	4.5							to tight; Secondary joints moderately dipping to high angle across foliation, moderately
								spaced, smooth to rough, planar to slightly undulating, slightly decomposed to discolored,
	5	C2	26.0	21	88	Slight		tight; Biotite seam from approximately 23.3 to 23.7 ft.
			28.0	15.5*	65*			Similar to C1, except foliation joints close to moderately spaced; Quartzite seam with
	4.5							garnets approximately 26.4 to 27.3 ft.
								*RQD qualifier: Closed high angle fracture through RQD zone from 26.7 to 28.1 ft, healed
								with secondary mineralization (probable biotite and pyrite)
							284.3	-QUINEBAUG FORMATION-
							28.0	-BEDROCK-
								BOTTOM OF EXPLORATION 28.0 FT
30								Note: Boring offset 26.0 ft north and 83.0 ft east per Mott MacDonald (to N 876,101, E 12,27,457).
35								
40								
45								
50								
55								

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-12 (OW)

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 3
Start May 26, 2016
Finish May 26, 2016
Driller C. Stone
H&A Rep. S. Poff
Elevation 330.5 (est.)
Datum NAVD88
Location See Plan
N 875928.2
E 1227230.1

	Casing	Sampler	Barrel
Type	HSA	S	NX
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8
Hammer Weight (lb)	--	140	-
Hammer Fall (in.)	--	30	-

Drilling Equipment and Procedures:
Rig Make & Model: Track mounted CME 850
Bit Type: Cutting Head
Drill Mud: None
Casing: Spun
Hoist/Hammer: Winch Automatic Hammer
PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	1 2 5 9	S1 8	0.0 2.0		330.3 0.2	ML/ OL	-FOREST LITTER- -TOPSOIL/LOAM-
					329.9 0.6	SM	Loose yellow-brown silty fine SAND, trace coarse to fine gravel, coarse to fine sand, no odor, dry
					328.9 1.6		-SUBSOIL-
	10 10 20 32	S2 14	2.0 4.0			SM	Medium dense light brown to yellow-brown silty medium to fine SAND, little coarse to fine gravel, coarse sand, no odor, dry
5	10 52 50 20	S3 16	5.0 7.0			SM	Similar to S2, cobble fragments from 5.5 to 6.7 ft
	32 28 34 42	S4 18	7.0 9.0			SM	Medium dense light brown silty SAND, little gravel, no odor, dry, cobble fragments from 8.2 to 8.7 ft
10	14 31 45 42	S5 16	10.0 12.0			SM	Very dense light brown to gray-brown coarse to fine gravelly SAND, some silt, with cobbles, no odor, dry
15	25 18 22 18	S6 23	15.0 17.0			SM	Similar to S5, except dense, moist
20							

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/31/2016	17:00	96.0	--	--	9.0

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 24.0
Rock Cored (ft) 5.0
Samples 7S, 1C

Boring No. B-12 (OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
20	24 13 20 50/1"	S7 12	20.0 21.6			GM	Dense light brown to gray-brown coarse to fine sandy GRAVEL, some silt, no odor, wet Note: Auger grinding/chattering from 21.6 to 24.0 ft. Auger refusal at 24.0 ft, began rock coring.
					306.5 24.0		-GLACIAL TILL- SEE CORE BORING REPORT FOR ROCK DETAILS
25							

HALEY ALDRICH

CORE BORING REPORT

Boring No. B-12 (OW)
File No. 43434-000
Sheet No. 3 of 3

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Well Dia-gram	Elev./ Depth (ft)	Visual Description and Remarks
									SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
25	6 6 5 5 5	C1	24.0 29.0	55 7	92 12	Slight		306.5 24.0	Hard, slightly weathered, gray and white (with orange to red discoloring throughout), medium to fine grained muscovite-biotite-quartz GNEISS; Foliation low angle, extremely thin, planar to slightly undulating; Primary (foliation) joints low angle, extremely to very close, smooth to rough, planar to slightly undulating, decomposed to discolored, open; Secondary joints moderately dipping to high angle across foliation, close to moderately spaced, rough, slightly undulating to stepped, slightly decomposed to discolored, open; Occasional garnets: Quartzite seam from approximately 28.7 to 29.0 ft. -QUINEBAUG FORMATION- -BEDROCK-
								301.5 29.0	BOTTOM OF EXPLORATION 29.0 FT
30									Note: Installed temporary groundwater observation well in completed borehole.
35									
40									
45									
50									
55									

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. B-12 (OW)

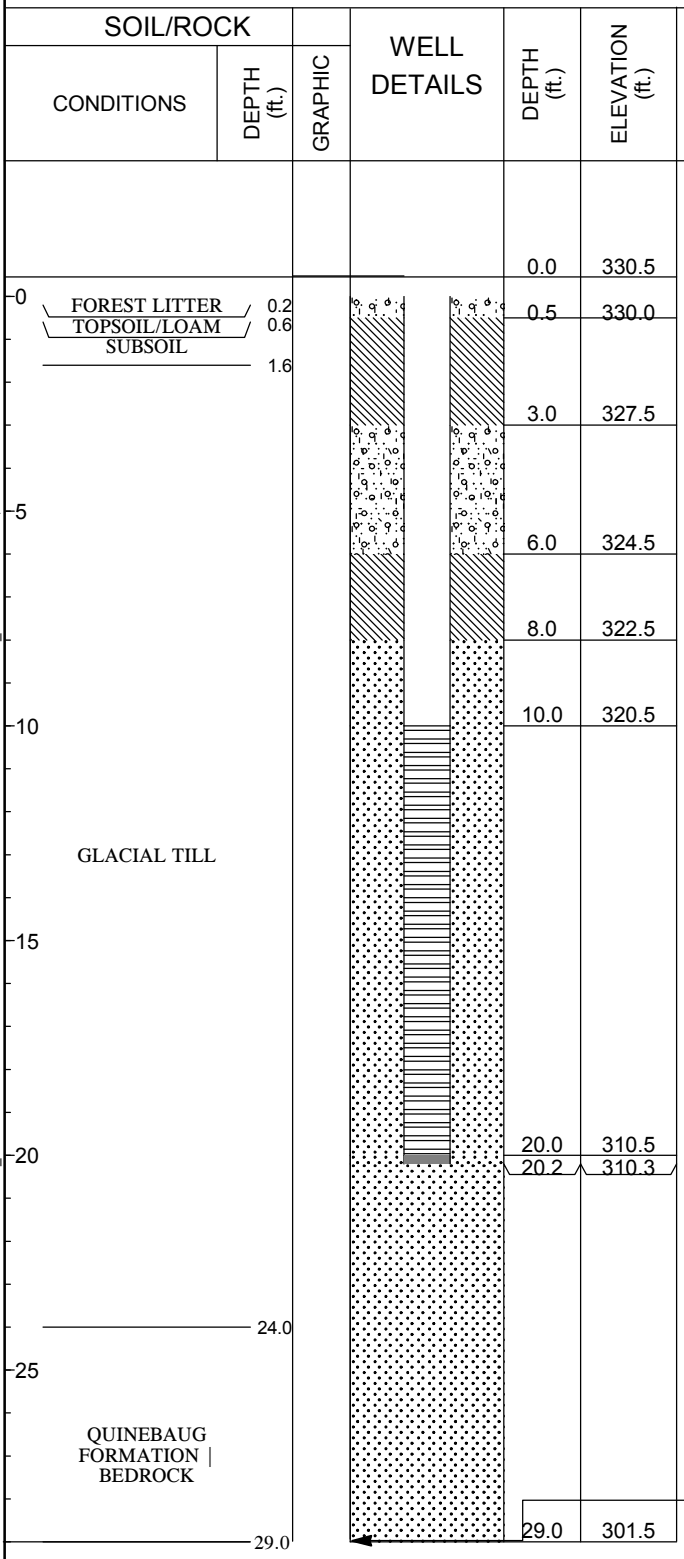
Project Killingly Energy Center
Location Killingly, Connecticut
Client NTE Energy
Contractor NYEG Drilling
Driller C. Stone

Initial Water Level (depth bgs) 9.0 ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 43434-000
Date Installed 26 May 2016
H&A Rep. S. Poff
Location N 875928.2
E 1227230.1

Ground El. 330.5 (est.)
Datum NAVD88



WELL CONSTRUCTION DETAILS

Type of protective cover	None
Height of NA above ground surface	NA
Height of top of riser above ground surface	2.6 ft
Type of protective casing	NA
Length	--
Inside diameter	--
Depth of bottom of NA	-
Type of riser pipe	Schedule 40 PVC
Inside diameter of riser pipe	2.0 in.
Depth of bottom of riser pipe	10.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	0.5
Bentonite	8.0	2.0
	-	-

Diameter of borehole	6.0 in.
Depth to top of well screen	10.0 ft
Type of screen	Machine slotted Sch 40 PVC
Screen gauge or size of openings	0.010 in.
Diameter of screen	2.0 in.
Type of Backfill around Screen	Filter Sand
Depth to bottom of well screen	20.0 ft
Bottom of silt trap	20.2 ft
Depth of bottom of borehole	29.0 ft

COMMENTS:

HA-LIB09-BOS.GLB GW INSTALLATION REPORT-07-1 G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\43434-000_TB.GPJ Jun 27, 16

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-13

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 31, 2016
Finish May 31, 2016
Driller C. Stone
H&A Rep. S. Poff
Elevation 343.8 (est.)
Datum NAVD88
Location See Plan
N 875733.8
E 1227120

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted CME 850
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	1 3 2 3	S1 8	0.0 2.0	343.6 0.2	ML/OL	-FOREST LITTER-
				343.2 0.6	SM	-TOPSOIL/LOAM- Loose orange-brown coarse to fine gravelly fine SAND, some silt, little coarse to medium sand, with cobbles, no odor, dry
	5 10 13 14	S2 18	2.0 4.0	341.8 2.0	SM	-SUBSOIL- Medium dense light brown coarse to fine gravelly coarse to fine SAND, some silt, no odor, dry
5	25 22 35 48	S3 9	5.0 7.0	338.8 5.0	GP	Very dense light brown coarse to fine sandy coarse to fine GRAVEL, trace silt, with cobbles, no odor, dry
	33 28 38 44	S4 19	7.0 9.0	336.8 7.0	SM	Very dense brown silty SAND, some gravel, silt, no odor, dry Note: Auger grinding through boulder from approximately 8.8 to 9.8 ft.
10	20 10 13 5	S5 16	10.0 12.0			Similar to S4, except medium dense, wet at 12.0 ft Note: Auger grinding through boulder from approximately 12.5 to 13.7 ft.
15	23 30 50/1"	S6 4	15.0 16.1		GP	Very dense light brown to white coarse to fine sandy fine GRAVEL, trace silt, no odor, dry (quartzite fragments) Note: Auger chattering from 16.1 to 18.0 ft. Auger and roller bit refusal at 18.0 ft, began rock coring at 18.0 ft.
				325.8 18.0		-GLACIAL TILL- SEE CORE BORING REPORT FOR ROCK DETAILS
20						

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
		NOT MEASURED			

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 18.0
Rock Cored (ft) 10.0
Samples 6S, 1C

Boring No. B-13

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

CORE BORING REPORT

Boring No. B-13
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
	11	C1	18.0 23.0	38 0	63 0	Moderate	325.8 18.0	Note: Core barrel jammed frequently. Hard, moderately weathered, black-gray-white (with orange-brown discoloring), medium to fine grained biotite-quartz GNEISS; Foliation low angle, extremely thin, planar to slightly undulating; Primary (foliation) joints low angle, extremely to very close, rough, planar to slightly undulating, decomposed to discolored, open; Secondary joints high angle to vertical, closely spaced, rough, planar to undulating, decomposed to discolored, open.
	11							
20	10							
	10							
	11							
	9	C2	23.0 28.0	31 5*	52 8*	Moderate		Similar to C1 *RQD qualifier: closed high angle fracture through RQD zone.
	9							
25	9							
	9							
	9							-QUINEBAUG FORMATION- -BEDROCK-
							315.8 28.0	
30								
35								
40								
45								
50								

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-14

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 26, 2016
Finish May 26, 2016
Driller C. Stone
H&A Rep. S. Poff
Elevation 343.4 (est.)
Datum NAVD88
Location See Plan
N 875647.1
E 1227443.2

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	--	Rig Make & Model: Track mounted CME 8560
Inside Diameter (in.)	4 1/4	1 3/8	--	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	1 1 12 18	S1 10	0.0 2.0	343.2 0.2	ML/ OL	-FOREST LITTER- -TOPSOIL/LOAM-
				342.7 0.7	SM	Very loose orange-brown to light brown silty fine SAND, little coarse to fine gravel, trace coarse to medium sand, trace roots, no odor, dry
				342.2 1.2	SM	-SUBSOIL-
	20 23 25 29	S2 21	2.0 4.0		SM	Medium dense light brown coarse to fine SAND, some coarse to fine gravel, little silt, no odor, dry S2: Dense light brown coarse to fine gravelly coarse to fine SAND, some silt, no odor, dry
						Note: Frequent cobbles from 4.0 to 15.0 ft.
5	19 25 25 18	S3 16	5.0 7.0		SM	Similar to S2
	25 30 24 20	S4 18	7.0 9.0		SM	Similar to S3, except light brown to orange-brown
10	10 15 30 32	S5 17	10.0 12.0		SM	Similar to S4, except dense
	33 40 35 53	S6 16	12.0 14.0		SM	Similar to S5, except very dense
15	14 30 32 45	S7 18	15.0 17.0		SM	Similar to S6
						Note: Auger grinding through boulder from approximately 17.0 to 18.0 ft.
						Note: Drill action suggests stratum change at approximately 19.0 ft.
				324.4 19.0		-GLACIAL TILL-
20						

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/27/2016	14:30	24.0 *COLLAPSED	--	18.3*	DRY

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft) 22.0
Rock Cored (ft) --
Samples 8S

Boring No. B-14

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-14
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
20	6 5 6 6	S8 12	20.0 22.0		ML	Medium dense brown to gray-brown medium to fine sandy SILT, trace fine gravel, coarse sand, clay, laminated (possible relict structure), no odor, wet, resembles weathered rock
				321.4 22.0		-PROBABLE WEATHERED BEDROCK- BOTTOM OF EXPLORATION 22.0 FT

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. B-14

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-15

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start June 2, 2016
Finish June 2, 2016
Driller J. Rauscher
H&A Rep. C. Snow

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted CME 8560
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Elevation 321.4 (est.)
Datum NAVD88

Location See Plan
N 876020.5
E 1227764.4

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	2 10 8 6	S1 14	0.0 2.0	320.2 1.2	ML/ OL	Loose dark brown SILT and ORGANIC SILT, little coarse to fine gravel, coarse to fine sand, trace roots, topsoil-like odor, moist
						-TOPSOIL/LOAM-
					SP- SM	Medium dense orange-brown medium to fine SAND, little gravel, little silt, trace coarse sand, no odor, dry
	10 15 38 42	S2 17	2.0 4.0	318.9 2.5	SP- SM	Similar to above
						-SUBSOIL-
					SW	Medium dense light brown coarse to fine SAND, some gravel, trace silt, no odor, dry
	30 50/2"	S3 7	4.0 5.8		SW	Similar to S2, below 2.5 ft
5						-GLACIAL TILL-
				315.6 5.8		Note: Split spoon refusal on probable boulder/bedrock at 5.8 ft. Advanced HSA to 6.0 ft and began core run.
						SEE CORE BORING REPORT FOR ROCK DETAILS
10						
15						
20						

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
NOT ENCOUNTERED					

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 4.0
Rock Cored (ft) 15.0
Samples 3S, 3C

Boring No. B-15

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-09 HA-LIB09-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\43434-000_TB.GPJ Jun 27, 16

HALEY ALDRICH

CORE BORING REPORT

Boring No. B-15
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
		C1	6.0 11.0	27 N/A	45			Recovered 27.0 in. of hard GNEISS BOULDER pieces
10								
		C2	11.0 16.0	6 N/A	10			Note: Borehole reamed to 11.0 ft, core barrel advanced from 11.0 to 16.0 ft. Recovered 6.0 in. of hard GNEISS and QUARTZITE COBBLE pieces
15								
		C3	16.0 21.0	20 N/A	33			Note: Borehole reamed to 16.0 ft, core barrel advanced from 16.0 to 21.0 ft. Recovered 20.0 in. of hard GNEISS and QUARTZITE COBBLE pieces
20							300.4 21.0	-GLACIAL TILL- BOTTOM OF EXPLORATION 21.0 FT
25								
30								
35								
40								

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-16

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 25, 2016
Finish May 26, 2016
Driller C. Stone
H&A Rep. S. Poff
Elevation 310.9 (est.)
Datum NAVD88
Location Offset 14.0 ft west, northwest
N 875521
E 1227859.9

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted CME 850
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	PID Readings (ppm) (sample/bkgd)
0	1 1 1 1	S1 16	0.0 2.0	310.3 0.6	ML/ OL	-TOPSOIL-	
					SM	Very loose orange-brown to yellow-brown silty fine SAND, trace coarse to medium sand, no odor, dry	
	2 3 5 25	S2 10	2.0 4.0		SM	Similar to S1	
					SP	Medium dense brown to orange-brown medium to fine SAND, trace coarse sand, silt, stratified, no odor, moist	
				305.9		-SUBSOIL-	
5	7 10 8 10	S3 20	5.0 7.0	5.0	SM	Medium dense light brown coarse to fine SAND, some silt, little fine gravel, no structure, no odor, moist	
	14 15 15 20	S4 16	7.0 9.0		SM	Similar to S3	
10	13 20 18 20	S5 16	10.0 12.0		SM	Similar to S4, except dense	
				298.9			
	22 28 32 42	S6 15	12.0 14.0	12.0	SM	Very dense light brown to brown coarse to fine gravelly SAND, some silt, no structure, no odor, moist	
15	17 21 23 30	S7 18	15.0 17.0		SM	Similar to S6, except dense, wet	
	22 28 36 45	S8 19	17.0 19.0		SM	Similar to S7, except very dense	
				290.9		-GLACIAL TILL-	
20						Note: Auger grinding from approximately 19.5 to 20 ft. HSA refusal at 20.0 ft. Began rock coring at	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/27/2016	--	24.0	--	8.0	4.5

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 20.0
Rock Cored (ft) 5.0
Samples 8S

Boring No. B-16

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

CORE BORING REPORT

Boring No. **B-16**
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
20	10	C1	20.0 21.0	12 0	100 0	High	290.9 20.0	Very hard highly weathered light gray and white medium to fine grained muscovite-biotite-quartz GNEISS; Orange-brown discoloring throughout Note: Core barrel clogged at 21.0 ft. Core barrel emptied, rock coring continued at 21.0 ft.
	8	C2	21.0 25.0	48 24	100 50	High to Slight	289.2 21.7	Similar to C1
	6							Very hard slightly weathered gray and white (with orange-brown discoloring) medium to fine grained muscovite-biotite-quartz GNEISS; Foliation low angle, extremely thin, planar; Primary (foliation) joints low angle, very close to moderately spaced, smooth to rough, discolored (orange-brown), open to tight; Secondary joints moderately dipping to high angle across foliation, moderately spaced, rough, slightly undulating, discolored, open to tight
	6							-QUINEBAUG FORMATION-
	6							-BEDROCK-
25							285.9 25.0	BOTTOM OF EXPLORATION 25.0 FT
30								
35								
40								
45								
50								
55								

H+A_CORE+WELL07-1 HA-LIB09-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\43434-000_TB.GPJ Jun 27, 16

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-17

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 23, 2016
Finish May 23, 2016
Driller C. Stone
H&A Rep. S. Poff
Elevation 325.7 (est.)
Datum NAVD88
Location See Plan
N 875296.1
E 1227766.5

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	--	Rig Make & Model: Track mounted CME 850
Inside Diameter (in.)	4 1/4	1 3/8	--	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	1 1 2 3	S1 6	0.0 2.0	325.6 0.1	ML	-FOREST LITTER- Very loose dark brown fine sandy SILT, trace coarse to medium sand, no odor, dry
				323.7		-TOPSOIL/LOAM-
	5 10 50/3"	S2 6	2.0 3.3	2.0	SM	Medium dense light gray-brown to tan coarse to fine gravelly SAND, trace silt, no odor, dry Note: Auger grinding through numerous cobbles from 3.3 to 6.5 ft.
5						
	26 60	S3 11	6.5 7.5		GM	Very dense gray to yellow-brown coarse to fine sandy GRAVEL, trace silt, no odor, dry Note: Auger refusal at 7.5 ft. Core barrel advanced to 12.5 ft, recovered 12.0 in. of cobble and gravel pieces.
10						
	50/1" --	S4 0	12.5 12.6			Split spoon refusal at 12.6 ft, no recovery
15	15 12 29 38	S5 18	15.0 17.0		GM	Dense light brown coarse to fine sandy GRAVEL, little silt, no structure, no odor, dry, decomposed cobble from approximately 16.5 to 17 ft.
20						

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/27/2016	--	41.0	--	20.3	DRY

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 30.0
Rock Cored (ft) --
Samples 7S

Boring No. B-17

Field Tests:
Dilatancy: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
20	17 18 20 32	S6 18	20.0 22.0		GM	Similar to S5, except no odor, dry
25	50/4" --	S7 4	25.0 25.3		GM	Similar to S6, except split spoon refusal at 25.3 ft
						Note: Air rotary to 25.5 ft, began rock coring at 25.5 ft. Core barrel advanced from 25.5 to 30.0 ft. Core barrel jammed at 30.0 ft, difficulty retrieving core barrel. Recovered 12.0 in. of QUARTZITE, probable boulder. Unable to re-advance core barrel past 25.0 ft, boring terminated.
						-GLACIAL TILL-
30				295.7 30.0		BOTTOM OF EXPLORATION 30.0 FT

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-18

Project	Killingly Energy Center, Killingly, Connecticut
Client	NTE Energy
Contractor	NYEG Drilling

File No. 43434-000
Sheet No. 1 of 2
Start May 23, 2016
Finish May 23, 2016
Driller J. Rauscher
H&A Rep. S. Poff
Elevation 310.8 (est.)
Datum NAVD88
Location See Plan
N 875720.5
E 1227885.2

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	NX	Rig Make & Model: Track mounted Diedrich D120
Inside Diameter (in.)	4 1/4	1 3/8	1 7/8	Bit Type: Cutting Head
Hammer Weight (lb)	--	140	-	Drill Mud: None
Hammer Fall (in.)	--	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)
0	1 2 1 1	S1 16	0.0 2.0	310.1 0.7	ML/ OL	-TOPSOIL/LOAM-
					SM	Very loose orange-brown to yellow-brown fine SAND, some silt, trace roots, no odor, dry
	2 2 6 38	S2 17	2.0 4.0		SM	Loose orange-brown to tan fine SAND, little silt, poorly-stratified, no odor, dry
				307.1 3.7		-SUBSOIL-
					SP	Very dense brown to gray-brown fine gravelly SAND, trace silt, no odor, dry, angular gravel (cobble fragments)
5	23 75/5"	S3 10	5.0 5.9		SM	Very dense light brown coarse to fine SAND, little fine gravel, silt, no odor, moist
						Note: Cobble from approximately 5.9 to 6.5 ft.
	19 23 26 32	S4 12	7.0 9.0		SM	Dense light brown coarse to fine gravelly SAND, little silt, no odor, dry
				301.3 9.5		
10	18 24 33 37	S5 14	10.0 12.0		GP- GM	Very dense brown to gray-brown coarse to fine sandy GRAVEL, trace silt, no odor, moist, with 4.0 in. of cobble fragments at bottom of sample, split spoon wet at approximately 11 ft
						Note: Drill action indicates gravelly soils, numberous cobbles from 10.0 to 15.0 ft.
15	14 34 21 24	S6 16	15.0 17.0		GP- GM	Similar to S5, except wet
						Note: Drill action indicates gravelly soils, numerous cobbles from 15.0 to 18.0 ft. Auger grinding steadily from approximately 18 to 20 ft. Began coring at 20.0 ft.
				292.8 18.0		-GLACIAL TILL-
20						SEE CORE BORING REPORT FOR ROCK DETAILS

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/24/2016	13:30	-- *COLLAPSED	--	14.0*	7.4

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 20.0
Rock Cored (ft) 10.0
Samples 6S, 2C

Boring No. B-18

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

CORE BORING REPORT

Boring No. B-18
File No. 43434-000
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
20	7	C1	20.0	31	52	High to		Note: Continuous loss of drill water.
	8		25.0	4	7	Moderate		Very hard to hard highly to moderately weathered yellow-gray-white QUARTZITE; Foliation low angle, extremely to very thin, planar, poorly-developed; Primary (foliation) joints low angle, very close to close, smooth, planar, discolored, open to tight; High angle, irregular, discolored (yellow), fractures throughout
	7							
	6							
	7							
							285.8	
25	5	C2	25.0	55	92	Moderate	25.0	Similar to C1, except moderately weathered; Primary (foliation) joints very close to close; Secondary joints moderately dipping to high angle across foliation, moderately spaced, rough, undulating, discolored (yellow to orange), open
	4		30.0	11.5	19			
	4							
	4							
							282.1	
	4						28.7	Similar to C2 above, except biotite-quartz GNEISS
								-QUINEBAUG FORMATION-
							280.8	-BEDROCK-
30							30.0	BOTTOM OF EXPLORATION 30.0 FT
35								
40								
45								
50								

APPENDIX D

Field Permeability Test Results

Appendix D
Summary of Field Hydraulic Conductivitiy Testing
Killingly Eneregy Center
Killingly, Connecticut
Project Number: 43434-000

Location - Test Number	Test Depth (ft)	Soil Stratum	Soil Description	Percent Fines	Test Type	Hydraulic Conductivity (in./hr)
B-01	3.1 to 3.4	glacial till	Light brown coarse to fine gravelly coarse to fine SAND (SM), little silt	20 [2]	Field/Guelph[1.]	0.009
B-04	3.0 to 3.3	glacial till	Brown silty SAND (SM), some gravel	22.0	Field/Guelph[1.]	0.011
B-06	3.1 to 3.4	glacial till	Light brown silty fine SAND (SM), some coarse to fine gravel, little coarse to medium sand	20 [2]	Field/Guelph[1.]	0.053
B-10	3.0 to 3.3	glacial till	Brown silty SAND (SM), trace gravel	43.7	Field/Guelph[1.]	0.061
B-11	3.1 to 3.4	glacial till	Light brown to orange-brown medium to fine SAND (SP), trace coarse sand, gravel	10 [2]	Field/Guelph[1.]	0.017

Notes:
1. Guelph permeameter provides field measurement of the saturated hydraulic conductivity of the soil at the test depth.
2. Visual estimate.
3. A safety factor has not been applied to the hydraulic conductivity values shown above.
The design hydraulic conductivity should incorporate appropriate correction factors to account for site varability and long-term siltation.

APPENDIX E

Field Soil Resistivity Test Results

C
E
G

Providing Support and Service to the Power Industry

Engineering • Consulting • Field Services

One Charlesview Road • Hopedale, MA 01747 • Phone: 508.634.5300 • Fax: 508.634.5400

June 21, 2016

Gary Fuerstenberg
Haley and Aldrich
100 Corporate Place, Suite 205
Rocky Hill CT, 06067

Subject: **Soil Resistivity Measurements at the Killingly Site**

Consulting Engineer Group, Inc. (CEG) was contracted to perform soil resistivity testing for the Killingly Site in Killingly CT.

Attached with the cover letter you will find the individual data sheets for locations E01, E02, and E03. All locations were determined using the site map and stakes that were provided by Haley and Aldrich. At each staked location soil resistivity was tested in accordance with ASTM G 57, and utilizing the Wenner 4-Point method (Figures 1&2).

Three tests were performed using a probe spacing of 4, 8, 12, 16, 20, 30, 40, and 50 feet. Tests were performed at each location in a North-South and East-West directions. Tests were carried out in accordance with the testing procedures established by Haley and Aldrich.

On the data sheets a-spacing (probe spacing), measured resistance in ohms, date, time, air temperature, topography, GPS coordinates, drainage and indications of potential interferences were recorded. Additionally digital photographs were taken at each location. The apparent resistivity was calculated as $\rho=2\pi aR$ and reported in ohm-cm with the a-spacing (probe spacing) measured in feet and resistivity (R) in ohms. An AEMC model 6470 ground tester, calibrated on 1/28/2016, was used.

Should you have any questions or require additional information please give me a call at 508-634-5300xt104.

Sincerely,
Marek Rutkowski
Operation Manager

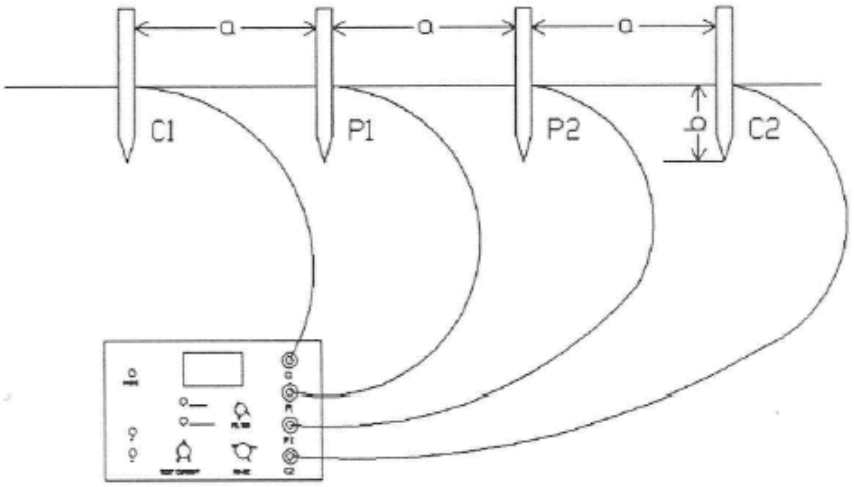


Figure 1 Werner 4 Point Method

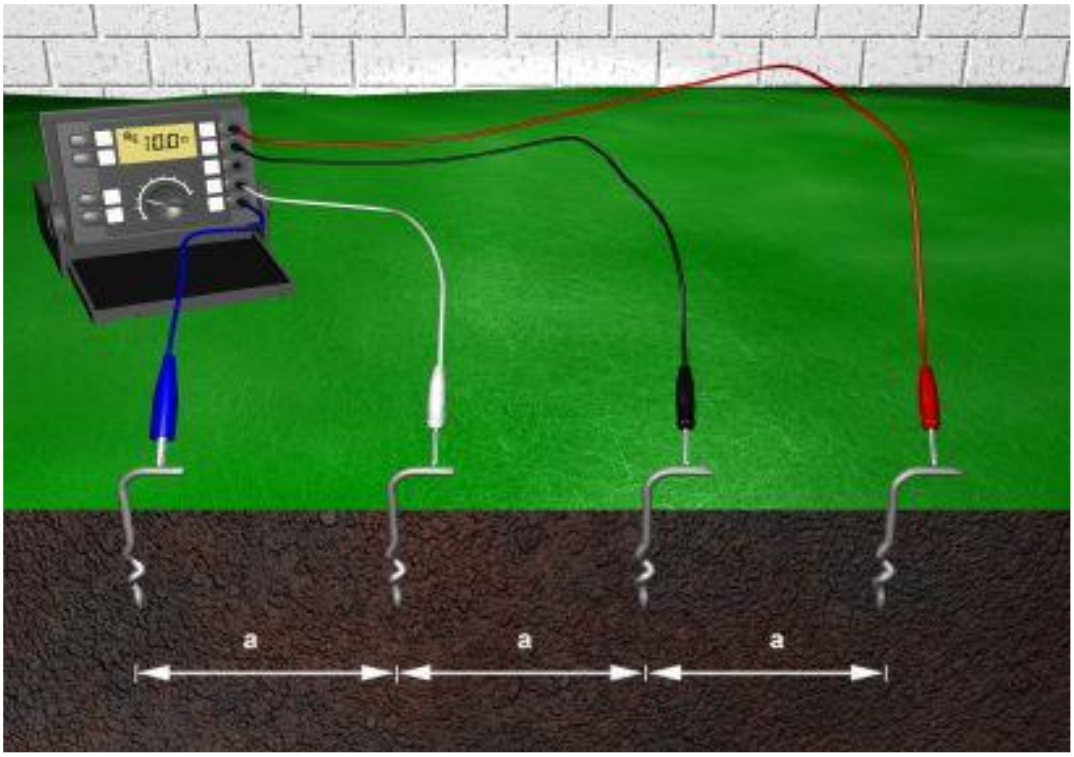


Figure 2 Werner 4 Point Method

C E G

Providing Support and Service to the Power Industry

Engineering / Consulting & Field Services

Wenner 4-Probe Test for Developing Soil Resistivity

Customer:	Haley & Aldrich	Date:	5/25/2016
Address:	100 Corporate Place Rocky Hill CT	Stake#:	E03
Location:	180 & 189 Lake Road, Killingly, Connecticut	Picture#:	E03
Identification:	N 41° 51.631'/ W071° 54. 817'	Tested By:	MB/JC
Rain within the last 24 hour period:	No	Season	Spring
Soil Condition:	Loamy	Weather:	Sunny
Topography:	Flat	Air Temp:	84°F
Drainage:	Good	Humidity:	50%
Indications of Potential Interferences:	Small Hill	Customer Rep.:	Gary Fuerstenberg

Probe Depth(ft) (C)	Probe Depth(ft) (P)	Probe Spacing (ft)	C1	P1	P2	C2	Reading (Ohms)	Apparent Resistivity (Ohm-cm)
0.4	0.4	4	6	2	2	6	664	508639.51
0.8	0.8	8	12	4	4	12	355	543876.59
1	1	12	18	6	6	18	186	427441.03
1	1	16	24	8	8	24	108	330922.09
1	1	20	30	10	10	30	67.9	260064.93
1	1	30	45	15	15	45	29.4	168908.15
1	1	40	60	20	20	60	16.7	127925.90
1	1	50	75	25	25	75	11.4	109158.33

Notes: Test was taken in North South direction. AEMC model 6470 ground tester was used Calibrated on 1/28/2016.

C E G

Providing Support and Service to the Power Industry

Engineering / Consulting & Field Services

Wenner 4-Probe Test for Developing Soil Resistivity

Customer:	Haley & Aldrich	Date:	5/25/2016
Address:	100 Corporate Place Rocky Hill CT	Stake#:	E03
Location:	180 & 189 Lake Road, Killingly, Connecticut	Picture#:	E03
Identification:	N 41° 51.631'/ W071° 54. 817'	Tested By:	MB/JC
Rain within the last 24 hour period:	No	Season	Spring
Soil Condition:	Loamy	Weather:	Sunny
Topography:	Flat	Air Temp:	84°F
Drainage:	Good	Humidity:	50%
Indications of Potential Interferences:	Small Hill	Customer Rep.:	Gary Fuerstenberg

Probe Depth(ft) (C)	Probe Depth(ft) (P)	Probe Spacing (ft)	C1	P1	P2	C2	Reading (Ohms)	Apparent Resistivity (Ohm-cm)
0.4	0.4	4	6	2	2	6	603	461912.09
0.8	0.8	8	12	4	4	12	326	499447.23
1	1	12	18	6	6	18	177	406758.40
1	1	16	24	8	8	24	104	318665.72
1	1	20	30	10	10	30	64.7	247808.56
1	1	30	45	15	15	45	27.4	157417.80
1	1	40	60	20	20	60	20.9	160098.88
1	1	50	75	25	25	75	10.6	101498.10

Notes: Test was taken in East West direction. AEMC model 6470 ground tester was used Calibrated on 1/28/2016.

C E G

Providing Support and Service to the Power Industry

Engineering / Consulting & Field Services

Wenner 4-Probe Test for Developing Soil Resistivity

Customer:	Haley & Aldrich	Date:	5/25/2016
Address:	100 Corporate Place Rocky Hill CT	Stake#:	E02
Location:	180 & 189 Lake Road, Killingly, Connecticut	Picture#:	E02
Identification:	N 41° 51.723'/ W071° 54. 943'	Tested By:	MB/JC
Rain within the last 24 hour period:	No	Season	Spring
Soil Condition:	Loamy/rocky	Weather:	Sunny
Topography:	Slight incline	Air Temp:	70°F
Drainage:	Good	Humidity:	60%
Indications of Potential Interferences:	Rock Wall	Customer Rep.:	Gary Fuerstenberg

Probe Depth(ft) (C)	Probe Depth(ft) (P)	Probe Spacing (ft)	C1	P1	P2	C2	Reading (Ohms)	Apparent Resistivity (Ohm-cm)
0.4	0.4	4	6	2	2	6	580	444293.55
0.8	0.8	8	12	4	4	12	229	350838.70
1	1	12	18	6	6	18	115	264278.06
1	1	16	24	8	8	24	62.8	192425.07
1	1	20	30	10	10	30	57.9	221763.76
1	1	30	45	15	15	45	25.8	148225.52
1	1	40	60	20	20	60	14.2	108775.32
1	1	50	75	25	25	75	9.29	88954.46

Notes: Test was taken in East West direction. AEMC model 6470 ground tester was used Calibrated on 1/28/2016.

C E G

Providing Support and Service to the Power Industry

Engineering / Consulting & Field Services

Wenner 4-Probe Test for Developing Soil Resistivity

Customer:	Haley & Aldrich	Date:	5/25/2016
Address:	100 Corporate Place Rocky Hill CT	Stake#:	E02
Location:	180 & 189 Lake Road, Killingly, Connecticut	Picture#:	E02
Identification:	N 41° 51.723'/ W071° 54. 943'	Tested By:	MB/JC
Rain within the last 24 hour period:	No	Season	Spring
Soil Condition:	Loamy/rocky	Weather:	Sunny
Topography:	Slight incline	Air Temp:	70°F
Drainage:	Good	Humidity:	60%
Indications of Potential Interferences:	Rock Wall	Customer Rep.:	Gary Fuerstenberg

Probe Depth(ft) (C)	Probe Depth(ft) (P)	Probe Spacing (ft)	C1	P1	P2	C2	Reading (Ohms)	Apparent Resistivity (Ohm-cm)
0.4	0.4	4	6	2	2	6	491	376117.47
0.8	0.8	8	12	4	4	12	226	346242.56
1	1	12	18	6	6	18	157	360797.00
1	1	16	24	8	8	24	93.3	285879.92
1	1	20	30	10	10	30	66.8	255851.80
1	1	30	45	15	15	45	24.1	138458.72
1	1	40	60	20	20	60	11.9	91156.78
1	1	50	75	25	25	75	7.98	76410.83

Notes: Test was taken in North South direction. AEMC model 6470 ground tester was used Calibrated on 1/28/2016.

CEG

Providing Support and Service to the Power Industry

Engineering / Consulting & Field Services

Wenner 4-Probe Test for Developing Soil Resistivity

Customer:	Haley & Aldrich	Date:	5/25/2016
Address:	100 Corporate Place Rocky Hill CT	Stake#:	E01
Location:	180 & 189 Lake Road, Killingly, Connecticut	Picture#:	E01
Identification:	N 41° 51.769'/ W071° 55. 000'	Tested By:	MB/JC
Rain within the last 24 hour period:	No	Season	Spring
Soil Condition:	Loamy/rocky	Weather:	Sunny
Topography:	Slight incline	Air Temp:	76°F
Drainage:	Good	Humidity:	60%
Indications of Potential Interferences:	Large rocks	Customer Rep.:	Gary Fuerstenberg

Probe Depth(ft) (C)	Probe Depth(ft) (P)	Probe Spacing (ft)	C1	P1	P2	C2	Reading (Ohms)	Apparent Resistivity (Ohm-cm)
0.4	0.4	4	6	2	2	6	701	536982.38
0.8	0.8	8	12	4	4	12	415	635799.39
1	1	12	18	6	6	18	259	595200.15
1	1	16	24	8	8	24	198	606690.50
1	1	20	30	10	10	30	151	578347.64
1	1	30	45	15	15	45	86.1	494659.58
1	1	40	60	20	20	60	63.8	488722.90
1	1	50	75	25	25	75	40.1	383969.21

Notes: Test was taken in North South direction. AEMC model 6470 ground tester was used Calibrated on 1/28/2016.

C E G

Providing Support and Service to the Power Industry

Engineering / Consulting & Field Services

Wenner 4-Probe Test for Developing Soil Resistivity

Customer:	Haley & Aldrich	Date:	5/25/2016
Address:	100 Corporate Place Rocky Hill CT	Stake#:	E01
Location:	180 & 189 Lake Road, Killingly, Connecticut	Picture#:	E01
Identification:	N 41° 51.769'/ W071° 55. 000'	Tested By:	MB/JC
Rain within the last 24 hour period:	No	Season	Spring
Soil Condition:	Loamy/rocky	Weather:	Sunny
Topography:	Slight incline	Air Temp:	76°F
Drainage:	Good	Humidity:	60%
Indications of Potential Interferences:	Large rocks	Customer Rep.:	Gary Fuerstenberg

Probe Depth(ft) (C)	Probe Depth(ft) (P)	Probe Spacing (ft)	C1	P1	P2	C2	Reading (Ohms)	Apparent Resistivity (Ohm-cm)
0.4	0.4	4	6	2	2	6	649	497149.16
0.8	0.8	8	12	4	4	12	334	511703.60
1	1	12	18	6	6	18	221	507873.49
1	1	16	24	8	8	24	145	444293.55
1	1	20	30	10	10	30	109	417482.73
1	1	30	45	15	15	45	63.2	363095.07
1	1	40	60	20	20	60	37.5	287258.76
1	1	50	75	25	25	75	19.2	183845.61

Notes: Test was taken in East West direction. AEMC model 6470 ground tester was used Calibrated on 1/28/2016.

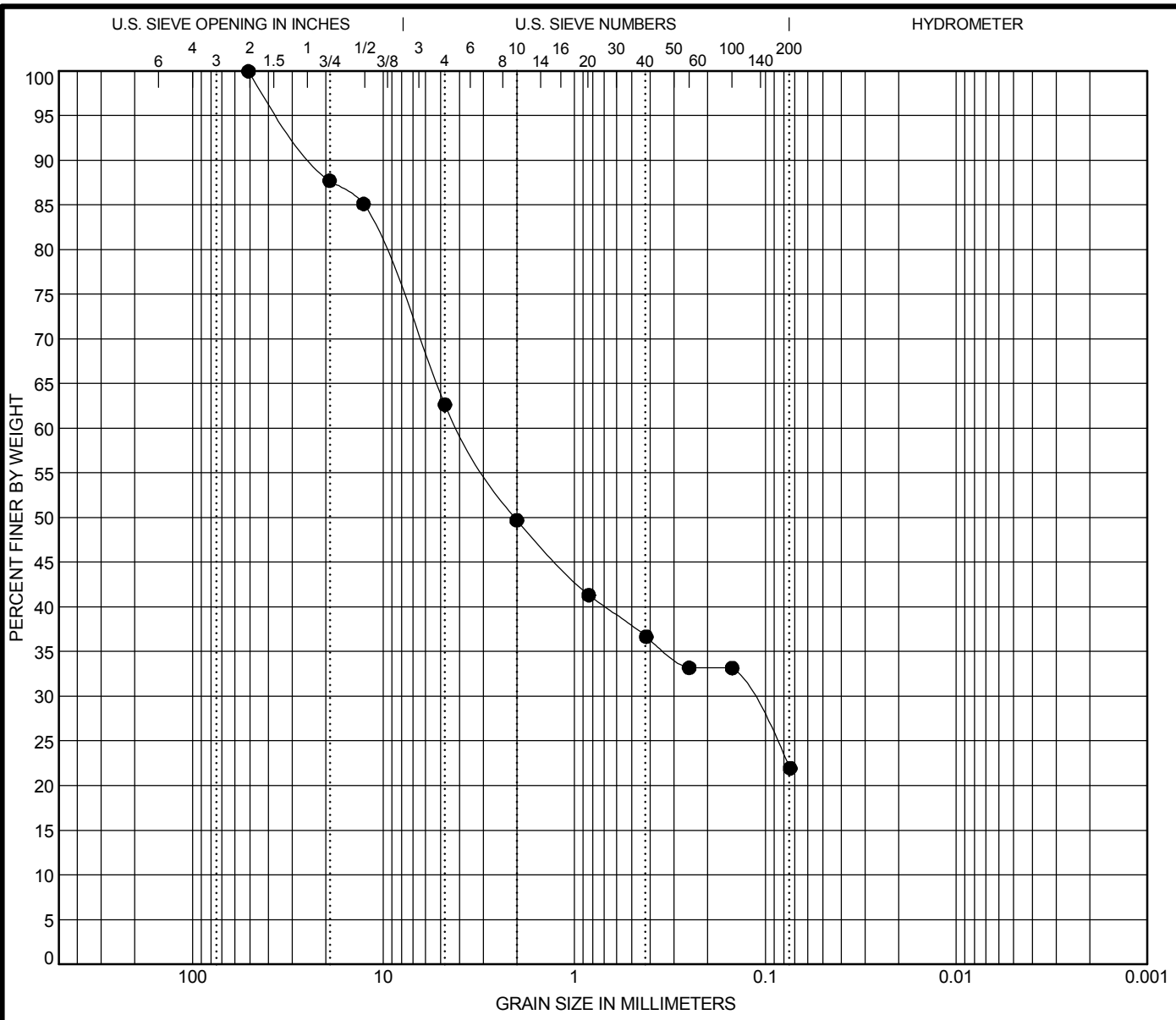

BORING E-01


BORING


BORT NGEL 03

APPENDIX F

Geotechnical Laboratory Test Results



	COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	% SILT	% CLAY
●		**12.3**	**25.1**	**13.0**	**13.0**	**14.7**	**22.0**	

	Expl. No.	Sample No.	Depth (ft.)	LL	PL	PI	Water Content (%)	Cc	Cu
●	**B-4**	**S2**	**2-4**				**6.1**		

Sample Description

● **Brown silty SAND (SM), some gravel**

Remarks:

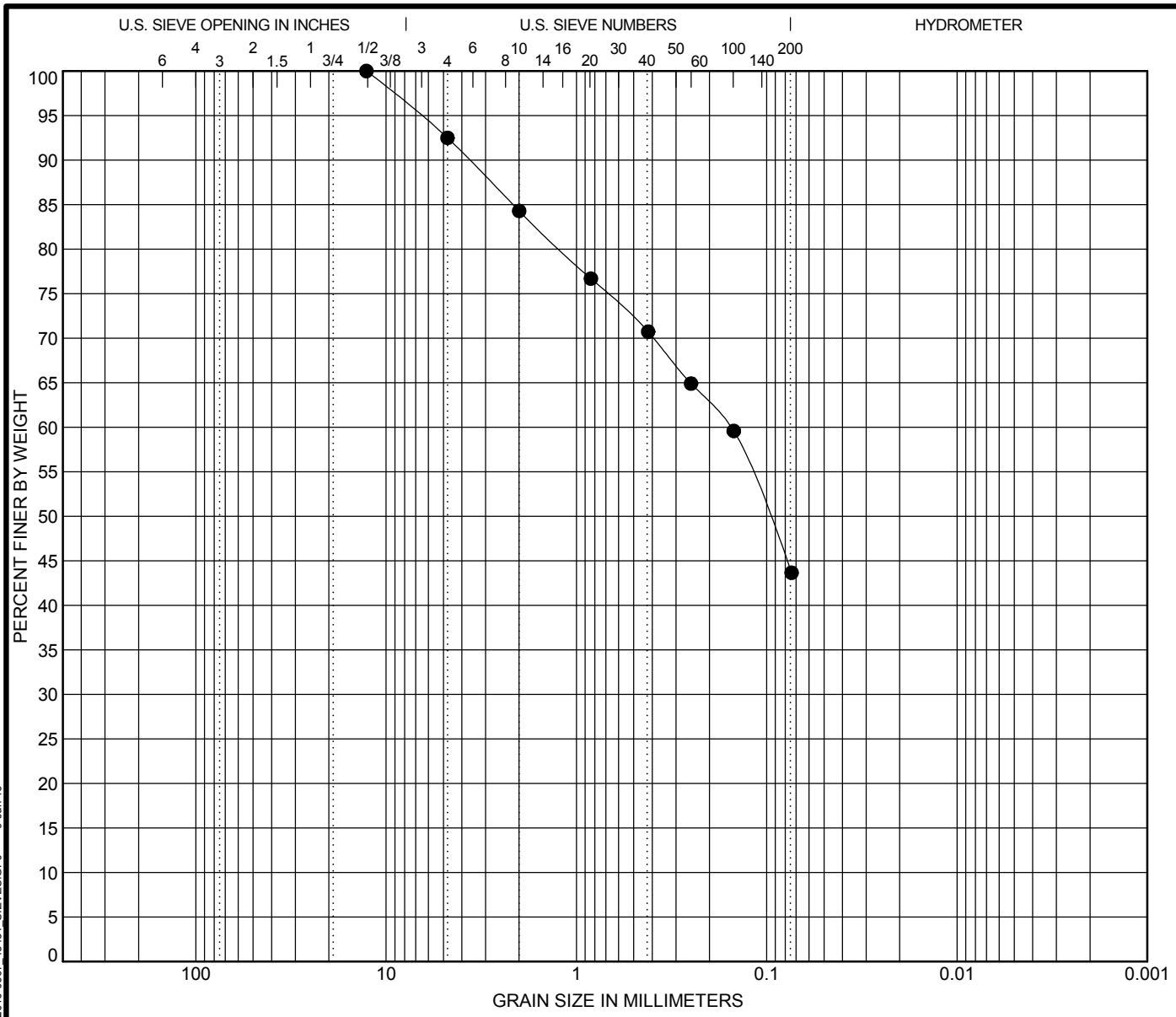
HALEY ALDRICH
Rocky Hill, Connecticut

Killingly Energy Center
Killingly, Connecticut

GRAIN SIZE DISTRIBUTION

Date: 6/8/2016 File No.: 43434-000

H&A SIEVE USCS LABTEMP.GDT G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\2016-0607_43434_SIEVES.GPJ Jun 22, 16



	COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	% SILT	% CLAY
●		**0.0**	**7.5**	**8.2**	**13.6**	**27.1**	**43.7**	

	Expl. No.	Sample No.	Depth (ft.)	LL	PL	PI	Water Content (%)	Cc	Cu
●	**B-10**	**S2**	**2-4**				**11.13**		

Sample Description

● **Brown silty SAND (SM), trace gravel**

Remarks:

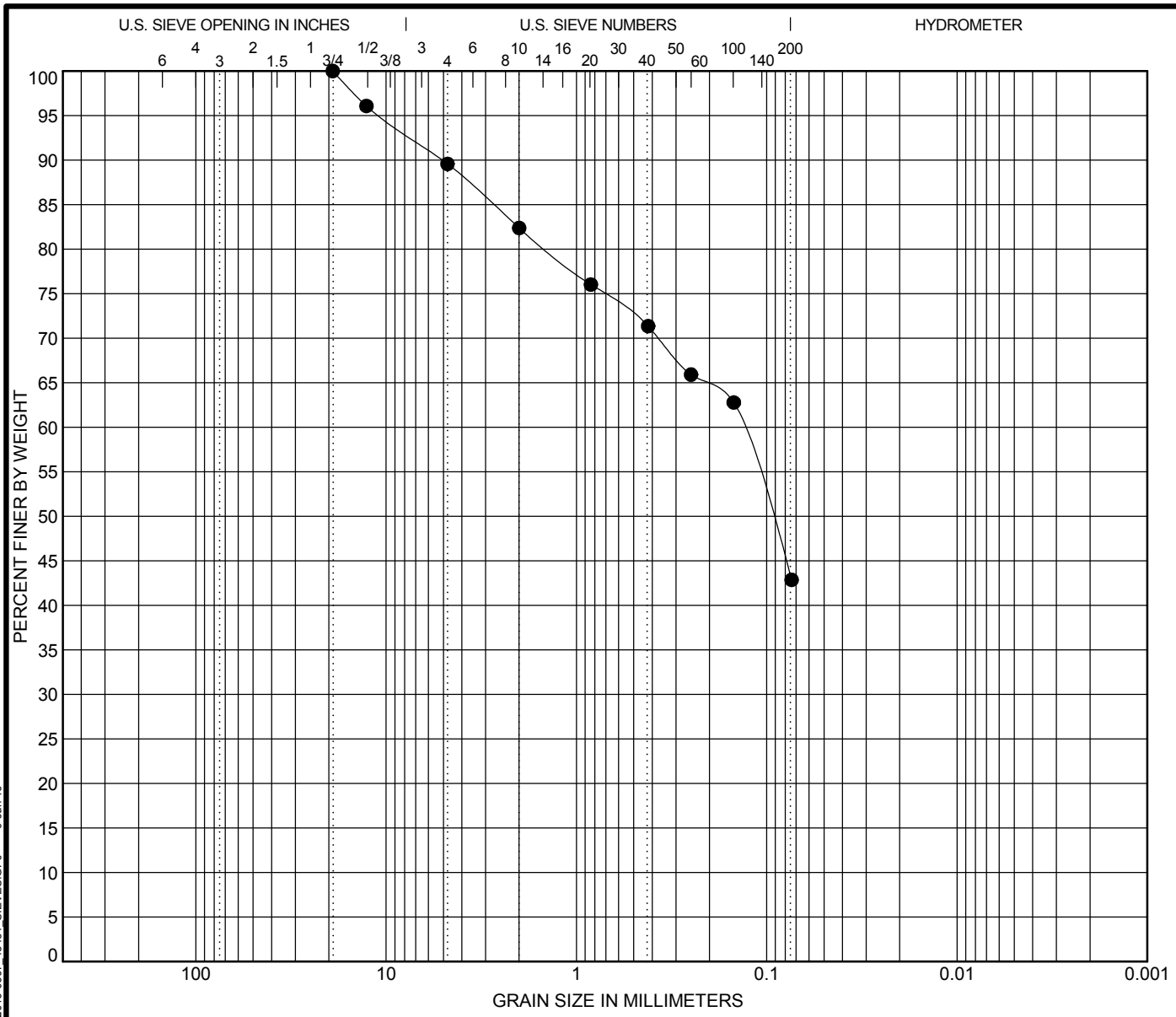
HALEY ALDRICH
Rocky Hill, Connecticut

Killingly Energy Center
Killingly, Connecticut

GRAIN SIZE DISTRIBUTION

Date: 6/8/2016 File No.: 43434-000

H&A SIEVE USCS LABTEMP.GDT G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\2016-0607_43434_SIEVES.GPJ 9 Jun 16



	COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	% SILT	% CLAY
●		**0.0**	**10.4**	**7.2**	**11.0**	**28.5**	**42.9**	

	Expl. No.	Sample No.	Depth (ft.)	LL	PL	PI	Water Content (%)	Cc	Cu
●	**B-12**	**S4**	**7-9**				**11.24**		

Sample Description

● **Light brown silty SAND (SM), little gravel**

Remarks:

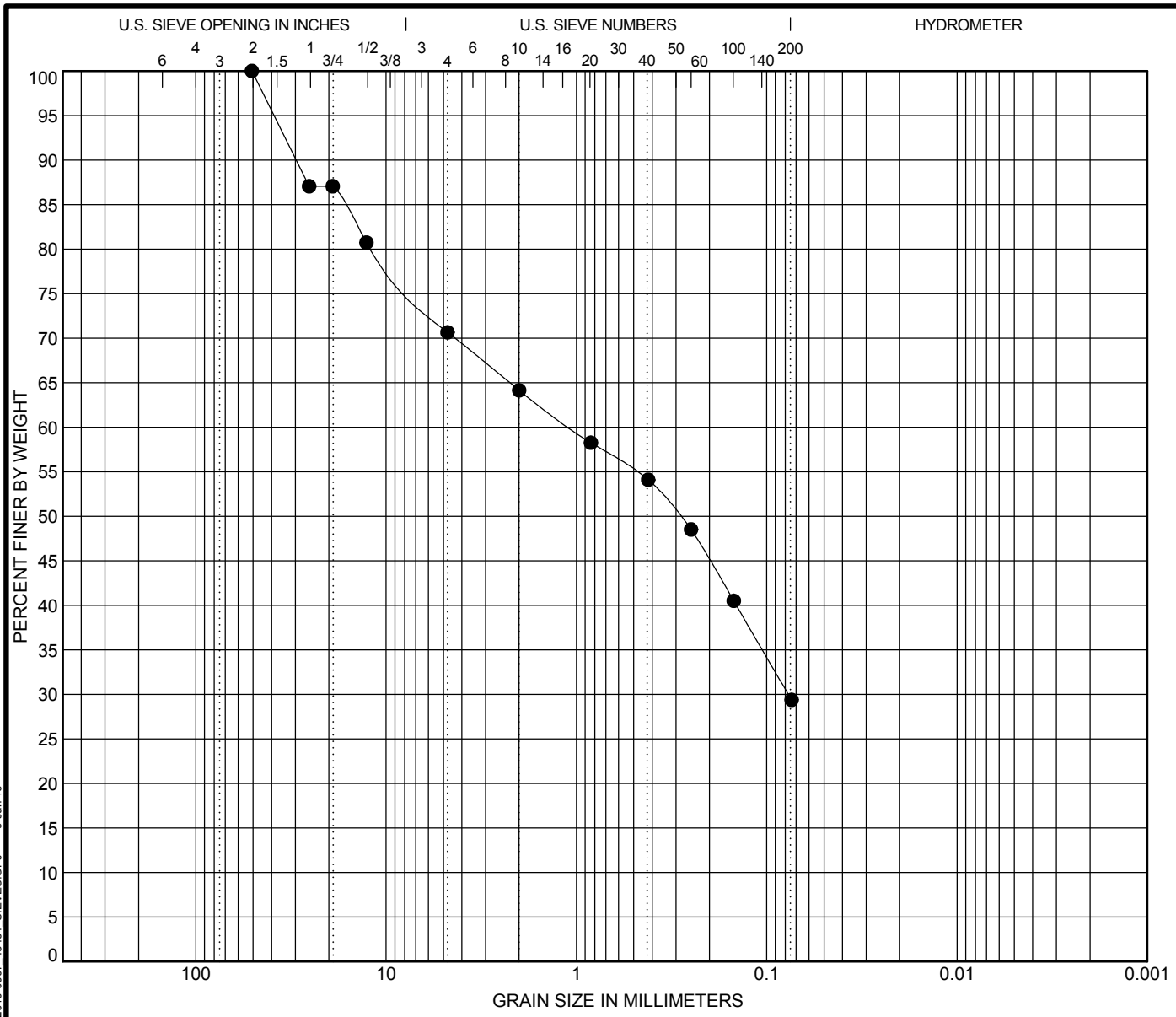
HALEY ALDRICH
Rocky Hill, Connecticut

Killingly Energy Center
Killingly, Connecticut

GRAIN SIZE DISTRIBUTION

Date: 6/8/2016 File No.: 43434-000

H&A SIEVE USCS LABTEMP.GDT G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\2016-0607_43434_SIEVES.GPJ 9 Jun 16



	COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	% SILT	% CLAY
●		**12.9**	**16.4**	**6.5**	**10.0**	**24.7**	**29.4**	

	Expl. No.	Sample No.	Depth (ft.)	LL	PL	PI	Water Content (%)	Cc	Cu
●	**B-13**	**S4**	**7-9**				**8.76**		

Sample Description

● **Brown silty SAND (SM), some gravel**

Remarks:

HALEY ALDRICH
Rocky Hill, Connecticut

Killingly Energy Center
Killingly, Connecticut

GRAIN SIZE DISTRIBUTION

Date: 6/8/2016 File No.: 43434-000

H&A SIEVE USCS LABTEMP.GDT G:\43434_NTE ENERGY - KILLINGLY ENERGY CENTER\CONFIDENTIAL\000\GINT\2016-0607_43434_SIEVES.GPJ 9 Jun 16

APPENDIX G

Geochemical Laboratory Test Results

SoilCor
CORROSION & THERMAL SCIENCES
41765 Hawthorn Street Murrieta, CA 92562
ph (951) 894-2682 • fx (951) 894-2683

Work Order No.: 16F1353
Client: Haley & Aldrich
Project No.: 43434-000
Project Name: NTE Energy
Report Date: June 10, 2016

Laboratory Test(s) Results Summary

The subject soil samples were processed with the U.S. Standard No. 10 Sieve and tested per ASTM International Standards for pH (G 51-95 2005), Soil Resistivity (G 57-06), Sulfate Ion Content (D 516-07) and Chloride Ion Content (D 512-10) and in accordance with Standard Methods procedures for Sulfide Content (SM 4500-S2- D) and Oxidation-Reduction Potential (SM 2580 B Mod.). Redox Potential value(s) reflect temperature correction based on Light's standard solution measurements applied to the calculation in section 6 of the procedure. The results follow:

Sample Identification	pH (H+)	As Rec'd Resistivity (ohm-cm)	Saturated Resistivity (ohm-cm)	Sulfate Content (mg/kg)	Chloride Content (mg/L)	Sulfide Content (mg/L)	Redox Potential	
							Eh (mV)	Temp. (°C)
South @ 1' to 5'	7.1	16,000	12,000	80	10	0.67	73	22.6
North @ 1' to 5'	6.1	42,000	15,000	50	10	0.35	284	22.4

*ND=No Detection

We appreciate the opportunity to serve you. Please do not hesitate to contact us with any questions or clarifications regarding these results or procedures.

Ahmet K. Kaya, Laboratory Manager