GEOTECHNICAL ENGINEERING REPORT
PROPOSED COMMERCIAL LAND-BASED AQUACULTURE FACILITY
285 NORTHPORT AVENUE
BELFAST, MAINE

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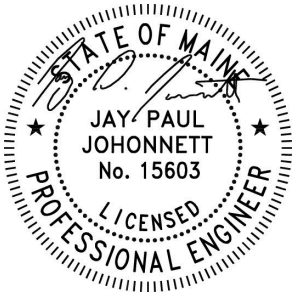

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EXECUTIVE SUMMARY

Ransom Consulting, Inc. (Ransom) has prepared this Geotechnical Engineering Report on behalf of Nordic Aquafarms, Inc. (Nordic) for the proposed development of a commercial land-based aquaculture facility to be located off Northport Avenue in Belfast, Maine. It is understood that the proposed facility will include construction of several buildings, including office space, storage space, full grow-out facilities with large tanks, and supporting infrastructure. This assessment was conducted to collect and evaluate data for planning and budgeting of the proposed project, and to provide design and construction recommendations for specific elements of the project.

The proposed commercial land-based aquaculture facility is planned to be located on the properties known as the Belfast Water District Lower Reservoir, Cassida Back Lot, and Matthews Brothers Lot, along Northport Avenue in the City of Belfast, Maine (the "Site"). The Site encompasses approximately 59 acres of flat and gently sloping terrain transected by steep gullies. The Site also includes an approximately 0.25-acre easement of steep gullied terrain immediately adjacent to Belfast Bay identified as the "Eckrote Property." Approximately 15 acres of the Site consists of an agricultural field (Mathews Brothers Lot). A 3-acre portion of the Site along Northport Avenue is developed and utilized by the Belfast Water District as offices and equipment storage space. The remainder of the Site is primarily undeveloped. Topographic survey of the Site indicates that the Site is situated at approximate elevations ranging from 5 to 80 feet above mean sea level (MSL), as referenced to the North American Vertical Datum of 1988 (NAVD88), and generally slopes down to the southeast towards the Little River and Lower Reservoir. Surface drainage condenses in gullies on Site and flows southeast into the Lower Reservoir.

Our understanding of the proposed development is based on discussions with Nordic and the design team, and review of a series of conceptual Site development plans, most recently the plan titled "Nordic Aquafarms, Multiphase Project, Site Context Plan," dated January 25, 2019 and prepared by SMRT Architects and Engineers, P.C. These conceptual site plans depict two phases of development. The facility layout plan indicates that the proposed facility will likely include construction of several buildings ranging in size from approximately 1,500 square feet to approximately 332,500 square feet, including office space, storage space, and full grow-out facilities (modules) with multiple large tanks, and supporting infrastructure. Additionally, a pipeline system for the intake and discharge of water to and from Belfast Bay is proposed to be constructed.

The structural loads, tolerable settlement amounts, and grading and drainage plans evaluated for this geotechnical investigation were based on discussions with the design team and review of the plan titled "Nordic Aquafarms, Multiphase Project, Site Context Plan," dated January 25, 2019 and prepared by SMRT Architects and Engineers, P.C. Finished floor elevations of the grow modules, smolt buildings, fish processing building, and central utility plant are planned to range from 60 to 70 feet above MSL. The finished floor elevation of the water treatment building is planned to be 36 feet above MSL. Each of the grow modules and water treatment building will have below grade levels. The lower levels of the grow modules will be 19 feet below the proposed finished floor elevations. The lower level of the water treatment plant will be 44 feet below the proposed finished floor elevation. Due to the scale of the development and the existing sloping terrain of the Site, grade cuts and fills of 5 to 10 feet are anticipated throughout the Site for the proposed development. Deeper gullies may require fills of approximately 15 feet or more depending on the final grading design. Excavation required to construct the foundations and lower levels of the grow modules will be approximately 15 to 20 feet below the existing grades. The water treatment building includes 2 stories below grade, requiring a cut up to approximately 48 feet below the existing grades to accommodate construction of the lower level and a seawater intake pipeline.

The subsurface explorations generally encountered a glaciomarine deposit of silt and clay, underlain by glacial till, and bedrock. The glaciomarine deposit ranged in thickness from approximately 4.5 to 20 feet. Upper portions of the glaciomarine deposit were observed to be medium to very stiff, while the lower portions of the glaciomarine deposit were observed to be very soft and compressible. Drilling refusals were encountered at depths ranging from approximately 10.5 to 29.4 feet below existing grades, likely on the bedrock surface. Groundwater was observed at depths of approximately 3.2 to 22.4 feet below ground surface.

The Site is underlain by a soft, compressible glaciomarine silt and clay deposit, which will consolidate under heavy structural loads imposed by the proposed buildings and/or the loads from raise-in-grade fills. The subsurface conditions in their current state are capable of supporting relatively light structural loads on shallow, conventional spread footing foundation systems.

Ransom's understanding of the anticipated structural loads for the grow modules indicate that the loads from these structures will not be suitable for bearing on a conventional spread footing foundation system without improvement of the soil conditions (for example, through aggregate piers or preloading) or employment of a deep foundation system such as piles. Through discussion with the project team Ransom understands that deep foundation systems and/or ground improvement programs, such as preloading or aggregate piers, are not desirable foundation alternatives for this project due to costs and potential design challenges. We understand that the design team prefers excavation and replacement of the unsuitable soils (soft glaciomarine soils) or design of the buildings to bear at elevations corresponding to suitable soils (i.e. glacial till or bedrock). Excavation and replacement of the glaciomarine soils with compacted structural fill, and/or design of the buildings to bear at elevations corresponding to suitable bearing soils are geotechnically feasible alternatives to allow construction of the proposed buildings on conventional spread footing foundation systems.

The native silt and clay soils that will be excavated are not suitable for reuse as structural fill at the Site. The silt and clay soils may be suitable for reuse as common fill provided the moisture content can be controlled and compaction can be achieved. If the native glacial till soils are excavated during construction, they could potentially be reused as common fill provided the moisture content can be controlled and compaction can be achieved. The native soils have a high fines content which may make placing and compacting difficult. Excavated rock could potentially be processed to produce a material suitable for use as structural fill at the Site.

Saturated soils were encountered in the borings at depths of approximately 3 to 22 feet below grade, corresponding to elevations of approximately 39.5 to 65 feet above MSL. It is likely that groundwater will be encountered during excavation for construction of the lower levels of the modules and water treatment building and groundwater management will be required during and following construction.

Approximately 3 to 6 feet of competent bedrock will need to be removed in the north-central and north-east portions of Building 2 to construct the lower level and approximately 1 foot in the central portion of Building 1. Ransom estimates that approximately 32 feet of competent bedrock will need to be removed to construct the lower levels of the water treatment building. The bedrock surface is likely irregular, and areas of bedrock shallower than the elevations observed in the Site test borings should be anticipated during construction. Excavations to install utilities, particularly the seawater intake pipe will require bedrock removal.

TABLE OF CONTENTS

1.0 INTRODUCTION

Ransom Consulting, Inc. (Ransom) has prepared this project Geotechnical Engineering Report on behalf of Nordic Aquafarms, Inc. (Nordic) to support the planning and development of a commercial land-based aquaculture facility to be located off Northport Avenue in Belfast, Maine. The execution of this geotechnical investigation was based on a series of conceptual facility layouts provided to Ransom, most recently being January 25, 2019. It is understood that the proposed facility will include construction of several buildings, including office space, storage space, full grow-out facilities with large tanks, and supporting infrastructure.

This geotechnical engineering evaluation was performed to obtain site-specific subsurface soil information and to make geotechnical evaluations and recommendations for design and construction of future buildings in the area of the investigation. As completed, Ransom's scope of services included the following items in general accordance with our (1) March 23, 2018 Proposed Scope of Work and Cost Estimate Addition, (2) July 23, 2018 Proposed Scope of Work Addendum, and (3) August 28, 2018 Proposed Scope of Work Addition:

1. Subcontracting and coordinating with a drilling contractor and contacting the underground utility clearance system as required by law.

2. Providing technical monitoring for the subsurface explorations, obtaining soil samples, and preparing test boring logs.

3. Submitting selected soil samples for laboratory geotechnical soil tests.

4. Evaluating the field and laboratory data with respect to the proposed development and preparing this report of our findings, evaluations, and recommendations for the future design and construction.

2.0 SITE AND PROJECT DESCRIPTIONS

This geotechnical investigation was performed for the proposed commercial land-based aquaculture facility to be located at the properties known as the Belfast Water District Lower Reservoir, Cassida Back Lot, and Matthews Brothers Lot located off Northport Avenue in the City of Belfast, Maine (the "Site"). The Site is identified by the City of Belfast Assessor's Office as Map 29 Lot 39 (285 Northport Avenue, Belfast Water District Lower Reservior), a portion of Map 4 Lot 12-A (22 Perkins Road, Mathews Brothers Lot), and Map 4 Lot 104 (271 Northport Avenue, Cassida Back Lot). In addition, Ransom performed geotechnical investigation activities on an approximately 0.25-acre easement parcel across Northport Avenue immediately adjacent to Belfast Bay known as the Eckrote Property. A Site Location Map and a Conceptual Site Plan showing the existing conditions and conceptual layout are provided as Figure 1 and Figure 2, respectively.

2.1 Existing Conditions

The Site encompasses approximately 59 acres of gently sloping terrain transected by steep gullies. Approximately 15 acres of the Site consists of an agricultural field (Mathews Brothers Lot). A 3-acre portion of the Site along Northport Avenue is developed and utilized by the Belfast Water District as offices and equipment storage space. The remainder of the Site is primarily undeveloped. Pre-existing logging and access roads were relied upon for access to the majority of the drilling locations.

2.2 Proposed Development

A 2018 topographic survey of the Site indicates that the Site is situated at approximate elevations ranging from 5 to 80 feet above mean sea level (MSL), as referenced to the North American Vertical Datum of 1988 (NAVD88), and generally slopes down to the southeast towards the Little River and Lower Reservoir. Surface drainage flows to gullies on Site which convey water to the southeast into the Lower Reservoir, and finally into Belfast Bay.

We understand that Nordic is considering the Site property for development of a commercial land-based aquaculture facility. Our understanding of the proposed development is based on conversations with Nordic and review of a series of conceptual Site development plans, most recently the plan titled "Nordic Aquafarms, Multiphase Project, Site Context Plan," dated January 25, 2019 and prepared by SMRT Architects and Engineers, P.C. The facility layout plan indicates that the proposed facility will include construction of several buildings ranging in size from approximately 1,500 square feet to approximately 332,500 square feet, including office space, storage space, and full grow-out facilities (modules) with multiple large tanks, and supporting infrastructure. Additionally, a pipeline system for the intake and discharge of water through Belfast Bay is proposed to be constructed. Figure 2 depicts the proposed Site layout.

The structural loads, tolerable settlement amounts, and grading and drainage plans were not finalized when this report was prepared. Finished floor elevations of the grow modules, smolt buildings, fish processing building, and central utility plant are planned to range from 60 to 70 feet above MSL. The finished floor elevation of the water treatment building is planned to be 36 feet above MSL. Each of the grow modules and water treatment building will have below grade levels. The lower levels of the grow modules will be 19 feet below the proposed finished floor elevations. The lower level of the water treatment plant will be 44 feet below the proposed finished floor elevation. Based on conversations with SMRT and Nordic, Ransom understands that each grow module will include three tanks, approximately 21.5 feet tall (6.5 meters) that will occupy the vast majority of each module footprint. Smaller modules

for smolt production will include multiple tanks, approximately 12 to 15 feet tall, and 30 to 40 feet in diameter. The geotechnical design criteria provided by Nordic for use in this report are as follows:

1. Production modules with distributed tank loads of 1,500 pounds per square foot (psf);

2. Building load of 730 psf; and

3. Maximum (allowable) total and differential foundation settlement of 1 inch and ½ inch, respectively.

Due to the scale of the development and the existing sloping terrain of the Site, grade cuts and fills of 5 to 10 feet are anticipated throughout the Site for the proposed development. Deeper gullies may require fills of approximately 15 feet or more depending on the final grading design. Cuts required to construct the lower levels of the grow modules (Figure 2) will be approximately 15 to 20 feet below the existing grades. The water treatment building includes 2 stories below grade, requiring a cut up to approximately 48 feet below the existing grades to accommodate construction of the lower level and a seawater intake pipeline.

3.0 SUBSURFACE INVESTIGATION

The geotechnical subsurface exploration program for the Site was conducted March 26 through 30, July 25, and September 4 through 7, 2018. The subsurface exploration program consisted of 36 test borings (designated B101 through B109, B109-B through B113, B201 through B203, B301, B302, B304 through B311, B311-A through B314, and B401 through B405), as shown on Figure 2. The explorations were not surveyed; their locations and elevations should be considered approximate.

3.1 Subsurface Explorations

Test drilling was performed by New England Boring Contractors of Derry, New Hampshire and Hermon, Maine, with a track-mounted drill rig using a combination of 2¼-inch inside-diameter (ID) hollow-stem augers and/or 3-inch driven casing washed by roller bit. Split-barrel sampling with standard penetration testing (ASTM D 1586), using a 140-pound drive hammer, was conducted continuously to 6 feet below the ground surface (bgs), then at 5-foot intervals to the bottoms of the borings; deviations from this sampling program were made at the discretion of Ransom field personnel. Borings were generally advanced to auger refusal or 30 feet bgs, whichever occurred first. A thin-walled tube (Shelby tube) sample of was collected at boring B311-A. Two additional thin-walled tube samples were attempted in borings B109-B and B304; however, recovery was unsuccessful.

A Ransom representative monitored the subsurface explorations and prepared field boring logs. Soil samples were placed in sealed containers and returned to Ransom's office for further evaluation. Soil samples were visually classified in general accordance with visual-manual procedures (ASTM D 2488) and described using the Burmister Soil Classification System. Exploration logs are included in Appendix A.

3.2 Laboratory Testing

Laboratory testing was performed on selected soil samples from the test borings. The geotechnical soil index testing (grain-size distributions with hydrometers, Atterberg limits, moisture content) was performed by ConTest Consultants, Inc. of Goffstown, New Hampshire. The geotechnical index testing and incremental consolidation testing for the thin-walled tube sample was performed by GeoTesting Express of Acton, Massachusetts. Corrosion potential analyses were performed by Alpha Analytical of Westborough, Massachusetts. The laboratory test reports are included in Appendix B. The laboratory tests were performed in general accordance with the applicable ASTM procedures.

4.0 SUBSURFACE CONDITIONS

Subsurface conditions at the Site were characterized by drilling into the overburden soil formations and shallow, weathered bedrock at accessible locations at the Site property. Figure 2 illustrates the existing Site features and approximate test boring locations. The general characteristics of the subsurface strata are described below; refer to the logs in Appendix A for more detailed soil descriptions at specific locations and depths.

4.1 Subsurface Soils

Test borings were advanced to depths ranging from approximately 10.4 to 30 feet below existing grades. The subsurface explorations generally encountered a glaciomarine deposit of silt and clay, underlain by glacial till, and bedrock. Portions of the glaciomarine deposit were observed to be very soft and compressible. Thin surficial layers of topsoil were observed in a sparse distribution across the Site. The general characteristics of the subsurface layers are described below in order of increasing depth encountered below the ground surface.

Glaciomarine Deposit

A native glaciomarine deposit was encountered immediately below the surficial layers in each soil boring. This glaciomarine deposit is typically referred to as the Presumpscot Formation and is encountered in the coastal areas of eastern New England that were formerly submerged sea floor.

The glaciomarine deposit is generally composed of an upper, stiff silt and clay unit, and a lower, very soft silt and clay deposit. Combined, the full thickness of the glaciomarine deposit was observed to range from approximately 5 to 20 feet thick and appears to have been deposited directly on the underlying glacial till or bedrock.

The uppermost portion of the glaciomarine deposit generally consists of gray/brown silt and clay, with occasional fine sand lenses and brown stained fracture planes. Standard penetration testing indicated that the upper glaciomarine unit is generally in a medium stiff to very stiff condition. Based on the results of laboratory testing and visual classification the upper glaciomarine deposit is classified as a lean clay (CL) in general accordance with the Unified Soil Classification System (USCS).

A very soft, lower gray clay unit was encountered at most of the boring locations directly underlying the stiff, upper glaciomarine clay at depths ranging from approximately 8 to 15 feet below grade. This lower unit was observed to range from approximately 1 to 6 feet thick. Standard penetration testing indicated that this lower zone of glaciomarine clay is in a very soft condition. A thin-walled tube (Shelby tube) sample of the very soft gray clay was collected from boring B311-A at an approximate depth of 13 to 15 feet below grade. The results of one-dimensional incremental consolidation testing (ASTM D2435) performed on this sample demonstrated that this clay will consolidate under moderate and heavy loading conditions. Based on the results of laboratory testing and visual classification, the very soft gray clay deposit is classified as lean clay (CL) in general accordance with the USCS.

Laboratory index tests (Appendix B) performed on samples of the glaciomarine deposit indicate that this deposit has the following characteristics.

Property	Stiff Silt and Clay	Soft Clay
Water content	21.3 – 31.7%	27.5 – 34.7%
Liquid limit	34 - 52	34 - 44
Plastic limit	17 - 23	16 - 21
Plasticity index	17 - 31	16 - 24
Liquidity index	0.03 – 0.62	0.52 – 0.88

Glacial Till

A native glacial till deposit was encountered directly underlying the glaciomarine deposit in all of the test borings with the exception of borings B104, B201, B202, B309, B313, and B314 (Appendix A).

The glacial till consists of medium dense to very dense, gray, silt and fine sand with some clay, and some gravel. Based on the results of laboratory testing and visual classification, the glacial till is classified as silty sand (SM) in general accordance with the USCS.

Weathered Bedrock

With the exception of borings encountering refusal presumably in the glacial till unit, highly weathered bedrock was encountered at depths ranging from approximately 10.4 to 23 feet below grade. At borings that fully penetrated that weathered bedrock unit, the weathered bedrock was approximately 1 to 15 feet thick. The rock was identified as a highly fractured dense to very dense dark grey phyllite. While often resilient to split-spoon sampling, recovered samples could be crumbled with hand pressure and the hollow-stem auger was generally able to advance with little to moderate effort.

Drilling Refusal

Drilling refusal, the depth at which the drilling equipment was not able to practically penetrate the deeper geologic units, was encountered in 25 borings. The depths of refusal were approximately 10.4 to 29.4 feet below existing grades (Appendix A). Ransom presumes all refusals to be the result of encountering sufficiently competent bedrock unless otherwise noted. Additionally, four borings (B102, B106, B109, and B111) were terminated at 30 feet bgs in weathered bedrock without encountering drilling refusal. The inferred depths to, and elevations of, the more competent bedrock are presented in the table below.

Test Boring	Estimated Ground Elevation (feet above MSL)	Depth to Drilling Refusal (feet)	Approximate Competent Bedrock Surface Elevation (feet above MSL)
B101	52	19.7	32.3
B102	57	>30	<27
B103	56	18.9	37.1
B104	61	29.4	31.6
B105	60	16.2	43.8
B106	58	>30	<28
B107	60	22.8	37.2

Test Boring	Estimated Ground Elevation (feet above MSL)	Depth to Drilling Refusal (feet)	Approximate Competent Bedrock Surface Elevation (feet above MSL)
B108	64	21.8	42.2
B109	65	>30	<35
B110	69	19	50
B111	57	>30	<27
B112	53	17.9	35.1
B113	44	16	28
B201	24	13.9	10.1
B202	26	23	3
B203	39	14.8	24.2
B301	71	21.7	49.3
B302	71	20.4	50.6
B304	65	15.5	49.5
B305	67	19.2	47.8
B306	63	15.7	47.3
B307	61	20	41
B308	63	25	38
B309	61	14.6	46.4
B310	59	27.3	31.7
B311	63	24.2	38.8
B312	56	19.3	36.7
B313	57	10.4	46.6
B314	66	19.8	46.2
B401	28	>12	<16
B402	28	>12	<16
B403	27	>17	<10
B404	24	>17	<7
B405	22	>17	<5

4.2 Groundwater

Groundwater-saturated soils were observed at depths ranging from approximately 3.2 to 22.4 feet below ground surface, corresponding to elevations ranging from approximately 39.5 to 65 feet above MSL. The shallower groundwater observations (3 to 4 feet +/- below grade) are inferred to represent groundwater perched in the glaciomarine deposit. Note that groundwater levels at the Site will fluctuate due to season, temperature, precipitation, topographic relief, nearby underground utilities, and construction activity. Therefore, water levels at other times may differ from the observations and measurements made during drilling.

5.0 ENGINEERING EVALUATIONS

The Site is underlain by a stiff to very soft glaciomarine silt and clay deposit, glacial till, and bedrock. The controlling geotechnical features for the development of the Site are:

1. Foundation-Bearing Soils – The soft glaciomarine silt and clay deposit will consolidate under the loads imposed by the proposed Site buildings with heavier structural loads and/or the loads from raise-in-grade fills. The subsurface conditions in their current state are capable of supporting relatively light structural loads on shallow, conventional spread footing foundation systems.

   Ransom's understanding of the anticipated structural loads for the grow modules indicate that the loads from these structures will not be suitable for bearing on a conventional spread footing foundation system without improvement of the soil conditions (for example, through aggregate piers or preloading) or employment of a deep foundation system such as piles. Through discussion with the project team, Ransom understands that deep foundation systems and/or ground improvement programs, such as preloading or aggregate piers, are not desirable foundation alternatives for this project due to costs and potential design challenges. We understand that the design team prefers excavation and replacement of the unsuitable soils (soft glaciomarine soils) or design of the buildings to bear at elevations corresponding to suitable soils (i.e. glacial till or bedrock). Excavation and replacement of the glaciomarine soils with compacted structural fill, and/or design of the buildings to bear at elevations corresponding to suitable bearing soils are geotechnically feasible alternatives to allow construction of the proposed buildings on conventional spread footing foundation systems.

2. Groundwater – Saturated soils were encountered in the borings at depths of approximately 3 to 22 feet below grade, corresponding to elevations of approximately 39.5 to 65 feet above MSL. It is likely that groundwater will be encountered during excavation for construction of the lower levels of the modules and water treatment building and groundwater management will be required during and following construction.

3. Rock Removal – Highly weathered bedrock was encountered at depths ranging from approximately 10 to 23 feet below grade. At borings that fully penetrated that weathered bedrock unit, the weathered bedrock was approximately 1 to 15 feet thick. While often resilient to split-spoon sampling, recovered samples could be crumbled with hand pressure and the hollow-stem auger was generally able to advance with little to moderate effort. Underlying the weathered bedrock, the inferred competent bedrock surface was observed at depths ranging from approximately 10 to 29 feet bgs, corresponding to elevations of 3 to 51 feet above MSL.

   Approximately 3 to 6 feet of competent bedrock will need to be removed in the north-central and north-east portions of Building 2 to construct the lower level and approximately 1 foot in the central portion of Building 1. Ransom estimates that approximately 32 feet of competent bedrock will need to be removed to construct the lower levels of the water treatment building. The bedrock surface is likely irregular, and areas of bedrock shallower than the elevations observed in the Site test borings should be

anticipated during construction. Excavations to install utilities, particularly the seawater intake pipe, will require bedrock removal.

Geotechnical engineering evaluations for this project are based on the subsurface conditions interpreted from widely spaced subsurface explorations, laboratory testing, and the project design information currently available. Should differing information become known prior to or during construction, the evaluations and recommendations in the following section should be reviewed by Ransom and modifications to these recommendations may be necessary.

6.0 DESIGN RECOMMENDATIONS

Based on the subsurface explorations and our geotechnical evaluations, Ransom presents the following recommendations for the design of the Nordic Aquafarms facility at 285 Northport Avenue in Belfast, Maine.

6.1 Site Grades

The presence of compressible clay soils below the Site indicates that addition of raise-in-grade fills should be minimized in order to reduce the amount of consolidation, and hence the post-construction settlement that could potentially occur. Some areas of the Site are more favorable geotechnically for supporting raise-in-grade fills; specifically, the easternmost area of the Site as represented by the conditions observed in borings B101 and B113, and the upland area of the Site represented by the conditions observed in borings B110 and B301.

Based on the proposed finished floor elevations provided on the most recent Site plan, cuts and fills of generally 3 to 5 feet will be required to meet the design grades at the Site. These fills are planned to be placed in areas of the Site underlain by soft compressible glaciomarine clay. The underlying clay soils could support lightly-loaded spread footing loads (up to 2,000 psf) and engineered fills up to 5 feet in height resulting in consolidation-related settlements less than approximately 1 inch. Placement of fills greater than 5 feet in height and/or construction of foundation systems with bearing pressures higher than 2,000 psf could result in consolidation of the clay and settlement beyond acceptable tolerances for Site buildings and structures.

6.2 Foundation Systems

The subsurface conditions beneath the Site include a medium to very stiff glaciomarine deposit that transitions to a soft, compressible glaciomarine deposit. The subsurface conditions are capable of supporting relatively lightly loaded structures on shallow, conventional spread footing foundation systems without the need for ground improvement provided raise-in-grade fills are limited to 5 feet or less. Ransom understands that the grow modules have been designed with a lower level (19 feet below the planned finished floor). Construction of the lower level will allow the grow modules to bear at elevations corresponding to soils with higher bearing capacities (i.e. glacial till and bedrock) and will allow construction of the proposed buildings on conventional spread footing foundation systems.

Foundation elements for the proposed buildings constructed without lower levels (bearing at elevations above the glaciomarine deposit, and with raise-in-grade fills limited to 5 feet or less) should be proportioned using a maximum allowable contact pressure of 2,000 psf. Foundation elements for buildings constructed with lower levels (bearing at elevations of glacial till) should be proportioned using a maximum allowable contact pressure of 4,000 psf. Spread footings should be at least 2 feet wide and continuous footings should be at least 1.5 feet wide. Post-construction total and differential settlements are anticipated to be no more than approximately 1 inch and 0.5 inch, respectively.

Lateral loads may be resisted by friction between the bottoms of footings and supporting subgrades, and by passive earth pressure against the sides of the foundation. A friction coefficient of 0.35 and an equivalent fluid unit weight of 150 pounds per cubic foot (pcf) against the sides of footings should be used.

Exterior footings should be placed a minimum of 5 feet below the lowest adjacent ground surface exposed to freezing conditions. At heated interior locations, footings may be designed to bear 2.5 feet below the top of ground floor slab. If exposure to freezing is anticipated during or after construction, interior footings should be lowered to bear 5 feet below the top of ground floor slab.

6.3 Floor Slabs

Subsurface conditions are suitable for slab-on-grade ground floors with consideration of the recommendations in Section 6.2. The uppermost 12 inches of material beneath all slabs-on-grade should consist of compacted structural fill that conforms to the gradation specification in this report. A modulus of subgrade reaction of 200 pounds per cubic inch (pci) should be used to proportion the slabs-on-grade constructed on properly compacted structural fill.

Exterior slabs at entrances should be underlain by at least 5 feet of free-draining material, such as structural fill or crushed stone, to reduce the potential for frost heaving. Surrounding grades should be sloped away from the buildings in order to reduce available moisture for forming frost and ice.

6.4 Basement Walls

The current design indicates that the proposed grow modules and water treatment building will be constructed with below-grade, basement levels. The basement walls will support unbalanced earth pressures and should be designed as retaining walls using "at rest" earth pressure conditions. At-rest conditions should be used for the design of walls that are not free to deflect or rotate. Other foundation or retaining walls that are free to deflect or rotate may be designed using active earth pressure conditions.

Foundation wall backfills should be adequately drained to eliminate hydrostatic pressures behind the wall. Backfill above and outside the foundation walls should consist of structural fill that conforms to the gradation specification in this report. The equivalent fluid weights specified in this subsection assume that the walls are constructed with a drainage system that will effectively drain to prevent hydrostatic pressures from building up behind the walls.

The following parameters are based on Rankine's Lateral Earth Pressure Theory and should be used to compute the lateral earth pressures for walls constructed with level backfill. Hydrostatic forces have not been accounted for. If drainage systems are not included in the design, the parameters should be modified accordingly to include hydrostatic forces.

Design Parameter	**Active**	**At-Rest**
Angle of Friction of Backfill	32°	
Coefficient of Lateral Earth Pressure	0.31	0.47
Unit Weight of Backfill (pcf)	135	135
Equivalent Fluid Unit Weight (pcf)	42	63
Coefficient of sliding friction (μ)	0.55	

In addition to differential earth pressures, any applicable surcharge pressures from floor loading, traffic, and other sources should be applied to the foundation walls. Uniformly distributed surcharge pressures can be resolved into forces, per lineal foot, which act at a depth of one-half the wall height below the upper level grade on the wall. Surcharge forces should be calculated using the following expression:

Fs = ½ *P*H, where:
Fs = surcharge force (pounds);
P = live and dead load pressure from surcharge; and
H = height of wall (feet).

The wall designs should achieve wall stability factors of safety of 2.0 for overturning, 1.5 for sliding, and 1.5 for overall ("global") stability.

6.5 Groundwater and Drainage

Groundwater was measured at depths ranging from approximately 3.2 to 22.4 feet below grade in Site borings, corresponding to approximate elevations 39.5 to 65 feet above MSL. Below-grade levels are currently planned for the grown modules with finished slab elevations ranging from 48.5 to 58.5 feet above MSL and for the water treatment building of -8 feet above MSL. Post-construction below-grade levels may also require long-term management of groundwater and may potentially include pumping systems and waterproofing of basement walls to prevent groundwater from entering below-grade levels or installing perimeter or interior drains and daylighting to gravity outfalls or connecting to municipal storm drainage.

Exterior foundation backfill should be sealed with a surficial layer of clayey or loamy soil in areas that will not be paved or finished with asphalt or concrete pavements or slabs in order to reduce infiltration into the backfill adjacent to the building foundation. Surface grades should be sloped away from the building to shed surface water.

Foundation/Basement Wall Drains

The perimeter drainage system should consist of 4-inch diameter, rigid polyvinyl chloride (PVC) SDR35 pipe with perforations of ¼ to ½ inch (openings should be oriented downward) or 4-inch diameter, Advanced Drainage Systems flexible drain pipe. The drain lines should be surrounded by a minimum of 6 inches of ¾-inch crushed stone wrapped in a nonwoven geotextile filter fabric (Mirafi 140N or approved equivalent). The foundation drains should be placed adjacent to the exterior bottom edges of the footings or grade beams.

Where possible, the foundation drains should be pitched down at a minimum slope of 0.5 percent in the direction of flow. Cleanouts should be provided at every other 90 degree bend in order to provide for future flushing the system as needed.

The foundation drains should be gravity drained to daylight or to a suitable system outlet. The final outlet of the drainage systems should be designed by the project Civil Engineer in consideration of all applicable municipal, state, and federal regulations.

Roof downspout drains should not be connected to the foundation drain system. Roof downspouts should be separately tightlined to their discharge outlets.

Underslab Drains

Because of the poor permeability of the soils outside and below the basement levels, we recommend that a network of underdrains be installed below the floor slabs in order to collect and convey water to suitable points of discharge and prevent water damage to the floor slabs. The underdrain system should consist of

4-inch diameter, rigid PVC SDR35 pipe with perforations of ¼ to ½ inch (openings oriented downward) surrounded by a minimum 6-inch thickness of ¾-inch crushed stone. The stone should be wrapped in a non-woven geotextile filter fabric (such as Mirafi 140N or approved equal) to prevent migration of fines into the crushed stone envelope. The spacing of the drain lines should be 25 feet (center-to-center) below the buildings. The drain lines should have an invert at least 12 inches below the bottom of the lowest level slab.

Cleanouts should be provided at every other 90-degree bend, in order to provide for flushing of the system. The roof drain system should not be connected to the underslab drains.

Underslab drains should be pitched downward at a minimum 0.5 percent slope and gravity drained to daylight or to a suitable system outlet. If gravity drainage is not feasible, the underslab drains could be terminated in a sump pit that discharges to the storm drain system. The final outlet of the underdrain system must be designed by the project civil engineer in consideration of the applicable municipal, state, and federal regulations.

Waterproofing

Waterproofing is used to prevent water migrating through the concrete walls. Exterior surfaces of the frost walls, basement walls, and footings should be waterproofed using a waterproofing agent and installation specifications specified by the project architect and/or structural engineer. The project architect should select waterproofing products that are compatible with the proposed flooring and adhesive materials.

Underslab Vapor Retarder

An underslab vapor barrier should be considered in areas of the buildings where surface treatments or floor coverings may be sensitive to moisture vapors. The type of vapor barrier and specifications for its installation should be specified by the project architect and/or structural engineer.

6.6 Seismic Considerations

Although a unit of soft glaciomarine silt and clay is present at the Site, the seismic evaluation considers the uppermost 100 feet of subsurface conditions which includes the dense glacial till and underlying bedrock. The soil profile encountered beneath the Site represents a “stiff soil profile” (when considered in total), and we assign the Site a Seismic Site Class of “D.”

Based on the subsurface conditions, the soils are sufficiently fine-grained so as to theoretically preclude seismically induced liquefaction during the regional design seismic event. Accordingly, it is our opinion that design provisions for liquefaction are not necessary at this Site.

6.7 Corrosion Potential

Ransom collected two samples of the native glaciomarine soils along the proposed pipeline easement at the assumed approximate depth of embedment (B405 sample S3 and B403 sample S3, depth of approximately 5 to 7 feet bgs) to assess the corrosion potential of the native soils to proposed underground utilities. The results of laboratory testing for the potential corrosivity of the soil that would be in contact with the pipeline elements are summarized below; the laboratory report is included in Appendix B of this report.

Soil Corrosivity Indicator	Corrosive Limits	B403 – S3 (5 – 7 feet bgs)	B405 – S3 (5 – 7 feet bgs)
pH (specific units)	< 4.5	7.3	7.4
Chloride Content (mg/kg)	> 500	<12	16
Sulfate Content (mg/kg)	> 2,000	<1300	<1500
Specific Conductance (uhmos/cm)	-	16	14

Notes: mg/kg = milligrams per kilogram; uhmos/cm= micromhos per centimeter

The laboratory results indicate that the soils that may be in contact with the pipeline exhibit a relatively neutral pH, and chloride and sulfate contents below the corrosivity thresholds. We, therefore, consider the soils at the Site to be non-corrosive. The low sulfate concentration indicates that sulfate exposure will be negligible. The low chloride content indicates that the soils will likely not be corrosive to ferrous metals.

7.0 EARTHWORK AND CONSTRUCTION CONSIDERATIONS

Based on the subsurface explorations and our geotechnical evaluations, Ransom presents the following recommendations for the development of the Nordic Aquafarms facility at 285 Northport Avenue in Belfast, Maine.

7.1 Subgrade Preparation

All topsoil, debris, frozen soils, and loose or disturbed soils should be removed from areas receiving new construction. These materials may be stockpiled for potential reuse in later stages of construction, based on the recommendations of this report.

Existing foundations, slabs, and/or utilities associated with former uses should be removed from below future building footprints. Subgrades should be compacted with at least four complete passes of a 10-ton vibratory drum roller in directions perpendicular to one another. Silty subgrades which are saturated or are observed to pump and weave during rolling should be rolled statically.

Unstable subgrade areas would be characterized by weaving or rutting of more than one inch during proofrolling. Any unstable areas identified should be undercut at least 12 inches, or to competent soil, and replaced with compacted structural fill or crushed stone. The depth of undercutting and type of backfill material should be selected with consideration of proposed use (i.e., building or pavement) and soil and weather conditions encountered during construction.

The contractor is responsible for construction means and methods and should anticipate the need for methods to prevent disturbance, softening, or rutting of subgrades, or damage to overlying soils resulting from construction traffic. Care must be taken to avoid disturbing subgrades by keeping construction traffic off of subgrades during wet conditions and/or inclement weather until a firm fill layer has been placed. Subgrade soils that become unstable should be undercut and replaced with structural fill or crushed stone as necessary.

Final foundation and floor slab subgrade preparation should include re-compaction of bearing surfaces. Care should be taken to limit disturbance to bearing surfaces prior to placement of concrete. Any loose, softened, or disturbed material should be removed and replaced with compacted structural fill prior to placement of concrete. Excavated subgrades should not be left exposed overnight unless the forecast calls for above-freezing, clear conditions.

7.2 Rock Excavations

Approximately 3 to 6 feet of competent bedrock will need to be removed in the north-central and north-east portions of Building 2 to construct the lower level and approximately 1 foot in the central portion of Building 1. Ransom estimates that approximately 32 feet of competent bedrock will need to be removed to construct the lower levels of the water treatment building. It should be noted that the bedrock surface is irregular, and areas of bedrock shallower than the elevations observed in the Site test borings should be planned for and anticipated during construction.

Where excavations encounter bedrock above design elevations, the bedrock should be over-excavated to allow for placement of a compacted structural fill layer, which will reduce the potential for differential settlement. Excavations of rock below footings and slabs should include removal of all loose rock and materials (including heavily weathered bedrock) to expose sound, undisturbed bedrock prior to placement

of compacted structural fill that will serve as a cushion between the competent bedrock and the foundation elements. If uneven surfaces occur within blasted rock foundation excavations, a 6-inch thick leveling course of structural fill should be placed below footings. Over-excavation of bedrock should be performed to the following minimum levels:

1. 12 inches below footings and slabs;

2. 24 inches below pavements;

3. 12 inches below Site utilities (or as directed by the project civil engineer); and

4. 12 inches below finished grades in landscaped areas (or as directed by the project landscape architect).

Every attempt should be made to over-excavate bedrock by mechanical means (i.e., excavators, hydraulic rock rippers). Blasting, where required to achieve final grades, should be controlled by methods employed by a licensed blaster acting in accordance with Local, State, and Federal regulations and codes. Pre-blast surveys of structures within 500 feet of the blast area should be completed by the Contractor to record the pre-construction conditions of adjacent facilities. Seismographs should be employed by the Contractor to monitor blast vibrations.

Test blasts should be performed early in the blasting phase of construction to assess that proper elevations are achieved with no excessive fragmentation or over-blasting of the bedrock. Prior to drilling and blasting operations, the blasting and earthwork contractors should be made aware of the need to remove all loose, fragmented rock from beneath load bearing areas. It is considered particularly important that the blasting and earthwork contractors employ accurate grade control in the proposed building footprint areas to avoid over-fragmentation.

Excavation of all loose, disturbed blast rock will be required below building footings and slabs to expose the undisturbed, competent bedrock surface prior to placement of structural fills. The resulting rock surfaces should be inspected by the project geotechnical engineer to ensure that all loose rock has been removed prior to placing fill or formwork.

7.3 Reuse of Site Soils

A preliminary assessment of the suitability of using the unconsolidated soils at the Site in the proposed construction is based on the soil classifications and observations at the Site. The silt and clay soils that will be excavated are not suitable for reuse as structural fill at the Site. The native silt and clay soils may be suitable for reuse as common fill at the Site provided the moisture content can be controlled and compaction can be achieved. The native silt and clay soils are fine grained, will be very sensitive to moisture, and will be difficult to place and compact. If the native glacial till soils are excavated during construction, they could potentially be reused as common fill provided the moisture content can be controlled and compaction can be achieved. The native glacial till soils also contain a high fines content which may make placing and compacting difficult. The on-site soils proposed for reuse should be covered with a polyethylene sheet to prevent moisture contact during construction. Construction scheduling should take into account the difficulties of reusing the Site soils (winter construction conditions will be costly and could be difficult if reusing these soils).

Materials to be used as structural fill will need to be imported to the Site. Excavated rock could potentially be processed to produce a material suitable for use as structural fill at the Site, provided the material conforms to the gradation requirements in this report. Representative samples of all proposed fills should be submitted for testing during construction to compare their gradation characteristics to the requirements of the project specifications, and to establish their optimum water contents and maximum dry densities (modified proctor testing, ASTM D 1557). The geotechnical engineer must approve use and reuse of on-site or borrow soils for structural and common fills. Use of fills assumes that the moisture content of the material will be strictly controlled in order to allow for proper placement and compaction.

7.4 Earthwork in Wet Environments

Foundation subgrade soils will likely consist of the native, in-place, glaciomarine or glacial till soils, or structural fill placed above bedrock. Care must be taken to avoid disturbing subgrades by keeping construction traffic off these subgrade soils during wet conditions and/or inclement weather until a firm fill layer has been placed. To reduce disturbance of exposed subgrade soils, it will be important to divert runoff, provide positive grading to shed seepage and runoff, and to compact exposed subgrades to reduce rutting, ponding, and surface water infiltration.

The native Site soils will be sensitive to moisture and difficult to place and compact during wet weather and freezing conditions. Moisture-density relationships (proctor tests) should be determined at the start of construction to determine the appropriate range of working moisture contents. Saturated clay or silt soils will not be suitable for use as common fill due to high moisture levels and might need to be exported from the Site.

7.5 Temporary Excavations

Construction Site safety, means and methods, and sequencing of construction activities are the sole responsibility of the Contractor. Under no circumstances should the following information be interpreted to mean that Ransom is assuming responsibility for construction Site safety, trench protection, or the Contractor's responsibilities. Such responsibility is not being implied and should not be inferred.

All temporary excavations should be performed according to Occupational Safety and Health Administration (OSHA) Standards (29 CFR 1926 Subpart P). It is our opinion that the native silt and clay soils that are likely to be excavated are OSHA Type B soils. Accordingly, temporary unbraced excavations should be cut no steeper than 1H:1V under dry or dewatered conditions.

7.6 Dewatering and Runoff Control

Groundwater was measured at depths ranging from approximately 3.2 to 22.4 feet below grade in Site borings, corresponding to approximate elevations 39.5 to 65 feet above MSL. Below-grade levels are currently planned for the grow modules with finished slab elevations ranging from 48.5 to 58.5 feet above MSL and for the water treatment building of -8 feet above MSL. Excavation for the lower levels and utilities will likely encounter groundwater and require dewatering during construction. The contractor should be prepared to implement water controls as needed.

Surface water runoff should be directed away from excavations to reduce dewatering efforts and to protect subgrades from becoming soft and unstable. The contractor should anticipate the need for controlling runoff during wet periods. Pre-drainage prior to excavation may be required by deep well

pumping systems or other groundwater depression methods to provide adequate control of water within deep excavations.

Earthwork should be completed "in the dry." Subgrade soils that become unstable should be undercut and replaced with structural fill or crushed stone, as necessary. Excavation side slopes should be monitored for potential seepage and maintained to promote stability, accordingly.

7.7 Placement of Granular Engineered Fills

Engineered fills will be required to achieve the final design grades in areas of the proposed Site development. The table below is the gradation specifications for soils used in fills at the Site. Reference is made to materials, described by the Maine Department of Transportation (MDOT) Standard Specifications, as possible alternatives. The different fill types should be used as follows:

1. Structural Fill should be used for engineered fills below building footprint areas and in foundation bearing zones.

2. Common Fill should be used for engineered fills below roadway, parking, and other non-structural areas.

Material	Sieve Size	% Passing
Structural Fill Standard Specification 703.06, Type C	3" (75 mm)	100
	1/4" (6.3 mm)	25 – 70
	No. 40 (425 µm)	0 – 30
	No. 200 (75 µm)	0 – 5
Common Fill	8"	100
	No. 200 (75 µm)	0 - 15 when placed within 2.5 feet of finished grade in paved areas

All granular fills should be placed in 12-inch maximum loose lifts and should be compacted to a minimum of 95 percent of the material's maximum dry density, as determined by ASTM D 1557 (modified proctor test) and verified with field density testing (ASTM D 6938 or equivalent method). Lift thickness should be a maximum of 6-inch loose lifts when compacted with hand-guided equipment.

Where subgrades become saturated, unstable, and/or difficult to compact, crushed stone should be placed and compacted in lieu of structural fill. Crushed stone, when used, should be wrapped in a geotextile filter fabric, such as Mirafi 140N or equal. At no time should structural fill or common fill be placed over crushed stone that has not been wrapped in a geotextile filter fabric.

7.8 Underground Utilities

Utility trenches should be properly excavated and shored according to the recommendations provided above. Shallow utility trenches should be backfilled according to the recommendations for fill and backfill provided above. Excavations for utility trenches or structures that extend proximal to or into underlying soft glaciomarine silt and clay may require additional design considerations, including structural support.

If the final design includes utilities or structures bearing at elevations of the soft glaciomarine soils, Ransom should be consulted to provide additional design and construction recommendations as necessary.

7.9 Construction Monitoring

Ransom should observe the earthwork for compliance with the recommendations of this report, identify changes in subsurface conditions as they become apparent, and assist in design changes should subsurface conditions differ from those anticipated in this report. The project geotechnical engineer should be present at the Site during several critical construction junctures:

1. Observe soil subgrade conditions as they are exposed and confirm that the exposed conditions are consistent with those in this report;

2. Observe and document bedrock surfaces following blasting and prior to placing engineered fills;

3. Document the preparation of foundation bearing surfaces and other subgrades;

4. Determine the need for additional cut, backfill, or stabilization of subgrades; and

5. Confirm that the soils used as fills and backfills conform to the project specifications.

8.0 CONCLUDING COMMENTS

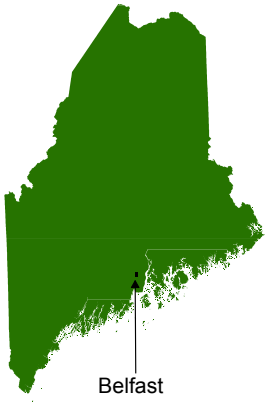
This report has been prepared for specific application to development of the Nordic Aquafarms facility at 285 Northport Avenue in Belfast, Maine as understood by Ransom at the time of the work. Ransom should be provided the opportunity to review final design plans when complete and provide a report addendum if necessary, which would include updated conclusions and recommendations specific to the final design, as necessary. The conclusions and recommendations contained in this report may not be valid for Site designs that differ from those considered herein; new Site designs should not be considered valid unless we have reviewed them and verified our findings in writing. Our recommendations are based in part upon data obtained from widely spaced test borings. The nature and extent of variations between explorations may not become evident until construction. If variations are apparent during construction, it may be necessary to reevaluate the recommendations of this report.

We recommend that Ransom be provided the opportunity to review the final design plans and project specifications in order to confirm that the recommendations made in this report were interpreted and implemented as intended, as well as to evaluate whether additional investigation is required to modify or change the design recommendations provided herein.

The findings, recommendations, specifications, and professional opinions contained within this project geotechnical report have been prepared in accordance with generally accepted professional geotechnical engineering practice. No warranties are implied or expressed.

RANSOM
Consulting Engineers and Scientists

Regional Locator Map



Notes

1. Data Source: USGS National Map Seamless Server, 24K DRG, 1/3" NED
2. USGS Quad Name: Searsport & Belfast
3. Latitude: 44° 23' 43" N
   Longitude: 68° 59' 39" W
   UTM Northing: 4915777 mN
   UTM Easting: 500444 mE

Scale and Orientation

0 1,000 2,000

1 inch = 2,000 feet

Prepared For

Nordic Aquafarms, Inc.
Øraveien 2,
1360 Gamle Fredrikstad
Norway

Site Address

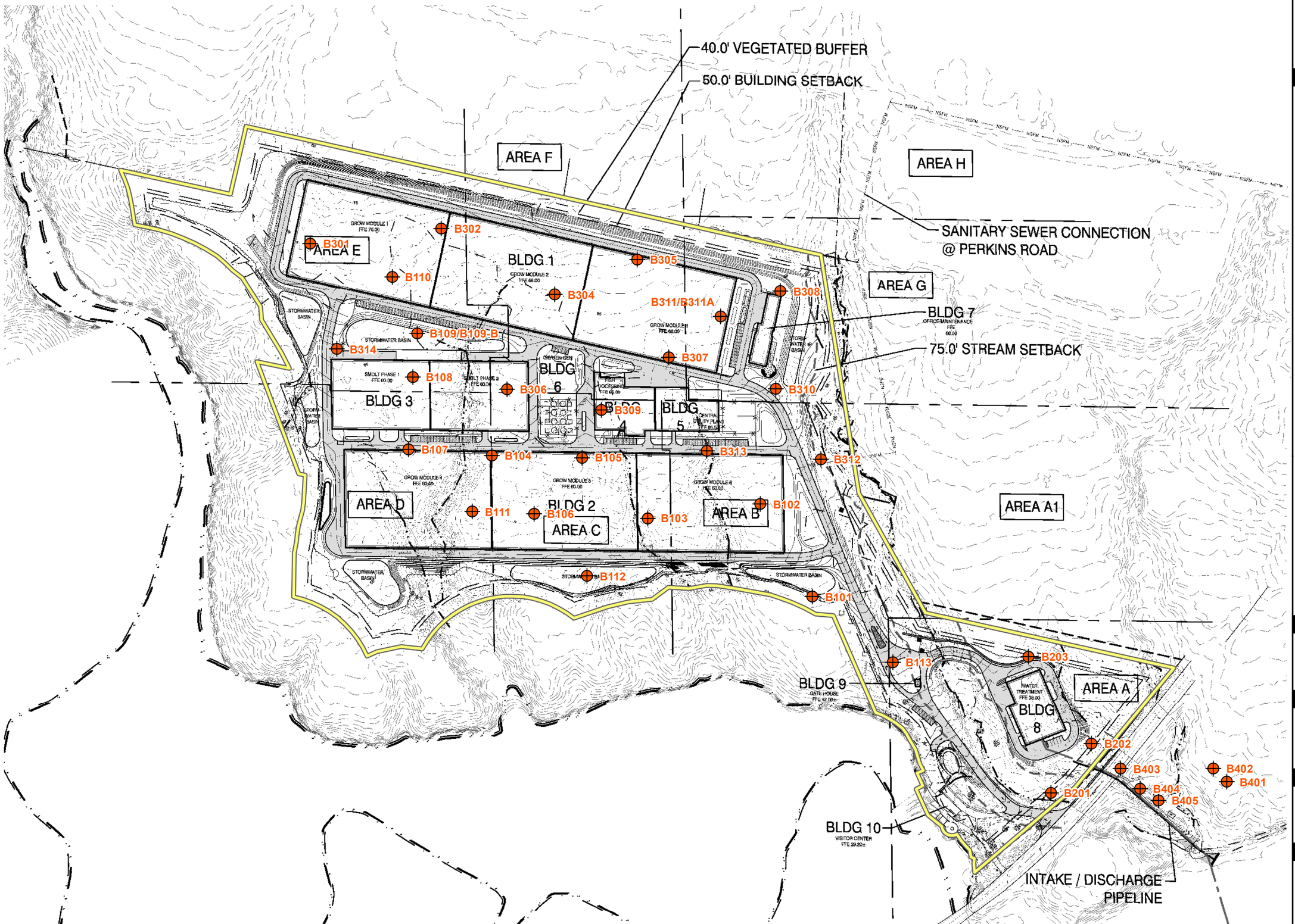
Lower Reservoir &
Cassida Back Lot Properties
285 Northport Avenue
Belfast, Maine

171.05027 | Feb 2019

Figure 1

Site Location Map

\\serverme\GISDATA\Data\NH\Project\171_05027\Maps\Figure_1_2.mxd



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Legend

- Site Boundary
- Borings

Notes

1. Building layout based on March 21, 2018 figures produced and provided by Nordic Aquafarms, Inc.
2.
3. Some features are approximate in location and scale.
4. This plan has been prepared for Nordic Aquafarms, Inc. All other uses are not authorized unless written permission is obtained from Ransom Consulting, Inc.

Scale & Orientation

0 125 250

1 inch = 250 feet

Prepared For

Nordic Aquafarms, Inc.
Øraveien 2, 1360 Gamle
Fredrikstad, Norway

Site Address

Lower Reservoir &
Cassida Back Lot Properties
285 Northport Avenue
Belfast, Maine

171.05027 | Feb 2019

Figure 2
Conceptual
Site Plan

APPENDIX A

Test Boring Logs

Geotechnical Engineering Report
Proposed Commercial Land-Based Aquaculture Facility
285 Northport Road
Belfast, Maine

RANSOM Consulting Engineers and Scientists

BORING LOG: B101

Reviewed by: JPS		Total Depth:	19.7 Feet	Logged By:	DAF
Date Reviewed: 2/27/19		Boring Diameter:	6 Inches	Date Drilled:	3/26/18 to 3/26/18
Surface Elevation (ft.):	52 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Stiff gray/tan SILT and CLAY, orange staining.	Silt and Clay		S1	WOH-1-8-23	9	24/9		
	S2 (2-4') Gray/tan SILT and CLAY, brown staining in fractures.	Silt and Clay		S2	NM-NM-9-13	NA	24/24		
5	S3 (4-6') 13" Medium stiff gray/tan SILT and CLAY, little fine sand, trace gravel (till), over 1" ROCK fragments (cobble).	Transition to Till		S3	3-5-82-68	87	24/14		
10	S4 (10-12') 12" Medium dense gray SILT and CLAY, some gravel (angular and subangular), little sand, orange staining (till), over 6" very dense gray, weathered ROCK (phyllite), crumbles under hand pressure. Auger to 15', transition to weathered rock at approximately 11.5'.	Transition to Bedrock		S4	11-12-23-31	35	24/18		
15	S5 (15-15.1') Very dense gray weathered ROCK (phyllite), crumbles under hand pressure. Slow, smooth augering to 18.5', then stiffened up.	Bedrock		S5	50/2"	NA	2/1		
20	Auger refusal, end of boring 19.7'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
dry	NM	3/26/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD Lower Reservoir & Cassida Back Lot
285 Northport Avenue
Belfast, ME

Project No.: 171.05027.005

RANSOM Consulting Engineers and Scientists

BORING LOG: B102

Reviewed by: JPJ		Total Depth:	30 Feet	Logged By:	DAF
Date Reviewed: 2/27/19		Boring Diameter:	6 Inches	Date Drilled:	3/26/18 to 3/26/18
Surface Elevation (ft.):	57 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 1" Very soft brown SILT and CLAY, over 19" medium stiff gray/tan SILT and CLAY, orange and brown staining.	Silt and Clay		S1	1-3-5-7	8	24/20		
	S2 (2-4') Very stiff gray/tan SILT and CLAY, brown staining in fractures.	Silt and Clay		S2	5-7-11-12	18	24/24		
5	S3 (4-6') Stiff gray/tan SILT and CLAY, brown staining in fractures.	Silt and Clay		S3	4-4-6-6	10	24/24		
10	S4 (10-12') 12" Very soft gray/tan SILT and CLAY, some fine sand, over 6" medium dense gray SILT and CLAY, some sand and gravel, trace orange staining (till).	Transition to Till		S4	WOH-1-7-10	8	24/18		
15	S5 (15-15.5') 1" Very dense gray SILT, some clay, little gravel, little sand (till), over 5" very dense gray, weathered ROCK (phyllite).	Transition to Bedrock		S5	115/6"	NA	6/6		
	Slow, smooth augering to 30', no refusal.								
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
4.5'	6.5'	3/26/18

WELL LEGEND: Filter Sand, Native Fill, Bentonite, Bentonite Grout, Concrete, PVC Screen, PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD Lower Reservoir & Cassida Back Lot
285 Northport Avenue
Belfast, ME

Project No.: 171.05027.005

RANSOM
Consulting Engineers and Scientists

BORING LOG: B102

Reviewed by:	JPS	Total Depth:	30 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/26/18 to 3/26/18
Surface Elevation (ft.):	57 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
30	End of boring 30'.								
35									
40									
45									

WATER LEVELS:

During Drilling	End of Boring	Date:
4.5'	6.5'	3/26/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD Lower Reservoir & Cassida Back Lot
285 Northport Avenue
Belfast, ME

Project No.: 171.05027.005

RANSOM
Consulting Engineers and Scientists

BORING LOG: B103

Reviewed by:	JPJ	Total Depth:	18.9 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/26/18 to 3/27/18
Surface Elevation (ft.):	56 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 2" Very soft brown SILT and CLAY, over 14" medium stiff gray/tan SILT and CLAY, orange staining.	Silt and Clay		S1	1-3-5-6	8	24/16		
	S2 (2-4') Very stiff gray/tan SILT and CLAY, brown staining in fractures.	Silt and Clay		S2	5-6-11-12	17	24/24		
5	S3 (5-7') Medium stiff gray/tan SILT and CLAY, brown staining in fractures.	Silt and Clay		S3	5-3-4-6	7	24/24		
10	S4 (10-12') 9" Soft gray/tan SILT and CLAY, little fine sand, over 7" medium dense gray SILT and CLAY, some gravel, little sand, orange staining (till).	Transition to Till		S4	WOH-3-8-9	11	24/16		
	Auger to 15', transition to weathered rock at approximately 13.3'.								
15	S5 (15-15.3') Very dense gray weathered ROCK, crumbles under hand pressure.	Bedrock		S5	50/3"	NA	3/3		
	Auger refusal, end of boring 18.9'.								
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
NM	9.9'	3/27/18

WELL LEGEND: Filter Sand, Native Fill, Bentonite, Bentonite Grout, Concrete, PVC Screen, PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD Lower Reservoir & Cassida Back Lot
285 Northport Avenue
Belfast, ME

Project No.: 171.05027.005

RANSOM Consulting Engineers and Scientists

BORING LOG: B104

Reviewed by:	JPS	Total Depth:	29.4 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/27/18 to 3/27/18
Surface Elevation (ft.):	61 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 3" Very soft dark brown SILT, some clay (topsoil), over 9" soft gray/tan SILT and CLAY, orange staining.	Silt and Clay		S1	1-1-3-8	4	24/12		
	S2 (2-4') Very stiff gray/tan SILT and CLAY, orange and brown staining in fractures.	Silt and Clay		S2	7-10-9-10	19	24/21		
5	S3 (4-6') Stiff gray/tan SILT and CLAY, trace fine sand, orange and brown staining in fractures.	Silt and Clay		S3	2-5-6-7	11	24/24		
10	S4 (10-12') Medium stiff gray SILT and CLAY, trace fine sand lenses, brown staining in fractures.	Silt and Clay		S4	1-3-3-3	6	24/24		
	Auger to 15', smooth, no evidence of till.								
15	S5 (15-17') Very dense gray weathered ROCK (phyllite), crumbles under hand pressure.	Bedrock		S5	42-41-15-42	56	24/16		
	Harder rock from 19-20'.								
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
12.7'	8.0'	3/27/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD Lower Reservoir & Cassida Back Lot
285 Northport Avenue
Belfast, ME

Project No.: 171.05027.005

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BORING LOG: B104

Reviewed by:	JPJ	Total Depth:	29.4 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/27/18 to 3/27/18
Surface Elevation (ft.):	61 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
30	Auger refusal, end of boring 29.4'.								
35									
40									
45									

WATER LEVELS:

During Drilling	End of Boring	Date:
12.7'	8.0'	3/27/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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BORING LOG: B105

Reviewed by:	JPS	Total Depth:	16.2 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/27/18 to 3/27/18
Surface Elevation (ft.):	60 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 3" Very soft dark brown SILT, some clay (topsoil), over 12" soft gray/tan SILT and CLAY, orange staining.	Silt and Clay		S1	WOH-WOH-4-6	4	24/15		
	S2 (2-4') Very stiff gray/tan SILT and CLAY, orange and brown staining in fractures.	Silt and Clay		S2	8-8-10-15	18	24/24		
5	S3 (4-6') Stiff gray/tan SILT and CLAY, brown staining in fractures.	Silt and Clay		S3	2-4-5-8	9	24/24		
10	S4 (10-12') 7" Stiff gray/tan SILT and CLAY, little fine to coarse sand, trace gravel, over 8" medium dense gray SILT, some clay, some gravel, little sand (till).	Transition to Till		S4	2-13-8-8	21	24/15		
15	S5 (15-16.2') Very dense gray SILT and CLAY, some fine to coarse sand and gravel.	Till		S5	50/2"	NA	2/2		
	Auger refusal, end of boring 16.2'.								
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
3.8'	4.2'	3/27/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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BORING LOG: B106

Reviewed by:	JPJ	Total Depth:	30 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/27/18 to 3/27/18
Surface Elevation (ft.):	58 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 1" Very soft dark brown SILT, some clay (topsoil), over 6" very soft brown SILT and CLAY, over 9" medium stiff gray/tan SILT and CLAY, orange staining.	Silt and Clay		S1	WOH-1-3-7	4	24/15		
	S2 (2-4') Stiff gray/tan SILT and CLAY, orange and brown staining in fractures.	Silt and Clay		S2	3-5-8-11	13	24/24		
5	S3 (4-6') Stiff gray/tan SILT and CLAY, brown staining in fractures, wet (perched water table).	Silt and Clay		S3	3-5-7-8	12	24/24		
10	S4 (10-12') 6" Stiff gray SILT and CLAY, little fine to medium orange sand pockets, over 8" very soft gray SILT and fine SAND, some clay, over 7" stiff gray SILT and CLAY, over 1" gray SILT and CLAY, some sand and gravel (till). Transition to till at approximately 12'.	Transition to Till		S4	6-1-1-9	2	24/22		
15	S5 (15-17') 9" Dense gray SILT, some clay, little sand and gravel (angular and subangular), over 8" very dense gray, weathered ROCK (phyllite), crumbles under hand pressure, orange staining. Auger to 20', harder and softer in sections.	Transition to Bedrock		S5	12-24-37-25	61	24/17		
20	S6 (20-22') Dense gray weathered ROCK (phyllite), orange staining. Auger to 30', no refusal.	Bedrock		S6	16-20-25-105	45	24/17		

WATER LEVELS:

During Drilling	End of Boring	Date:
Dry	13.5'	3/27/18

WELL LEGEND: Filter Sand, Native Fill, Bentonite, Bentonite Grout, Concrete, PVC Screen, PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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Project No.: 171.05027.005 Page: 1

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BORING LOG: B106

Reviewed by:	JPS	Total Depth:	30 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/27/18 to 3/27/18
Surface Elevation (ft.):	58 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
30	End of boring 30'.								
35									
40									
45									

WATER LEVELS:

During Drilling	End of Boring	Date:
Dry	13.5'	3/27/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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BORING LOG: B107

Reviewed by:	JPS	Total Depth:	22.8 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/28/18 to 3/28/18
Surface Elevation (ft.):	60 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 2" Very soft dark brown SILT, some clay (topsoil), over 16" very soft gray/tan SILT and CLAY, orange staining.	Silt and Clay		S1	WOH-1-1-3	2	24/18		
	S2 (2-4') Medium stiff gray/tan SILT and CLAY, orange and brown staining in fractures.	Silt and Clay		S2	3-4-4-4	8	24/18		
5	S3 (4-6') Medium stiff gray/tan SILT and CLAY, orange and brown staining in fractures.	Silt and Clay		S3	2-3-5-6	8	24/20		
10	S4 (10-12') Very soft gray/tan SILT and CLAY, trace fine sand, brown staining in fractures.	Silt and Clay		S4	WOH-WOH-1-2	1	24/24		
15	S5 (15-17') Soft gray/tan SILT and CLAY, trace fine sand, brown staining in fractures.	Silt and Clay		S5	WOH-WOH-3-5	3	24/21		
	Transitions to till at approximately 18.1'.								
20	S6 (20-22') Very dense gray SILT and CLAY, some sand (orange) and gravel (angular and subangular).	Till		S6	18-62-43-34	105	24/5		
	Auger refusal, end of boring 22.8'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
NM	3.2'	3/28/18

WELL LEGEND: Filter Sand; Native Fill; Bentonite; Bentonite Grout; Concrete; PVC Screen; PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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BORING LOG: B108

Reviewed by:	JPS	Total Depth:	21.8 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/28/18 to 3/28/18
Surface Elevation (ft.):	64 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 1" Very soft dark brown SILT, some clay (topsoil), over 16" very soft gray/tan SILT and CLAY, orange staining.	Silt and Clay		S1	WOH-WOH-1-5	1	24/17		
	S2 (2-4') Very stiff gray/tan SILT and CLAY, orange and brown staining in fractures.	Silt and Clay		S2	4-7-10-14	17	24/24		
5	S3 (5-7') 20" Stiff gray/tan SILT and CLAY, orange and brown staining, over 4" medium dense gray/tan SILT and CLAY, little fine sand, trace gravel (till).	Silt and Clay, Transitioning to Till		S3	3-4-5-9	9	24/24		
	Transistions to till at approximately 7.6'.								
10	S4 (10-12') Medium dense gray/brown SILT and SAND, some clay and gravel (angular and subangular), orange staining.	Till		S4	6-8-11-12	19	24/20		
15	S5 (15-15.7') Very dense gray weathered ROCK (phyllite), crumbles under hand pressure, orange staining.	Bedrock		S5	90-50/3"	NA	9/6		
20	S6 (20-20.1') Very dense gray weathered ROCK (phyllite), crumbles under hand pressure.	Bedrock		S6	50/1"	NA	1/1		
	Auger refusal, end of boring 21.8'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
12.1'	12.9'	3/28/18

WELL LEGEND: Filter Sand; Native Fill; Bentonite; Bentonite Grout; Concrete; PVC Screen; PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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BORING LOG: B109

Reviewed by:	JPS	Total Depth:	30 Feet	Logged By:	DAF
Date Reviewed:	7/09/19	Boring Diameter:	6 Inches	Date Drilled:	3/28/18 to 3/28/18
Surface Elevation (ft.):	65 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 1" Very soft dark brown SILT, some clay (topsoil), over 9" very soft gray/tan SILT and CLAY, orange staining.	Silt and Clay		S1	WOH-WOH-2-5	2	24/10		
	S2 (2-4') Stiff gray/tan SILT and CLAY, orange and brown staining in fractures.	Silt and Clay		S2	3-4-6-7	10	24/24		
5	S3 (5-7') Medium stiff gray/tan SILT and CLAY, orange and brown staining in fractures.	Silt and Clay		S3	2-3-5-5	8	24/24		
10	S4 (10-12') Very soft gray CLAY, some silt, brown staining in fractures.	Soft Clay		S4	WOH-WOH-WOH-1	<1	24/24		
15	S5 (15-17') Loose gray SILT, some clay, little fine sand, little gravel (till) interbedded with gray, weathered ROCK (phyllite), crumbles under hand pressure.	Interbedded Till and Bedrock Surface		S5	3-3-3-7	6	24/9		
20	S6 (20-22') 11" Dense gray, weathered ROCK (phyllite), over 4" very dense light gray/white weathered ROCK (quartzite), crumbles under hand pressure.	Bedrock		S6	4-7-24-34	31	24/15		

WATER LEVELS:

During Drilling	End of Boring	Date:
4.9'	3.4'	3/28/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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Belfast, ME

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BORING LOG: B109

Reviewed by:	JPJ	Total Depth:	30 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/28/18 to 3/28/18
Surface Elevation (ft.):	65 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S7 (25-25.8') Very dense gray, weathered ROCK (phyllite), crumbles under hand pressure.	Bedrock		S7	33-75/3"	NA	9/8		
30	End of boring 30'.								
35									
40									
45									

WATER LEVELS:

During Drilling	End of Boring	Date:
4.9'	3.4'	3/28/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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BORING LOG: B109-B

Reviewed by:	JPJ	Total Depth:	12 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/29/18 to 3/29/18
Surface Elevation (ft.):	65 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	Auger to 10' in attempt to collect shelby tube sample.								
10	S1 (10-12') Set shelby tube, recovered gray CLAY.	Soft Clay		S1	NA	NA	24/10		
	End of boring 12'								
15									
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
NM	NM	

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Boring intentionally located within 5' of B109 to collect Shelby tube sample of soft clay.
2. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
3. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
4. NA = not applicable; NM = not measured; WOH = weight of hammer.

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BORING LOG: B110

Reviewed by:	JPJ	Total Depth:	19 Feet	Logged By:	JPJ
Date Reviewed:	7/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/29/18 to 3/29/18
Surface Elevation (ft.):	69 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Very soft brown/gray SILT, some clay.	Silt and Clay		S1	WOH-WOH-2-7	2	24/18		
	S2 (2-4') Stiff brown/gray SILT and CLAY.	Silt and Clay		S2	6-7-8-9	15	24/21		
	Transition to till at 4.6' bgs.								
5	S3 (5-7') Dense brown, fine to coarse SAND, some silt, some gravel (angular to subangular).	Till		S3	10-30-16-12	46	24/15		
10	S4 (10-11.8') Dense brown, fine to coarse SAND, some silt, some gravel (angular to subangular).	Till		S4	10-16-29-50/3"	45	21/11		
15	S5 (15-17') Very dense gray SILT, little gravel (angular), trace fine brown sand.	Till		S5	6-51-20-23	71	24/14		
	Transition to bedrock at approximately 18'.								
	Auger refusal, end of boring 19'.								
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
4.8'	4.0'	3/29/18

WELL LEGEND: Filter Sand; Native Fill; Bentonite; Bentonite Grout; Concrete; PVC Screen; PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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Project No.: 171.05027.005

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BORING LOG: B111

Reviewed by:	JPJ	Total Depth:	30 Feet	Logged By:	JPJ/DAF
Date Reviewed:	7/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/29/18 to 3/29/18
Surface Elevation (ft.):	57 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Soft brown/gray SILT, some clay, trace fine sand.	Silt and Clay		S1	1-1-2-4	3	24/15		
	S2 (2-4') Stiff gray/brown SILT and CLAY, orange stained fractures.	Silt and Clay		S2	5-8-7-8	15	24/21		
5	S3 (5-7') Stiff gray/brown SILT and CLAY, orange stained fractures.	Silt and Clay		S3	2-4-5-6	9	24/23		
10	S4 (10-12') Soft gray SILT and CLAY.	Silt and Clay		S4	WOH-2-2-3	4	24/24		
15	S5 (15-17') Medium dense gray weathered ROCK (phyllite), crumbles under hand pressure, little fine sand (orange), trace gravel. Transitions to weathered rock.	Till		S5	4-9-13-13	22	24/18		
20	S6 (20-22') Stiff gray weathered ROCK (phyllite), crumbles under hand pressure, some intact gravel-sized hard rock.	Bedrock		S6	15-8-7-7	15	24/13		

WATER LEVELS:

During Drilling	End of Boring	Date:
NM	NM	

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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Project No.: 171.05027.005

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BORING LOG: B111

Reviewed by:	JPJ	Total Depth:	30 Feet	Logged By:	JPJ/DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/29/18 to 3/29/18
Surface Elevation (ft.):	57 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S7 (25-26.2') Dense gray weathered ROCK (phyllite), transitioning to more competent rock at tip.	Bedrock		S7	7-39-50/2"	NA	14/9		
30	End of boring 30'.								
35									
40									
45									

WATER LEVELS:

During Drilling	End of Boring	Date:
NM	NM	

WELL LEGEND: Filter Sand; Native Fill; Bentonite; Bentonite Grout; Concrete; PVC Screen; PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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BORING LOG: B112

Reviewed by:	JPJ	Total Depth:	17.9 Feet	Logged By:	DAF
Date Reviewed:	7/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/30/18 to 3/30/18
Surface Elevation (ft.):	53 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 0.5" Very soft dark brown SILT, some clay (topsoil), over 3" very soft brown SILT and CLAY, over 13.5" medium stiff gray/tan SILT and CLAY, orange staining.	Silt and Clay		S1	WOH-1-5-6	6	24/17		
	S2 (2-4') Very stiff gray/tan SILT and CLAY, orange and brown staining, wet (perched water table).	Silt and Clay		S2	5-10-10-15	20	24/22		
5	S3 (5-7') Stiff gray/tan SILT and CLAY, orange and brown staining in fractures.	Silt and Clay		S3	2-4-6-9	10	24/21		
10	S4 (10-12') Medium stiff gray/tan SILT and CLAY, trace fine sand, brown staining in fractures.	Silt and Clay		S4	1-5-3-2	8	24/24		
	Transition to till at approximately 12.9'.								
	Transition to bedrock at approximately 14.3'.								
15	S5 (17.5-17.7') Very dense gray pulverized ROCK fragments (phyllite).	Bedrock		S6	100/2"	NA	2/1		
	Auger refusal, end of boring 17.9'.								
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
NM	13.5'	3/30/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD Lower Reservoir & Cassida Back Lot
285 Northport Avenue
Belfast, ME

Project No.: 171.05027.005

RANSOM Consulting Engineers and Scientists

BORING LOG: B113

Reviewed by:	JPJ	Total Depth:	16 Feet	Logged By:	DAF
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	3/30/18 to 3/30/18
Surface Elevation (ft.):	44 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 1" Very soft brown SILT and CLAY, over 15" soft gray/tan SILT and CLAY, orange staining.	Silt and Clay		S1	WOH-1-2-4	3	24/16		
	S2 (2-4') Very stiff gray/tan SILT and CLAY, orange and brown staining in fractures.	Silt and Clay		S2	5-7-11-12	18	24/24		
5	S3 (5-7') Stiff gray/tan SILT and CLAY, trace fine sand, orange and brown staining in fractures.	Silt and Clay		S3	3-4-6-7	10	24/24		
10	S4 (10-12') Dense gray/brown SILT and SAND, some gravel and clay (till).	Till		S4	5-16-18-20	34	24/12		
15	S5 (15-16') No recovery.	Likely Bedrock		S6	50/2"	NA	2/0		
	Auger refusal, end of boring 16'.								
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
NM	Dry	3/30/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a tracked Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA = not applicable; NM = not measured; WOH = weight of hammer.

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BORING LOG: B201

Reviewed by:	JPJ	Total Depth:	13.9 Feet	Logged By:	JPJ
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	7/25/18 to 7/25/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 6" TOPSOIL, over 14" medium dense, brown/gray SILT, some clay and fine gravel, moist.			S1	2-7-7-8	14	24/20		
	S2 (2-4') Loose, medium dense, brown/gray SILT, some clay and fine gravel, over 2" gray CLAY, some silt, moist.			S2	5-5-2-2	7	24/10		
5	S3 (4-6') 10" Brown/gray CLAY and SILT, over 5" brown/gray SILT, some clay, little gravel, moist.			S3	2-2-4-9	6	24/15		
10	S4 (10-12') Medium dense, gray SILT, some clay, little gravel, angular to subangular, trace fine to coarse sand, moist.			S4	11-10-10-4	20	24/17		
	Grinding on rock at 13.9'.								
	Auger refusal, end of boring 13.9'.								
15									

WATER LEVELS:

During Drilling: NE | End of Boring: | Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a track-mounted Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA=not applicable; NM=not measured; NE=not encountered.

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BORING LOG: B202

Reviewed by:	JPJ	Total Depth:	28 Feet	Logged By:	JPJ
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	7/25/18 to 7/25/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 3" TOPSOIL, over 8" brown/gray SILT, some clay, moist.	Silt and Clay		S1	1-2-5-8	7	24/11		
	S2 (2-4') Brown/gray SILT, some clay, trace angular gravel, moist.			S2	5-5-8-8	13	24/23		
	S3 (4-6') Brown/gray SILT and CLAY, moist.			S3	3-5-8-8	13	24/23		
5									
10	S4 (10-12') Brown SILT, some clay, moist.	Silt		S4	1-1-1-2	2	24/8		
	S5 (14-16') Gray SILT, little clay, little gravel and fine sand.								
15		Silt		S5	10-6-17-17	23	24/8		

WATER LEVELS:

During Drilling: NE | End of Boring: | Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a track-mounted Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA=not applicable; NM=not measured; NE=not encountered.

CLIENT:
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285 Northport Avenue
Belfast, ME

Project No.: 171.05027.005

RANSOM Consulting Engineers and Scientists

BORING LOG: B202

Reviewed by:	JPJ	Total Depth:	28 Feet	Logged By:	JPJ
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	7/25/18 to 7/25/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S6 (20-22') Gray SILT and GRAVEL, angular, little clay, little fine to coarse sand.			S6	7-6-7-11	13	24/7		
	Bedrock core 23-28'. Hard, gray, very fine grained PHYLITE, moderately weathered, closely spaced fractures, low angle (0-10'), moderately open with clay in filling, moderately fractured. RQD: 0% Very poor.				1'21"				
25		Bedrock		C1	1'50"				
					2'14"		60/60		
					2'12"				
					2'58"				
	End of boring 28'.								
30									
35									

WATER LEVELS:

During Drilling: NE | End of Boring: | Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a track-mounted Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA=not applicable; NM=not measured; NE=not encountered.

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BORING LOG: B203

Reviewed by:	JPJ	Total Depth:	15.2 Feet	Logged By:	JPJ
Date Reviewed:	7/27/19	Boring Diameter:	6 Inches	Date Drilled:	7/25/18 to 7/25/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') TOPSOIL, poor recovery.			S1	1-36-11-14	14	24/4		
	S2 (2-4') Gray/brown SILT, some clay, moist.	Silt and Clay		S2	4-6-8-9	7	24/24		
	S3 (4-6') Gray/brown SILT, some clay, moist.			S3	3-4-5-6	6	24/24		
5									
10	S4 (10-12') SILT, trace clay, trace fine sand lenses, moist.	Silt		S4	2-1-2-2	20	24/20		
	S5A (12-13') SILT, trace clay, trace fine sand lenses, moist.			S5A	2-5-16-14	100+	24/24		
	S5B (13-14') Gray, fine to coarse SAND and SILT, little gravel, angular, moist.	Till		S5B					
	Augers grinding at 14.8'.	Rock		S6	100/3"		4/3		
15	S6 (15-15.2') Gray, weathered BEDROCK, crumbles under hand pressure. Split-spoon refusal, end of boring 15.2.'								

WATER LEVELS:

During Drilling: NE | End of Boring: | Date:

WELL LEGEND: Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a track-mounted Mobile Drill - 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. auto-hammer.
3. NA=not applicable; NM=not measured; NE=not encountered.

CLIENT:
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Belfast, ME

Project No.: 171.05027.005

RANSOM Consulting Engineers and Scientists

BORING LOG: B301

Reviewed by:	JPJ	Total Depth:	21.7 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/7/18 to 9/7/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Medium dense, tan/brown SILT and fine SAND, trace clay, dry.	Silt and Sand		S1	3-7-10-11	17	24/18		
	S2 (2-4') Stiff, brown/gray SILT and CLAY, trace fine sand, moist, mottled.	Silt and Clay		S2	6-6-8-7	14	24/20		
	Auger to 5'.								
5	S3 (5-7') Stiff, brown/gray SILT, some clay, moist.	Silt		S3	6-5-8-9	13	24/22		
	Auger to 10'.								
10	S4 (10-12') Soft, brown/gray CLAY, little silt, moist.	Clay		S4	1-2-2-2	4	24/24		
	Auger to 15'.								
15	S5 (15-16') 4" Very soft, brown/gray CLAY, little silt, moist to wet. S6 (16-17') 8" Dense, dark gray SILT and fine to medium SAND, trace decomposed bedrock, wet.	Clay Till		S5 S6	1-1-9-26	10	24/12		
	Auger to 20'. Difficult drilling from 18-20'.								
20	S7 (20-21.7') Dense, dark gray, fine to medium SAND and SILT, trace clay, wet, over 2" decomposed BEDROCK.	Till, Sand and Decomposed Bedrock		S7	5-20-33-50/3"	53	24/14		
	Auger refusal, end of boring 21.7'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
~16'	16.8'	9/7/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027 Page: 1

RANSOM Consulting Engineers and Scientists

BORING LOG: B302

Reviewed by:	JPS	Total Depth:	20.4 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/7/18 to 9/7/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 2" TOPSOIL, over 10" loose, brown/gray SILT and fine SAND, dry.	Silt and Sand		S1	2-4-4-8	8	24/12		
	S2 (2-4') Very stiff, brown SILT, some clay, trace fine sand, moist.	Silt		S2	3-6-9-11	15	24/20		
	Auger to 5'.								
5	S3 (5-7') Stiff, brown CLAY, some silt, moist, mottled.	Clay		S3	4-4-6-7	10	24/24		
	Auger to 10'.								
10	S4 (10-12') Medium stiff, gray/brown CLAY, little silt and fine sand, moist, silt and sand in 1/8" lenses, smears.	Clay		S4	1-1-4-7	5	24/24		
	Auger to 15'.								
15	S5 (15-16') Dense, dark gray, fine to medium SAND and SILT, trace fine gravel, subrounded, wet.	Till		S5	12-15-14-36	29	24/10		
	Auger to 20'.								
20	S6 (20-20.4') 3" Loose, dark gray, fine to medium SAND, some silt, wet, over 2" decomposed BEDROCK.	Till, Sand and Bedrock		S6	50/5"	NA	5/5		
	Refusal, end of boring 20.4'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
~15'	15.4'	9/7/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

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Project No.: 171.05027

RANSOM
Consulting Engineers and Scientists

BORING LOG: B304

Reviewed by:	JPJ	Total Depth:	15.5 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/5/18 to 9/5/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Loose, light brown SILT and SAND, little roots, siltier at bottom 3", dry.	Silt and Sand		S1	2-4-5-11	9	24/16		
	S2 (2-4') Stiff, brown SILT, little fine sand, moist.	Silt		S2	5-5-9-9	14	24/22		
	Auger to 5'.								
5	S3 (5-7') Stiff, brown/gray CLAY, little silt, oxidization staining, moist, mottled.	Clay		S3	4-5-5-4	10	24/24		
	Auger to 10'.								
10	Tube pushed 10-10.8', tube refusal at 10.8', till at base of tube. Tube sample discarded. No recovery. S4 (11-13') 3" Brown, fine to medium CLAY, little silt, moist, over 9" medium dense, gray SILT and fine SAND, little gravel, subrounded.	Till		S4	20-13-11-8	24	24/12		
	Auger to 15.5'. Drill clatter from 14.5-15.5'.								
15	Refusal, end of boring 15.5'.	Bedrock		NA	25/0"	NA	0/0		
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
~14.5'	13.1'	9/5/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
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Belfast, ME

Project No.: 171.05027 Page: 1

RANSOM Consulting Engineers and Scientists

BORING LOG: B305

Reviewed by:	JPS	Total Depth:	19.2 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/5/18 to 9/5/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Medium dense, light brown SAND and SILT, little roots, siltier at bottom 3", dry.	Sand and Silt (Topsoil)		S1	5-5-6-5	11	24/16		
	S2 (2-4') Stiff, brown/gray SILT and CLAY, trace fine sand, moist.	Silt and Clay		S2	6-6-6-14	12	24/20		
	Auger to 5'.								
5	S3 (5-7') Stiff, brown/gray CLAY, little silt, moist.	Clay		S3	4-6-5-8	11	24/24		
	Auger to 10'.								
10	S4 (10-12') Soft, brown CLAY, little silt, moist.	Clay		S4	1-1-2-4	3	24/24		
	Auger to 15'.								
15	S5 (15-17') 2" Very soft, gray CLAY, wet, smears, over 10" medium dense, dark gray SAND and SILT, little gravel and fine sand, moist (till).	Till		S5	6-10-11-14	21	24/12		
		Bedrock							
	Auger refusal, end of boring 19.2'.								
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
NE	18.5'	9/5/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.
4. Undisturbed tube sample attempted at 15'. Not able to reach 15' depth without sampler filling with fall-in material. Sample not taken.

CLIENT:
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BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027

RANSOM
Consulting Engineers and Scientists

BORING LOG: B306

Reviewed by: JPJ		Total Depth:	15.7 Feet	Logged By:	MJP
Date Reviewed: 7/27/19		Boring Diameter:	6 Inches	Date Drilled:	9/5/18 to 9/5/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Loose, light brown SILT and SAND, trace corase sand, dry.	Silt and Sand		S1	1-2-5-8	7	24/16		
	S2 (2-4') Stiff, brown/gray SILT, some clay, trace fine sand, moist, mottled.	Silt		S2	8-5-6-7	11	24/22		
	Auger to 5'.								
5	S3 (5-7') Medium stiff, brown CLAY, little silt, moist, abundant dark staining.	Clay		S3	2-2-5-4	7	24/24		
	Auger to 10'.								
10	S4 (10-12') Dense, dark gray SILT and fine to coarse SAND, trace subrounded gravel, moist.	Till		S4	8-21-30-48	51	24/12		
	Auger to 15'.								
15	S5 (15-15.7') Decomposed BEDROCK, very weak schist and phylite. Refusal, end of boring 15.7'.	Bedrock		S5	50/2"	NA	2/0.5		
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
NE	NE	9/5/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

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Project No.: 171.05027

RANSOM Consulting Engineers and Scientists

BORING LOG: B307

Reviewed by:	JPJ	Total Depth:	20 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/5/18 to 9/5/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 1" TOPSOIL, over 15" loose, brown, fine SAND and SILT, little roots, dry.	Silt and Sand		S1	2-4-4-5	8	24/16		
	S2 (2-4') Very stiff, dark brown SILT, little fine sand, trace clay, dry.	Silt		S2	10-15-9-10	24	24/18		
	Auger to 5'.								
5	S3 (5-7') Medium dense, dark brown SILT and fine SAND, trace angular gravel, less sand at bottom 10", moist.	Silt and Sand		S3	3-6-15-15	21	24/16		
	Auger to 10'.								
10	S4 (10-12') 6" Very stiff, brown SILT, little clay, trace gravel, moist, over 6" dense, dark gray SILT and fine SAND, trace gravel, moist (till).	Silt Till		S4-1 S4-2	15-22-31-25	53	24/12		
	Auger to 15'.								
15	S5 (15-17') Dense, dark gray SILT and fine SAND, trace coarse sand, subrounded, moist (till).	Till		S5	12-15-18-20	33	24/16		
	Auger to 20'.								
		Bedrock		NA	25/0"	NA	0/0		
20	Refusal, end of boring 20'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
NE	NE	9/5/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027

RANSOM
Consulting
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and Scientists

BORING LOG: B308

Reviewed by:	JPJ	Total Depth:	25 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/4/18 to 9/4/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Medium stiff/loose, brown SILT and fine SAND, dry.	Silt and Sand		S1	2-3-5-13	8	24/20		
	S2 (2-4') Medium stiff, brown SILT, little fine sand and clay, moist.	Silt		S2	4-4-5-7	9	24/18		
	Auger to 5'.								
5	S3 (5-7') Medium stiff, brown CLAY, some silt, trace fine sand, moist.	Clay		S3	3-3-5-5	8	24/24		
	Auger to 10'.								
10	S4 (10-12') Soft, brown CLAY, little silt, moist.	Clay		S4	1-2-1-4	3	24/24		
	Auger to 15'.								
15	S5 (15-17') Very soft, gray CLAY, little silt, wet/moist.	Soft Clay		S5	1-WOH-1-2	1	24/24		
	Auger to 20'. Difficult drilling from 18-20'.								
20	Spoon refusal at 20.3'.								
	Auger to 25'.								
	End of boring 25'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
~15'	19.1'	9/4/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027 Page: 1

RANSOM Consulting Engineers and Scientists

BORING LOG: B309

Reviewed by:	JPS	Total Depth:	14.6 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/5/18 to 9/5/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 8" TOPSOIL, over 8" loose, brown SILT and fine SAND, trace clay, dry.	Topsoil Silt and Sand		S1	1-2-6-11	8	24/16		
	S2 (2-4') Very stiff, brown SILT, some clay, moist, mottled.	Silt		S2	9-9-11-14	20	24/18		
	Auger to 5'.								
5	S3 (5-7') Stiff, brown SILT, some clay, little fine sand, moist.	Silt		S3	3-7-8-10	15	24/22		
	Auger to 10'.								
10	S4 (10-10.2') Pulverized BEDROCK. Spoon refusal at 10.2'.	Weathered Bedrock		S4	50/2"	NA	2/2		
	Auger to 14.6'								
15	Auger refusal, end of boring 14.6'.								
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
NE	NE	9/5/18

WELL LEGEND:

NOTES:
1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027 Page: 1

RANSOM
Consulting Engineers and Scientists

BORING LOG: B310

Reviewed by:	JPJ	Total Depth:	27.3 Feet	Logged By:	MJP
Date Reviewed:	2/7/19	Boring Diameter:	6 Inches	Date Drilled:	9/4/18 to 9/4/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 1" TOPSOIL, over 19" loose, light brown SILT and SAND, little roots, siltier at bottom 3", dry.	Silt and Sand		S1	2-2-3-8	5	24/20		
	S2 (2-4') Medium stiff, brown SILT, some fine sand, iron staining, dry.	Silt		S2	5-3-6-9	9	24/12		
	Auger to 5'.								
5	S3 (5-7') Stiff, gray/brown SILT and CLAY, moist.	Silt and Clay		S3	3-5-6-8	11	24/24		
	Auger to 10'.								
10	S4 (10-12') Medium stiff, brown/gray CLAY, some silt, iron staining, moist.	Clay		S4	2-3-3-4	6	24/24		
	Auger to 15'.								
15	S5 (15-17') Very soft, gray CLAY, little silt and fine sand, wet at 16', not water table.	Soft Clay		S5	1-1-1-3	4	24/24		
	Auger to 20'.								
20	S6 (20-22') Dense, dark gray, fine to medium SAND, some silt, trace fine gravel, moist (till).	Till		S6	8-12-15-20	27	24/12		
	Auger to 25'. Drill clatter from 23.5-25'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
NE	NE	9/4/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027 Page: 1

RANSOM Consulting Engineers and Scientists

BORING LOG: B310

Reviewed by:	JPJ	Total Depth:	27.3 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/4/18 to 9/4/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S7 (25-27') Medium dense, dark gray SILT, some fine to medium sand, little clay, moist (till). Auger to 27.3'.	Till		S7	7-6-12-23	18	24/15		
	Auger refusal, end of boring 27.3'.								
30									
35									
40									
45									

WATER LEVELS:

During Drilling	End of Boring	Date:
NE	NE	9/4/18

WELL LEGEND: Filter Sand; Native Fill; Bentonite; Bentonite Grout; Concrete; PVC Screen; PVC Riser

NOTES:
1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027

RANSOM Consulting Engineers and Scientists

BORING LOG: B311

Reviewed by: JAP		Total Depth:	24.2 Feet	Logged By:	MJP
Date Reviewed: 2/27/19		Boring Diameter:	6 Inches	Date Drilled:	9/4/18 to 9/4/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Loose, light brown, fine SAND and SILT, little roots, dry.	Silt and Sand		S1	2-2-6-9	8	24/10		
	S2 (2-4') Medium stiff, brown SILT, little fine sand, trace clay, dry.	Silt		S2	2-3-4-7	7	24/24		
	Auger to 5'.								
5	S3 (5-7') Medium stiff, brown SILT and CLAY, trace fine sand, heavy oxidization staining, moist.	Silt and Clay		S3	2-5-3-4	8	24/24		
	Auger to 10'.								
10	S4 (10-12') Very soft, brown CLAY, little silt, moist.	Clay		S4	1-1-1-1	2	24/24		
	Auger to 15'.								
15	S5 (15-17') Very soft, gray CLAY, trace silt, wet/moist.	Soft Clay		S5	1-0-1-1	1	24/24		
	Auger to 20'.								
20	S6 (20-22') Dense, dark gray, fine to coarse SAND, some silt, little fine gravel, subrounded, wet (till).	Till		S6	5-18-21-26	39	24/6		
	Auger refusal, end of boring 24.2'.	Bedrock							

WATER LEVELS:

During Drilling	End of Boring	Date:
~20'	22.4'	9/4/18

WELL LEGEND: Filter Sand; Native Fill; Bentonite; Bentonite Grout; Concrete; PVC Screen; PVC Riser

NOTES:
1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027 Page: 1

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BORING LOG: B311-A

Reviewed by:	JPS	Total Depth:	15 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/6/18 to 9/6/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	Auger to 13', no sampling. Attempt undisturbed tube sample 13-15'.								
	Cuttings: brown SILT and CLAY.								
5									
10									
	Undisturbed tube sample taken, 1.3' recovered.			T1					
	S1 (15') Very soft, gray CLAY.	Clay		S1	NA	NA	24/16		
15	End of boring 15'.								
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
NE	NE	9/6/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027

RANSOM Consulting Engineers and Scientists

BORING LOG: B312

Reviewed by: SD		Total Depth:	19.3 Feet	Logged By:	MJP
Date Reviewed: 2/27/19		Boring Diameter:	6 Inches	Date Drilled:	9/4/18 to 9/4/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 2" TOPSOIL, over 11" soft, brown SILT, some sand, moist.	Silt		S1	3-2-2-3	4	24/13		
	S2 (2-4') Stiff, dark brown SILT, little sand and clay, moist.	Silt		S2	4-4-5-12	9	24/22		
	Auger to 5'.								
5	S3 (5-7') Stiff, gray/brown CLAY and SILT, iron staining, moist.	Clay and Silt		S3	3-3-5-4	8	24/24		
	Auger to 10'.								
10	S4 (10-12') Stiff, brown/gray CLAY and SILT, decomposed rock at bottom 3", moist.	Clay and Silt		S4	2-3-4-45	7	24/20		
	Auger to 15'.								
15	S5 (15-17') 12" Medium dense, brown SILT and SAND, trace fine gravel, over 8" medium stiff, gray SILT and CLAY, little fine to medium sand, moist.	Silt and Clay		S5	12-9-4-10	13	24/20		
	Auger to refusal at 19.3'.								
		Bedrock		NA	50/0"	NA	0/0		
	Refusal, end of boring 19.3'.								
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
NE	NE	9/4/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027 Page: 1

RANSOM Consulting Engineers and Scientists

BORING LOG: B313

Reviewed by:	JPJ	Total Depth:	10.4 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/4/18 to 9/4/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Medium dense, brown SILT and SAND, siltier at bottom 4", dry.	Silt and Sand		S1	4-5-7-7	12	24/18		
	S2 (2-4') Very firm, brown SILT, little fine sand and clay, oxidization staining, moist.	Silt		S2	4-11-9-12	20	24/22		
	Auger to 5'.								
5	S3 (5-7') Very firm, brown SILT, some clay, trace fine sand, slightly siltier at bottom 4", moist.	Silt		S3	2-9-9-9	18	24/24		
	Auger to 10'. Difficult drilling from 9-10'.								
10	Auger efusal, end of boring 10.4'.	Weathered Bedrock							
15									
20									

WATER LEVELS:

During Drilling	End of Boring	Date:
NE	NE	9/4/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027

RANSOM Consulting Engineers and Scientists

BORING LOG: B314

Reviewed by:	JPJ	Total Depth:	19.8 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/7/18 to 9/7/18
Surface Elevation (ft.):		Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 2" TOPSOIL, over 14" loose, tan/brown SILT and fine SAND, trace clay, dry/moist.	Silt and Sand		S1	1-2-6-7	8	24/16		
	S2 (2-4') Stiff, tan/brown SILT, some fine sand and clay, moist, mottled.	Silt		S2	5-5-5-7	10	24/16		
	Auger to 5'.								
5	S3 (5-7') Stiff, brown/gray SILT and CLAY, moist, mottled.	Silt and Clay		S3	5-6-8-10	14	24/22		
	Auger to 10'.								
10	S4 (10-12') Medium stiff, brown/gray CLAY, little silt, moist.	Clay		S4	1-2-3-3	5	24/24		
	Auger to 15'.								
15	S5 (15-17') Soft, brown/gray CLAY, little silt and fine sand, moist.	Clay		S5	2-2-2-5	4	24/24		
	Auger to 19.8'. Difficult drilling from 19-19.8'.								
		Bedrock							
20	Refusal, end of boring 19.8'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
NE	NE	9/7/18

WELL LEGEND: Filter Sand, Native Fill, Bentonite, Bentonite Grout, Concrete, PVC Screen, PVC Riser

NOTES:
1. Drilling performed using a track-mounted Mobile Drill 53 and 2 1/4" I.D. hollow-stem augers.
2 Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NM=not measured; WOH=weight of hammer.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
BWD-Matthews Brothers Lot
285 Northport Ave
Belfast, ME

Project No.: 171.05027 Page: 1

RANSOM Consulting Engineers and Scientists

BORING LOG: B401

Reviewed by:	JPS	Total Depth:	12 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/6/18 to 9/6/18
Surface Elevation (ft.):	28 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Medium dense, tan/brown, fine SAND and SILT, dry, mottled.	Sand and Silt		S1	6-11-12-12	23	24/10	NA	
	S2 (2-4') Very stiff, brown SILT, little clay, trace fine sand, dry.	Silt		S2	14-13-12-15	25	24/18	NA	
5	S3 (4-6') Stiff, brown/gray SILT and CLAY, moist, mottled.	Silt and Clay		S3	5-5-7-16	12	24/20	NA	
	Auger to 10'.								
10	S4 (10-12') Medium stiff, brown/gray CLAY, some silt, moist.	Clay		S4	2-3-3-3	6	24/24	NA	
	End of boring 12'.								
15									

WATER LEVELS:

During Drilling	End of Boring	Date:
NE		9/6/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a tracked drill rig and 2 1/4" hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NE=not encountered.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
282 & 285 Northport Ave
Belfast, ME

Project No.: 171.05027

RANSOM Consulting Engineers and Scientists

BORING LOG: B402

Reviewed by: JPS		Total Depth:	12 Feet	Logged By:	MJP
Date Reviewed: 2/27/19		Boring Diameter:	6 Inches	Date Drilled:	9/6/18 to 9/6/18
Surface Elevation (ft.):	28 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') 3" TOPSOIL, over 10" medium dense, brown, fine to medium SAND, some silt, trace coarse sand, rounded.	Sand		S1	5-8-8-7	16	24/13	NA	
	S2 (2-4') Stiff, brown/gray SILT and CLAY, trace fine sand, moist, mottled.	Silt and Clay		S2	5-8-6-8	14	24/18	NA	
	S3 (4-6') Stiff, brown/gray CLAY, little silt, moist.	Clay		S3	3-4-8-6	12	24/24	NA	
5	Auger to 10'.								
10	S4 (10-12') Medium stiff, brown/gray CLAY, little silt, moist, mottled.	Clay		S4	1-3-4-4	7	24/24	NA	
	End of boring 12'.								
15									

WATER LEVELS:

During Drilling	End of Boring	Date:
NE	NE	9/6/18

WELL LEGEND: Filter Sand, Native Fill, Bentonite, Bentonite Grout, Concrete, PVC Screen, PVC Riser

NOTES:
1. Drilling performed using a tracked drill rig and 2 1/4" hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NE=not encountered.

CLIENT: Nordic Aquafarms, Inc.

SITE: 282 & 285 Northport Ave, Belfast, ME

Project No.: 171.05027 Page: 1

RANSOM Consulting Engineers and Scientists

BORING LOG: B403

Reviewed by: JPJ		Total Depth: 17 Feet		Logged By: MJP	
Date Reviewed: 2/27/19		Boring Diameter: 6 Inches		Date Drilled: 9/6/18 to 9/6/18	
Surface Elevation (ft.): 28 +/-		Well Stickup: NA		Driller: NEBC	

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Medium dense, tan/brown SILT and fine SAND, dry.	Silt and Sand		S1	4-8-10-8	18	24/16	NA	
	S2 (2-4') Very stiff, brown/gray SILT, some clay, moist, mottled.	Silt		S2	3-6-10-7	16	24/20	NA	
	Auger to 5'.								
5	S3 (5-7') Stiff, gray CLAY, little silt, moist, harder oxidized modules.	Clay		S3	2-4-6-7	10	24/24	NA	
	Auger to 10'.								
10	S4 (10-12') Soft, brownish gray CLAY, trace fine sand moist, fine sand in lenses.	Clay		S4	1-2-2-1	4	24/24	NA	
	Auger to 15'.								
15	S5 (15-17') Stiff, dark gray CLAY, little silt and fine to coarse sand, trace fine gravel, moist, till observed at very base.	Clay		S5	2-4-5-12	9	24/10	NA	
	End of boring 17'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
NE		9/6/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Drilling performed using a tracked drill rig and 2 1/4" hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NE=not encountered.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
282 & 285 Northport Ave
Belfast, ME

Project No.: 171.05027 Page: 1

RANSOM
Consulting Engineers and Scientists

BORING LOG: B404

Reviewed by:	JPJ	Total Depth:	17 Feet	Logged By:	MJP
Date Reviewed:	2/27/19	Boring Diameter:	6 Inches	Date Drilled:	9/6/18 to 9/6/18
Surface Elevation (ft.):	19 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Medium dense, tan, fine SAND and SILT, dry.	Silt and Sand		S1	5-10-8-10	18	24/16	NA	
	S2 (2-4') Very stiff, brown/gray SILT and CLAY, trace fine sand, moist, mottled.	Silt and Clay		S2	11-9-9-9	18	24/18	NA	
	Auger to 5'.								
5	S3 (5-7') Stiff, brown/gray SILT and CLAY, moist, mottled.	Silt and Clay		S3	3-5-7-10	12	24/22	NA	
	Auger to 10'.								
10	S4 (10-12') Medium stiff, brown/gray CLAY, some silt, trace fine sand, moist.	Clay		S4	1-2-4-2	6	24/22	NA	
	Auger to 15'.								
15	S5 (15-17') 6" Stiff, brown SILT and CLAY, trace fine sand, moist, over 6" daker gray SILT and fine to medium SAND, little clay and fine gravel, moist.	Silt, Clay & Till		S5	2-5-5-12	10	24/12	NA	
	End of boring 17'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
NE		9/6/18

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Drilling performed using a tracked drill rig and 2 1/4" hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NE=not encountered.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
282 & 285 Northport Ave
Belfast, ME

Project No.: 171.05027

RANSOM Consulting Engineers and Scientists

BORING LOG: B405

Reviewed by:	JPD	Total Depth:	17 Feet	Logged By:	MJP
Date Reviewed:	7/17/19	Boring Diameter:	6 Inches	Date Drilled:	9/6/18 to 9/6/18
Surface Elevation (ft.):	22 +/-	Well Stickup:	NA	Driller:	NEBC

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
	S1 (0-2') Loose, tan/brown SILT and fine SAND, dry, siltier at last 3".	Silt and Sand		S1	2-3-6-6	9	24/12	NA	
	S2 (2-4') Stiff, brown/gray CLAY, some silt, moist, hard oxidized modules.	Clay		S2	2-4-7-9	11	24/22	NA	
	Auger to 5'.								
5	S3 (5-7') Stiff, brown/gray CLAY, little silt, moist.	Clay		S3	3-5-7-15	12	24/24	NA	
	Auger to 10'.								
10	S4 (10-12') Medium stiff, brown/gray CLAY, little silt, moist, mottled.	Clay		S4	1-3-4-3	7	24/24	NA	
	Auger to 15'.								
15	S5 (15-17') Soft, gray CLAY, some fine sand, wet, over 3" dense, dark gray SAND and SILT, little fine gravel, wet,.	Clay and Till		S5	WOH-1-2-4	3	24/24	NA	
	End of boring 17'.								

WATER LEVELS:

During Drilling	End of Boring	Date:
15'	NE	9/6/18

WELL LEGEND: Filter Sand; Native Fill; Bentonite; Bentonite Grout; Concrete; PVC Screen; PVC Riser

NOTES:
1. Drilling performed using a tracked drill rig and 2 1/4" hollow-stem augers.
2. Soil sampling conducted by standard penetration test using 140 lb. safety hammer.
3. NA=not applicable; NE=not encountered.

CLIENT:
Nordic Aquafarms, Inc.

SITE:
282 & 285 Northport Ave
Belfast, ME

Project No.: 171.05027

APPENDIX B

Laboratory Test Results

Geotechnical Engineering Report
Proposed Commercial Land-Based Aquaculture Facility
285 Northport Road
Belfast, Maine

ConTest Consultants, Inc.

Providing Inspection/Testing & Consulting Services

LETTER OF TRANSMITTAL

TO: Ransom Consulting - Jay Johonnett

DATE: 4/20/2018

PROJECT: Nordic Aquafarms – Belfast, ME 171.05027

CTC PROJECT NO.: 218146

Attached are the following for your use:

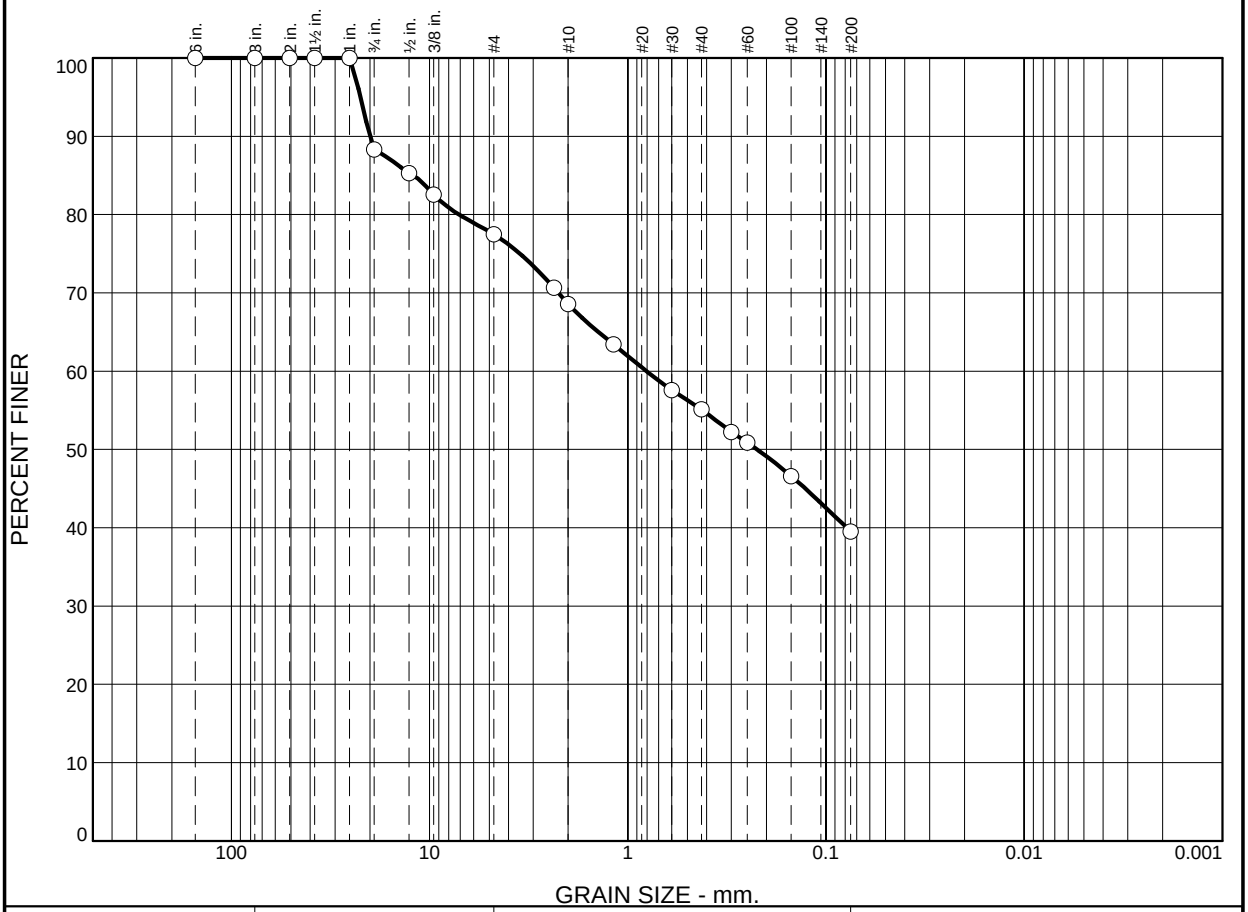
COPIES	DATE	LAB NUMBER	DESCRIPTION
			Concrete Reports - Cylinders
			Concrete Inspection Report
			Reinforcing Steel Inspection Report
			Field Density Report
1		L-218-18	Particle Size Distribution Report
5		L-217-18 L-219-18 L-220-18 L-221-18 L-222-18	Particle Size Distribution & Hydrometer Report
5		L-217-18 L-219-18 L-220-18 L-221-18 L-222-18	Atterberg Limits Report

CC: Ransom Consulting - Ken Milender

Reviewed By: Donald Walden

18 Cote Ave. Unit 11 Goffstown, NH 03045
p (603) 626-4422 • *f* (603) 782-0064
www.contestconsultantsinc.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.7	10.8	8.9	13.5	15.6	39.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	88.3		
1/2"	85.3		
3/8"	82.5		
#4	77.5		
#8	70.7		
#10	68.6		
#16	63.4		
#30	57.6		
#40	55.1		
#50	52.2		
#60	50.9		
#100	46.6		
#200	39.5		

* (no specification provided)

Soil Description

SILT, coarse to fine Sand, some med to fine Gravel silty sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 19.9605 D_{85}= 12.0608 D_{60}= 0.8060
D_{50}= 0.2227 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Moisture Content (as received) 10.7%

Location: B-102, S-4B
Sample Number: L-218-18 **Depth:** 11'-12' **Date:** 4/18/2018

ConTest Consultants, Inc.

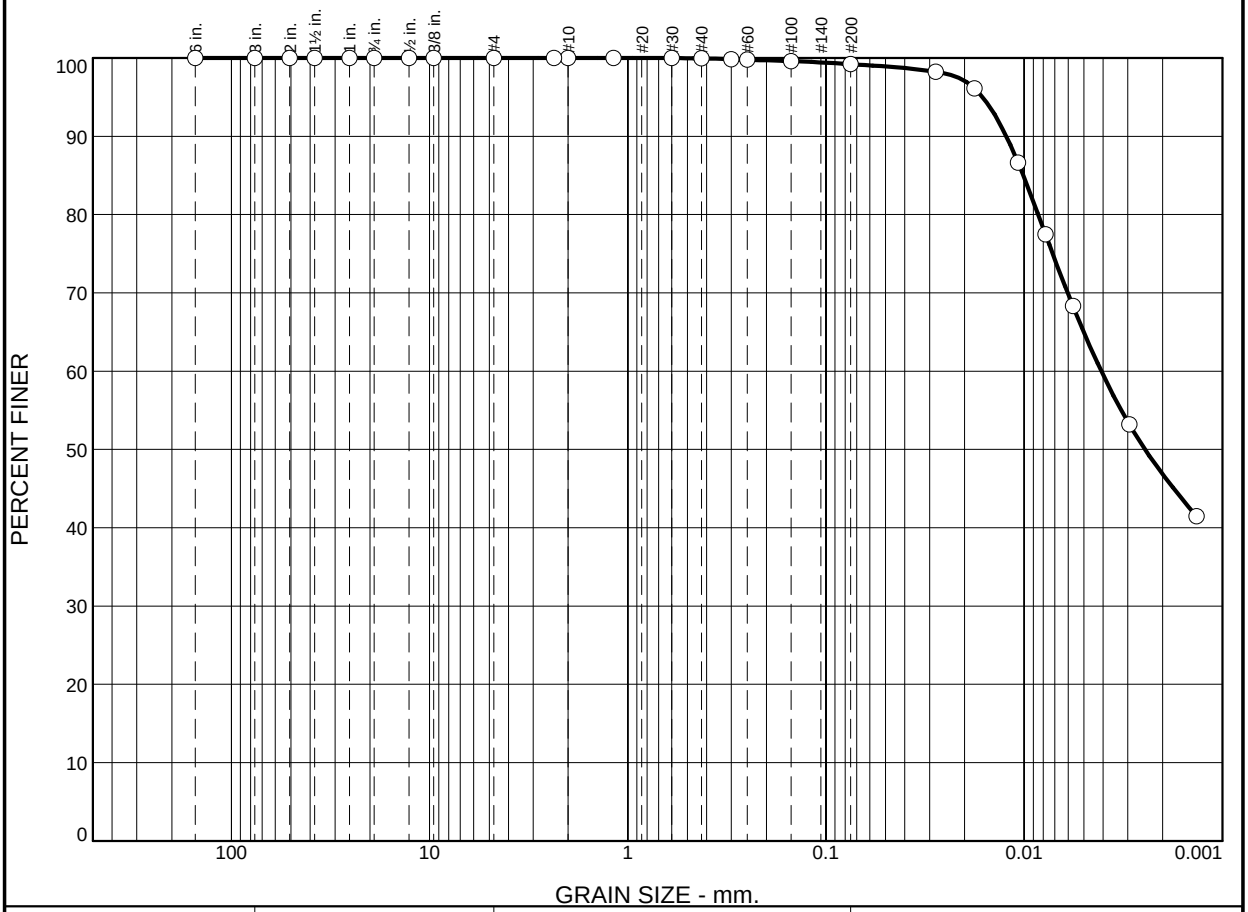
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	0.7	34.2	65.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	100.0		
#40	99.9		
#50	99.8		
#60	99.8		
#100	99.6		
#200	99.2		
0.0279 mm.	98.2		
0.0178 mm.	96.1		
0.0107 mm.	86.6		
0.0078 mm.	77.5		
0.0057 mm.	68.3		
0.0030 mm.	53.2		
0.0014 mm.	41.5		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 23 LL= 45 PI= 22

Coefficients

D_{90}= 0.0123 D_{85}= 0.0101 D_{60}= 0.0041
D_{50}= 0.0025 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(24)

Remarks

Moisture Content (as received) 24.0%

Location: B-101, S-2
Sample Number: L-217-18 **Depth:** 2'-4' **Date:** 4/18/2018

ConTest Consultants, Inc.

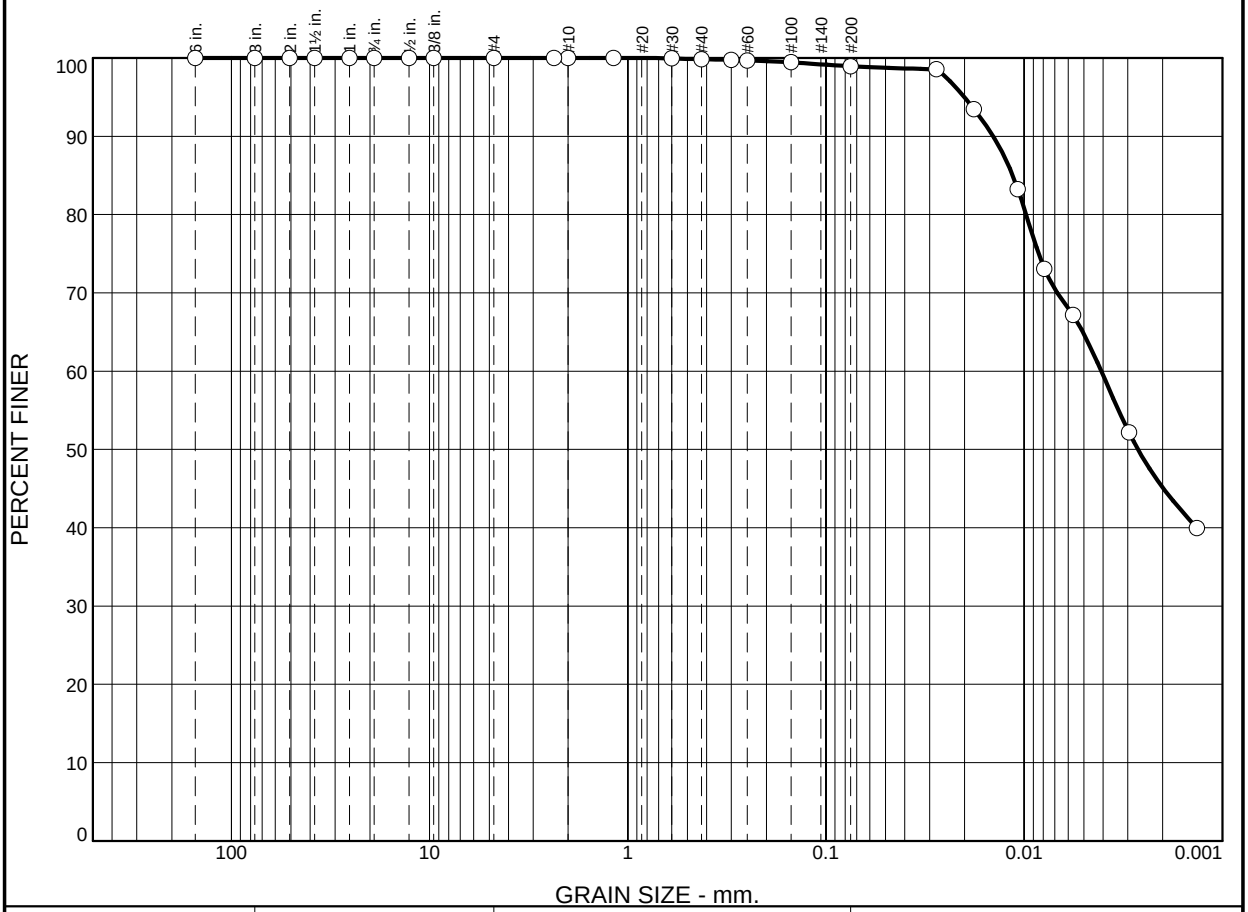
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	0.9	34.2	64.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	99.9		
#40	99.8		
#50	99.8		
#60	99.7		
#100	99.4		
#200	98.9		
0.0277 mm.	98.6		
0.0179 mm.	93.4		
0.0108 mm.	83.3		
0.0079 mm.	73.1		
0.0057 mm.	67.2		
0.0030 mm.	52.2		
0.0013 mm.	40.0		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 20 LL= 37 PI= 17

Coefficients

D_{90}= 0.0143 D_{85}= 0.0114 D_{60}= 0.0041
D_{50}= 0.0027 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(18)

Remarks

Moisture Contest (as received) 30.6%

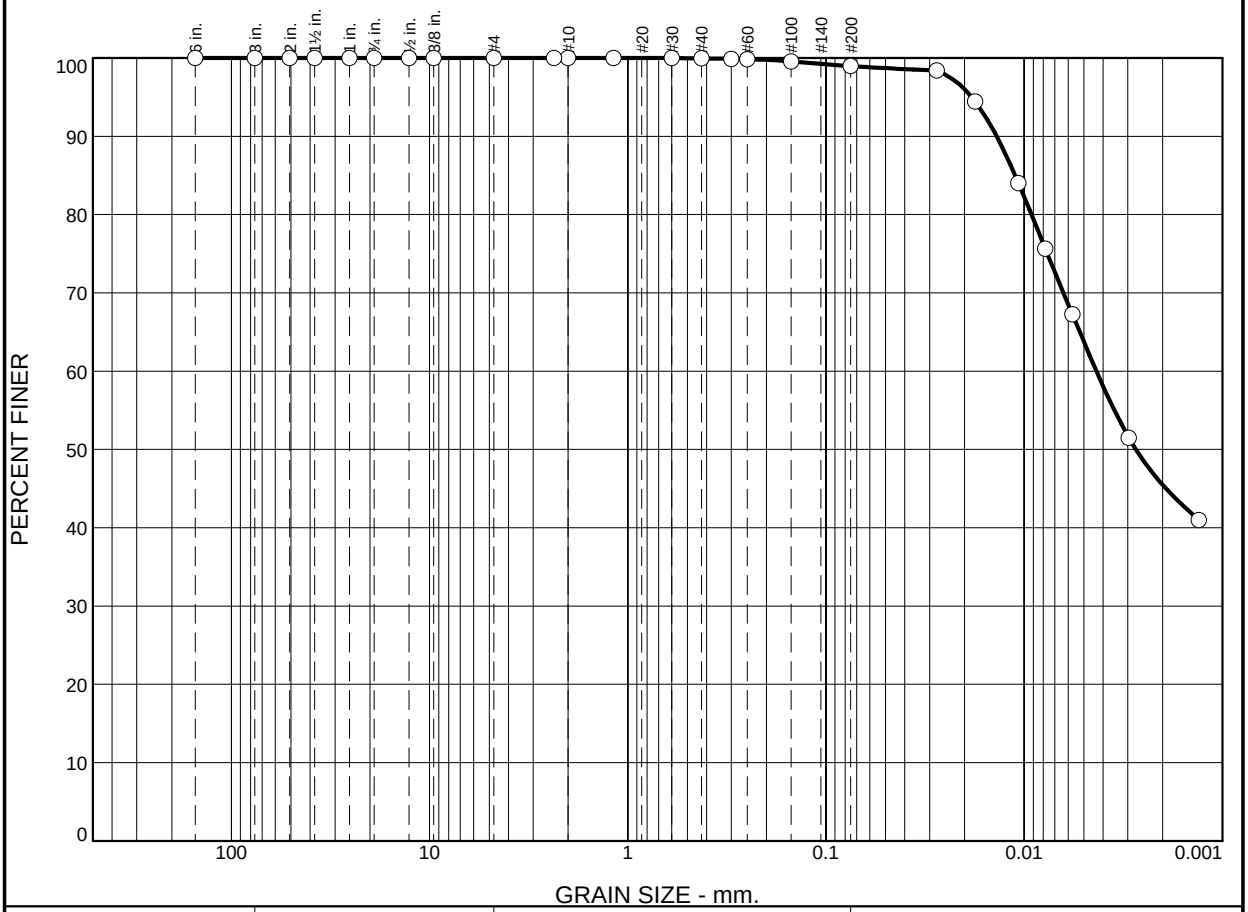
Location: B-104, S-4
Sample Number: L-219-18 **Depth:** 10'-12' **Date:** 4/19/2018

ConTest Consultants, Inc.

Goffstown, New Hampshire

Client: Ransom Consulting, Inc.
Project: Nordic Aquafarms (171.05027)
Belfast, Maine
Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	0.9	35.2	63.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	100.0		
#40	99.9		
#50	99.9		
#60	99.8		
#100	99.5		
#200	99.0		
0.0276 mm.	98.4		
0.0177 mm.	94.5		
0.0107 mm.	84.0		
0.0078 mm.	75.6		
0.0057 mm.	67.3		
0.0030 mm.	51.5		
0.0013 mm.	41.0		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 20 LL= 38 PI= 18

Coefficients

D_{90}= 0.0138 D_{85}= 0.0111 D_{60}= 0.0043
D_{50}= 0.0027 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(19)

Remarks

Moisture Content (as received) 25.0%

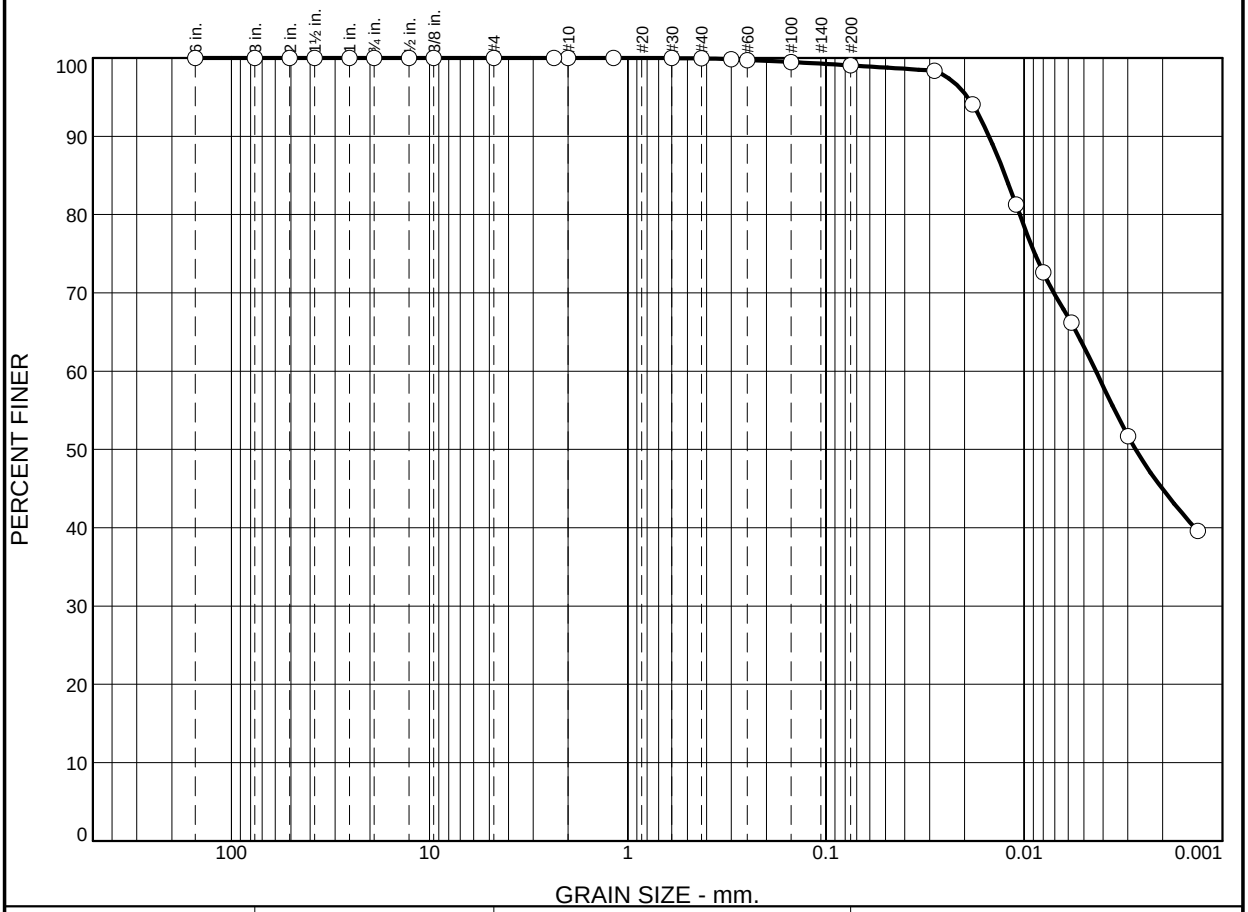
Location: B-106, S-3
Sample Number: L-220-18 **Depth:** 4'-6' **Date:** 4/19/2018

ConTest Consultants, Inc.

Goffstown, New Hampshire

Client: Ransom Consulting, Inc.
Project: Nordic Aquafarms (171.05027)
Belfast, Maine
Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	0.9	35.8	63.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	100.0		
#40	99.9		
#50	99.8		
#60	99.7		
#100	99.5		
#200	99.0		
0.0283 mm.	98.4		
0.0182 mm.	94.1		
0.0110 mm.	81.3		
0.0080 mm.	72.6		
0.0058 mm.	66.2		
0.0030 mm.	51.7		
0.0013 mm.	39.6		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 20 LL= 39 PI= 19

Coefficients

D_{90}= 0.0150 D_{85}= 0.0125 D_{60}= 0.0043
D_{50}= 0.0027 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(20)

Remarks

Moisture Content (as recieved) 29.8%

Location: B-107, S-4
Sample Number: L-221-18 **Depth:** 10'-12' **Date:** 4/19/2018

ConTest Consultants, Inc.

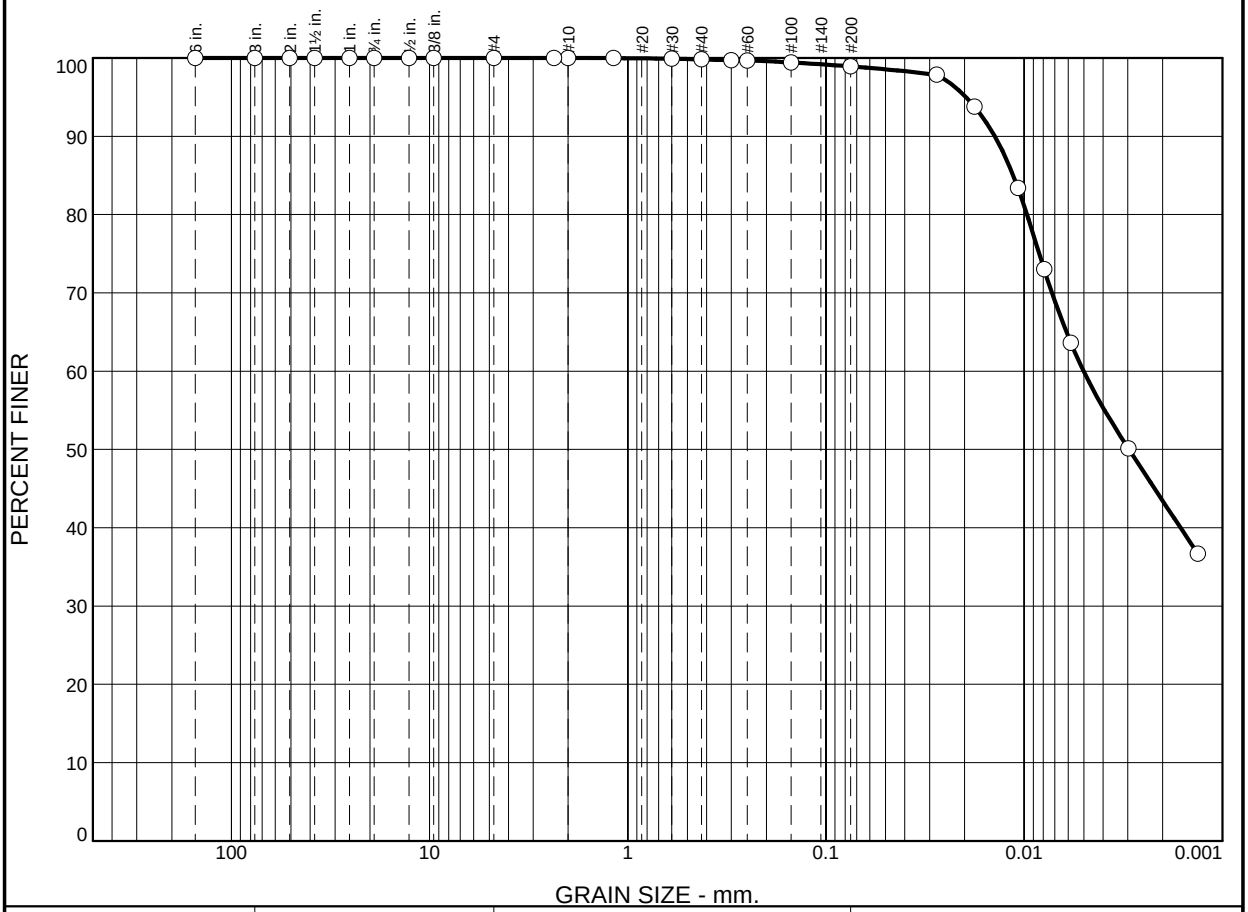
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	0.9	39.0	59.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	99.9		
#40	99.8		
#50	99.7		
#60	99.7		
#100	99.4		
#200	98.9		
0.0277 mm.	97.9		
0.0178 mm.	93.8		
0.0108 mm.	83.4		
0.0079 mm.	73.0		
0.0058 mm.	63.6		
0.0030 mm.	50.1		
0.0013 mm.	36.7		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 20 LL= 36 PI= 16

Coefficients

D_{90}= 0.0141 D_{85}= 0.0114 D_{60}= 0.0050
D_{50}= 0.0030 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(17)

Remarks

Moiture Content (as received) 33.5%

Location: B-109, S-4
Sample Number: L-222-18 **Depth:** 10'-12' **Date:** 4/19/2018

ConTest Consultants, Inc.

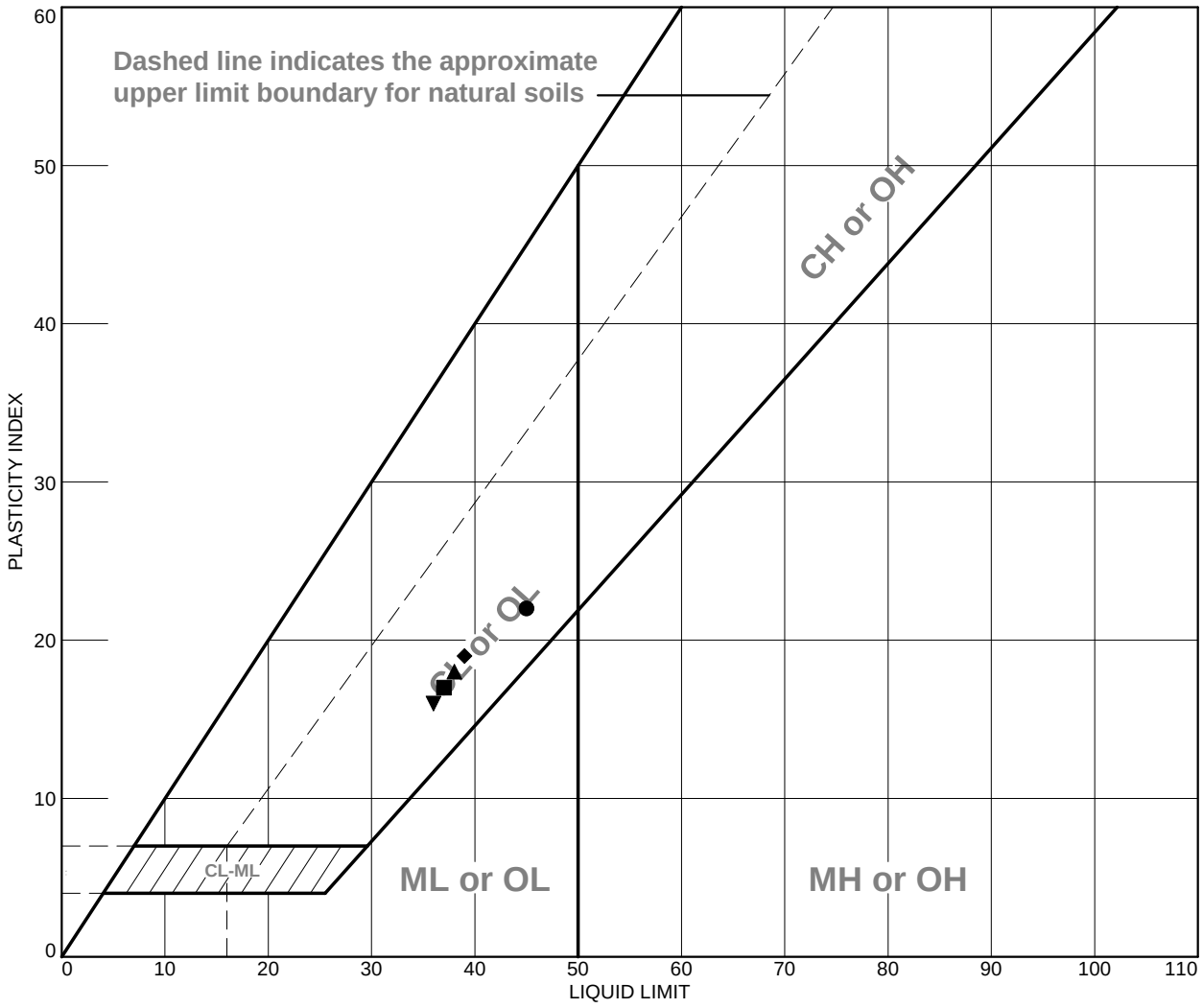
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	lean clay	45	23	22	99.9	99.2	CL
■	lean clay	37	20	17	99.8	98.9	CL
▲	lean clay	38	20	18	99.9	99.0	CL
◆	lean clay	39	20	19	99.9	99.0	CL
▼	lean clay	36	20	16	99.8	98.9	CL

Project No. 218146 **Client:** Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)

Belfast, Maine

● **Location:** B-101, S-2 **Depth:** 2'-4' **Sample Number:** L-217-18

■ **Location:** B-104, S-4 **Depth:** 10'-12' **Sample Number:** L-219-18

▲ **Location:** B-106, S-3 **Depth:** 4'-6' **Sample Number:** L-220-18

◆ **Location:** B-107, S-4 **Depth:** 10'-12' **Sample Number:** L-221-18

▼ **Location:** B-109, S-4 **Depth:** 10'-12' **Sample Number:** L-222-18

ConTest Consultants, Inc.

Goffstown, New Hampshire

Remarks:

Figure

ConTest Consultants, Inc.

Providing Inspection/Testing & Consulting Services

LETTER OF TRANSMITTAL

TO: Ransom Consulting - Jay Johonnett

DATE: 9/19/2018

PROJECT: Nordic Aquafarms – Belfast, ME 171.05027

CTC PROJECT NO.: 218146

Attached are the following for your use:

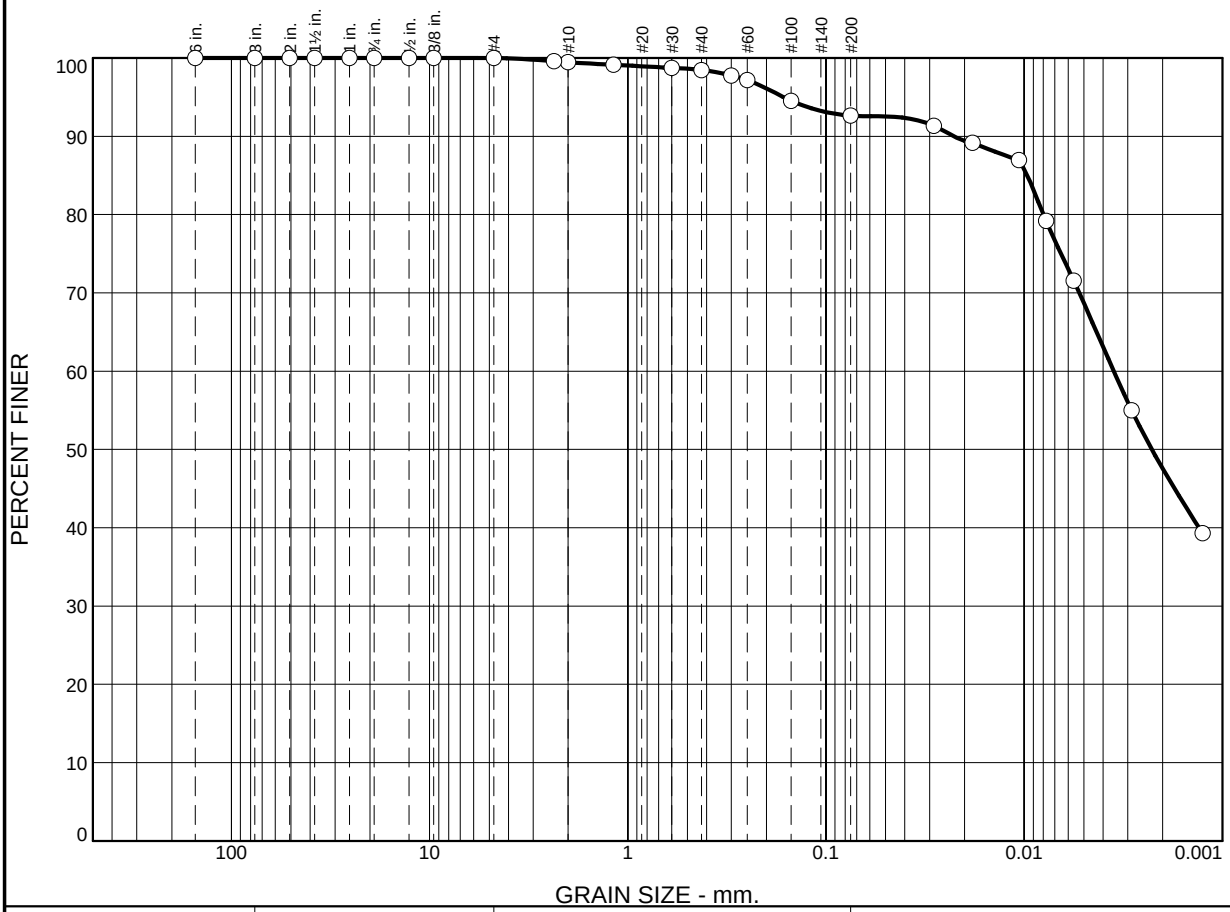
COPIES	DATE	LAB NUMBER	DESCRIPTION
			Concrete Reports - Cylinders
			Concrete Inspection Report
			Reinforcing Steel Inspection Report
			Field Density Report
			Particle Size Distribution Report
10		L-483-18 Thru L-492-18	Particle Size Distribution & Hydrometer Report
10		L-483-18 Thru L-492-18	Atterberg Limits Report

CC: Ransom Consulting – Mike Petro

Reviewed By: Donald Walden

18 Cote Ave. Unit 11 Goffstown, NH 03045
p (603) 626-4422 • *f* (603) 782-0064
www.contestconsultantsinc.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	1.0	5.9	23.9	68.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.6		
#10	99.5		
#16	99.1		
#30	98.7		
#40	98.5		
#50	97.8		
#60	97.2		
#100	94.5		
#200	92.6		
0.0286 mm.	91.3		
0.0182 mm.	89.1		
0.0106 mm.	87.0		
0.0077 mm.	79.2		
0.0056 mm.	71.5		
0.0029 mm.	55.0		
0.0013 mm.	39.3		

* (no specification provided)

Soil Description

fat clay

Atterberg Limits

PL= 21 LL= 52 PI= 31

Coefficients

D_{90}= 0.0227 D_{85}= 0.0097 D_{60}= 0.0035
D_{50}= 0.0023 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(31)

Remarks

Moisture Content (as received) = 24.0%

Location: B-202, S-3
Sample Number: L-483-18 **Depth:** 4'-6' **Date:** 9/15/2018

ConTest Consultants, Inc.

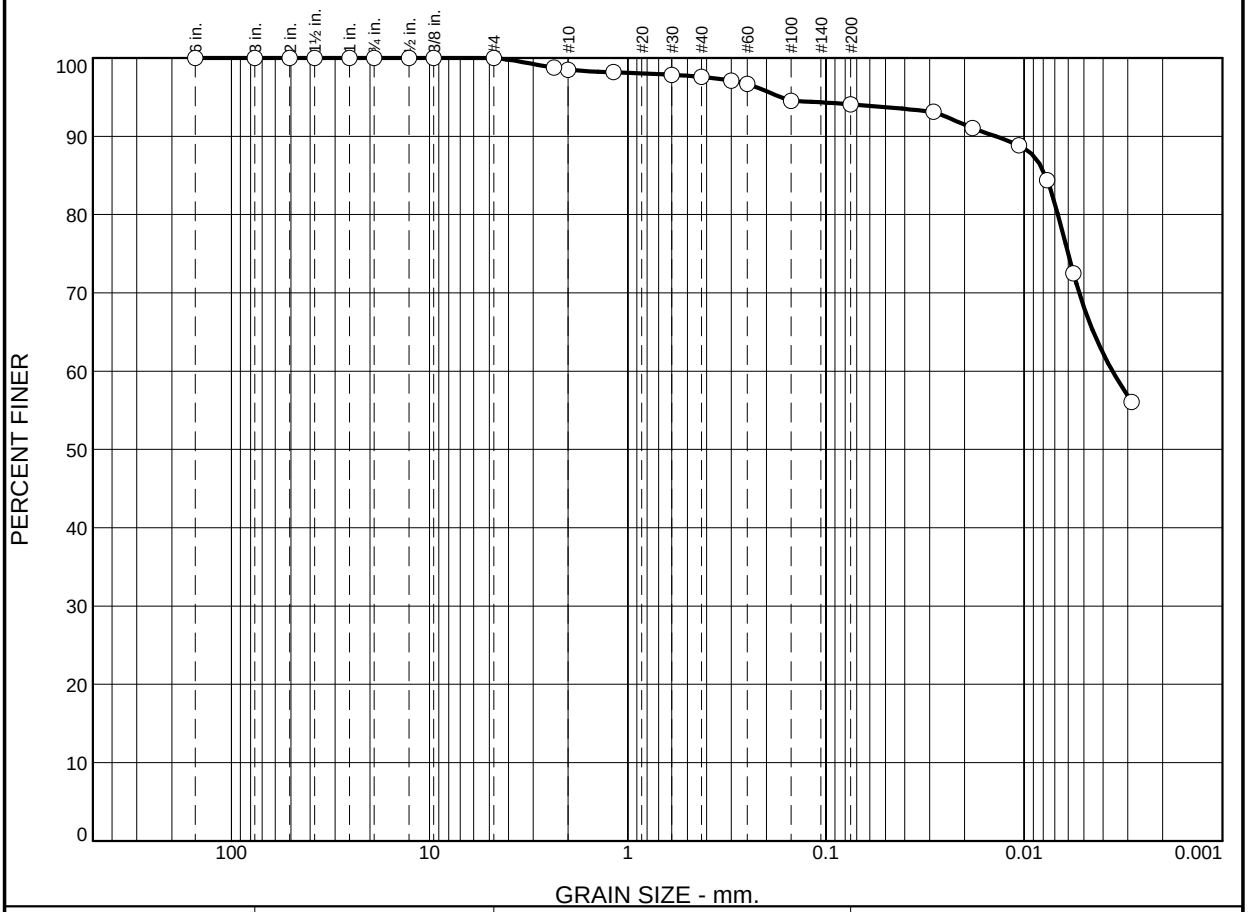
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.5	0.9	3.5	25.9	68.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	98.7		
#10	98.5		
#16	98.2		
#30	97.8		
#40	97.6		
#50	97.1		
#60	96.7		
#100	94.5		
#200	94.1		
0.0287 mm.	93.1		
0.0182 mm.	91.1		
0.0106 mm.	88.8		
0.0077 mm.	84.4		
0.0056 mm.	72.5		
0.0029 mm.	56.1		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 20 LL= 48 PI= 28

Coefficients

D_{90}= 0.0140 D_{85}= 0.0078 D_{60}= 0.0036
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(28)

Remarks

Moisture Content (as received) = 25.8%

Location: B-404, S-3
Sample Number: L-484-18 **Depth:** 5'-7' **Date:** 9/15/2018

ConTest Consultants, Inc.

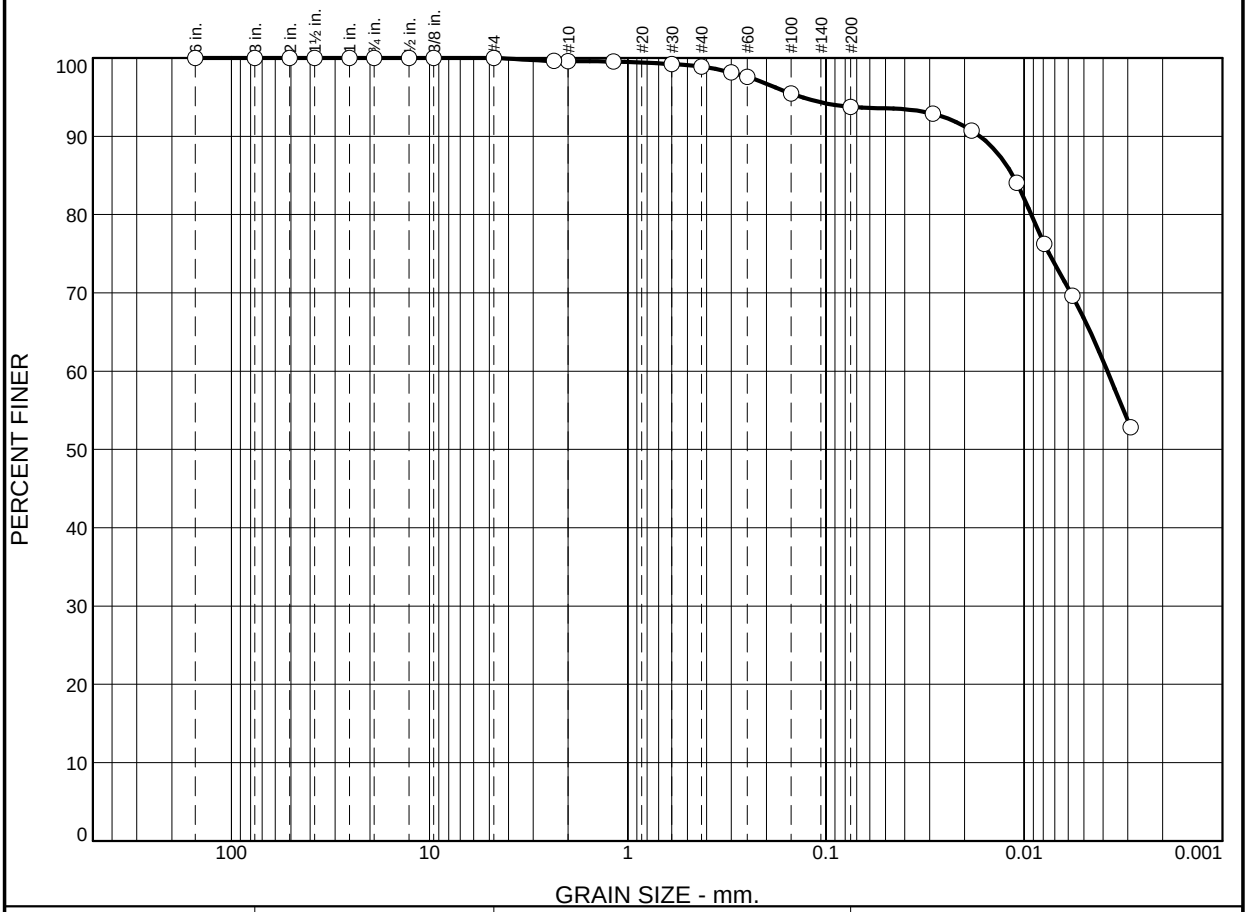
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	0.7	5.1	27.1	66.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.6		
#10	99.6		
#16	99.5		
#30	99.2		
#40	98.9		
#50	98.1		
#60	97.6		
#100	95.4		
#200	93.8		
0.0289 mm.	92.9		
0.0184 mm.	90.7		
0.0109 mm.	84.0		
0.0079 mm.	76.3		
0.0057 mm.	69.6		
0.0029 mm.	52.8		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 19 LL= 46 PI= 27

Coefficients

D_{90}= 0.0168 D_{85}= 0.0114 D_{60}= 0.0038
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(27)

Remarks

Moisture content (as received) = 31.7%

Location: B-405, S-4
Sample Number: L-485-18 **Depth:** 10'-12' **Date:** 9/18/2018

ConTest Consultants, Inc.

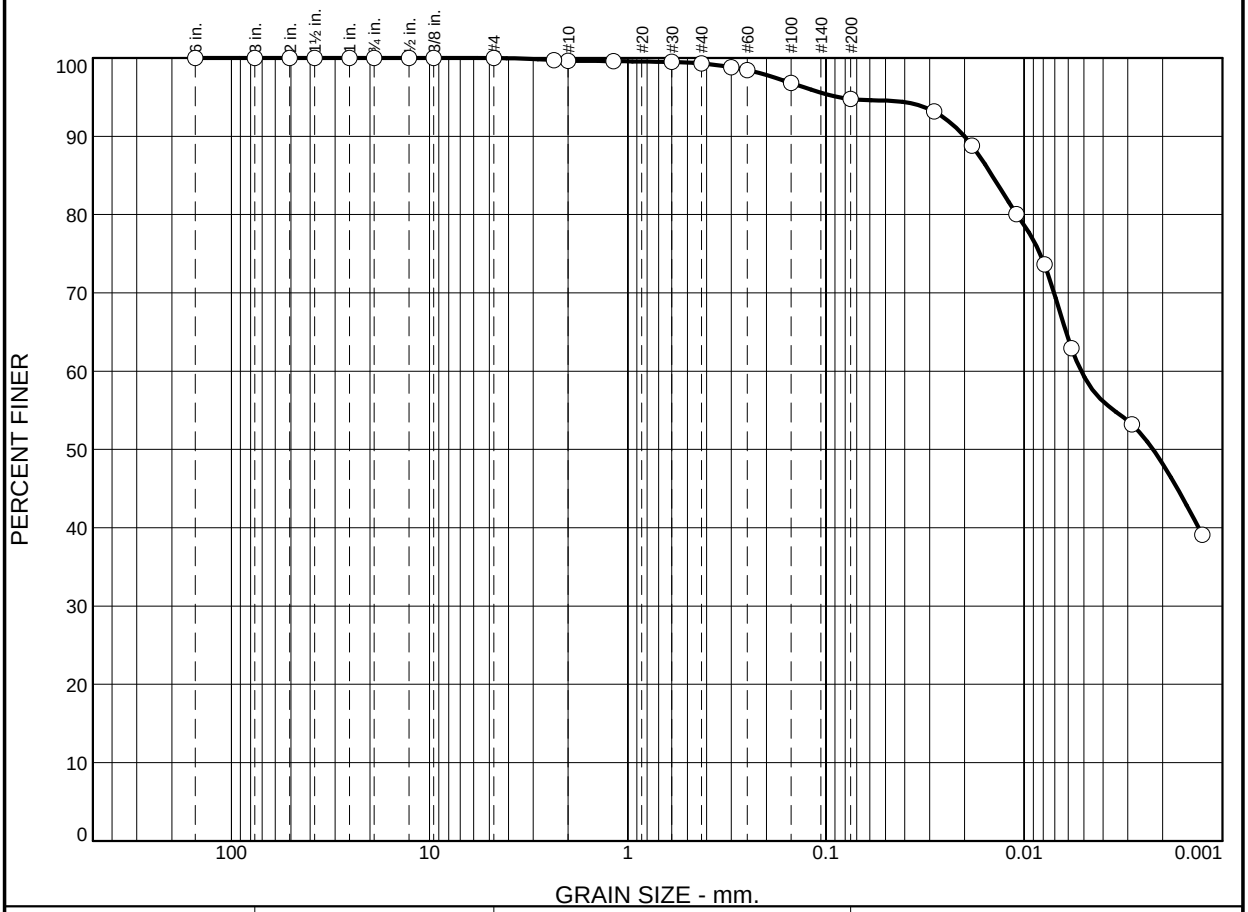
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	0.3	4.5	35.4	59.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.7		
#10	99.6		
#16	99.6		
#30	99.5		
#40	99.3		
#50	98.8		
#60	98.4		
#100	96.8		
#200	94.8		
0.0285 mm.	93.2		
0.0183 mm.	88.8		
0.0109 mm.	80.1		
0.0079 mm.	73.6		
0.0058 mm.	62.9		
0.0029 mm.	53.2		
0.0013 mm.	39.1		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 20 LL= 44 PI= 24

Coefficients

D_{90}= 0.0201 D_{85}= 0.0145 D_{60}= 0.0052
D_{50}= 0.0022 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(24)

Remarks

Moisture Content (as received) = 34.7%

Location: B-202, S-4
Sample Number: L-486-18 **Depth:** 10'-12' **Date:** 9/15/2018

ConTest Consultants, Inc.

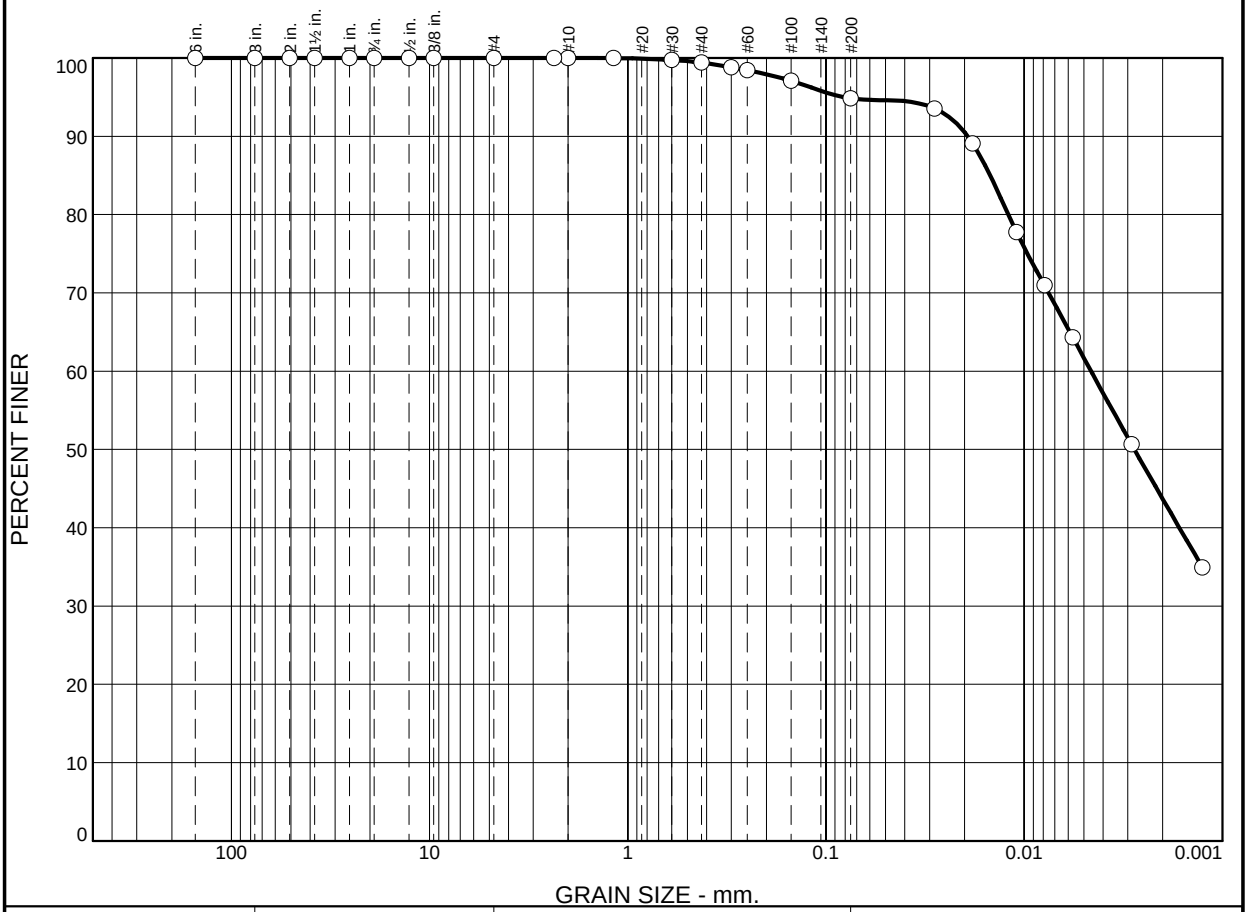
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.6	4.6	33.1	61.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	99.7		
#40	99.4		
#50	98.8		
#60	98.4		
#100	97.1		
#200	94.8		
0.0283 mm.	93.5		
0.0182 mm.	89.1		
0.0109 mm.	77.8		
0.0079 mm.	71.0		
0.0057 mm.	64.3		
0.0029 mm.	50.7		
0.0013 mm.	34.9		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 20 LL= 46 PI= 26

Coefficients

D_{90}= 0.0193 D_{85}= 0.0149 D_{60}= 0.0046
D_{50}= 0.0028 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(27)

Remarks

Moisture Content (as received) = 27.6%

Location: B-311, S-3
Sample Number: L-487-18 **Depth:** 5'-7' **Date:** 9/18/2018

ConTest Consultants, Inc.

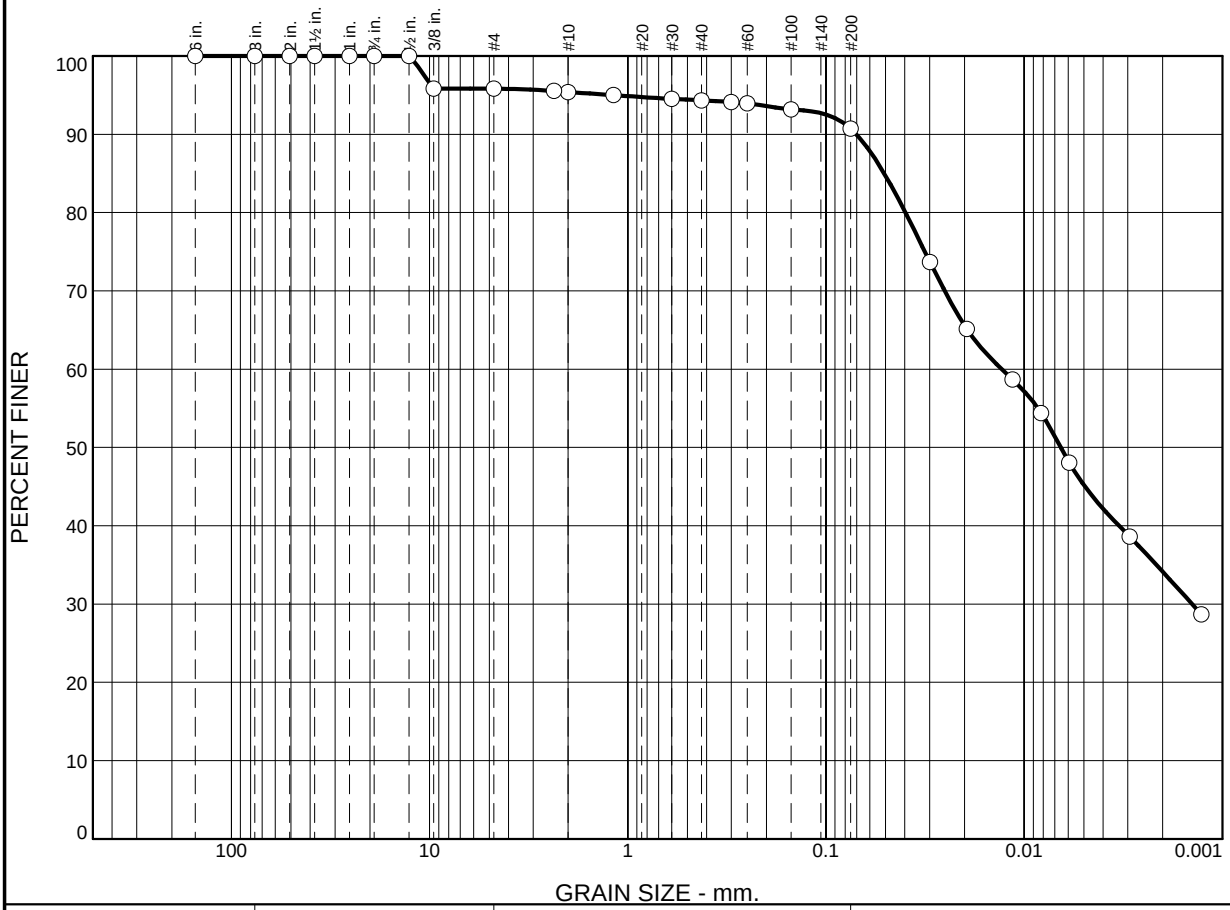
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.2	0.4	1.1	3.6	45.5	45.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	95.8		
#4	95.8		
#8	95.5		
#10	95.4		
#16	95.0		
#30	94.5		
#40	94.3		
#50	94.1		
#60	93.9		
#100	93.2		
#200	90.7		
0.0299 mm.	73.7		
0.0194 mm.	65.1		
0.0115 mm.	58.7		
0.0082 mm.	54.4		
0.0059 mm.	48.0		
0.0029 mm.	38.6		
0.0013 mm.	28.7		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 16 LL= 34 PI= 18

Coefficients

D_{90}= 0.0703 D_{85}= 0.0509 D_{60}= 0.0130
D_{50}= 0.0065 D_{30}= 0.0014 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(16)

Remarks

Moisture Content (as received) = 27.5%

Location: B-311, S-5
Sample Number: L-488-18 **Depth:** 15'-17' **Date:** 9/18/2018

ConTest Consultants, Inc.

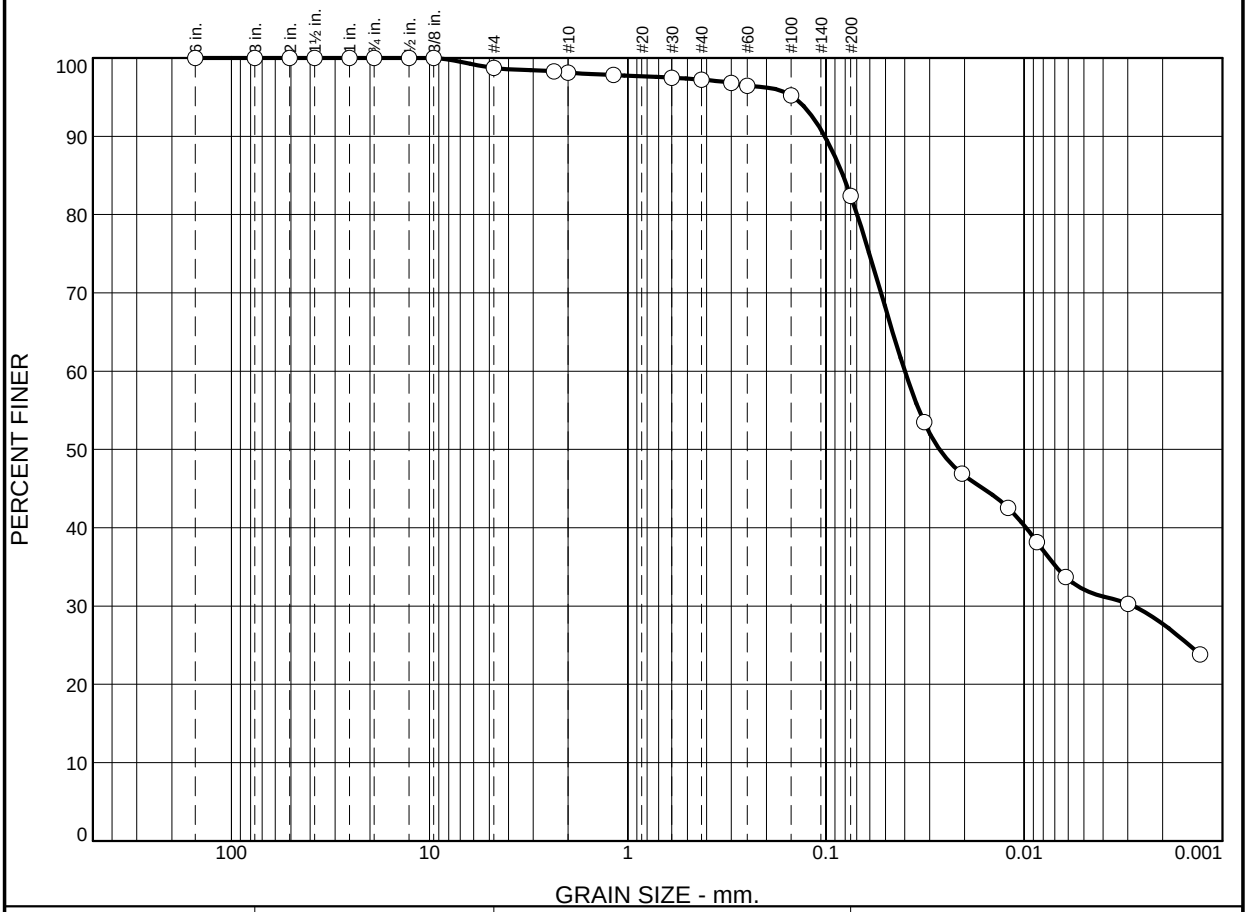
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.3	0.6	0.9	14.8	50.3	32.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	98.7		
#8	98.3		
#10	98.1		
#16	97.8		
#30	97.5		
#40	97.2		
#50	96.8		
#60	96.5		
#100	95.2		
#200	82.4		
0.0320 mm.	53.5		
0.0206 mm.	46.9		
0.0120 mm.	42.5		
0.0086 mm.	38.2		
0.0062 mm.	33.7		
0.0030 mm.	30.3		
0.0013 mm.	23.8		

* (no specification provided)

Soil Description

lean clay with sand

Atterberg Limits

PL= 17 LL= 34 PI= 17

Coefficients

D_{90}= 0.1014 D_{85}= 0.0821 D_{60}= 0.0400
D_{50}= 0.0268 D_{30}= 0.0028 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(13)

Remarks

Moisture Content (as received) = 21.3%

Location: B-312, S-4
Sample Number: L-489-18 **Depth:** 10'-12' **Date:** 9/18/2018

ConTest Consultants, Inc.

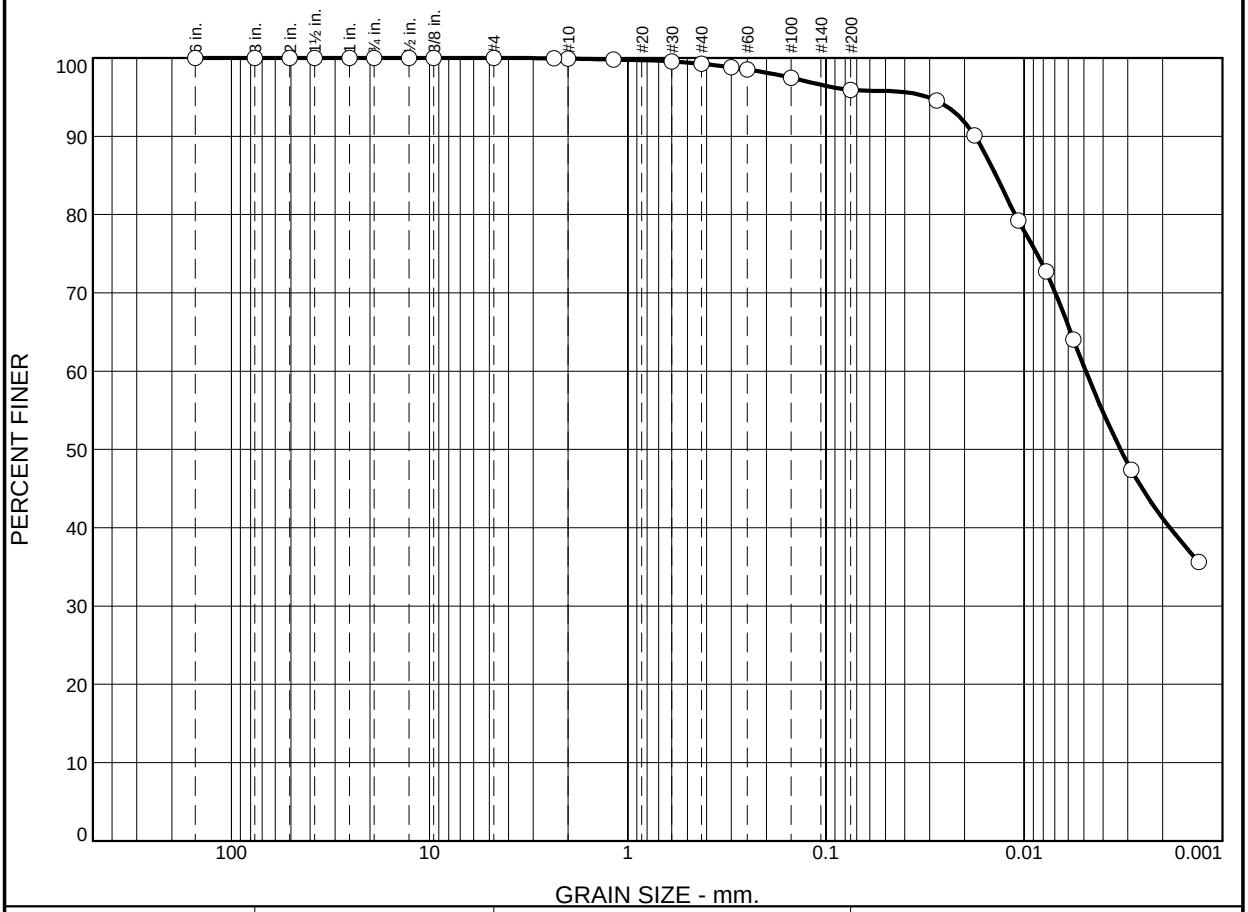
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.6	3.4	35.3	60.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.9		
#10	99.9		
#16	99.8		
#30	99.6		
#40	99.3		
#50	98.8		
#60	98.5		
#100	97.5		
#200	95.9		
0.0277 mm.	94.5		
0.0178 mm.	90.1		
0.0107 mm.	79.2		
0.0077 mm.	72.7		
0.0056 mm.	64.0		
0.0029 mm.	47.4		
0.0013 mm.	35.6		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 21 LL= 49 PI= 28

Coefficients

D_{90}= 0.0177 D_{85}= 0.0139 D_{60}= 0.0049
D_{50}= 0.0033 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(30)

Remarks

Moisture Content (as received) = 27.7%

Location: B-304, S-3
Sample Number: L-490-18 **Depth:** 5'-7' **Date:** 9/19/2018

ConTest Consultants, Inc.

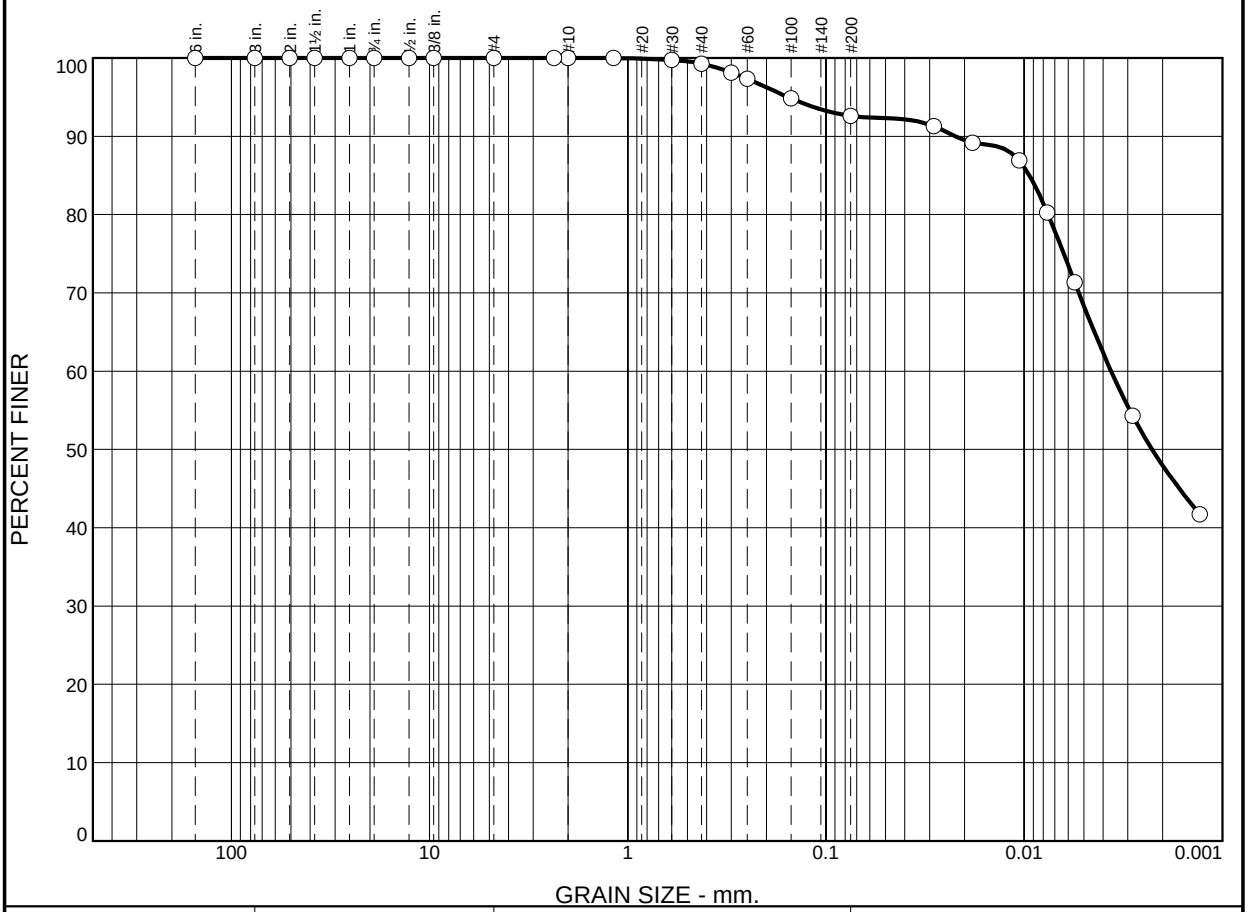
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.7	6.7	24.2	68.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	99.7		
#40	99.3		
#50	98.1		
#60	97.3		
#100	94.8		
#200	92.6		
0.0286 mm.	91.3		
0.0182 mm.	89.2		
0.0106 mm.	86.9		
0.0077 mm.	80.3		
0.0056 mm.	71.4		
0.0028 mm.	54.3		
0.0013 mm.	41.7		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 21 LL= 43 PI= 22

Coefficients

D_{90}= 0.0222 D_{85}= 0.0094 D_{60}= 0.0036
D_{50}= 0.0023 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(22)

Remarks

Moisture Content (as received) = 33.2%

Location: B-301, S-4
Sample Number: L-491-18 **Depth:** 10'-12' **Date:** 9/19/2018

ConTest Consultants, Inc.

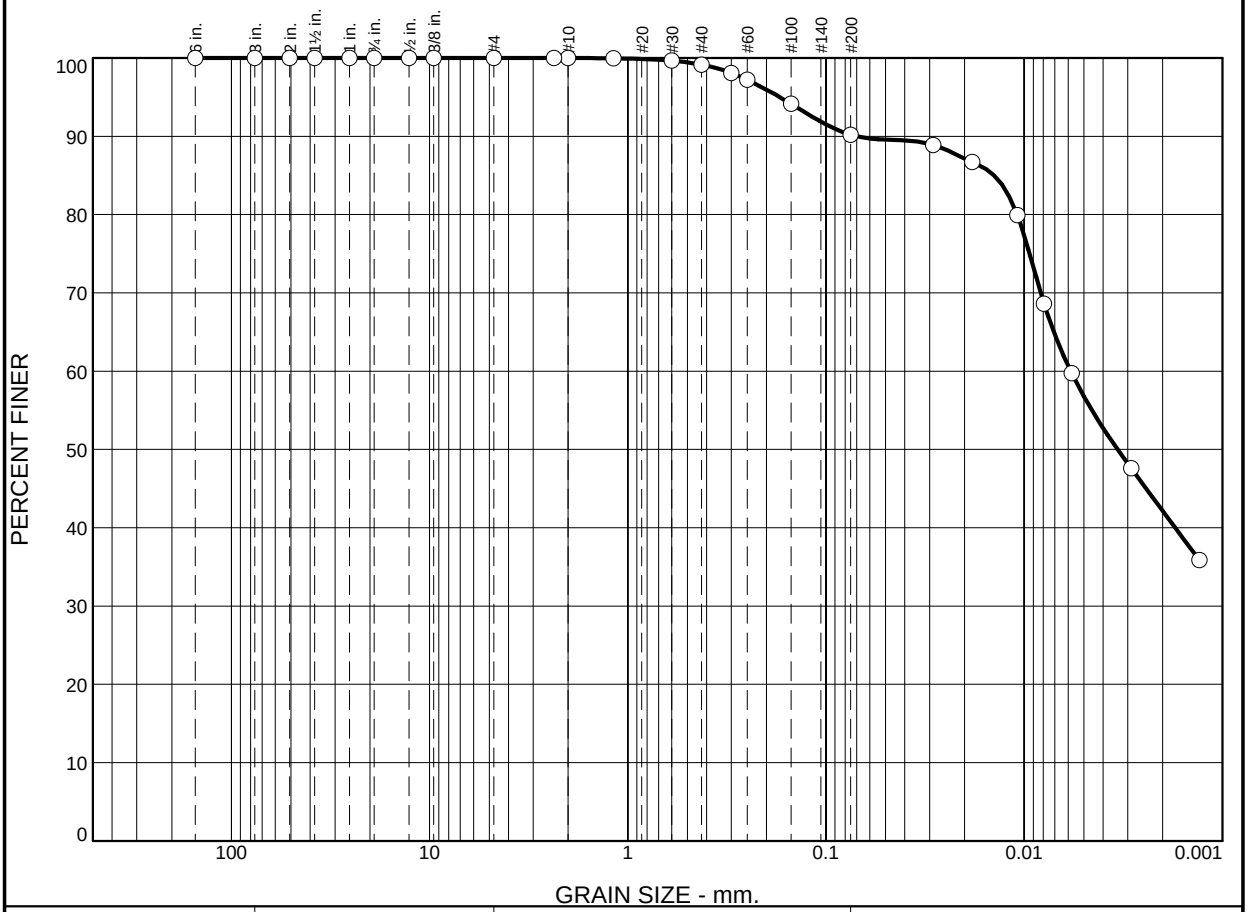
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.9	8.9	33.4	56.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6"	100.0		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	99.9		
#30	99.7		
#40	99.1		
#50	98.1		
#60	97.2		
#100	94.1		
#200	90.2		
0.0287 mm.	88.9		
0.0183 mm.	86.7		
0.0108 mm.	79.9		
0.0079 mm.	68.6		
0.0058 mm.	59.8		
0.0029 mm.	47.6		
0.0013 mm.	35.9		

* (no specification provided)

Soil Description

lean clay

Atterberg Limits

PL= 21 LL= 47 PI= 26

Coefficients

D_{90}= 0.0703 D_{85}= 0.0142 D_{60}= 0.0058
D_{50}= 0.0034 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(25)

Remarks

Moisture Content (as received) = 21.8%

Location: B-305, S-2
Sample Number: L-492-18 **Depth:** 2'-4' **Date:** 9/19/2018

ConTest Consultants, Inc.

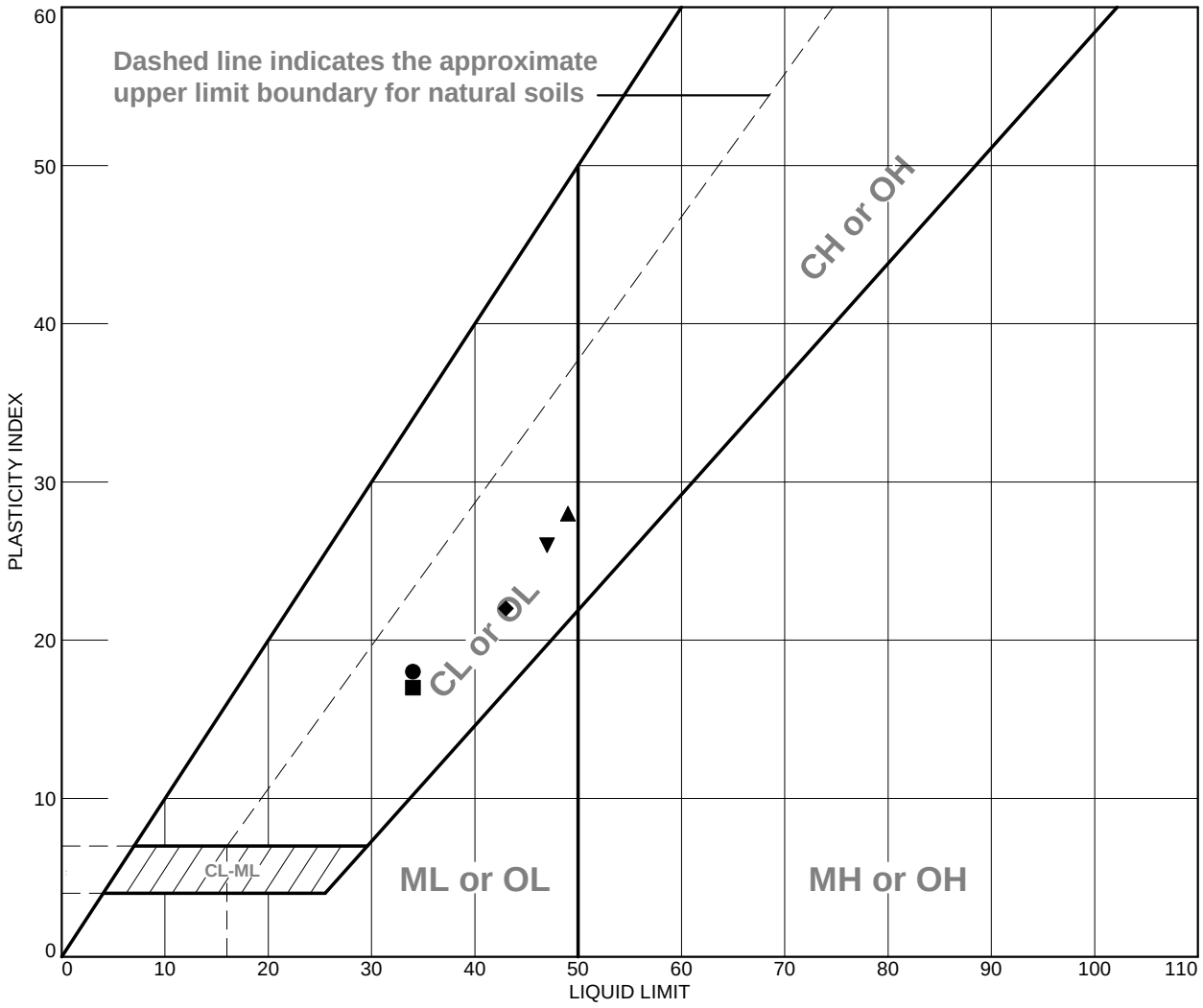
Goffstown, New Hampshire

Client: Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)
Belfast, Maine

Project No: 218146 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	lean clay	34	16	18	94.3	90.7	CL
■	lean clay with sand	34	17	17	97.2	82.4	CL
▲	lean clay	49	21	28	99.3	95.9	CL
◆	lean clay	43	21	22	99.3	92.6	CL
▼	lean clay	47	21	26	99.1	90.2	CL

Project No. 218146 **Client:** Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)

Belfast, Maine

● **Location:** B-311, S-5 **Depth:** 15'-17' **Sample Number:** L-488-18

■ **Location:** B-312, S-4 **Depth:** 10'-12' **Sample Number:** L-489-18

▲ **Location:** B-304, S-3 **Depth:** 5'-7' **Sample Number:** L-490-18

◆ **Location:** B-301, S-4 **Depth:** 10'-12' **Sample Number:** L-491-18

▼ **Location:** B-305, S-2 **Depth:** 2'-4' **Sample Number:** L-492-18

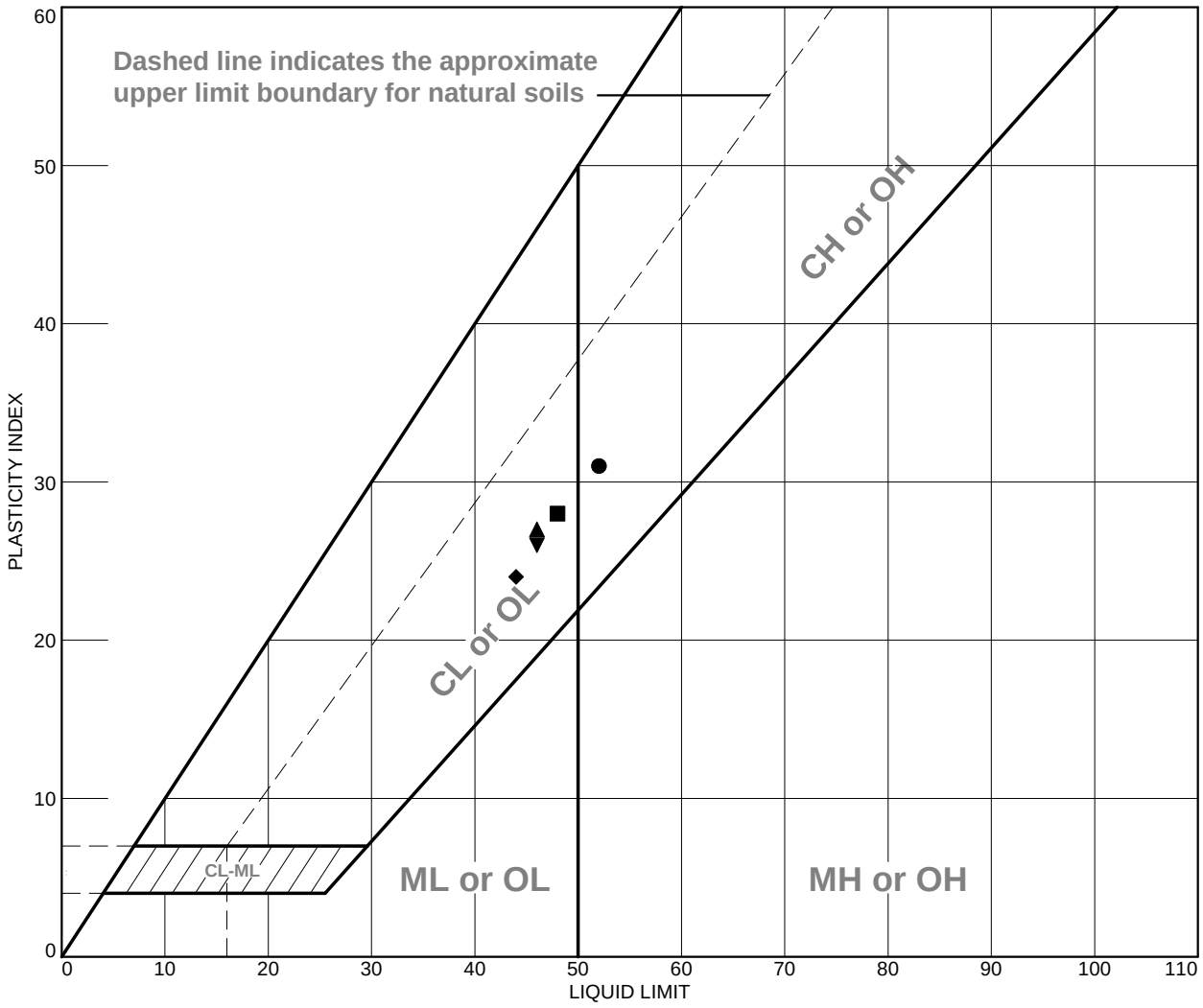
ConTest Consultants, Inc.

Goffstown, New Hampshire

Remarks:

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay	52	21	31	98.5	92.6	CH
■	lean clay	48	20	28	97.6	94.1	CL
▲	lean clay	46	19	27	98.9	93.8	CL
◆	lean clay	44	20	24	99.3	94.8	CL
▼	lean clay	46	20	26	99.4	94.8	CL

Project No. 218146 **Client:** Ransom Consulting, Inc.

Project: Nordic Aquafarms (171.05027)

Belfast, Maine

● **Location:** B-202, S-3 **Depth:** 4'-6' **Sample Number:** L-483-18

■ **Location:** B-404, S-3 **Depth:** 5'-7' **Sample Number:** L-484-18

▲ **Location:** B-405, S-4 **Depth:** 10'-12' **Sample Number:** L-485-18

◆ **Location:** B-202, S-4 **Depth:** 10'-12' **Sample Number:** L-486-18

▼ **Location:** B-311, S-3 **Depth:** 5'-7' **Sample Number:** L-487-18

ConTest Consultants, Inc.

Goffstown, New Hampshire

Remarks:

Figure

Client:	Ransom Consulting Engineers and Scientists				
Project:	Nordic Aquafarms				
Location:	Belfast, ME			Project No:	GTX-308779
Boring ID:	B311-A	Sample Type:	tube	Tested By:	jbr
Sample ID:	T1	Test Date:	09/25/18	Checked By:	emm
Depth :	13-15 ft	Test Id:	472703		
Test Comment:	---				
Visual Description:	Moist, olive clay				
Sample Comment:	---				

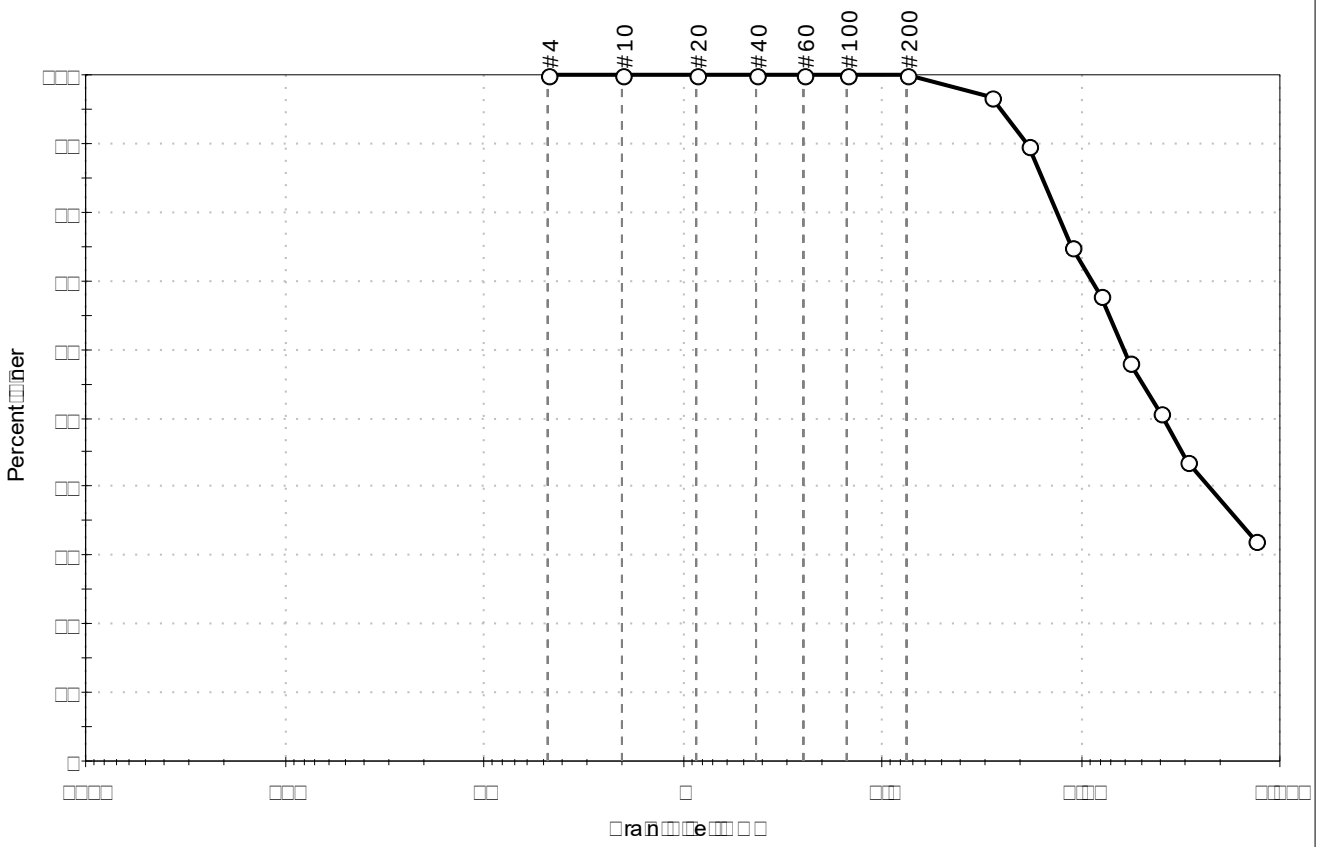
Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
B311-A	T1	13-15 ft	Moist, olive clay	31.8

Notes: Temperature of Drying : 110° Celsius

Client:	Ransom Consulting Engineers and Scientists				
Project:	Nordic Aquafarms				
Location:	Belfast, ME			Project No:	GTX-308779
Boring ID:	B311-A	Sample Type:	tube	Tested By:	jbr
Sample ID:	T1	Test Date:	09/25/18	Checked By:	emm
Depth :	13-15 ft	Test Id:	472702		
Test Comment:	---				
Visual Description:	Moist, olive clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



Cobble	Gravel	Sand	Silt or Clay

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	100		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0280	97		
---	0.0185	90		
---	0.0112	75		
---	0.0080	68		
---	0.0057	58		
---	0.0040	51		
---	0.0029	44		
---	0.0013	32		

Coefficients

D_{85} = 0.0158 mm	D_{30} = N/A
D_{60} = 0.0061 mm	D_{15} = N/A
D_{50} = 0.0038 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Lean CLAY (CL)

AASHTO Clayey Soils (A-6 (16))

Sample / Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

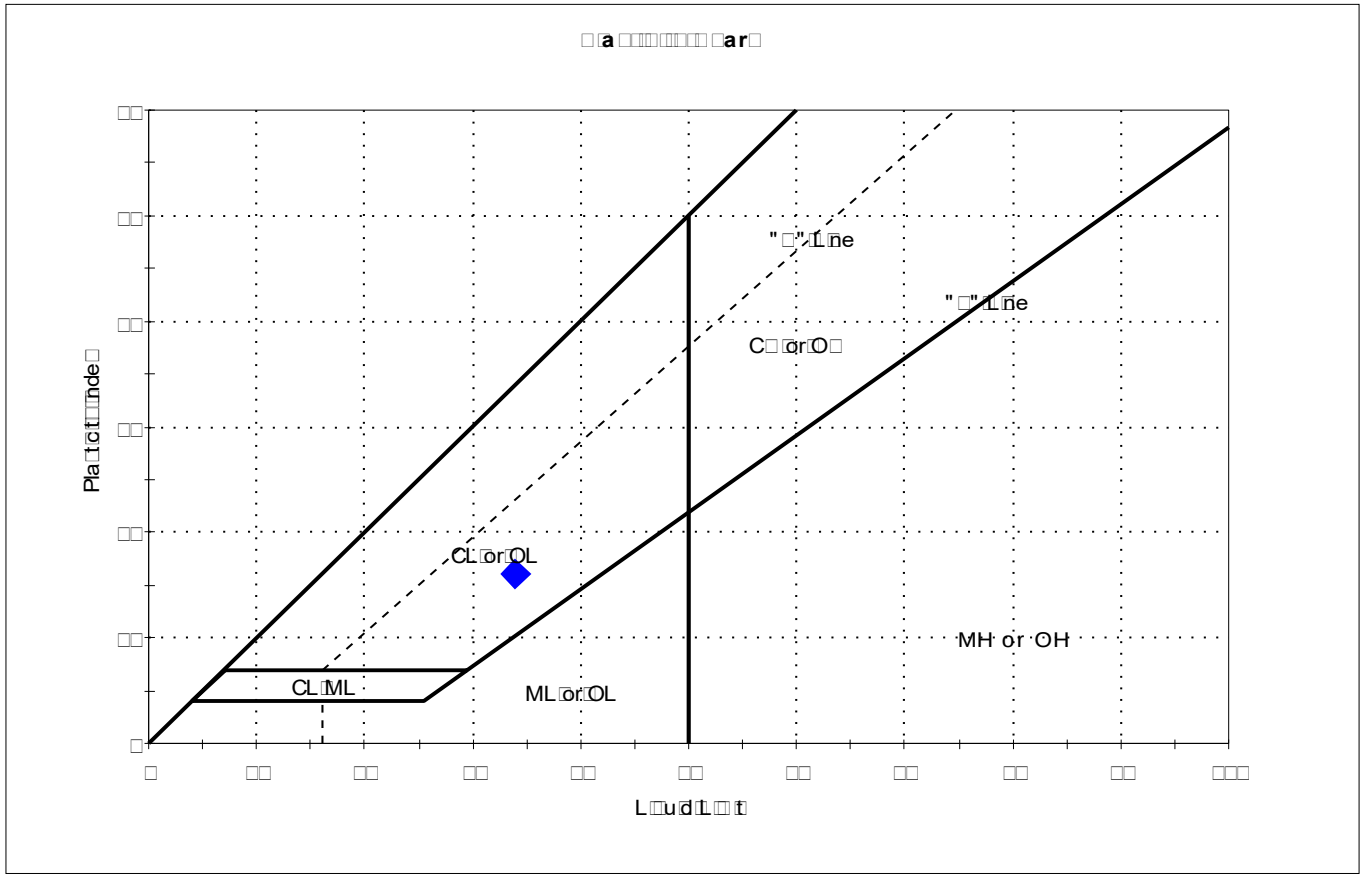
Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

Client:	Ransom Consulting Engineers and Scientists				
Project:	Nordic Aquafarms				
Location:	Belfast, ME			Project No:	GTX-308779
Boring ID:	B311-A	Sample Type:	tube	Tested By:	cam
Sample ID:	T1	Test Date:	09/19/18	Checked By:	emm
Depth :	13-15 ft	Test Id:	472701		
Test Comment:	---				
Visual Description:	Moist, olive clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	T1	B311-A	13-15 ft	32	34	18	16	0.9	Lean CLAY (CL)

Sample Prepared using the WET method

0% Retained on #40 Sieve

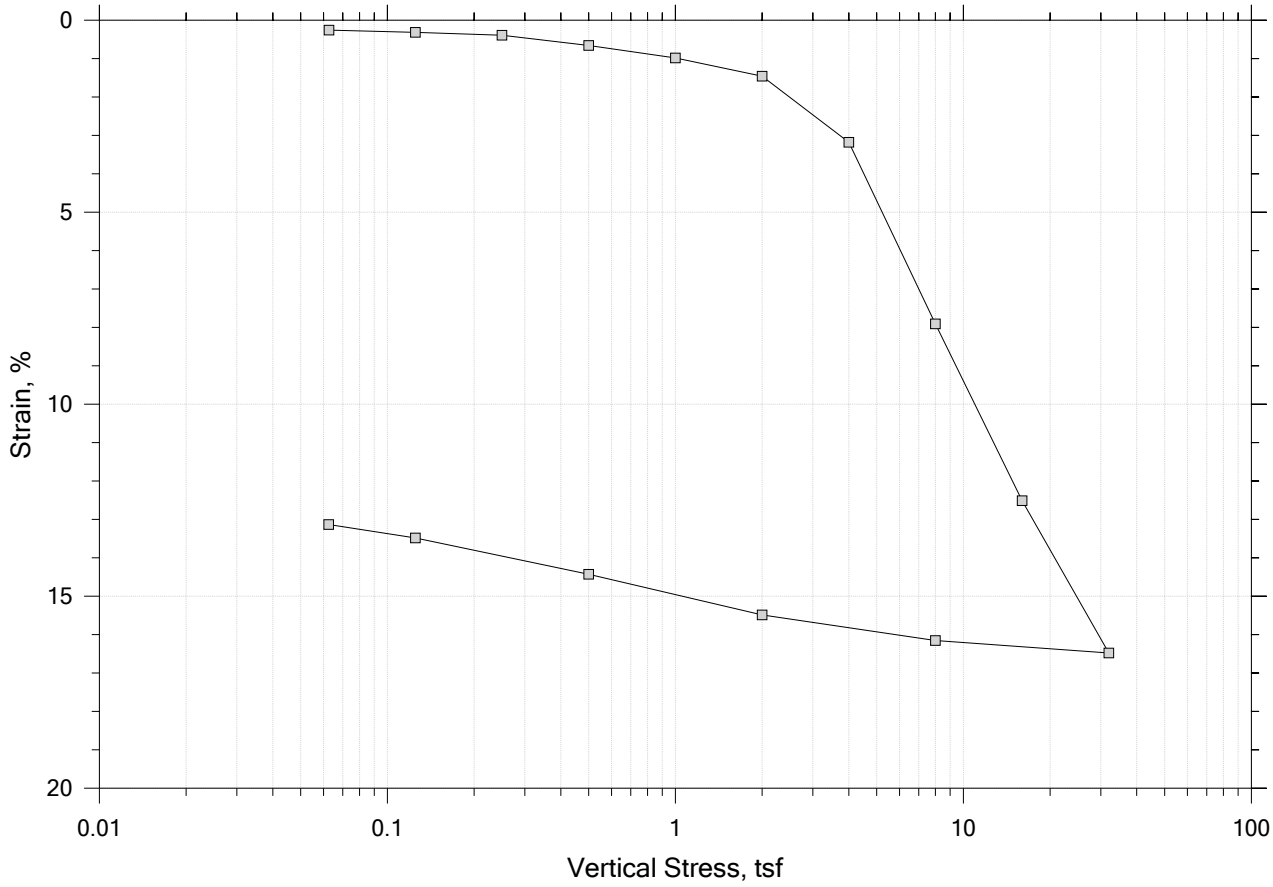
Dry Strength: VERY HIGH

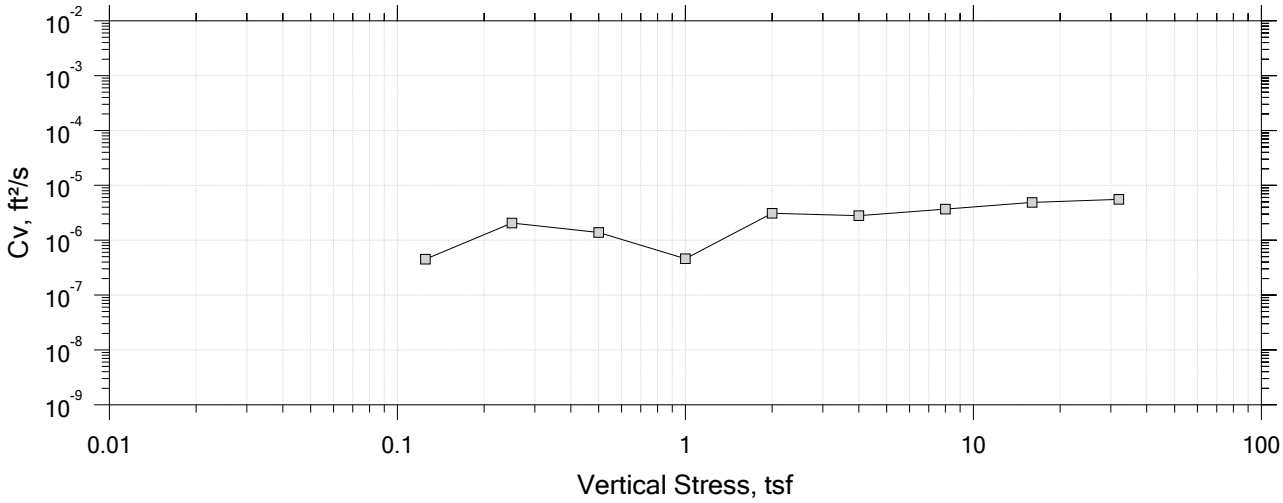
Dilatancy: SLOW

Toughness: LOW

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report

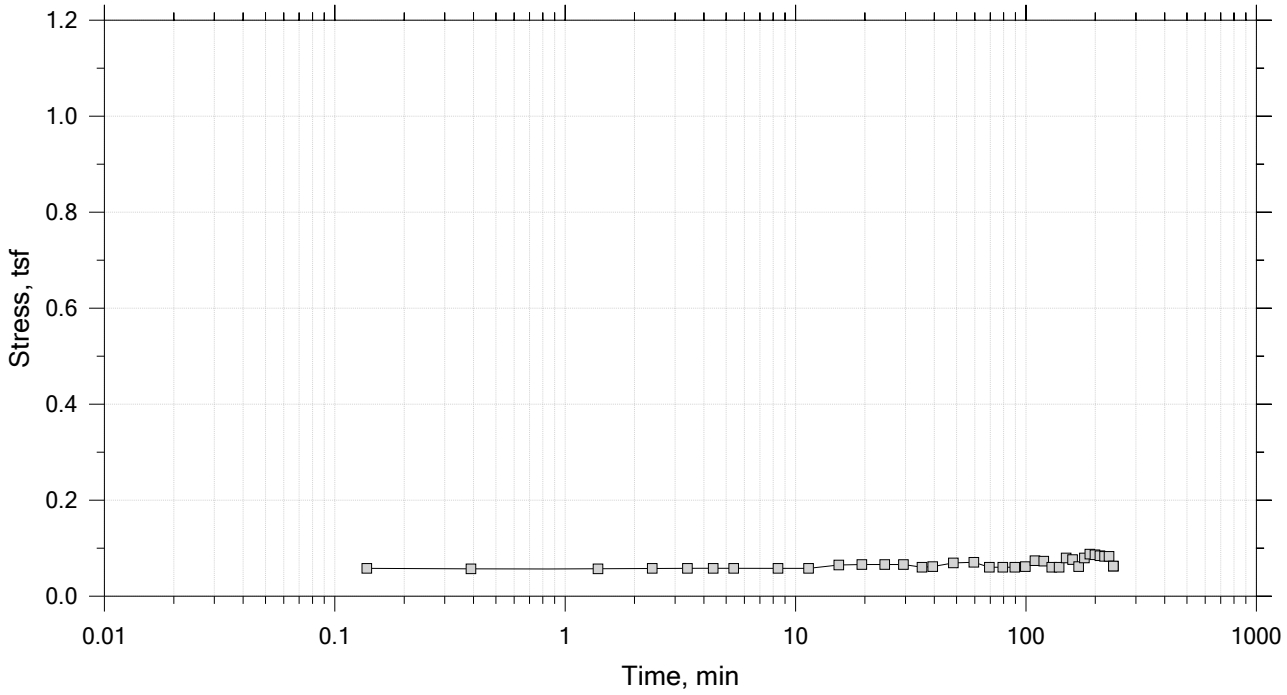


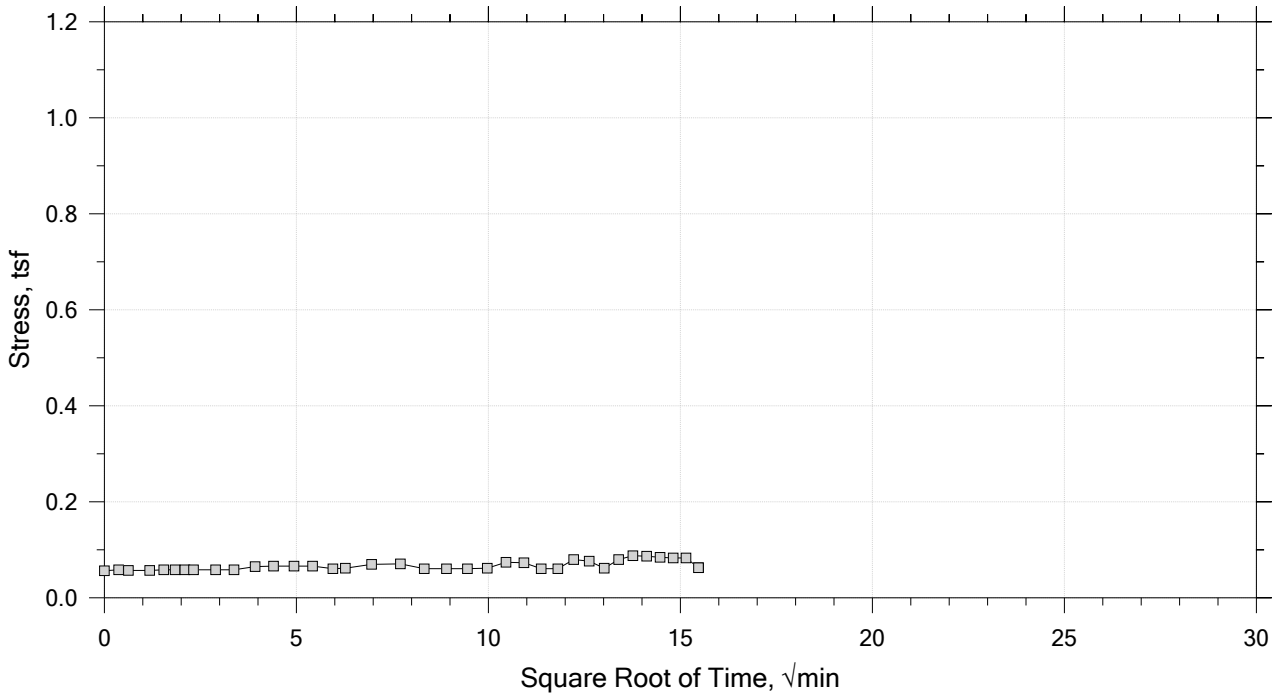


GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0627 tsf





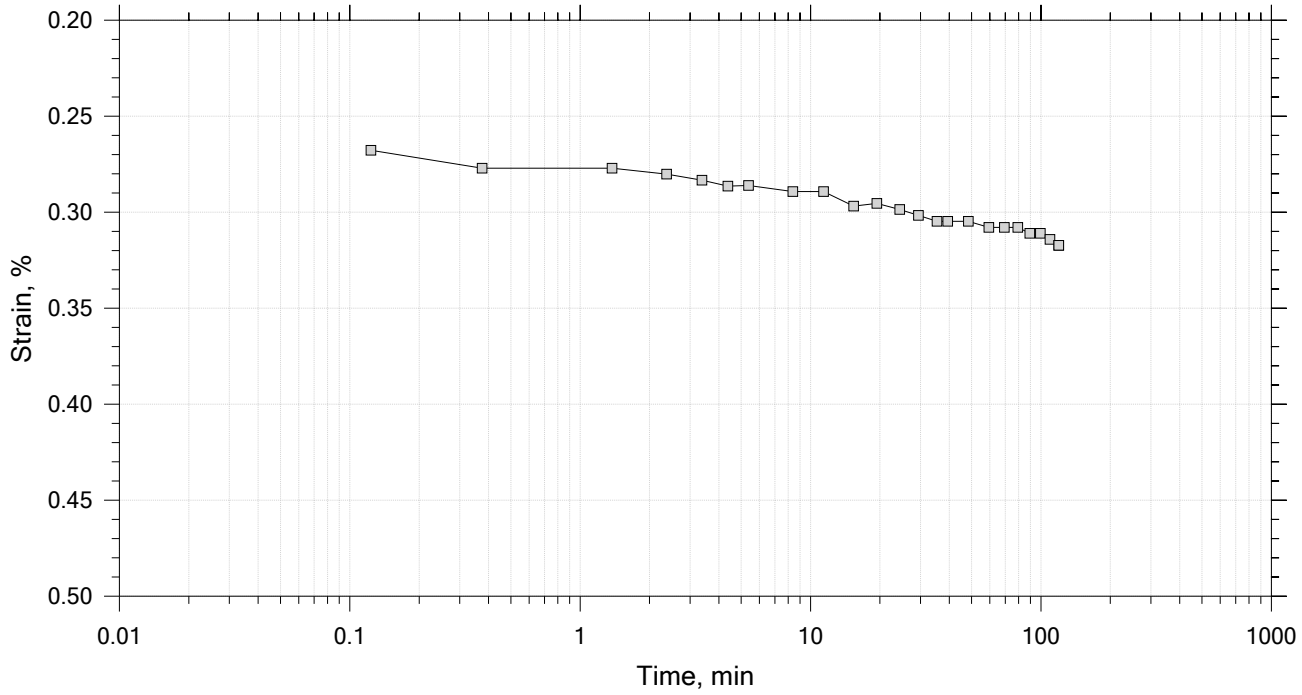
GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

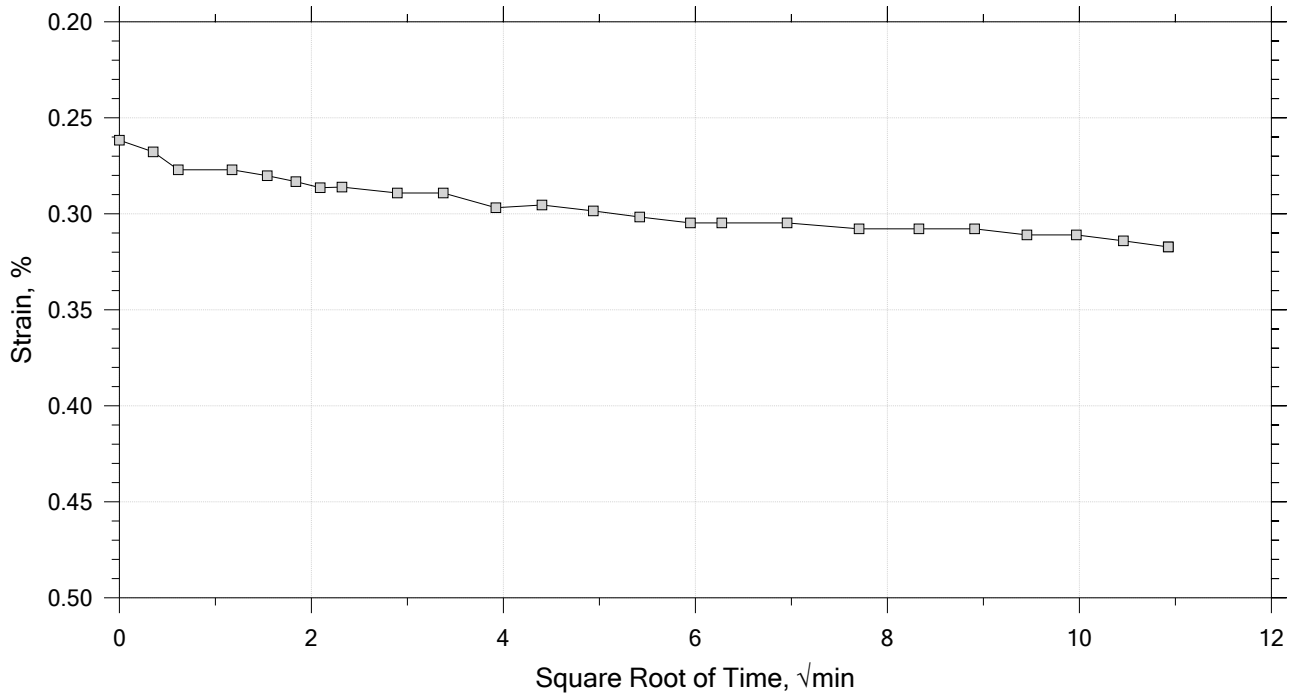
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf

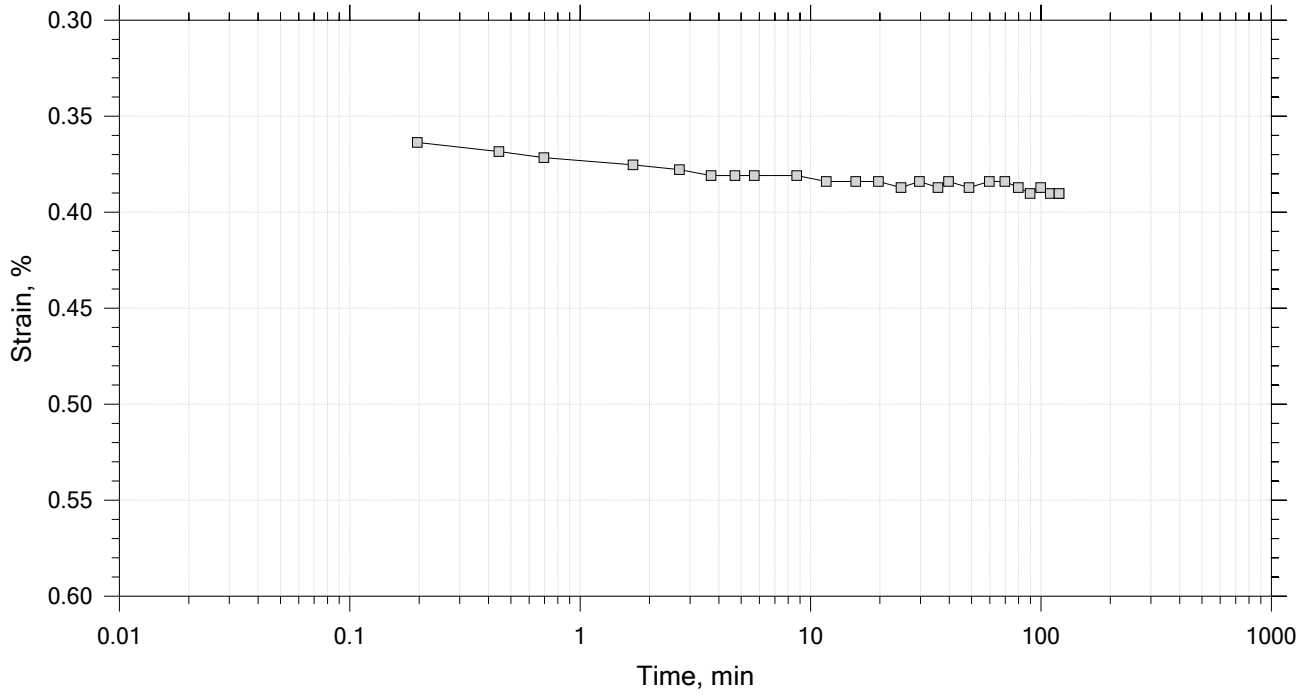


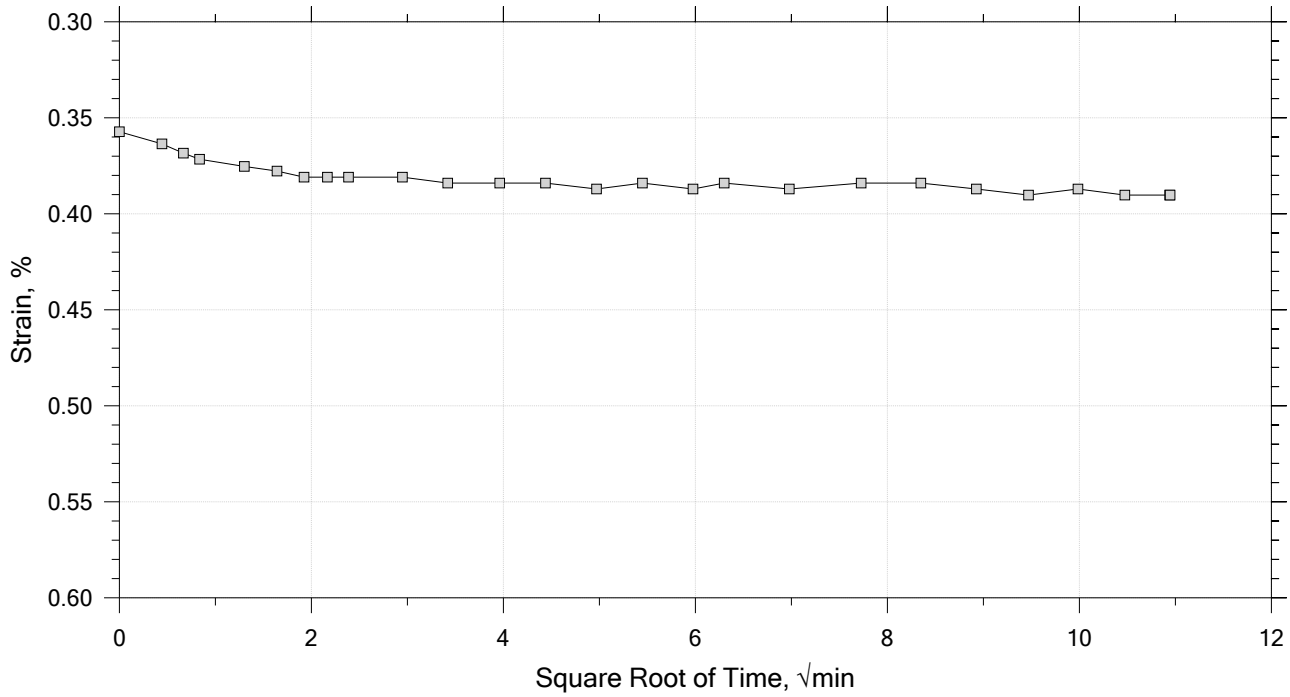


GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15
Constant Load Step
Stress: 0.25 tsf





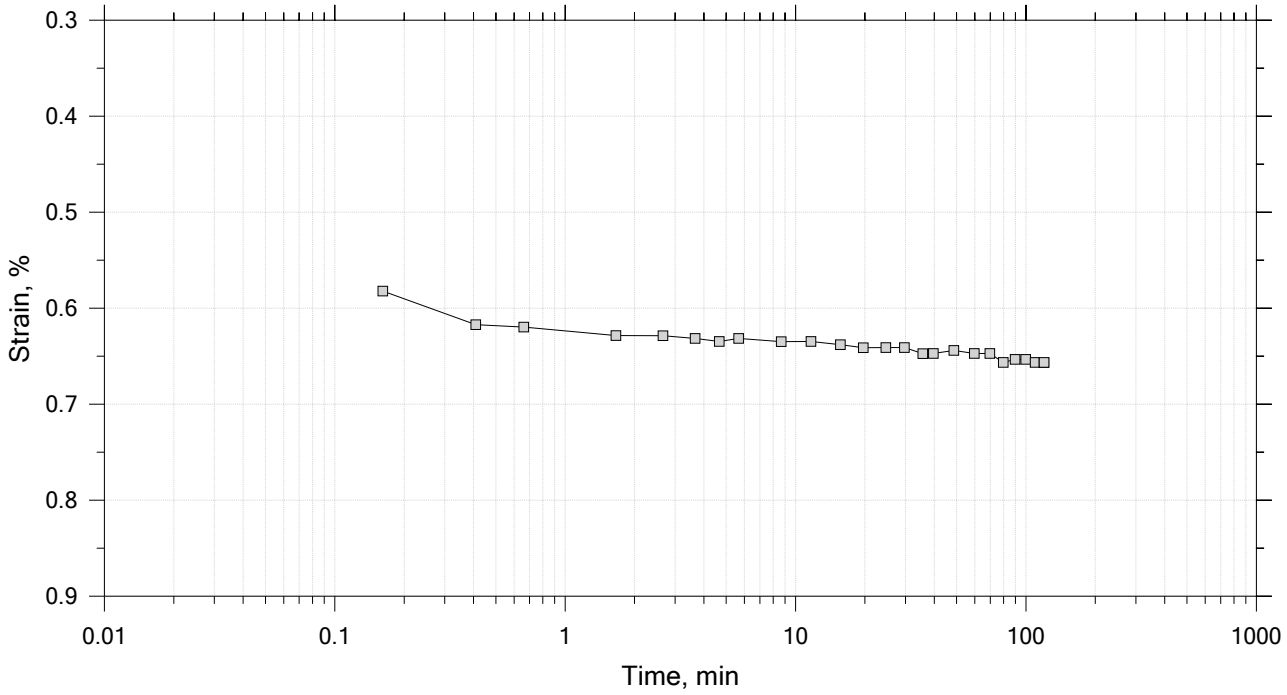
GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

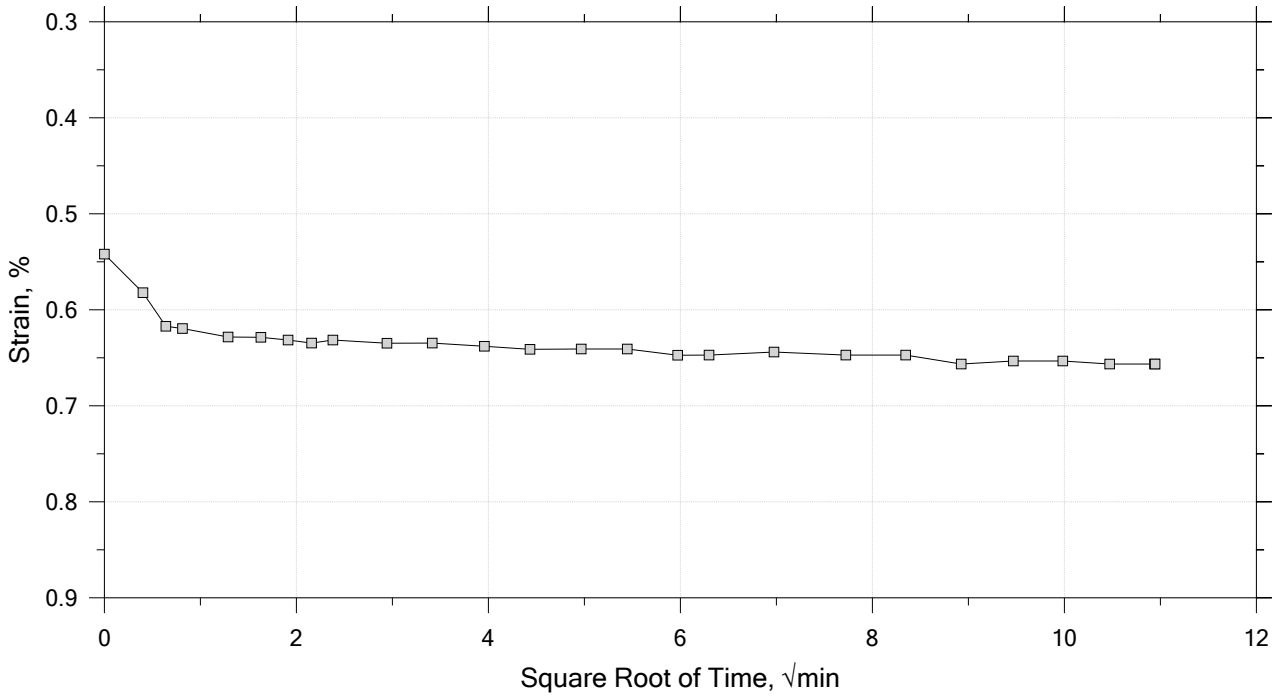
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf





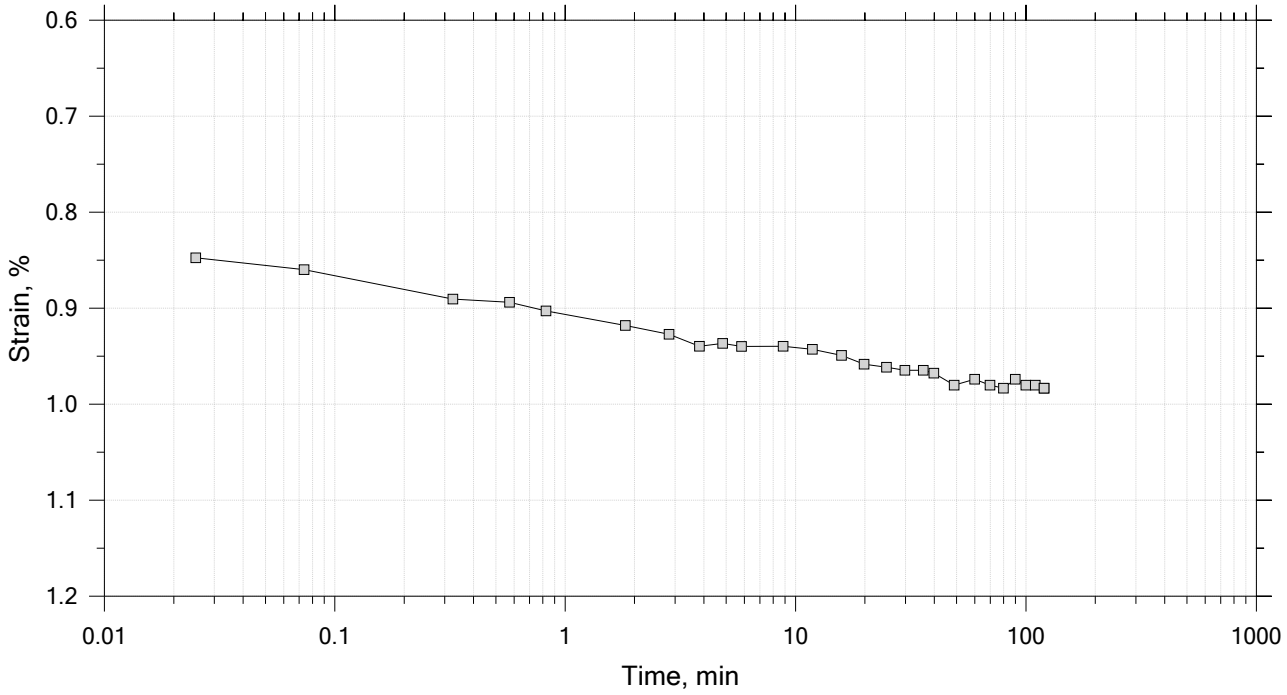
Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
Boring No.: B311-A	Tested By: md	Checked By: njh
Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
Test No.: IP-1A	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System M, Swell Pressure = 0.0627 tsf		

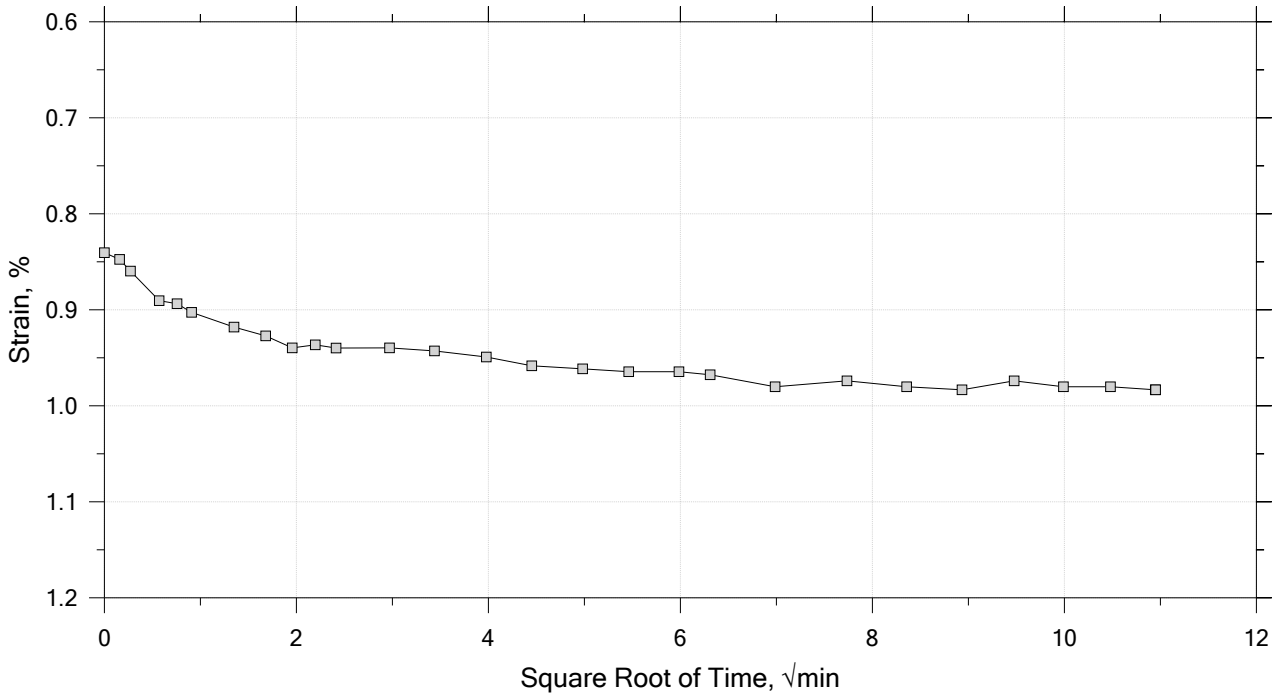
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf





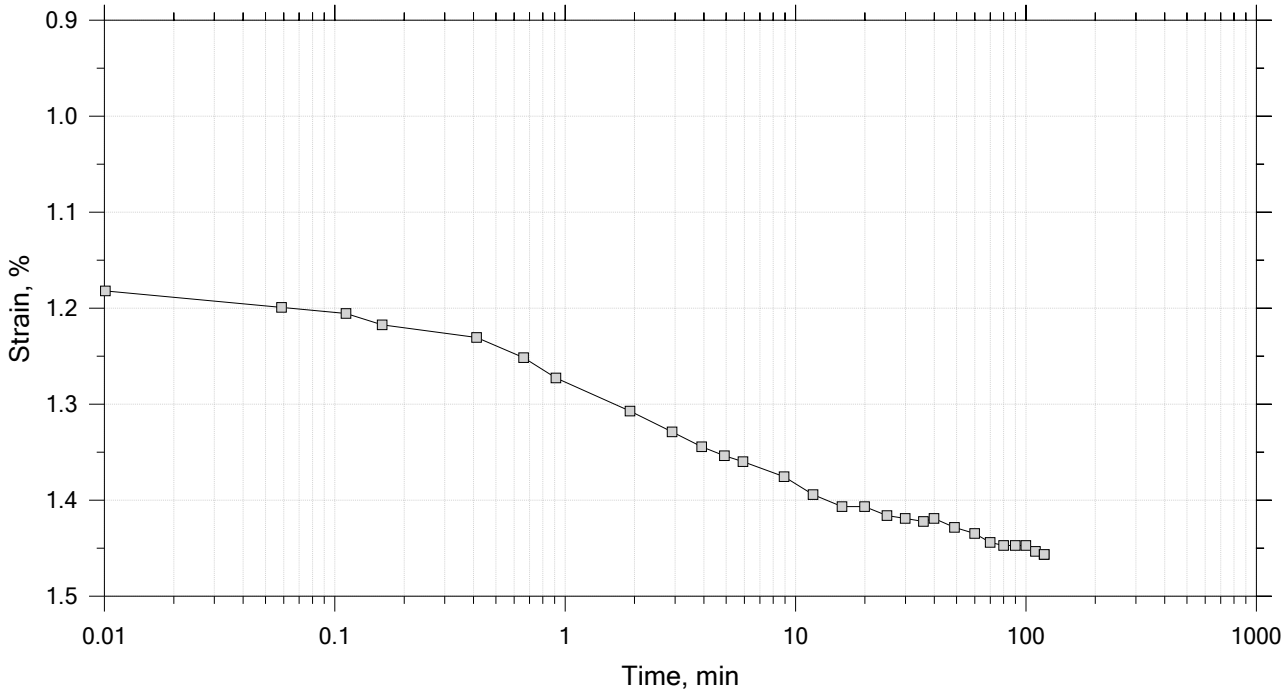
GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

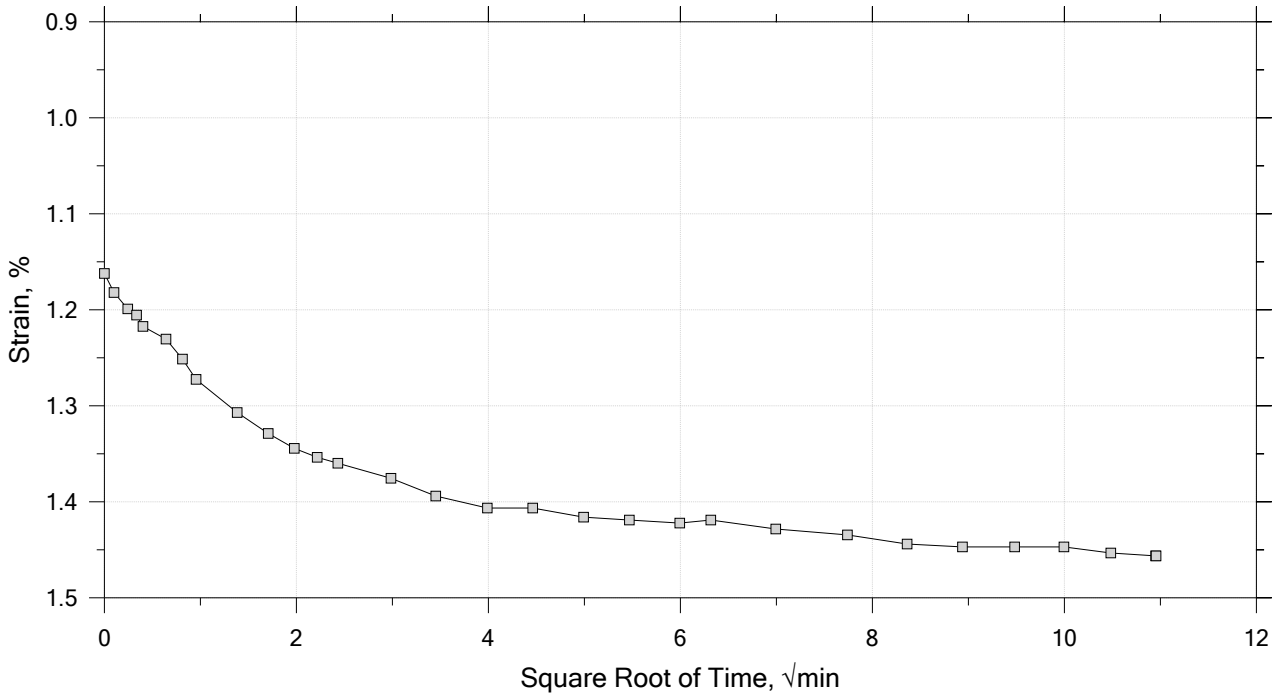
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf





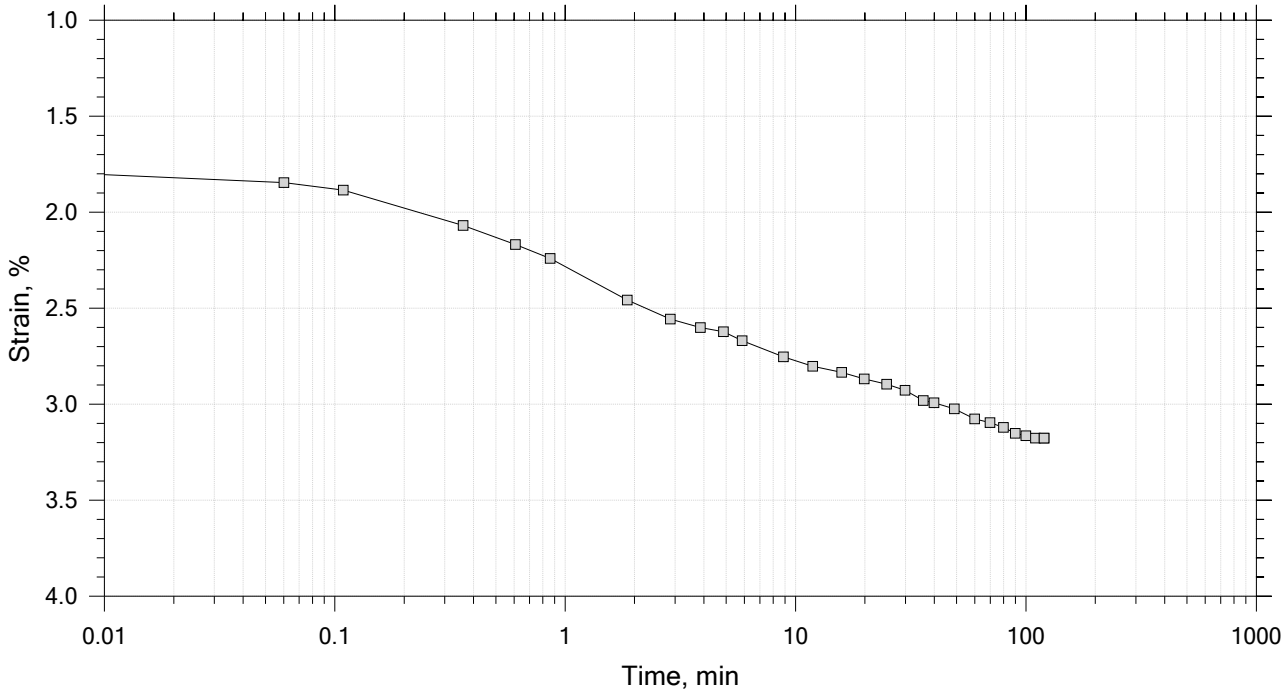
GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

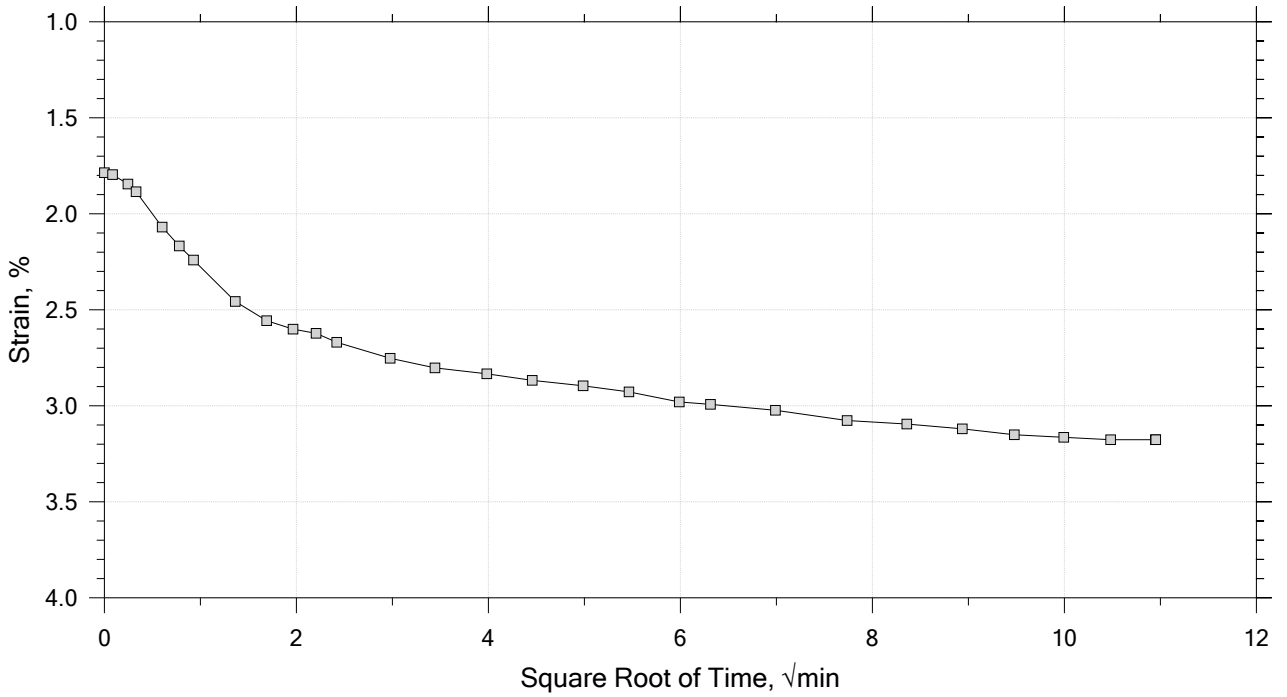
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf





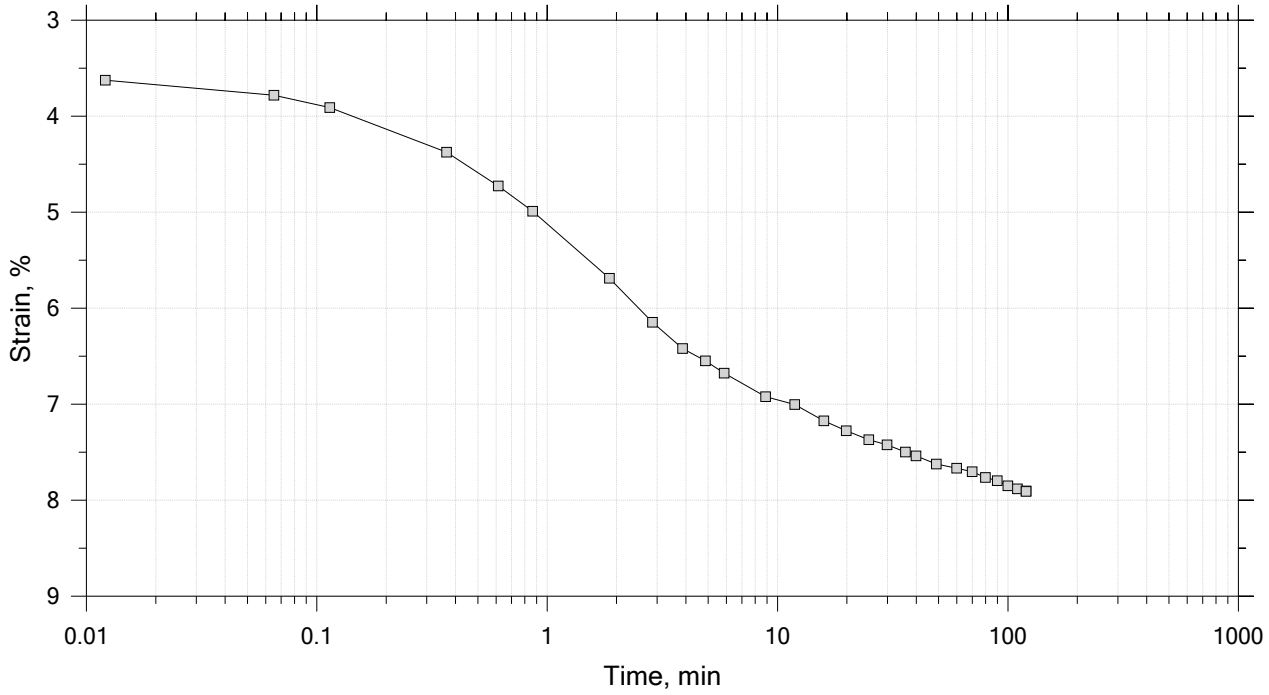
GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

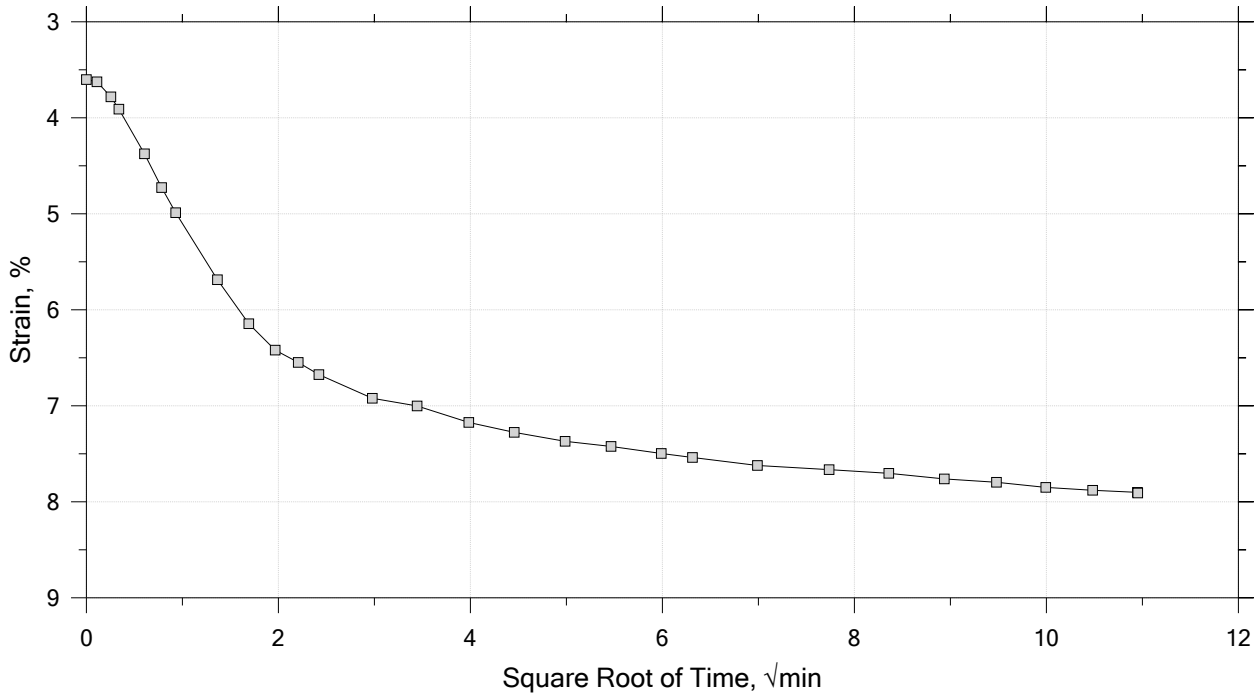
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf

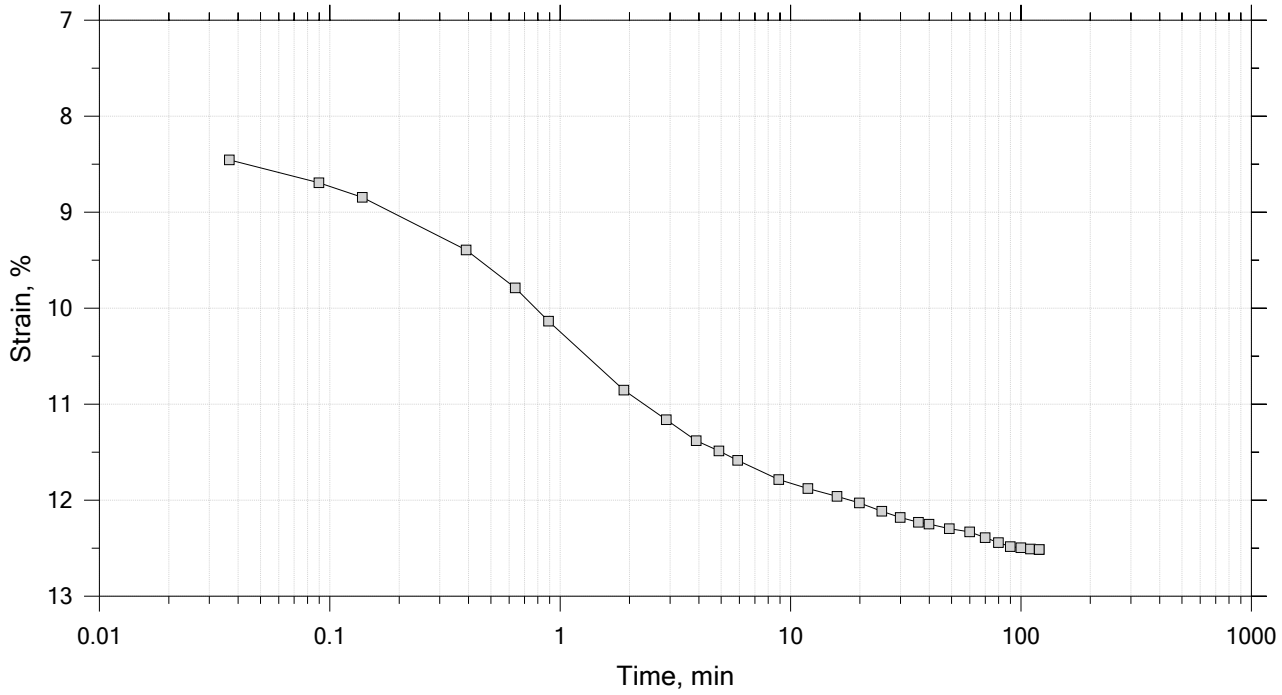


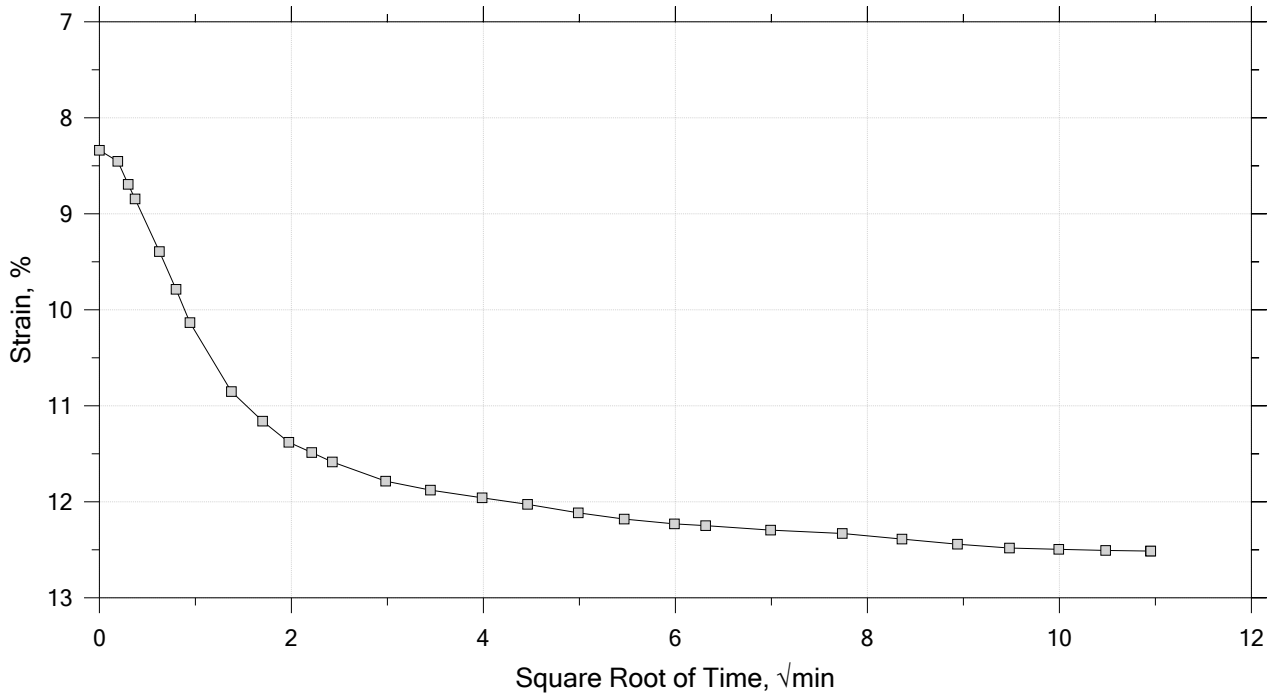


GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15
Constant Load Step
Stress: 16 tsf

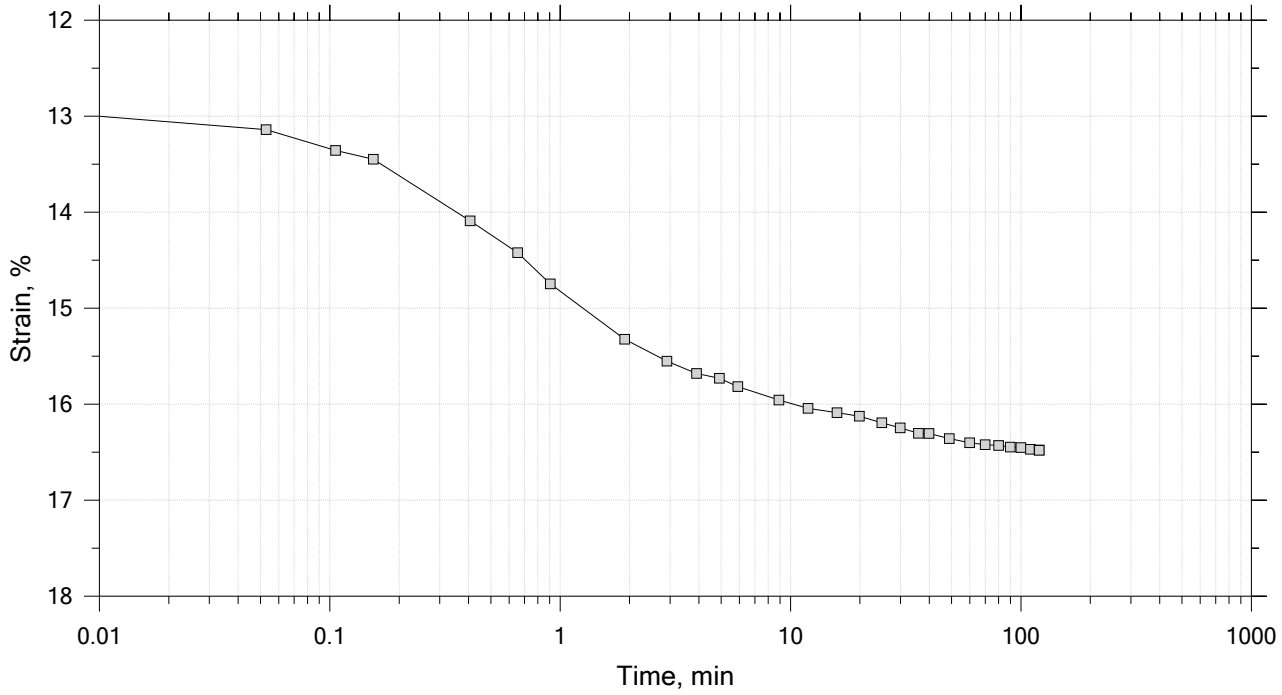


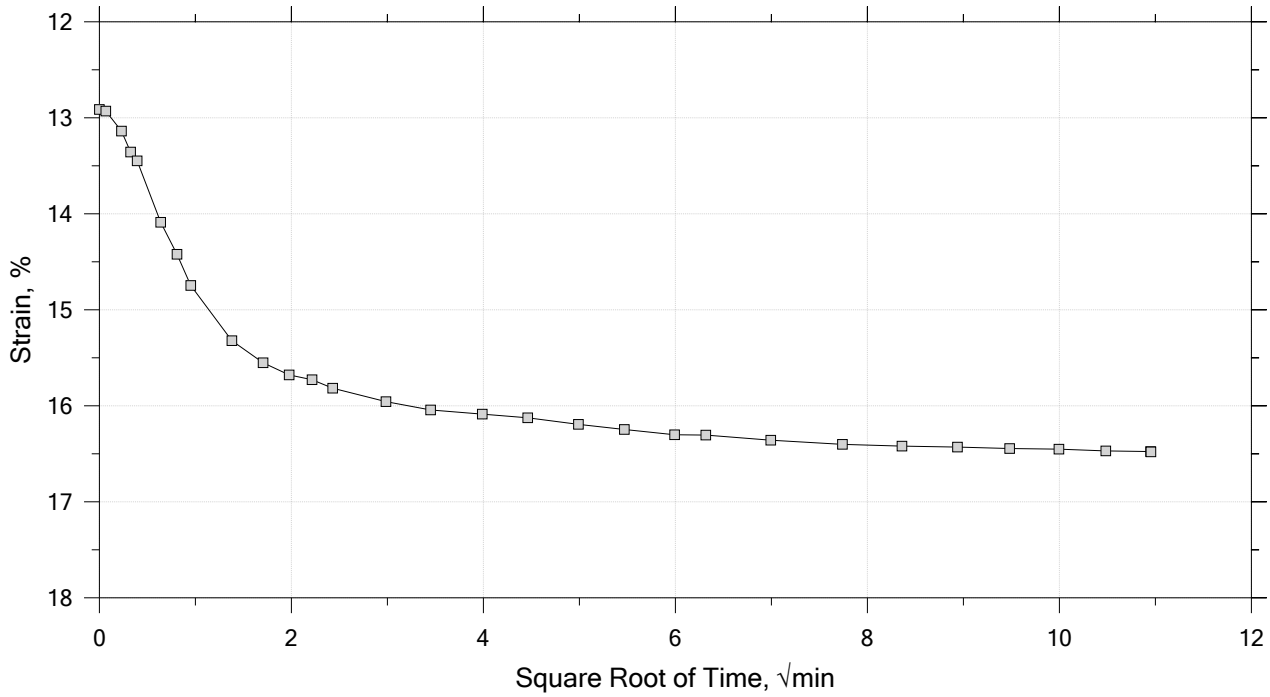


GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15
Constant Load Step
Stress: 32 tsf

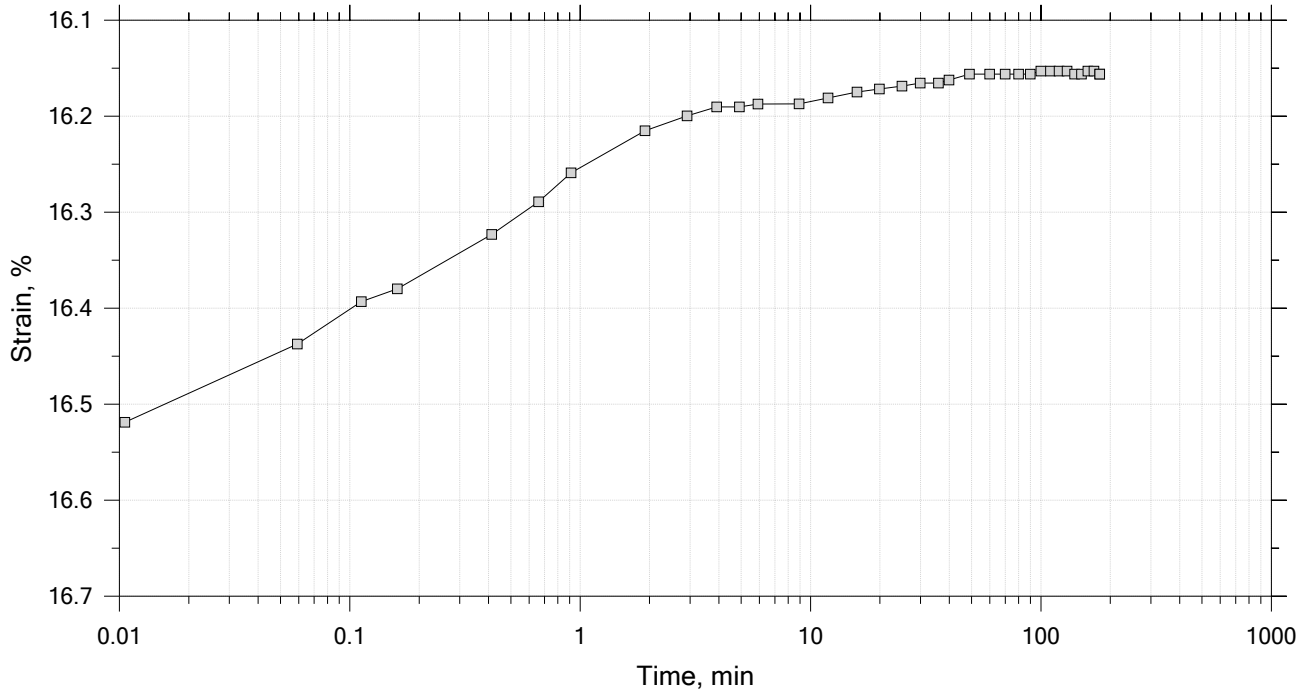


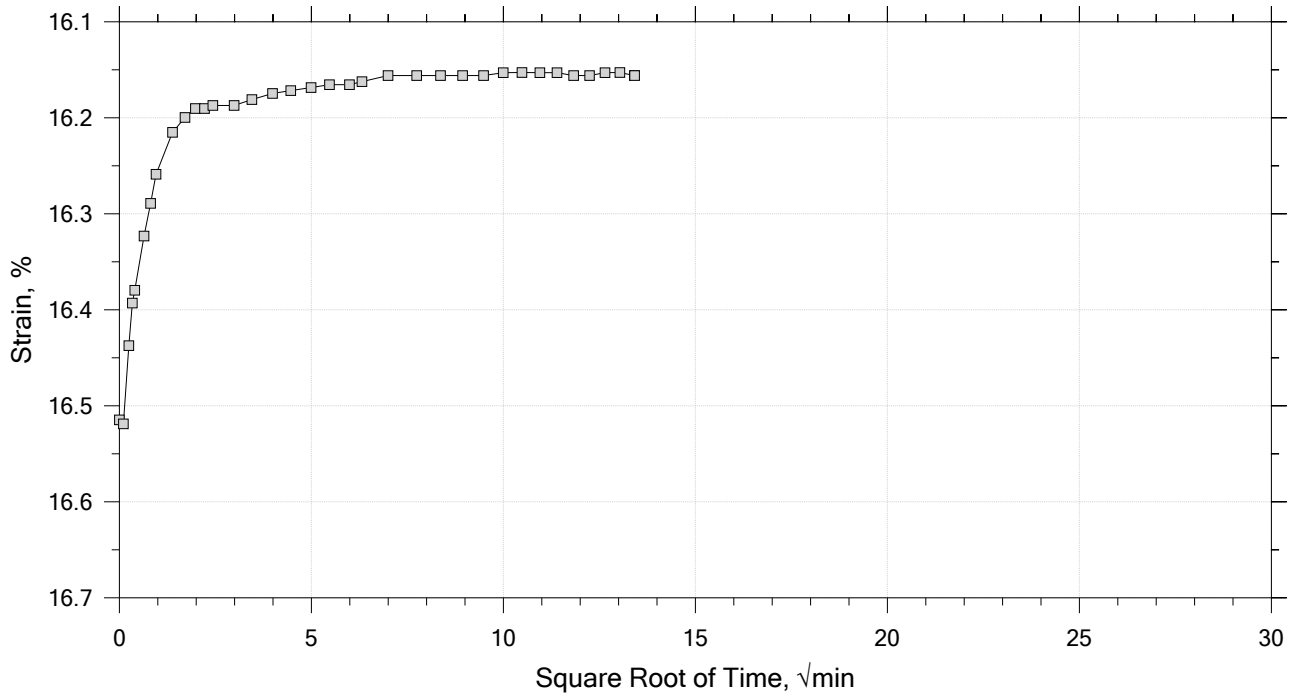


GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15
Constant Load Step
Stress: 8 tsf

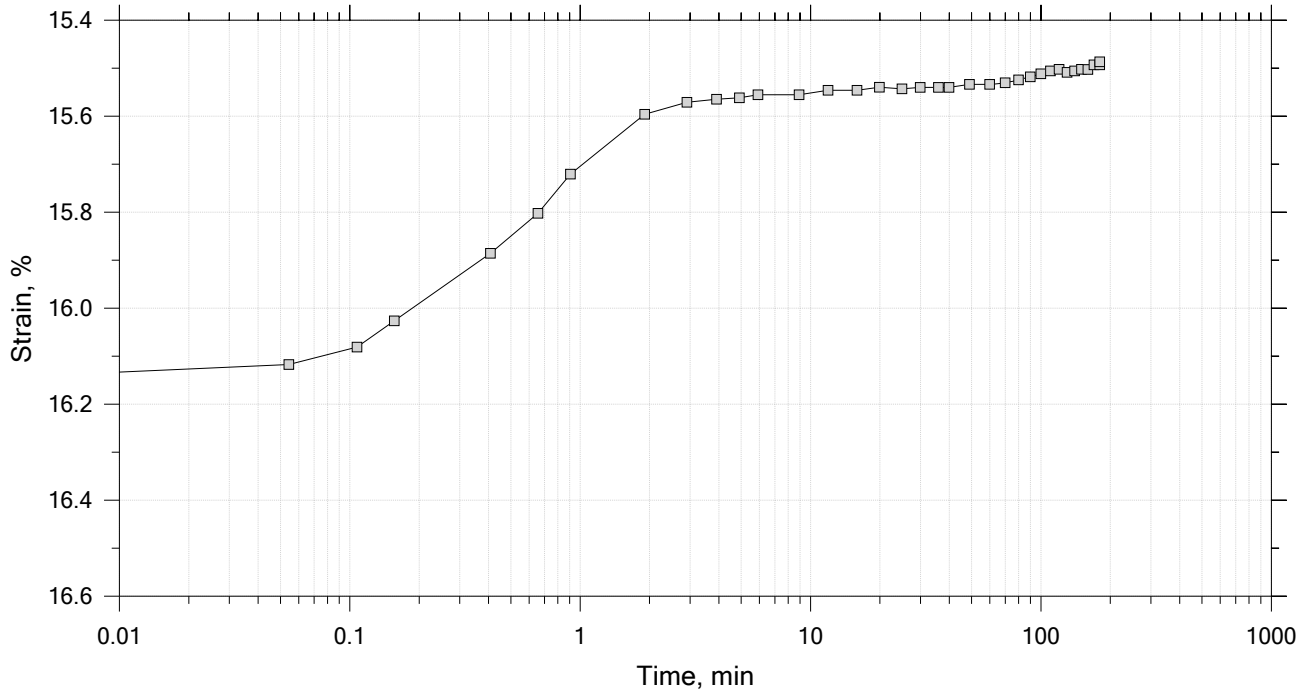


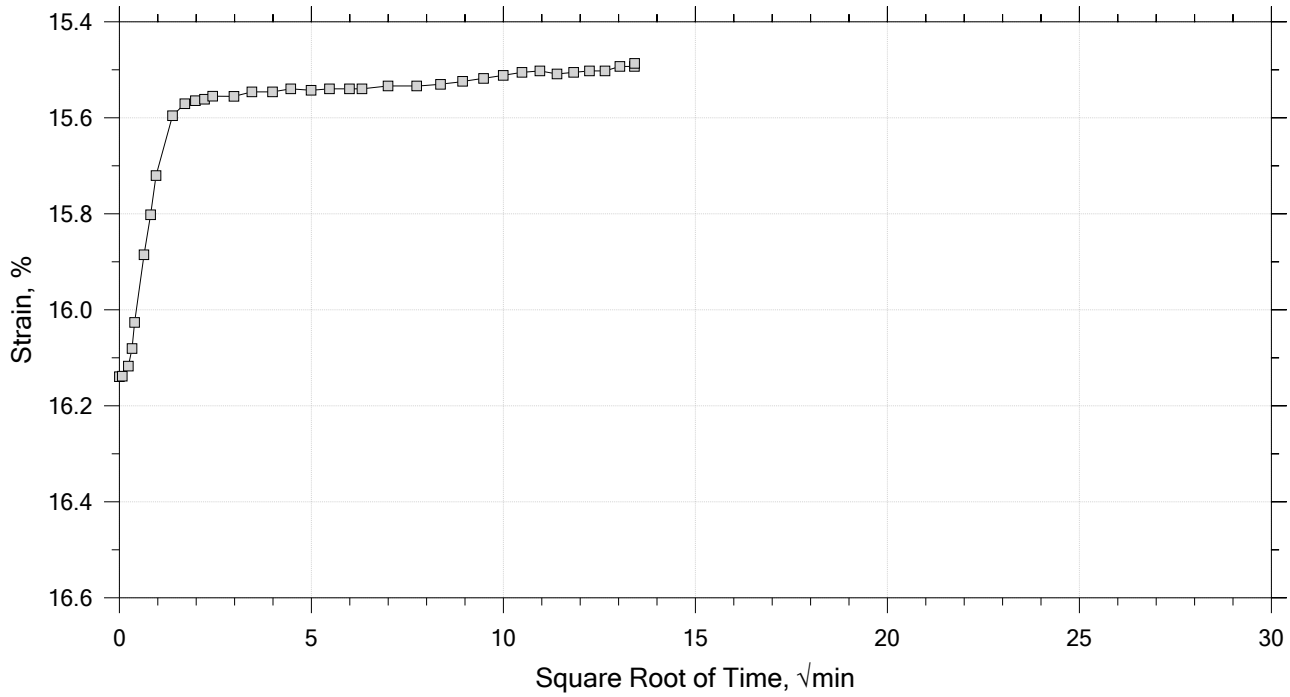


GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15
Constant Load Step
Stress: 2 tsf

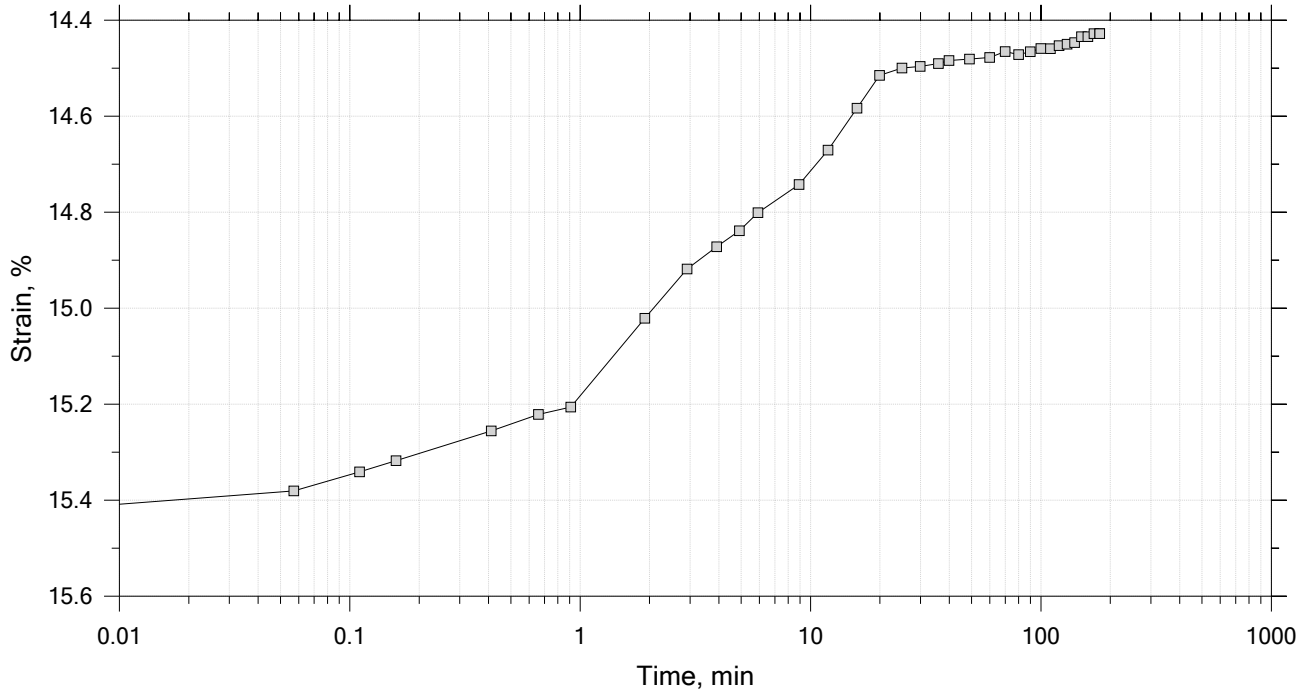


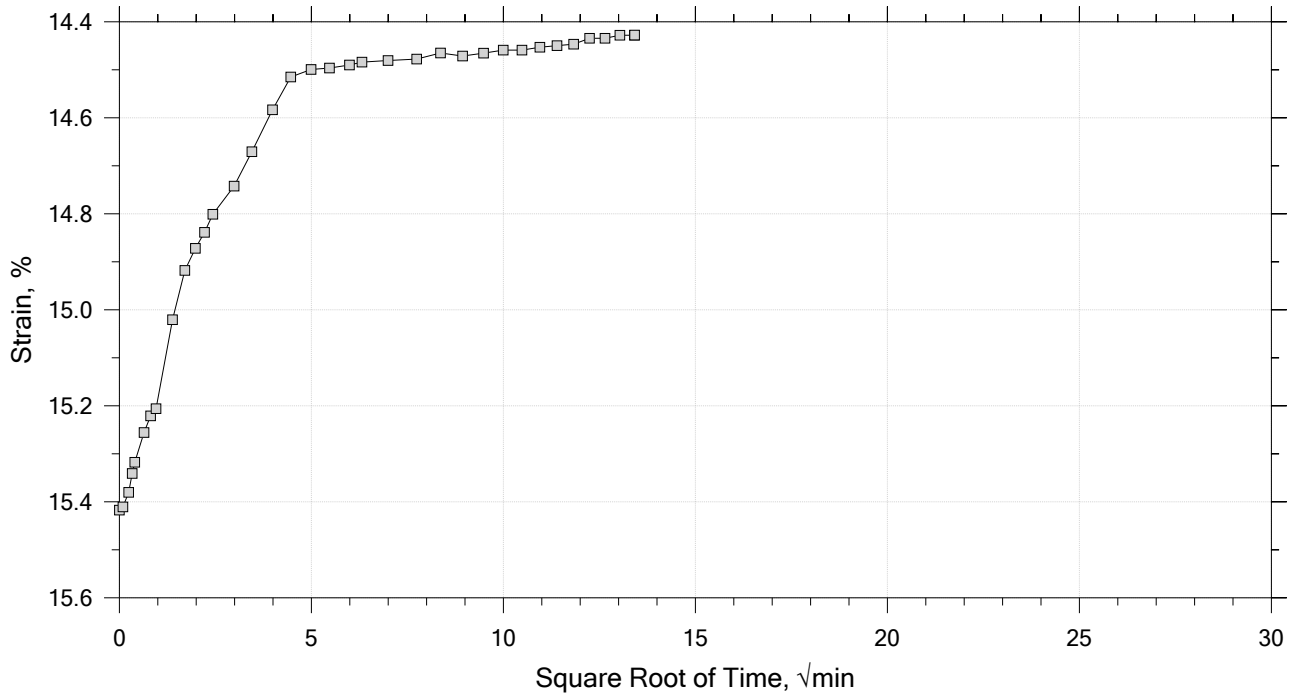


Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
Boring No.: B311-A	Tested By: md	Checked By: njh
Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
Test No.: IP-1A	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System M, Swell Pressure = 0.0627 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15
Constant Load Step
Stress: 0.5 tsf

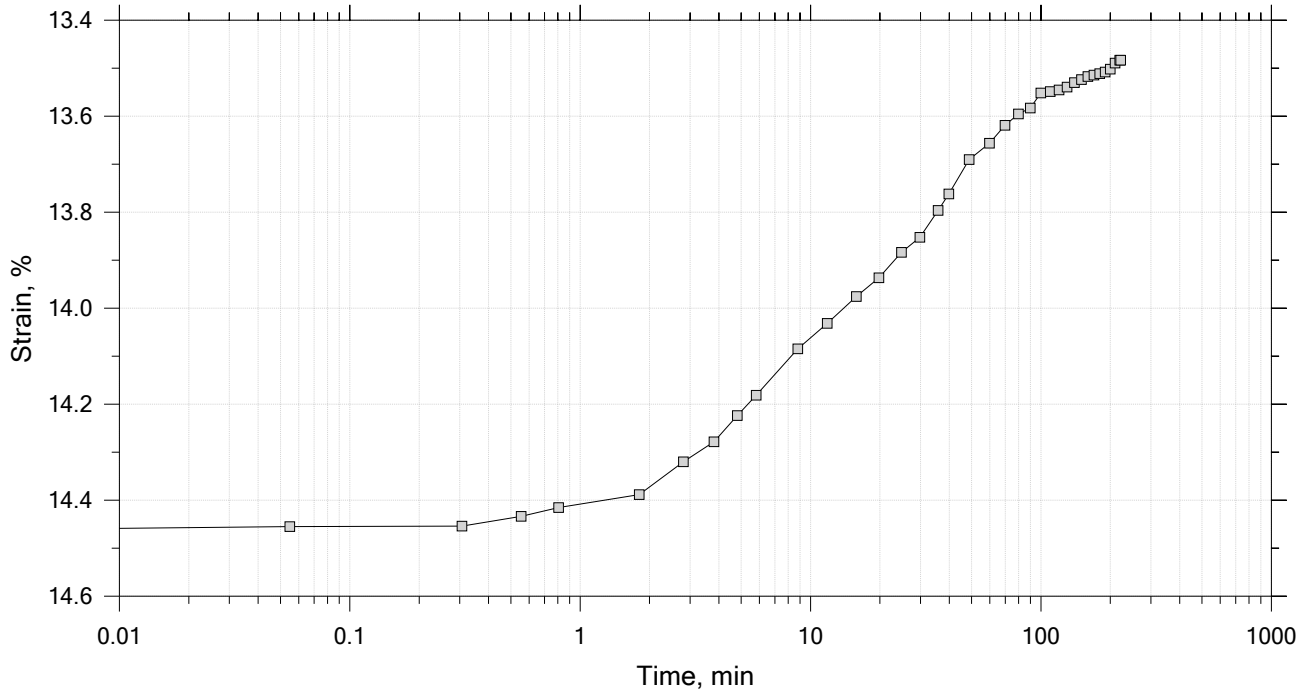


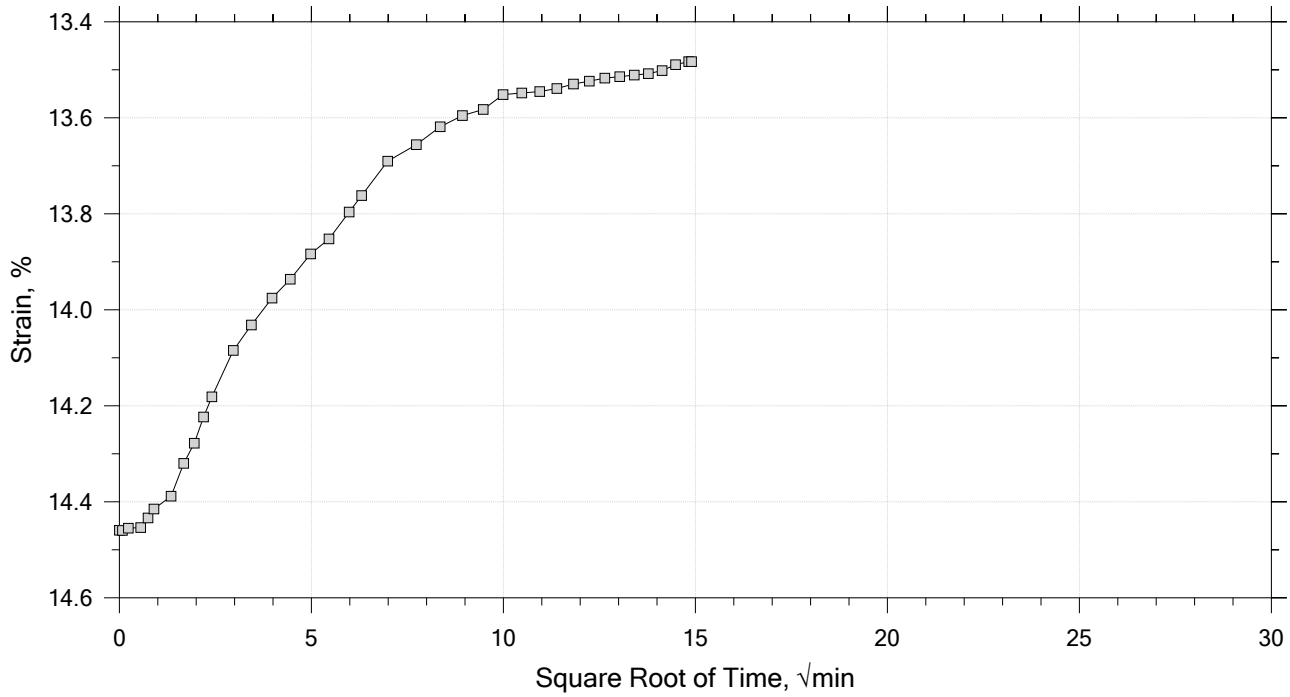


Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
Boring No.: B311-A	Tested By: md	Checked By: njh
Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
Test No.: IP-1A	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System M, Swell Pressure = 0.0627 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15
Constant Load Step
Stress: 0.125 tsf

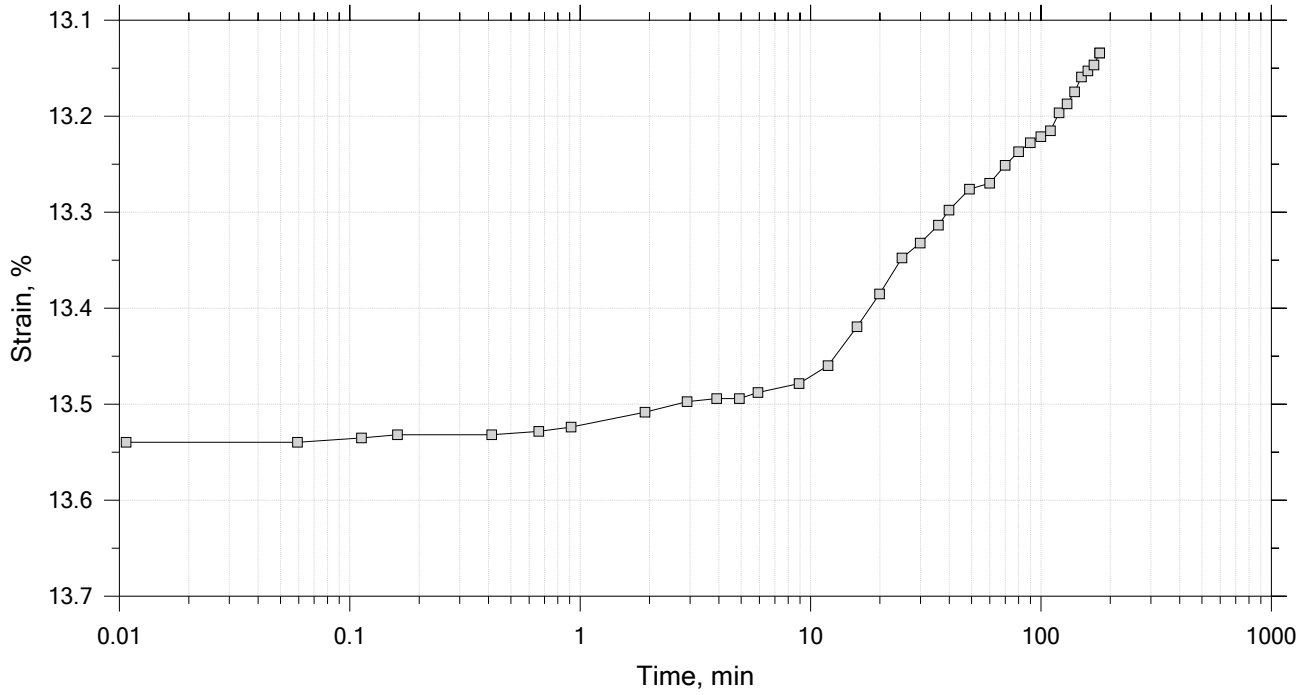


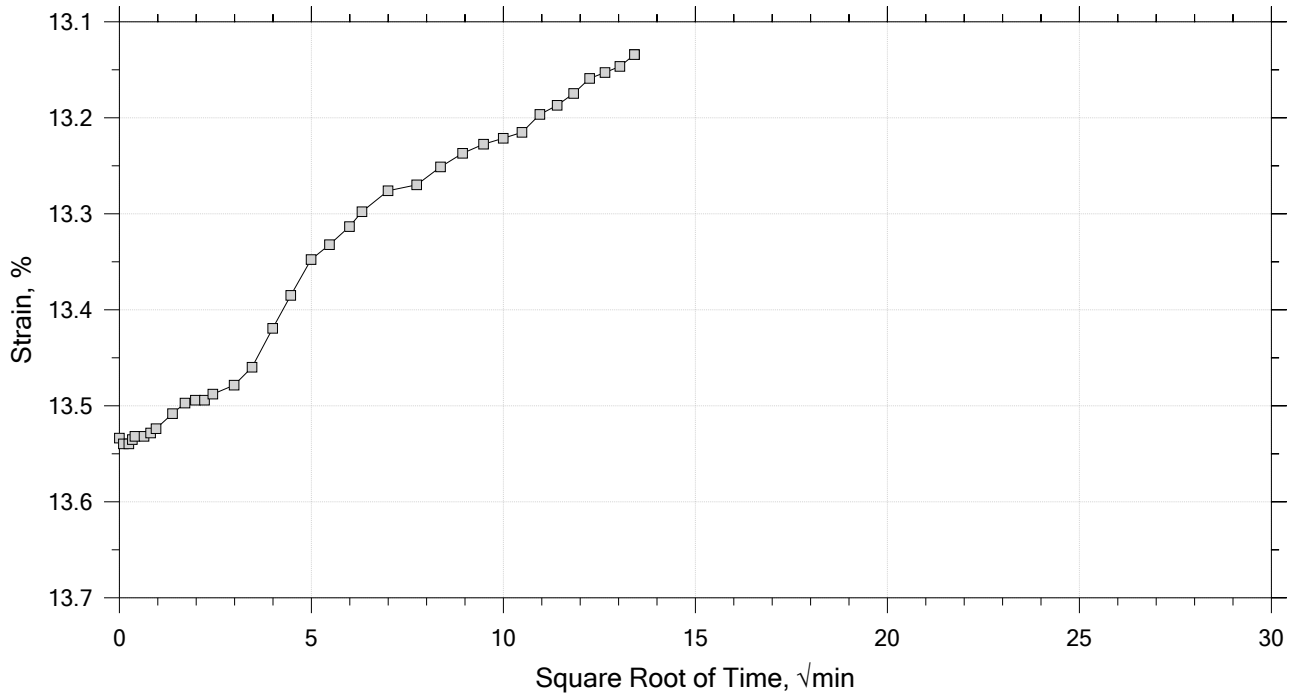


GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15
Constant Load Step
Stress: 0.0625 tsf





Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
Boring No.: B311-A	Tested By: md	Checked By: njh
Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
Test No.: IP-1A	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System M, Swell Pressure = 0.0627 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.74	Liquid Limit: 34
Initial Height: 1.00 in	Initial Void Ratio: 0.85	Plastic Limit: 18
Final Height: 0.87 in	Final Void Ratio: 0.61	Plasticity Index: 16

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A-2126	RING		D-1669
Mass Container, gm	8.2	111.66	111.66	8.15
Mass Container + Wet Soil, gm	229.55	267.79	257.34	154.32
Mass Container + Dry Soil, gm	176.2	230.83	230.83	127.72
Mass Dry Soil, gm	168	119.17	119.17	119.57
Water Content, %	31.76	31.02	22.25	22.25
Void Ratio	---	0.85	0.61	---
Degree of Saturation, %	---	99.98	100.00	---
Dry Unit Weight, pcf	---	92.485	106.3	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0627	0.002585	0.846	0.259	0.000	0.00e+00	4.13e-02	0.00e+00	0.00e+00
2	0.125	0.003172	0.845	0.317	0.000	0.00e+00	9.42e-03	0.00e+00	0.00e+00
3	0.250	0.003902	0.843	0.390	0.000	0.00e+00	5.84e-03	0.00e+00	0.00e+00
4	0.500	0.006565	0.838	0.656	0.000	0.00e+00	1.06e-02	0.00e+00	0.00e+00
5	1.00	0.009833	0.832	0.983	0.000	0.00e+00	6.54e-03	0.00e+00	0.00e+00
6	2.00	0.01456	0.823	1.46	1.570	3.54e-06	4.73e-03	4.52e-05	0.00e+00
7	4.00	0.03177	0.792	3.18	1.222	4.45e-06	8.60e-03	1.03e-04	0.00e+00
8	8.00	0.07909	0.704	7.91	1.398	3.64e-06	1.18e-02	1.16e-04	0.00e+00
9	16.0	0.1251	0.619	12.5	0.921	4.99e-06	5.76e-03	7.74e-05	0.00e+00
10	32.0	0.1648	0.545	16.5	0.813	5.12e-06	2.48e-03	3.42e-05	0.00e+00
11	8.00	0.1616	0.551	16.2	0.000	0.00e+00	1.35e-04	0.00e+00	0.00e+00
12	2.00	0.1549	0.564	15.5	0.529	7.64e-06	1.12e-03	2.30e-05	0.00e+00
13	0.500	0.1443	0.583	14.4	0.000	0.00e+00	7.06e-03	0.00e+00	0.00e+00
14	0.125	0.1348	0.601	13.5	0.000	0.00e+00	2.52e-02	0.00e+00	0.00e+00
15	0.0625	0.1313	0.607	13.1	0.000	0.00e+00	5.58e-02	0.00e+00	0.00e+00

GeoTesting EXPRESS	Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
	Boring No.: B311-A	Tested By: md	Checked By: njh
	Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
	Test No.: IP-1A	Sample Type: intact	Elevation: ---
	Description: Moist, olive clay		
	Remarks: System M, Swell Pressure = 0.0627 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0627	0.002585	0.846	0.259	0.000	0.00e+00	4.13e-02	0.00e+00
2	0.125	0.003172	0.845	0.317	86.908	2.81e-07	9.42e-03	7.13e-06
3	0.250	0.003902	0.843	0.390	82.170	2.97e-07	5.84e-03	4.67e-06
4	0.500	0.006565	0.838	0.656	79.662	3.05e-07	1.06e-02	8.75e-06
5	1.00	0.009833	0.832	0.983	47.696	5.06e-07	6.54e-03	8.92e-06
6	2.00	0.01456	0.823	1.46	8.429	2.84e-06	4.73e-03	3.62e-05
7	4.00	0.03177	0.792	3.18	12.469	1.88e-06	8.60e-03	4.36e-05
8	8.00	0.07909	0.704	7.91	5.883	3.72e-06	1.18e-02	1.19e-04
9	16.0	0.1251	0.619	12.5	4.436	4.46e-06	5.76e-03	6.92e-05
10	32.0	0.1648	0.545	16.5	2.992	6.00e-06	2.48e-03	4.01e-05
11	8.00	0.1616	0.551	16.2	1.010	1.70e-05	1.35e-04	6.19e-06
12	2.00	0.1549	0.564	15.5	3.178	5.47e-06	1.12e-03	1.65e-05
13	0.500	0.1443	0.583	14.4	24.337	7.29e-07	7.06e-03	1.39e-05
14	0.125	0.1348	0.601	13.5	69.432	2.62e-07	2.52e-02	1.78e-05
15	0.0625	0.1313	0.607	13.1	136.542	1.35e-07	5.58e-02	2.03e-05

GeoTesting EXPRESS

Project: Nordic Aquafarms	Location: Belfast, ME	Project No.: GTX-308779
Boring No.: B311-A	Tested By: md	Checked By: njh
Sample No.: T1	Test Date: 9/19/2018	Depth: 13-15 ft
Test No.: IP-1A	Sample Type: intact	Elevation: ---
Description: Moist, olive clay		
Remarks: System M, Swell Pressure = 0.0627 tsf		
Displacement at End of Increment		

ANALYTICAL REPORT

Lab Number:	L1835879
Client:	Ransom Consulting, Inc. 112 Corporate Drive Pease International Tradeport Portsmouth, NH 03801
ATTN:	Jay Johonnett
Phone:	(603) 436-1490
Project Name:	NORDIC AQUAFARMS
Project Number:	171.05027.005
Report Date:	09/19/18

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: NORDIC AQUAFARMS
Project Number: 171.05027.005

Lab Number: L1835879
Report Date: 09/19/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1835879-01	B403-S3-(5-7')	SOIL	BELFAST, ME	09/06/18 14:00	09/11/18
L1835879-02	B405-S3-(5-7')	SOIL	BELFAST, ME	09/06/18 14:30	09/11/18

Project Name:	NORDIC AQUAFARMS	**Lab Number:**	L1835879
Project Number:	171.05027.005	**Report Date:**	09/19/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name:	NORDIC AQUAFARMS	**Lab Number:**	L1835879
Project Number:	171.05027.005	**Report Date:**	09/19/18

Case Narrative (continued)

Sulfate

L1835879-01 and -02: The sample has an elevated detection limit due to the dilution required by the sample matrix.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Amita Naik

Title: Technical Director/Representative Date: 09/19/18

INORGANICS
&
MISCELLANEOUS

Project Name: NORDIC AQUAFARMS
Project Number: 171.05027.005
Lab Number: L1835879
Report Date: 09/19/18

SAMPLE RESULTS

Lab ID: L1835879-01
Client ID: B403-S3-(5-7')
Sample Location: BELFAST, ME
Sample Depth:
Matrix: Soil

Date Collected: 09/06/18 14:00
Date Received: 09/11/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	16		umhos/cm	10	--	1	-	09/12/18 08:53	1,9050A	MA
Solids, Total	78.4		%	0.100	NA	1	-	09/16/18 19:22	121,2540G	SB
Chloride	ND		mg/kg	12	--	1	-	09/17/18 19:03	1,9251	ML
pH (H)	7.3		SU	-	NA	1	-	09/12/18 02:38	1,9045D	MA
Sulfate	ND		mg/kg	1300	--	9.9	-	09/15/18 18:30	1,9038	JR

Project Name: NORDIC AQUAFARMS
Project Number: 171.05027.005

Lab Number: L1835879
Report Date: 09/19/18

SAMPLE RESULTS

Lab ID: L1835879-02
Client ID: B405-S3-(5-7')
Sample Location: BELFAST, ME

Date Collected: 09/06/18 14:30
Date Received: 09/11/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	14		umhos/cm	10	--	1	-	09/12/18 08:53	1,9050A	MA
Solids, Total	81.6		%	0.100	NA	1	-	09/16/18 19:22	121,2540G	SB
Chloride	16		mg/kg	11	--	1	-	09/17/18 19:05	1,9251	ML
pH (H)	7.4		SU	-	NA	1	-	09/12/18 02:38	1,9045D	MA
Sulfate	ND		mg/kg	1500	--	12.4	-	09/15/18 18:30	1,9038	JR

Project Name: NORDIC AQUAFARMS
Project Number: 171.05027.005
Lab Number: L1835879
Report Date: 09/19/18

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1156816-1										
Sulfate	ND		mg/kg	100	--	1	-	09/15/18 18:30	1,9038	JR
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1157819-1										
Chloride	ND		mg/kg	10	--	1	-	09/17/18 18:54	1,9251	ML

Lab Control Sample Analysis

Batch Quality Control

Project Name: NORDIC AQUAFARMS

Project Number: 171.05027.005

Lab Number: L1835879

Report Date: 09/19/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1156025-1								
Specific Conductance	100		-		99-101	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1156035-1								
pH	100		-		99-101	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1156816-2								
Sulfate	100		-		80-121	-		12
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1157819-2								
Chloride	104		-		89-109	-		35

Matrix Spike Analysis
Batch Quality Control

Project Name: NORDIC AQUAFARMS
Project Number: 171.05027.005

Lab Number: L1835879
Report Date: 09/19/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1156816-4 QC Sample: L1835879-01 Client ID: B403-S3-(5-7')												
Sulfate	ND	254	350	140		-	-		22-183	-		12
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1157819-4 QC Sample: L1835879-01 Client ID: B403-S3-(5-7')												
Chloride	ND	489	490	101		-	-		62-129	-		35

Lab Duplicate Analysis

Batch Quality Control

Project Name: NORDIC AQUAFARMS

Project Number: 171.05027.005

Lab Number: L1835879

Report Date: 09/19/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1156025-2 QC Sample: L1835879-01 Client ID: B403-S3-(5-7')						
Specific Conductance @ 25 C	16	15	umhos/cm	6		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1156035-2 QC Sample: L1835879-01 Client ID: B403-S3-(5-7')						
pH (H)	7.3	7.4	SU	1		5
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1156816-3 QC Sample: L1835879-01 Client ID: B403-S3-(5-7')						
Sulfate	ND	ND	mg/kg	NC		12
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1157467-1 QC Sample: L1835879-01 Client ID: B403-S3-(5-7')						
Solids, Total	78.4	76.9	%	2		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1157819-3 QC Sample: L1835879-01 Client ID: B403-S3-(5-7')						
Chloride	ND	13	mg/kg	NC		35

Project Name: NORDIC AQUAFARMS
Project Number: 171.05027.005

Lab Number: L1835879
Report Date: 09/19/18

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1835879-01A	Glass 500ml/16oz unpreserved	A	NA		5.1	Y	Absent		CL-9251(28),SO4-9038(28),PH-9045(1),ME-TS-2540(7),COND-9050(28)
L1835879-02A	Glass 500ml/16oz unpreserved	A	NA		5.1	Y	Absent		CL-9251(28),SO4-9038(28),PH-9045(1),ME-TS-2540(7),COND-9050(28)

*Values in parentheses indicate holding time in days

Project Name:	NORDIC AQUAFARMS	**Lab Number:**	L1835879
Project Number:	171.05027.005	**Report Date:**	09/19/18

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample¿s toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: Data Usability Report

Project Name:	NORDIC AQUAFARMS	**Lab Number:**	L1835879
Project Number:	171.05027.005	**Report Date:**	09/19/18

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	NORDIC AQUAFARMS	**Lab Number:**	L1835879
Project Number:	171.05027.005	**Report Date:**	09/19/18

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 9/11/18

ALPHA Job #: L1835879

Client Information

Client: Ransom Consulting, Inc.
Address: 12 Capoule Dr., Portsmouth, NH 03884
Phone: 1-603-436-1490
Email: Michael.petro@ransomenv.com

Additional Project Information:

Project Information

Project Name: Nordic Aquafarms
Project Location: Belfast, ME
Project #: 171.05027.005
Project Manager: Jay Johannet
ALPHA Quote #: -

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #: 11216

Regulatory Requirements & Project Information Requirements

☐ Yes ☒ No MA MCP Analytical Methods
☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☒ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2	SVOC: ☐ ABN ☐ PAH	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	☐ PCB ☐ PEST	TPH: ☐ Quant Only ☐ Fingerprint	pH, Sulfate, Chloride, Spec. Fic Conductivity	SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do	Sample Comments	TOTAL # BOTTLES
35879-01	B403-S3-(5-7')	9/6/18	14:00	S	MSP									X			1
02	B405-S3-(5-7')	9/6/18	14:30	S	MSP									X			1

Container Type: G G
Preservative: A A

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H= $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
	9/11/18 13:22		9/11/18 13:22
	9/11/18 1602		9-11-18 14:30
	9/11/18		9/11/18 1620

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)