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RIB HYDRAULIC LOADING TEST

Pinetree Power
469 Plains Road
Tamworth, New Hampshire, 03886

NHDES Site #: 199407004
Project Type: Rapid Infiltration Basin
Project Number: 0038933

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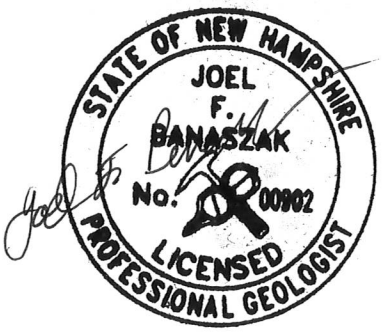

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RAPID INFILTRATION BASIN HYDRAULIC LOADING TESTS

Pinetree Power

Tamworth, New Hampshire

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PINETREE POWER - TAMWORTH
RAPID INFILTRATION BASIN
HYDRAULIC LOAD TESTING

1.0 INTRODUCTION

Pinetree Power owns and operates a biomass power generation facility on Plains Road in Tamworth, New Hampshire. A **Site Location Map** is included as **Appendix A**. The biomass power generation facility has had ongoing issues with cooling water quality, specifically the precipitation of hardness and silica in the facility cooling towers. The estimated amount of water used daily for the cooling process at the plant ranges from approximately 30,000 gallons per day (gpd) in the winter months to a maximum of 100,000 gpd in the summer months. Historically, to mitigate this problem, Pinetree Power had been trucking effluent to Plymouth in order to dilute the cooling circulation water with fresh groundwater from the on Site water supply well, Well C.

As a potential alternative to trucking circulation water to Plymouth, Horizons Engineering, Inc. (HEI) proposed the construction of a rapid infiltration basin system for disposal of the circulation water. In December of 2018 HEI prepared a report titled Preliminary RIB Siting Report and Proposal for Hydraulic Loading Test and submitted it to NHDES for review and comment. The report also included an application for a Temporary Groundwater Discharge Permit (TGDP). A copy of the **TGDP** is included as **Appendix B**.

This document reports the findings of the hydraulic loading test of Basin 4 (see **Annotated Site Plan** in **Appendix C**) on January 8-11 (Loading Test I) and April 9-29, 2019 (Loading Test II). Under the Temporary Discharge Permit (TGP-199407004-001) a total of 1,031,665 gallons of water was discharged to Test Basin 4 over the span of both tests. 399,400 gallons during Loading Test I and 632,265 gallons during Loading Test II. The total effluent run through the basin was 732,115 gallons with the balance being freshwater dilution from Well C.

2.0 TEST BORINGS AND MONITORING WELL INSTALLATION

In conformance with the Proposal, test borings and monitoring well installations were completed between November 1 and November 9, 2018 at previously determined locations. All of the borings and well installations were performed by Geosearch Inc. of Sterling, Massachusetts. The borings were completed under the field observation of Horizons geologist, Joel Banaszak, who logged the soils. The locations of the soils borings and monitoring wells are presented on the **Site Plan** included in **Appendix C**.

2.1 Test Borings

A total of 19 soil borings were advanced at the Site. Of these borings, four (4) were continuously sampled within the anticipated perimeter of the RIB's. The sampled borings were MW-2, MW-7, MW-10, and MW-12. The protocol at the four (4) locations was to advance the borings with hollow stem augers while continuously collecting split spoon samples. The final depth of the four (4) borings was 50 feet below the ground surface (bgs). Soil samples from each split spoon were obtained for project records. No sieve

analyses or other tests were performed. The findings of the test boring program are presented in Table 1. The other 15 test borings were described by auger cuttings. All 19 test borings were completed as temporary monitoring wells. **Soil Boring Logs** are included in **Appendix D**.

The 15 soil borings which were advanced in the upland area where the proposed RIB system is to be located exhibited similar soil characteristics. The ground surface layer consisted of loose, loamy sand topsoil down to approximately 6-inches. This was underlain by approximately 30-feet of moderately well sorted, medium dense, medium to coarse sand with occasional gravel. Underlying the medium to coarse sand unit is a very well sorted, dense, silt-free, fine sand. Bedrock was not encountered in any of the soil borings. The average depth to groundwater was 38-feet bgs.

Four (4) soils borings were also advanced in the low lying area, down gradient of the proposed RIB system. These soil borings had similar lithologic characteristics as the lower unit encountered in the previously mentioned soil borings; a very well sorted, dense, silt-free, fine sand. Bedrock was not encountered in any of the 4 borings. Average depth to groundwater in the four (4) borings was 1-foot bgs.

The findings of the test boring program are presented in Table 1 below.

Table 1
Summary of Test Boring Program

Boring#	Total Depth (ft)	Refusal (Yes / No)	Generalized Soil Profile
MW-1	50	No	Sand
MW-2	50	No	Sand
MW-3	50	No	Sand
MW-4	50	No	Sand
MW-5	50	No	Sand
MW-6	50	No	Sand
MW-7	50	No	Sand
MW-8	50	No	Sand
MW-9	50	No	Sand
MW-10	50	No	Sand
MW-11	50	No	Sand-some gravel
MW-12	50	No	Sand-some gravel
MW-13	50	No	Sand-some gravel
MW-14	50	No	Sand-some gravel
MW-15	20	No	Sand-some gravel
MW-16	20	No	Sand
MW-17	20	No	Sand
MW-18	20	No	Sand
MW-19	20	No	Sand

Note Bedrock refusal was not encountered in any of the soil borings.

2.2 Permanent Monitoring Wells

All installed monitoring wells were designed with the ability to be converted to permanent monitoring wells, pending the final design and regulatory needs of the RIB system. At this time, none of the wells have been designated as permanent. General construction consisted of a 10-foot slotted PVC screen with well point installed at terminal depth of the boring. This was then threaded to 10-foot sections of 2-inch PVC riser until roughly 3-feet stood above ground level. The boring was then filled with filter sand to roughly 2-feet above the top of the screened interval. Over top of the fresh sand, roughly 3-feet of bentonite seal was added, before backfilling the boring to grade with soil cuttings. Table 2 contains a summary of each installation. All measurements made were from top of casing (TOC).

Table 2
Summary of Temporary Monitoring Well Installations

MW #	Total Depth TOC (ft)	Screened Interval (ft.)	Sand Interval (ft.)	Bentonite Interval (ft.)
MW-1	52.17	42.17'-52.17'	40.17'-52.17'	37.17'-40.17'
MW-2	52.10	42.10'-52.10'	40.10'-52.10'	37.10'-40.10'
MW-3	52.15	42.15'-52.15'	40.15'-52.15'	37.15'-40.15'
MW-4	52.25	42.25'-52.25'	40.25'-52.25'	37.25'-40.25'
MW-5	53.95	43.95'-53.95'	41.95'-53.95'	38.95'-41.95'
MW-6	52.70	42.70'-52.70'	40.70'-52.70'	37.70'-40.70'
MW-7	52.60	42.60'-52.60'	40.60'-52.60'	37.70'-40.60'
MW-8	52.90	42.90'-52.90'	40.90'-52.90'	37.90'-40.90'
MW-9	53.95	43.95'-53.95'	41.95'-53.95'	38.95'-41.95'
MW-10	52.30	42.30'-52.30'	40.30'-53.30'	37.30'-40.30'
MW-11	51.18	41.18'-51.18'	39.18'-51.18'	36.18'-39.18'
MW-12	52.25	42.25'-52.25'	40.25'-52.25'	37.25'-40.25'
MW-13	51.50	41.50'-51.50'	39.50'-51.50'	36.50'-39.50'
MW-14	53.30	43.30'-53.30'	41.30'-53.30'	38.30'-41.30'
MW-15	52.30	42.30'-52.30'	40.30'-52.30'	37.30'-40.30'
MW-16	19.65	9.65'-19.65'	7.65'-19.65'	4.65'-7.65'
MW-17	22.91	12.91'-22.91'	10.91'-22.91'	7.91'-10.91'
MW-18	22.30	12.30'-22.30'	10.30'-22.30'	7.30'-10.30'
MW-19	22.75	12.75'-22.75'	10.75'-22.75'	7.75'-10.75'

3.0 HYDRAULIC LOADING TEST OPERATION

Two hydraulic loading tests were conducted on the rapid infiltration basin which was excavated at the southernmost location at the Site. For the purposes of this report the basin is designated at Basin 4. The basin was excavated to a depth of approximately 3.5-feet bgs with a bottom dimension of 30-feet by 50-feet. The basin was provided with a graduated stake to monitor any ponding in the basin.

3.1 Hydraulic Loading Test I

Groundwater elevation response to the first loading test was monitored utilizing In Situ-Level Troll 700 electronic pressure transducers installed in surrounding site monitoring wells; MW-1, MW-9, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16 and MW-17; adjacent to, up-gradient and down-gradient of the test basin. The transducers were programmed to log water level data every minute for the duration of the test and through the recovery period. Approximately coincident with the data logger installation, depths to the water table were measured in each of the observation wells.

Hydraulic Loading Test I of Basin 4 was conducted over a span of 4 days from January 8-11, 2019. A total of 399,400-gallons of water was discharged to the test basin over this time interval. The total amount of circulation water effluent discharged to the basin was 99,850-gallons with the remaining balance of 299,550-gallons being freshwater dilution from Well C.

Loading was accomplished utilizing two tanker trucks running alternating trips until the desired loading for that day was achieved. One truck had a 5,000-gallon capacity, and the other 4,200-gallons. Each load was 25 percent effluent and with 75 percent fresh water from Well-C, mixed in the truck. The water was discharged onto plywood to reduce scouring of the test basin. A loading log is attached in **Appendix E - Load Test I, Basin Loading Log**, along with a graph of the daily and total discharge volume achieved during testing.

Below is a summary of the daily loading rates during the test;

January 8: 96,200 gallons total (24,050 gallons of circulation water effluent)
January 9: 50,000 gallons total (12,500 gallons of circulation water effluent)
January 10: 188,200 gallons total (47,050 gallons of circulation water effluent)
January 11: 65,000 gallons total (16,250 gallons of circulation water effluent)

The maximum loading achieved by Loading Test I resulted in a peak of 17.1-feet of water in MW-12 which is roughly centered in the test basin. The average pre-test groundwater level of MW-12 was 12.7-feet, equating to a maximum increase in groundwater elevation of 4.4-feet achieved on the third day of the test with the introduction of 188,200-gallons to the system. A graph of MW-12 with the peak water column heights can be found in **Appendix F.**

In the proximal wells (MW-12, MW-11, MW-13, MW-14, MW-15) the individual days of loading are readily apparent on the loading test graphs. Further to the west of the tested basin, the response in MW-9 was present, but lacked the distinct peaks seen in the data from the previously mentioned closer wells. Near the base of the hill, downgradient from the test basin, there was little response noted in MW-16. There was no perceivable response in either MW-1 which lies roughly 3,300-feet to the north-northeast, and MW-17 which lies roughly 3,000-feet to the west-northwest. A full suite of graphs for all monitored wells for Hydraulic Loading Test I is included in **Appendix F**.

3.2 Hydraulic Loading Test II

Hydraulic Loading Test II of Basin 4 was conducted over a span of 20 days from April 9-29, 2019. A total of 632,265 gallons of blended effluent was discharged to the test basin over this period. In order to accomplish more efficient disposal of effluent, individual volumes of circulation water were stored in five frac tanks on site. These were then individually tested for dissolved metals in order to determine the correct dilution ratios for each to remain below AGQS with particular attention paid to the dissolved arsenic component. The tanks were then blended in accordance with their results prior to discharging to the basin by pump. **Appendix G** contains a table of the different mixes and ratios used throughout the testing, along with a graph displaying daily and cumulative discharge totals.

Water levels were monitored once a day that discharge occurred by Pinetree Power personnel. The following monitoring wells were observed for water level change during testing; MW-1, MW-9, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17. Data for MW-12, located in the center of the basin is sparse due to difficulties accessing the monitoring well when there was water in the basin. A full suite of water level graphs for all monitored wells is included in **Appendix H.**

4.0 GROUNDWATER AND EFFLUENT MONITORING

Prior to the Hydraulic Load Testing of Basin 4, groundwater samples were collected from supply Well C, and monitoring wells MW-11, MW-14, and MW-16 to ascertain baseline water quality. Numerous effluent samples were also taken prior to testing in order to determine the average water quality of the effluent, and to determine the correct dilution ratio necessary per the Temporary Discharge Permit. All **Water Sample Results** can be found in **Appendix I**.

4.1 Circulation Water/Effluent Sampling and Analysis

Prior to and over the course of the loading tests, multiple samples of the wastewater were collected from the cooling tower effluent. Effluent samples were tested on eight (8) separate occasions. The samples were collected in laboratory supplied containers, placed on ice and transported to Eastern Analytical, Inc. of Concord, New Hampshire to be analyzed for the following; sulfate, chloride, nitrite, nitrate, ammonia, TKN, total phosphorus, BOD, COD, pH, specific conductance, total hardness (as CaCO3), and metals including; arsenic, selenium, antimony, beryllium, calcium, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, silver, sodium, thallium, and zinc. Effluent samples were also tested for perfluorinated alkylated substances (PFAS). The PFAS results reported analyte below detection limits for the sample on September 21, 2018. The sample on January 7, 2019 reported a PFBA (Perfluorobutanoate-PFBA) concentration of 9.27 ng/L, with all other compounds below detection limit.

Initial pre-test laboratory analytical results for the sample taken on January 7, 2019 reported dissolved arsenic concentration of 29 µg/L, almost three times the AGQS of 10 µg/L. All other analytes reported concentrations either below method detection levels or the AGQS.

The effluent was sampled periodically throughout and after the conclusion of the first infiltration test. By the end of the initial hydraulic load testing on January 11, 2019, only arsenic reported levels above the AGQS. It was however diminishing rapidly as the roughly 100,000-gallons of effluent were removed from the cooling system and replaced with fresh water from Well-C over the course of the test.

Over the course of the initial testing most compounds showed a decreasing concentration trend, as more fresh water was being added to the system while the diluted effluent was loaded into the basin. Of note, Sulfate and Chloride concentration decreased over the course of testing, 44 percent and 56 percent respectively. Analytical results from compounds with reported concentrations above the laboratory detection limit are summarized in the table contained in **Appendix I**, with their respective New Hampshire Department of Environmental Services (NHDES) Ambient Groundwater Quality Standard (AGQS).

The circulation water continued to be tested with particular interest in the arsenic concentration, which increased in the testing of January 22nd but decreased again as of the results of January 24, 2019.

Prior to initiation of Hydraulic Load Test II on Basin 4 the effluent/cooling water was temporarily stored in five 21,357-gallon frac tanks on site. Prior to discharge, the five frac tanks (UST, SV2, FTS, SV2-7, and SV3) were tested for dissolved metals including Antimony, Arsenic, Beryllium, Calcium, Cadmium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, and Zinc. The frac tanks were also tested for Total Hardness (as CaCO3), Sulfate, Chloride, Nitrite-N, Nitrate-N, Ammonia-N, TKN, Total Phosphorus-P, pH, and Specific Conductance. These analytical results were utilized to determine dilution and blending ratios for the discharge to keep compound levels below AGQS. All **Analytical Laboratory Results** can be found in **Appendix I**.

The slight increase in Arsenic post Loading Test I was likely due to the fact that they cannot remove the large volume of effluent that was accomplished during the load test by trucking. Due to the above noted trend, it can be reasonably concluded that once the RIB system is operational, the plant will have the ability to mitigate and reduce the arsenic content to below AGQS via dilution and running fewer cycles of concentration on the system. This should also help reduce the concentrations of the other compounds in the system.

It is hypothesized that the arsenic is leaching out of pressure treated trussing in the cooling tower substructure when exposed to the high temperatures of the cooling water/steam. If this is the case, each cycle through the system further concentrates the dissolved arsenic. It is likely that with fewer cycles of concentration on the cooling water, the effluent discharged could be brought to reasonable contaminant levels without treatment or dilution. Another option discussed would be to replace the pressure treated substructure timber with a different material. This would eliminate the arsenic problem at its source.

4.2 Well C/Influent Sampling and Analysis

Well C was sampled twice prior to the start of the initial hydraulic loading test. The samples were collected in laboratory supplied containers, placed on ice and transported to Eastern Analytical, Inc. of Concord, New Hampshire to be analyzed for the following; sulfate, chloride, nitrite, nitrate, ammonia, TKN, total phosphorus, BOD, COD, pH, specific conductance, total hardness (as CaCO3), and metals including; arsenic, selenium, antimony, beryllium, calcium, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, silver, sodium, thallium, zinc, and uranium. The influent was also tested for perfluorinated alkylated substances (PFAS) with the pre-test sample suite on January 7, 2019. Analytical results reported PFAS concentration below method detection limits.

Laboratory analytical results reported the following compounds at concentration less than their respective laboratory detection limit; antimony, arsenic, cadmium, chromium, copper, mercury, molybdenum, selenium, COD, ammonia, and total phosphorus.

After the conclusion of Loading Test II, Well C was tested for only dissolved arsenic and total arsenic in order to rule out the influent definitively as a source of the arsenic. The sample was made on June 10, 2019. Analytical results reported that concentrations for both tests were below method detection limits.

Analytical results from compounds with reported concentrations above the laboratory detection limit are summarized in the table in **Appendix I,** with their respective NHDES AGQS. No compounds were found to exceed the AGQS in either sampling event.

4.3 Monitoring Well Sampling and Analysis

Monitoring Wells MW-11, MW-14, and MW-16 were sampled prior to the start of hydraulic load testing in order to ascertain baseline water quality. They were also sampled again at the conclusion of both rounds of load testing. The samples were collected in laboratory supplied containers, placed on ice and transported to Eastern Analytical, Inc. of Concord, New Hampshire to be analyzed for the following; sulfate, chloride, nitrite, nitrate, ammonia, TKN, total phosphorus, BOD, COD, pH, specific conductance, total hardness (as CaCO3), and metals including; arsenic, selenium, antimony, beryllium, calcium, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, silver, sodium, thallium, and zinc.

The initial post Loading Test II analytical results reported dissolved arsenic concentrations above AGQS in two of the monitoring wells. MW-11 reported a dissolved arsenic concentration of 40 µg/L and MW-14 reported a dissolved arsenic concentration of 26 µg/L, both exceeding the AGQS of 10 µg/L. All other analytes were below AGQS or were below detection threshold. The samples of May 16, 2019 were taken by a Pinetree Power employee. It is Horizons Engineering suspicion that proper sample taking protocol was not adhered to in this round of sampling. Two follow-up sampling events followed, executed by Horizons Engineering personnel for consistency. Individual results are summarized below.

Analytical results from compounds with reported concentrations above the laboratory detection limit are summarized in **Appendix I**, with their respective New Hampshire Department of Environmental Services (NHDES) Ambient Groundwater Quality Standard (AGQS).

4.3.1 Monitoring Well MW-11

Loading Test I

Monitoring well MW-11 is situated to the northeast of the test location, roughly 50 feet from the edge of the test basin. The sampling results for MW-11 reported a post-test increase in arsenic, beryllium, cadmium, calcium, chloride, copper, magnesium, manganese, potassium, selenium, sodium, zinc, total hardness, TKN, specific conductance and sulfate. While these compounds showed an increase, mostly to detectable levels, most are all still well below their respective AGQS. Arsenic concentration increased to 3.3µg/L, from a previous level below detection threshold. Chloride increased roughly 37 percent over the span of the loading test.

Loading Test II

The initial post-Loading Test II sampling results for monitoring well MW-11 had a reported concentration of dissolved arsenic of 40 µg/L, four times the AGQS of 10 µg/L. MW-11 was then sampled on two separate occasions to confirm the analytical results. Both of the follow-up sampling events had reported dissolved arsenic concentrations below detection threshold. All other analytes reported concentrations either below method detection levels or the AGQS.

4.3.2 Monitoring Well MW-14

Loading Test I

Monitoring well-14 is situated directly to the west of the test basin, slightly down gradient. The sampling results for monitoring well-14 reported a post-test concentration increase in arsenic, beryllium, cadmium, calcium, chloride, copper, magnesium, potassium, selenium, sodium, zinc, total hardness, and specific conductance. While these compounds showed an increase from background, mostly to detectable levels, they are all still well below their respective AGQS. Notably, arsenic increased to 2.5µg/L, from a previous level below detection threshold and chloride increased roughly 58 percent over the span of the loading test. Total phosphorus, TKN, and pH reported a decrease in concentration at the conclusion of the first loading test.

Monitoring well-14 was also tested for perfluorinated alkylated substances (PFAS) with the pre-test sample suite on January 7, 2019. Testing reported PFAS levels below detection limits for the sample.

Loading Test II

The initial May 16, 2019 post-loading test II sampling results for monitoring well-14 reported a dissolved arsenic concentration of 26 µg/L, exceeding the AGQS of 10 µg/L. MW-14 was sampled on three more occasions, with both the May 24, 2019 and June 3, 2019 events having a reported concentration of dissolved arsenic of 11 µg/L and 14 µg/L respectively. Both of these analytical results were above the arsenic AGQS of 10 µg/L, so the well was tested again on June 10, 2019 yielding a reported dissolved arsenic concentration of 2.2 µg/L. All other analytes reported concentrations either below method detection levels or the AGQS.

4.3.3 Monitoring Well MW-16

Loading Test I

Monitoring Well-16 is situated to the west of the test basin, down a steep gradient just upslope from the lowlands and wetlands adjacent to the Chocorua River. The sampling results for monitoring well MW-16 reported a post-test increase in calcium, chloride, copper, magnesium, potassium, sodium, zinc, and pH. While these compounds showed a slight increase from background, all were still well below their respective AGQS. Manganese, COD, and total hardness reported a decrease post loading test.

Loading Test II

The initial post-Loading Test II sampling results for monitoring well MW-16 were taken on May 16, 2019 and reported a dissolved arsenic concentration of 1.1 µg/L, well below the AGQS of 10 µg/L. Follow-up testing on May 24, 2019 and June 3, 2019 both reported dissolved arsenic concentrations below method detection limits. All other analytes reported concentrations either below method detection levels or their respective AGQS.

5.0 HYDRAULIC LOADING TEST ANALYSES

5.1 Loading Test I Analysis

Water table response was observed at observation wells MW-9, MW-11, MW-12, MW-13, MW-14 and MW-15. Additional responses were noted in other wells which were monitored but did not directly correlate to the loading of the basin. A maximum water table response of 4.98-feet was observed at MW-12. MW-1 was also monitored for water level during the loading test. The maximum response observed at MW-1 was 0.19-feet. It is interpreted that the response noted at MW-1 is not correlative with the basin loading but rather a semi-regional natural rise in water level.

For ease of analysis, the data has been graphed in several formats:

- **Figure 1** – Response; Arithmetic
- **Figure 2** – Response; Semi-Log
- **Figure 3** – Water Elevation; Arithmetic

- **Figure 4** – Water Elevation; Semi-Log
- **Figure 5 - 9** – Modeled versus Actual Mounding Height

Hydraulic conductivity was calculated using the water elevations on the third day of testing when the basin was dosed with the largest volume of water, 188,200 gallons. Wells MW-9, MW-11, MW-13, MW-14 and MW-15 were used to calculate the hydraulic conductivity. The equilibrium equation for an unconfined aquifer was used. The calculated hydraulic conductivity from; MW-13 to MW-14 is 74.205 feet per day (ft/day), MW-13 to MW-15 is 67.01 ft/day, MW-14 to MW-15 is 123.46 ft/day, MW-11 to MW-15 is 22.657 ft/day and MW-15 to MW-9 is 39.33 ft/day. The calculated average hydraulic conductivity for the Site is 65.332 ft/day.

The RIB mounding analysis uses the Hantush Method. Input data includes the dimensions of the recharge basin, hydraulic conductivity, the initial saturated thickness, and the time frame for the calculation. The real variable in the analysis is the hydraulic conductivity. This value is refined by calibrating the Hantush model to agree with the actual groundwater mound growth observed during the loading tests. Multiple calculations were made for each of the observation wells using the actual measured saturated thickness before the test started and the measured flow rate into the basin. A range of hydraulic conductivities were used and the results graphed. The best fits were obtained using hydraulic conductivities of 50 ft/day, 18 ft/day, 25 ft/day, 42 ft/day, and 42 ft/day for MW-11, MW-14, MW-13, MW-12 and MW-15, respectively. The geometric mean for the area is 35.4 ft/day.

All figures and calculations related to Load Test I response and calculations are included in **Appendix J**.

5.2 Loading Test II Analysis

Hydraulic Loading Test II of Basin 4 was conducted over a span of 20 days from April 9-29, 2019. A total of 632,265-gallons of water was discharged to the test basin over this period. Monitoring wells MW-1, MW-9, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17 were monitored for water table response to the loading test. Data for MW-12, located in the center of the basin is sparse due to difficulties accessing the monitoring well when there was water in the basin. Water levels were measured for each day of loading utilizing a tape measure by Pinetree Power personnel. The maximum water level response occurred at MW-9, northwest and down gradient from the test basin. 4.84-feet of water table response was noted on April 19, 2019. Significant response was also observed in MW-13 with an elevation change of 4.5-feet from pre-test levels. Response was noted in all monitored wells with the exception of MW-16 and MW-17. Both lie downgradient by the Chocorua River and both showed little response from loading. Maximum response in those wells was 0.83 feet, likely due to rainfall and snow melt affecting local water table variation more than the loading influence. Over the course of testing 5.28-inches of precipitation fell, and approximately 15-inches of snowpack melted. The NOAA climatological data for the area can be found in **Appendix K**, along with water level graphical response charts for the monitored wells.

For ease of analysis, the data has been graphed in several formats:

- **Figure 10** – Response; Arithmetic
- **Figure 11** – Response; Semi-Log
- **Figure 12** – Water Elevation; Arithmetic
- **Figure 13** – Water Elevation; Semi-Log

The test basin did not show signs of overtopping or breakout during or after the load testing.

6.0 RIB GROUNDWATER MOUNDING ANALYSES

The hydraulic conductivity values from Loading Test I were used to run the groundwater mounding analyses for the RIB area. The RIB area is defined as the area north/northwest of the existing basin and west of the Pinetree Power Plant.

A calculation was completed for a scenario during "average" water table conditions. The calculations were run for two scenarios at the area; during "average" water table conditions. Average water table conditions are assumed to be those measured prior to the start of the loading tests. The calculations were done for various times ranging up to the 90 days specified in the NHDES publication Land Treatment and Disposal of Reclaimed Wastewater: Guidance for Groundwater Discharge Permitting.

To determine the direction of groundwater flow over the entire site, a comprehensive set of water measurements was obtained on December 10, 2018. The groundwater contour plan produced from that data is included as **Appendix L**. The overall direction of groundwater flow is westerly, toward Chocorua River.

Test Run #1

Test run #1 was for the area to be loaded at 25,000 gpd. It can be seen in Table 1 that at 90 days under normal water conditions the RIB area has 37.151 feet of unsaturated soil below the RIBs. This area meets the 4 feet of unsaturated soil at the 90 day requirement.

Test Run #2

Test run #2 was for the area to be loaded at 50,000 gpd. It can be seen in Table 2 that at 90 days under normal water conditions the RIB area has 35.628 feet of unsaturated soil below the RIBs. This area meets the 4 feet of unsaturated soil at the 90 day requirement.

Test Run #3

Test run #3 was for the area to be loaded at 100,000 gpd. It can be seen in Table 3 that at 90 days under normal water conditions the RIB area has 32.832 feet of unsaturated soil below the RIBs. This area meets the 4 feet of unsaturated soil at the 90 day requirement.

Table 1
Long-Term Mounding at RIB Area
Loading Rate: 25,000 gpd

	Normal Water Table		
Days	Mound Height (ft)	Elev at Avg Water Table	Unsaturated Soil (ft)
1	0.853	433.333	37.927
2	0.973	433.453	37.807
3	1.044	433.524	37.736
4	1.094	433.574	37.686
5	1.132	433.612	37.648
6	1.164	433.644	37.616
7	1.191	433.671	37.589
8	1.214	433.694	37.566
9	1.234	433.714	37.546
10	1.252	433.732	37.528
20	1.372	433.852	37.408
30	1.441	433.921	37.339
40	1.491	433.971	37.289
50	1.529	434.009	37.251
60	1.560	434.040	37.22
70	1.586	434.066	37.194
80	1.609	434.089	37.171
90	1.629	434.109	37.151

Table 2
Long-Term Mounding at RIB Area
Loading Rate: 50,000 gpd

	Normal Water Table		
Days	Mound Height (ft)	Elev at Avg Water Table	Unsaturated Soil (ft)
1	1.677	434.157	37.103
2	1.908	434.388	36.872
3	2.043	434.523	36.737
4	2.139	434.619	36.641
5	2.213	434.693	36.567
6	2.273	434.753	36.507
7	2.324	434.804	36.456
8	2.368	434.848	36.412
9	2.406	434.886	36.374
10	2.441	434.921	36.339
20	2.667	435.147	36.113
30	2.799	435.279	35.981
40	2.892	435.372	35.888
50	2.963	435.443	35.817
60	3.022	435.502	35.758
70	3.071	435.551	35.709
80	3.114	435.594	35.666
90	3.152	435.632	35.628

Table 3
Long-Term Mounding at RIB Area
Loading Rate: 100,000 gpd

	Normal Water Table		
Days	Mound Height (ft)	Elev at Avg Water Table	Unsaturated Soil (ft)
1	3.248	435.728	35.532
2	3.679	436.159	35.101
3	3.930	436.41	34.850
4	4.106	436.586	34.674
5	4.242	436.722	34.538
6	4.353	436.833	34.427
7	4.446	436.926	34.334
8	4.527	437.007	34.253
9	4.598	437.078	34.182
10	4.661	437.141	34.119
20	5.074	437.554	33.706
30	5.313	437.793	33.467
40	5.481	437.961	33.299
50	5.610	438.090	33.170
60	5.715	438.195	33.065
70	5.804	438.284	32.976
80	5.881	438.360	32.900
90	5.948	438.428	32.832

It is clear from the data presented above that the area for the RIB system meets the 4' of unsaturated soil requirement under normal water conditions. It is noted that seasonal high water table may fluctuate some amount but it is interpreted the natural fluctuation will not exceed the available capacity of the unsaturated soil column.

7.0 SUMMARY AND RECCOMENDATIONS

Based on the data and results presented in this report it is recommended that Pinetree Power continue the development of the RIB system in the proposed area and be permitted to dispose of up to 100,000 gallons per day of wastewater effluent from the facility's cooling system. This is to include the construction of 3 additional, 50 feet by 30 feet rapid infiltration basins. A Groundwater Discharge Permit application is included as **Appendix M**.

Recommended standard conditions of the permit are as follows;

- Pinetree Power shall not violate surface water quality standards (N.H. Admin. Rules, Env-Wq 1700) in any surface water body.
- The discharge shall not result in erosion or sedimentation on site or into any surface water, wetland, or storm water drainage way.
- The discharge shall not *cause* a violation of the Ambient Groundwater Quality Standards adopted by the NHDES (N.H. Admin Rules, Env-Wq-402).
- Pinetree Power shall allow an authorized member of the NHDES' staff, or its agent, to enter the property covered by the permit for the purpose of collecting information,

examining records, collecting samples, or undertaking other actions associate with the permit.

- Pinetree Power shall comply with any conditions associated with the discharge that are stipulated by the municipality or county authority in which it is located.
- Any chemical treatment or alteration of the discharge shall be documented.
- Erosion controls shall be implemented and maintained to eliminate scouring and erosion as needed.
- Pinetree Power shall maintain a water quality monitoring program and submit monitoring results to the NHDES' Waste Management Division no later than 45 days after sampling. Samples shall be taken from on-site monitoring wells as shown and labeled on the referenced Site plan and other sampling points listed on the following table in accordance with the schedule outlined herein.

Monitoring Locations	Sampling Frequency	Parameters
MW-1, MW-4, MW-5, MW-8, MW-9, MW-19, MW-17, MW-16, MW-14, MW-11, MW-13	April and October each year	Specific conductance @ 25°C, pH, chloride, nitrate, nitrite, dissolved metals including; antimony, arsenic, beryllium, cadmium, calcium, chromium, copper, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, sulfate and static water elevation
Circulation Water Effluent	Weekly	Specific conductance @ 25°C, pH, chloride, nitrate, nitrite, total metals including; antimony, arsenic, beryllium, cadmium, calcium, chromium, copper, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, sulfate

Sampling shall be performed in accordance with the documents listed in Env-Or 704.01 (i). Samples shall be analyzed by a laboratory certified by the U.S. Environmental Protection Agency or the New Hampshire Department of Environmental Services. All overburden groundwater samples collected for metals analyses shall be analyzed for dissolved metals; and thus must be field filtered (with a 0.45 micron filter) and acidified after filtration in the field. Water samples collected from the circulation water effluent shall be analyzed for total metals and shall not be filtered.

Summaries of water quality shall be submitted annually to the NHDES' Waste Management Division, in the month of December, using a format acceptable to the NHDES. The Annual

Report shall include a tabular summary of all monitoring results to date, an assessment of trends in the data, a groundwater contour map utilizing the most recent groundwater elevation data, an evaluation of the performance of the water quality monitoring program and any recommendations for modifications to the permit.

The Annual Report shall be prepared and stamped by a professional engineer or professional geologist licensed in the State of New Hampshire.

Please do not hesitate to contact the undersigned at 603-877-0116 if you have any questions or comments regarding the information contained within this report.

Sincerely,

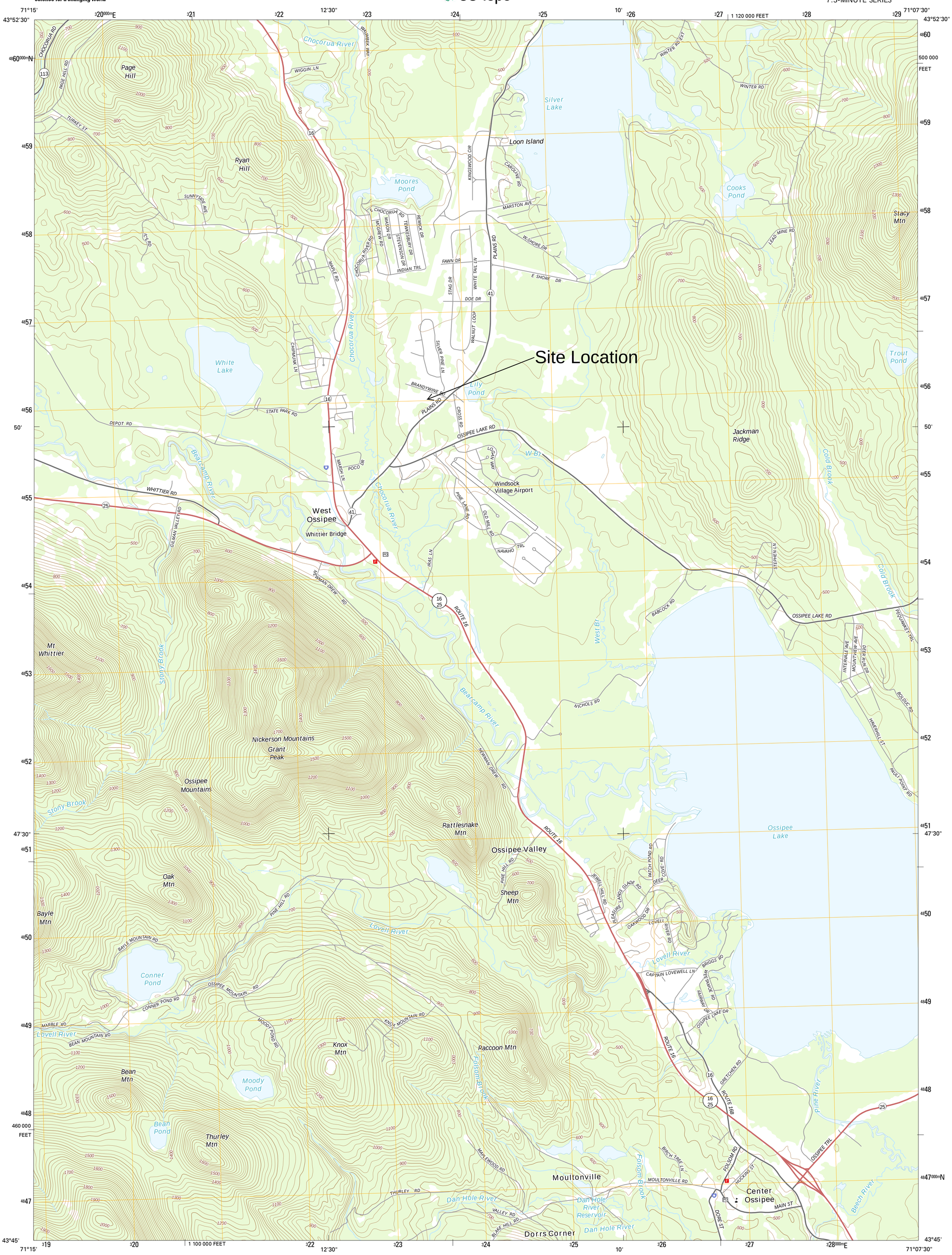
Joel F. Banaszak

APPENDIX A
Site Location Map

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

OSSIPEE LAKE QUADRANGLE
NEW HAMPSHIRE-CARROLL CO.
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 19T
10 000-foot ticks: New Hampshire Coordinate System of 1983

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, August 2012
Roads.....HERE, ©2013 - 2014
Names.....GNIS, 2015
Hydrography.....National Hydrography Dataset, 2012
Contours.....National Elevation Dataset, 2008
Boundaries.....Multiple sources; see metadata file 1972 - 2015

UTM GRID AND 2015 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
MN 15° 12' 270 MILS
GN 1° 31' 27 MILS

U.S. National Grid
100,000-m Square ID
CJ
Grid Zone Designation
19T

SCALE 1:24 000
1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18

NEW HAMPSHIRE
QUADRANGLE LOCATION

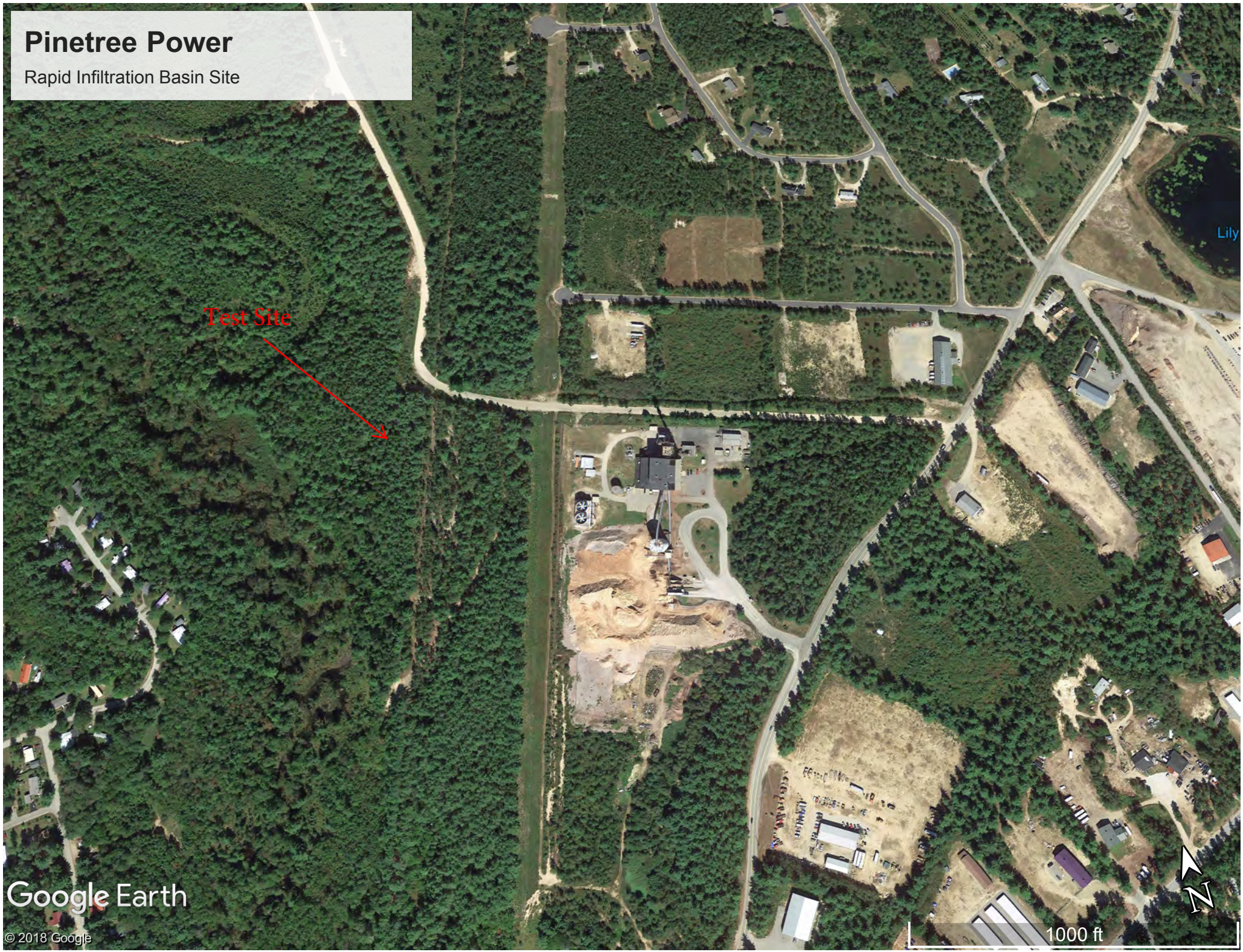
ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 Mount Chocorua
2 Silver Lake
3 Conway
4 Tamworth
5 Freedom
6 Melvin Village
7 Tuftonboro
8 Ossipee

OSSIPEE LAKE, NH
2015

NSN 7643016382280
NGA REF NO. USGSX24K33571


Pinetree Power
Rapid Infiltration Basin Site
Test Site
Lily
Google Earth
© 2018 Google
1000 ft
N

APPENDIX B
Temporary Groundwater Discharge Permit

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

December 28, 2018

JOEL F. BANASZAK
HORIZONS ENGINEERING, INC.
P.O. BOX 1825
NEW LONDON, NH 03257-1825

TEMPORARY DISCHARGE PERMIT

SUBJECT: TAMWORTH – ENGIE-Pine Tree Power, 469 Palins Road, Temporary Discharge Permit for Proposed Rapid Infiltration Basin Site
Site # 199407004 / RSN# 38933 / Activity # 264283

Dear Mr. Banaszak:

Please find enclosed the Temporary Discharge Permit Number TGP-199407004-T-001, approved by the Water Division of the Department of Environmental Services (NHDES) for the discharge of water for hydraulic basin testing activities.

The discharge shall not result in erosion or sedimentation into any surface water or wetland.

Please contact me at the number below or by e-mail at *mitchell.locker@des.nh.gov*.if you have any questions

Sincerely,

Mitchell Locker P.G.
Drinking Water & Groundwater Bureau

S:\WD-DWGB\...\...\2019mdl\Permits\199407004-T-001 tgp basintest.doc
e-copy: Stephen Roy, NHDES/DWGB
File
copy: Robert Lussier, Pine Tree Power, Inc.

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

The

NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES

WATER DIVISION

hereby issues

TEMPORARY DISCHARGE PERMIT

NO. TGP-199407004-T-001

to the permittee

ENGIE – PINE TREE POWER, INC.

for the discharge of water for basin testing

off of PLAINS ROAD

in TAMWORTH, NH

TO: PINE TREE POWER, INC.
469 PLAINS ROAD
TAMWORTH, NH 03886
ATTN: ROBERT LUSSIER

Date of Issuance: December 28, 2018
Date of Expiration: April 27, 2019

Pursuant to authority in N.H. RSA 485-A:13, I(a), the New Hampshire Department of Environmental Services (NHDES), hereby grants this permit to discharge water at the above described location subject to the following conditions:

(continued)

STANDARD PERMIT CONDITIONS

1. The permittee shall not violate surface water quality standards (N.H. Admin. Rules, Env-Wq 1700) in any surface water body.

2. The discharge shall not result in erosion or sedimentation on site or into any surface water, wetland, or storm water drainage way.

3. The discharge shall not cause a violation of the Ambient Groundwater Quality Standards adopted by the NHDES (N.H. Admin. Rules, Env-Wq-402). If the natural groundwater quality exceeds the AGQS the discharge shall not exceed the site's natural levels.

4. The permittee shall allow an authorized member of the NHDES' staff, or its agent, to enter the property covered by this permit for the purpose of collecting information, examining records, collecting samples, or undertaking other action associated with this permit.

5. The permittee shall comply with any conditions associated with this discharge that are stipulated by the municipality or county authority in which it is located.

6. The NHDES reserves the right under RSA 485-A, to require additional sampling of the discharge and/or discharge area.

7. Any chemical treatment or alteration of the discharge shall be documented.

8. Erosion controls shall be implemented and maintained to eliminate scouring and erosion as needed.

Mitchell D. Locker, P.G.
Water Division / Drinking Water & Groundwater Bureau

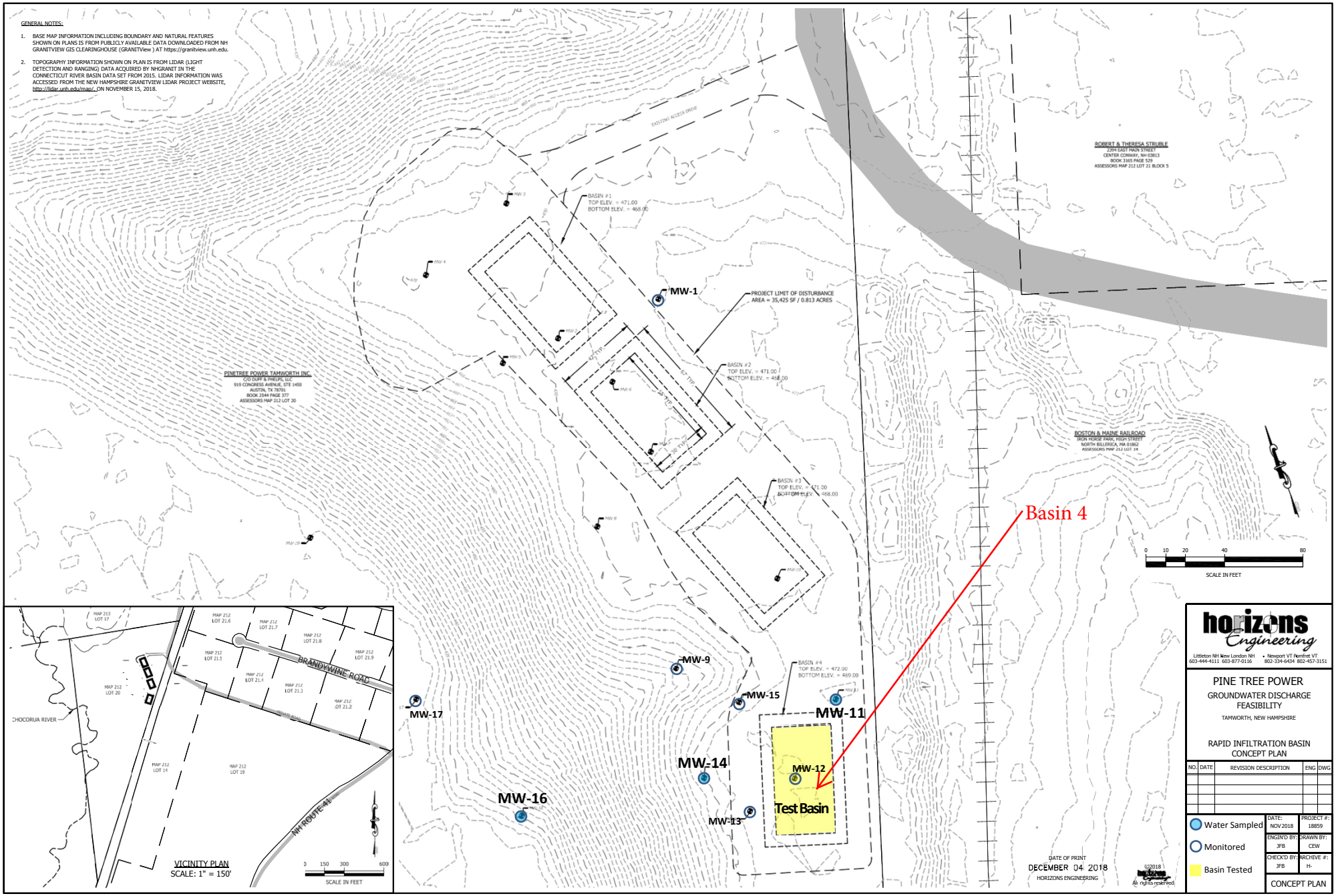
Under RSA 21-0:14 and 21-0:7-IV, any person aggrieved by any terms or conditions of this permit may appeal to the Water Council in accordance with RSA 541-A and N.H. Admin. Rules, Env-WC 200. Such appeal must be made to the Council within 30 days and must be addressed to the Chairman, Water Council, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095.

APPENDIX C
Annotated Site Plan

GENERAL NOTES:

1. BASE MAP INFORMATION INCLUDING BOUNDARY AND NATURAL FEATURES SHOWN ON PLANS IS FROM PUBLICLY AVAILABLE DATA DOWNLOADED FROM NH GRANITVIEW GIS CLEARINGHOUSE (GRANITView) AT https://granitview.unh.edu.

2. TOPOGRAPHY INFORMATION SHOWN ON PLAN IS FROM LIDAR (LIGHT DETECTION AND RANGING) DATA ACQUIRED BY NHGRANIT IN THE CONNECTICUT RIVER BASIN DATA SET FROM 2015. LIDAR INFORMATION WAS ACCESSED FROM THE NEW HAMPSHIRE GRANITVIEW LIDAR PROJECT WEBSITE, http://lidar.unh.edu/map/ ON NOVEMBER 15, 2018.



VICINITY PLAN
SCALE: 1" = 150'

horizons Engineering
Littleton NH New London NH • Newport VT Pomfret VT
603-444-4111 603-877-0116 • 802-334-6434 802-457-3151

PINE TREE POWER
GROUNDWATER DISCHARGE FEASIBILITY
TAMWORTH, NEW HAMPSHIRE

RAPID INFILTRATION BASIN CONCEPT PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

Water Sampled
Monitored
Basin Tested

DATE:	PROJECT #:
NOV 2018	18859
ENGN'D BY: JFB	DRAWN BY: CEW
CHECK'D BY: JFB	ARCHIVE #: H-

CONCEPT PLAN

DATE OF PRINT
DECEMBER 04 2018
HORIZONS ENGINEERING

APPENDIX D
Soil Boring Logs

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-1	MW-1

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 5, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 5, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.9 -71 11 59.94

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.66	TOC

SAMPLER

Type: None
Hammer (lb):
Fall (in):

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☑ Standpipe
- ☐ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.3' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.3' - 18.0' Medium to coarse sand, biege/tan, medium well sorted, dry, loose	~S~
5							
10							
15						18.0'-30.0' Medium to fine sand, white/biege, well sorted dry, loose	
20							

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND	INTERVAL (FT)	
Concrete		BGS
Backfill	0'-35'	BGS
Grout		BGS
Bentonite	35'-38'	BGS
Sand Pack	38'-50'	BGS
Riser Pipe	+3' - 40'	BGS
Screen	40' - 50'	BGS

SUMMARY	
Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- ~C~ CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-1	MW-1

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 5, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 5, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.9 -71 11 59.94

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.66	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☑ Standpipe ☐ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20						18.0'-30.0' Medium to fine sand, white/biege, well sorted dry, loose	
25							
30						30.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	~S~
35							
40							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

	INTERVAL (FT)
Concrete	
Backfill	0'-35' BGS
Grout	
Bentonite	35'-38' BGS
Sand Pack	38'-50' BGS
Riser Pipe	+3' - 40' BGS
Screen	40' - 50' BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-1	MW-1

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 5, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 5, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.9 -71 11 59.94

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.66	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☑ Standpipe
- ☐ None

Well Development

- ☐ Air Lift
- ☐ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40						30.0'-50.0' Fine sand, white/biege, well sorted dry, loose	~S~
45							
50							
55							
60							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		
	BGS	Overburden (linear ft.): 50
0'-35'	BGS	Feet of rock core/air hammer: 0
	BGS	Well solid riser pipe length:(ft) 43
35'-38'	BGS	Well standpipe height ags: 3
38'-50'	BGS	Well diameter (in.): 2
+3' - 40'	BGS	Screen length (ft.): 10
40' - 50'	BGS	Screen slot size: 0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-2	MW-2

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 5, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 5, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.89 -71 12 0.69

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.23	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0							
	S-24	3	16.5/24			0.0 - 0.5' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
		3				0.5' - 2.3' Fine sand, orangish-brown, well sorted, dry, very loose	
		4					
		5					
	S-25	4	19/24			2.3' - 18.0' Medium to coarse sand, beige, medium well sorted, dry,	
		5				loose	
		7					
		7					
5	S-26	5	17/24				
		9					
		9					
		8					
	S-27	6	17/24				
		8					
		6					
		6					
	S-28	7	18/24				
		5					
		7					
10		7					
	S-29	4	16/24				~S~
		6					
		7					
		9					
	S-30	7	22/24				
		7					
		6					
		7					
15	S-31	3	17/24				
		5					
		8					
		8					
	S-32	8	19/24				
		7					
		7					
		7					
	S-33	4	16/24			18.0' - 30.0' Medium to fine sand, tan/beige, well sorted, dry, loose	
		6					
		8					
20		8					

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND	INTERVAL (FT)	
Concrete		BGS
Backfill	0'-35'	BGS
Grout		BGS
Bentonite	35'-38'	BGS
Sand Pack	38'-50'	BGS
Riser Pipe	+3' - 40'	BGS
Screen	40' - 50'	BGS

SUMMARY	
Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-2	MW-2

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 5, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 5, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.89 -71 12 0.69

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.23	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20							
	S-34	3	15/24			18.0' - 30.0' Medium to fine sand, tan/beige, well sorted, dry, loose	
		6					
		6					
		5					
	S-35	10	21/24				
		9					
		4					
		6					
25	S-36	5	21/24				
		6					
		5					
		7					
	S-37	10	20/24				
		8					
		8					
		7					
	S-38	6	19/24				
		7					
		9					
30		8					~S~
	S-39	6	17/24			30.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	
		8					
		9					
		9					
	S-40	7	18/24				
		9					
		9					
		9					
35	S-41	6	20/24				
		12					
		9					
		9					
	S-42	9	21/24				
		8				Saturated soils at 37.0' bgs	
		10					
		11					
	S-43	5	22/24				
		6					
		9					
40		8					

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-2	MW-2

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 5, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 5, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.89 -71 12 0.69

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.23	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40	S-34	3 3 4 5	16/24			30.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	~S~
	NS					Standard penetration test could not be completed beyond 42 feet bgs due to flowing sands entering the borehole. 8.25" diameter hollow stem augers were advanced to a terminal depth of 50 feet bgs.	
45	NS						
	NS						
	NS						
50							
55							
60							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

Concrete
Backfill
Grout
Bentonite
Sand Pack
Riser Pipe
Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-3	MW-3

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 5, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 5, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 14.62 -71 12 0.7

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.08	TOC

SAMPLER

Type: None
Hammer (lb):
Fall (in):

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.5' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.5' - 16.0' Medium to coarse sand, biege/tan, medium well sorted, dry, loose	
5							
10							~S~
15						16.0'-30.0' Medium to fine sand, white/biege, well sorted dry, loose	
20							

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-3	MW-3

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 5, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 5, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 14.62 -71 12 0.7

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.08	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20						16.0'-30.0' Medium to fine sand, white/biege, well sorted dry, loose	
25							
30						30.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	~S~
35							
40							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

	INTERVAL (FT)	
Concrete		BGS
Backfill	0'-35'	BGS
Grout		BGS
Bentonite	35'-38'	BGS
Sand Pack	38'-50'	BGS
Riser Pipe	+3' - 40'	BGS
Screen	40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-3	MW-3

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 5, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 5, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 14.62 -71 12 0.7

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.08	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40						30.0'-50.0' Fine sand, white/biege, well sorted, dry, loose	~S~
45							
50							
55							
60							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		
	BGS	Overburden (linear ft.): 50
0'-35'	BGS	Feet of rock core/air hammer: 0
	BGS	Well solid riser pipe length:(ft) 43
35'-38'	BGS	Well standpipe height ags: 3
38'-50'	BGS	Well diameter (in.): 2
+3' - 40'	BGS	Screen length (ft.): 10
40' - 50'	BGS	Screen slot size: 0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-4	MW-4

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 6, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 6, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 14.42 -71 12 1.4

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.38	TOC

SAMPLER

Type: None
Hammer (lb):
Fall (in):

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.3' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.3' - 18.0' Medium to coarse sand, biege/tan, medium well sorted, dry, loose	
5							
10							~S~
15						18.0'-30.0' Medium to fine sand, white/biege, well sorted dry, loose	
20							

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY	
Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-4	MW-4

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 6, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 6, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 14.42 -71 12 1.4

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.38	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20						18.0'-26.0' Medium to fine sand, white/biege, well sorted dry, loose	
25						26.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	
30							~S~
35							
40							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-4	MW-4

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 6, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 6, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 14.42 -71 12 1.4

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.38	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40						26.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	~S~
45							
50							
55							
60							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		
	BGS	Overburden (linear ft.): 50
0'-35'	BGS	Feet of rock core/air hammer: 0
	BGS	Well solid riser pipe length:(ft) 43
35'-38'	BGS	Well standpipe height ags: 3
38'-50'	BGS	Well diameter (in.): 2
+3' - 40'	BGS	Screen length (ft.): 10
40' - 50'	BGS	Screen slot size: 0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-5	MW-5

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 6, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 6, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.87 -71 12 1.11

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.35	TOC

SAMPLER

Type: None
Hammer (lb):
Fall (in):

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.6' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.6' - 22.0' Medium to coarse sand, biege/tan, medium well sorted, dry, loose	
5							
10							~S~
15						22.0'-30.0' Medium to fine sand, white/biege, well sorted dry, loose	
20							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-5	MW-5

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 6, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 6, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.87 -71 12 1.11

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.35	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20							
						22.0'-30.0' Medium to fine sand, white/biege, well sorted dry, loose	
25							
30						30.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	~S~
35							
40							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

Concrete, Backfill, Grout, Bentonite, Sand Pack, Riser Pipe, Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND, SL SILT, C CLAY, SAND & GRAVEL, TILL, FILL, R/C ROCK / COMPETENT, R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-5	MW-5

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 6, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 6, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.87 -71 12 1.11

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.35	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40						30.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	~S~
45							
50							
55							
60							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		SUMMARY	
	BGS	Overburden (linear ft.):	50
0'-35'	BGS	Feet of rock core/air hammer:	0
	BGS	Well solid riser pipe length:(ft)	43
35'-38'	BGS	Well standpipe height ags:	3
38'-50'	BGS	Well diameter (in.):	2
+3' - 40'	BGS	Screen length (ft.):	10
40' - 50'	BGS	Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

horizons Engineering Inc.

BORING NO.:	WELL ID:
MW-6	MW-6

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 9, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 9, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.59 -71 12 0.44

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.89	TOC

SAMPLER

Type: None
Hammer (lb):
Fall (in):

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.6' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.6' - 10.0' Medium to coarse sand, biege/tan, medium well sorted, dry, loose	
10						10.0' - 20.0' Fine to medium sand, biege/tan, medium well sorted, dry, loose	~S~
20							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-6	MW-6

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 9, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 9, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.59 -71 12 0.44

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.35	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20						20.0'-33.0' Medium to fine sand, white/biege, well sorted dry, loose	
25							
30						33.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	~S~
35							
40							

NON-COHESIVE SOILS BLOWS/FT	CONSISTENCY	COHESIVE SOILS BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

INTERVAL (FT)	
	Concrete
0'-35'	Backfill
	Grout
35'-38'	Bentonite
38'-50'	Sand Pack
+3' - 40'	Riser Pipe
40' - 50'	Screen

SUMMARY

	BGS	Overburden (linear ft.): 50
0'-35'	BGS	Feet of rock core/air hammer: 0
	BGS	Well solid riser pipe length:(ft) 43
35'-38'	BGS	Well standpipe height ags: 3
38'-50'	BGS	Well diameter (in.): 2
+3' - 40'	BGS	Screen length (ft.): 10
40' - 50'	BGS	Screen slot size: 0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-6	MW-6

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 6, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 6, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.59 -71 12 0.44

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.89	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40						33.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	~S~
45							
50							
55							
60							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		SUMMARY	
	BGS	Overburden (linear ft.):	50
0'-35'	BGS	Feet of rock core/air hammer:	0
	BGS	Well solid riser pipe length:(ft)	43
35'-38'	BGS	Well standpipe height ags:	3
38'-50'	BGS	Well diameter (in.):	2
+3' - 40'	BGS	Screen length (ft.):	10
40' - 50'	BGS	Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-7	MW-7

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 7, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 7, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.19 -71 12 0.36

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.60	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0							
	S-45	3	19/24			0.0 - 0.3' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
		3				0.3' - 2.0' Medium to fine sand, orangish-tan, well sorted, dry, very loose	
		3				2.0' - 9.5' Medium to coarse sand, beige, medium well sorted, dry,	
		3				loose	
	S-46	4	19/24				
		4					
		4					
		4					
5	S-47	2	17/24				
		4					
		4					
		5					
	S-48	5	18/24				
		6					
		6					
		6					
	S-49	3	17/24				
		3					
		4				9.5' - 19.0' Fine to medium sand, white/beige, well sorted, dry, very loose to	
10		5				loose	
	S-50	2	20/24				~S~
		3					
		4					
		6					
	S-51	6	17/24				
		5					
		5					
		6					
15	S-52	3	17/24				
		4					
		4					
		6					
	S-53	6	18/24				
		5					
		5					
		7					
	S-54	5	21/24			19.0' - 24.0' Fine sand, white/beige, well sorted, dry, loose	
		7					
		9					
20		8					

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

Concrete, Backfill, Grout, Bentonite, Sand Pack, Riser Pipe, Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND, SL SILT, ~C~ CLAY, SAND & GRAVEL, TILL, FILL, R/C ROCK / COMPETENT, R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-7	MW-7

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 7, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 7, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.19 -71 12 0.36

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.60	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20	S-55	4	17/24			19.0' - 24.0' Fine sand, white/beige, well sorted, dry, loose	
		5					
		6					
		6					
	S-56	10	19/24				
		7					
		8					
		6					
25	S-57	3	17/24			24.0' - 33.0' Medium sand, beige, medium well sorted, dry, very loose to loose	
		5					
		6					
		6					
	S-58	7	18/24				
		6					
		6					
		6					
	S-59	4	17/24				
		5					
		7					
30		9					~S~
	S-60	4	19/24				
		8					
		8					
		9					
	S-61	8	17/24				
		9					
		9				33.0' - 50.0' Fine sand, white/beige, well sorted, dry, loose	
		9					
	S-62	5	21/24				
35		7					
		7					
		7					
	S-63	8	17/24				
		6					
		7					
		7					
	S-64	1	21/24				
		1					
		2					
40		3					

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

Concrete
Backfill
Grout
Bentonite
Sand Pack
Riser Pipe
Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-7	MW-7

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 7, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 7, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.19 -71 12 0.36

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.60	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40	S-65	1 1 2 2	0/24			33.0' - 50.0' Fine sand, white/beige, well sorted, dry, loose	~S~
	NS						
45	NS					Standard penetration test could not be completed beyond 42 feet bgs due to flowing sands entering the borehole. 8.25" diameter hollow stem augers were advanced to a terminal depth of 50 feet bgs.	
	NS						
50	NS						
55							
60							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		SUMMARY	
	BGS	Overburden (linear ft.):	50
0'-35'	BGS	Feet of rock core/air hammer:	0
	BGS	Well solid riser pipe length:(ft)	43
35'-38'	BGS	Well standpipe height ags:	3
38'-50'	BGS	Well diameter (in.):	2
+3' - 40'	BGS	Screen length (ft.):	10
40' - 50'	BGS	Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-8	MW-8

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 7, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 7, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 12.93 -71 12 0.89

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.62	TOC

SAMPLER

Type: None
Hammer (lb):
Fall (in):

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod ☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash ☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.3' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.3' - 12.0' Medium to coarse sand, biege/tan, medium well sorted, dry, loose	
5							
10						12.0' - 20.0' Fine to medium sand, biege/tan, medium well sorted, dry, loose	~S~
15							
20							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-8	MW-8

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 7, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 7, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 12.93 -71 12 0.89

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.62	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20						20.0'-30.0' Medium to fine sand, white/biege, well sorted dry, loose	
25							
30						30.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	~S~
35							
40							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

	INTERVAL (FT)	
Concrete		BGS
Backfill	0'-35'	BGS
Grout		BGS
Bentonite	35'-38'	BGS
Sand Pack	38'-50'	BGS
Riser Pipe	+3' - 40'	BGS
Screen	40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-8	MW-8

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 7, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 7, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 12.93 -71 12 0.89

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	39.62	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☑ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☐ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40						30.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	~S~
45							
50							
55							
60							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		
	BGS	Overburden (linear ft.): 50
0'-35'	BGS	Feet of rock core/air hammer: 0
	BGS	Well solid riser pipe length:(ft) 43
35'-38'	BGS	Well standpipe height ags: 3
38'-50'	BGS	Well diameter (in.): 2
+3' - 40'	BGS	Screen length (ft.): 10
40' - 50'	BGS	Screen slot size: 0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-9	MW-9

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 9, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 9, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 12.12 -71 12 0.72

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	33.95	TOC

SAMPLER

Type: None
Hammer (lb):
Fall (in):

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.3' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.3' - 22.0' Fine to medium sand, biege/tan, medium well sorted, dry, loose	
5							
10							~S~
15							
20							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-8	MW-8

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 7, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 7, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 12.12 -71 12 0.72

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	33.95	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20						22.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	
25							
30							~S~
35							
40							

NON-COHESIVE SOILS BLOWS/FT	CONSISTENCY	COHESIVE SOILS BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

INTERVAL (FT)	
	Concrete
0'-35'	Backfill
	Grout
35'-38'	Bentonite
38'-50'	Sand Pack
+3' - 40'	Riser Pipe
40' - 50'	Screen

SUMMARY

	BGS	Overburden (linear ft.): 50
0'-35'	BGS	Feet of rock core/air hammer: 0
	BGS	Well solid riser pipe length:(ft) 43
35'-38'	BGS	Well standpipe height ags: 3
38'-50'	BGS	Well diameter (in.): 2
+3' - 40'	BGS	Screen length (ft.): 10
40' - 50'	BGS	Screen slot size: 0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SI SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings.

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-9	MW-9

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 7, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 7, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 12.12 -71 12 0.72

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	33.95	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40						22.0' - 50.0' Fine sand, tan/beige, well sorted, dry, loose	~S~
45							
50							
55							
60							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		
	BGS	Overburden (linear ft.): 50
0'-35'	BGS	Feet of rock core/air hammer: 0
	BGS	Well solid riser pipe length:(ft) 43
35'-38'	BGS	Well standpipe height ags: 3
38'-50'	BGS	Well diameter (in.): 2
+3' - 40'	BGS	Screen length (ft.): 10
40' - 50'	BGS	Screen slot size: 0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-10	MW-10

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 8, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 8, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 12.37 -71 11 59.84

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.71	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0							
	S-66	3	16/24			0.0 - 0.3' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
		4				0.3' - 17.0' Medium to coarse sand, orangish-tan, medium well sorted, dry,	
		4				loose	
		4					
	S-67	4	17/24				
		2					
		2					
		3					
5	S-68	2	15/24				
		3					
		3					
		5					
	S-69	5	18/24				
		6					
		6					
		7.					
	S-70	3	17/24				
		4					
		6					
10		8					~S~
	S-71	3	17/24				
		7					
		4					
		6					
	S-72	6	20/24				
		5					
		5					
		6					
	S-73	3	18/24				
15		4					
		4					
		6					
	S-74	6	19/24				
		5					
		5				17.0'-50.0' Fine sand, white/biege, well sorted dry, loose	
		7					
	S-75	5	18/24				
		7					
		9					
20		8					

NON-COHESIVE SOILS BLOWS/FT	CONSISTENCY	COHESIVE SOILS BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

	INTERVAL (FT)	
Concrete		BGS
Backfill	0'-35'	BGS
Grout		BGS
Bentonite	35'-38'	BGS
Sand Pack	38'-50'	BGS
Riser Pipe	+3' - 40'	BGS
Screen	40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-10	MW-10

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 8, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 8, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 12.37 -71 11 59.84

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.71	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20	S-76	3 5 6 5	16/24			17.0'-50.0' Fine sand, white/biege, well sorted dry, loose	
	S-77	7 7 6 6	17/24				
25	S-78	4 7 7 8	15/24				
	S-79	8 8 9 8	18/24				
	S-80	6 7 9 10	17/24				
30	S-81	5 9 9 10	17/24				~S~
	S-82	8 5 8 8	20/24				
35	S-83	8 11 10 11	18/24				
	S-84	6 6 5 5	19/24			Saturated soils at 37' bgs	
	S-85	2 4 4 4	18/24				
40							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)	
	BGS
0'-35'	BGS
	BGS
35'-38'	BGS
38'-50'	BGS
+3' - 40'	BGS
40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-10	MW-10

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 8, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 8, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 12.37 -71 11 59.84

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.71	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40	S-86	3 5 6 5	24/24			17.0'-50.0' Fine sand, white/biege, well sorted dry, loose	~S~
	NS					Standard penetration test could not be completed beyond 42 feet bgs due to flowing sands entering the borehole. 8.25" diameter hollow stem augers were advanced to a terminal depth of 50 feet bgs.	
45	NS						
	NS						
	NS						
50							
55							
60							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		SUMMARY	
	BGS	Overburden (linear ft.):	50
0'-35'	BGS	Feet of rock core/air hammer:	0
	BGS	Well solid riser pipe length:(ft)	43
35'-38'	BGS	Well standpipe height ags:	3
38'-50'	BGS	Well diameter (in.):	2
+3' - 40'	BGS	Screen length (ft.):	10
40' - 50'	BGS	Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-11	MW-11

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 1, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 1, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.7 -71 11 59.75

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.91	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.4' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.4' - 2.0' Medium - fine sand, beige/ orange, well sorted, dry, very loose	~S~
						2.0' - 30.0' Medium sand with occasional gravel (<5%) tan/ beige, well sorted, dry, medium dense	S/G
5							
10							
15							
20							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

	INTERVAL (FT)	
Concrete		BGS
Backfill	0'-35'	BGS
Grout		BGS
Bentonite	35'-38'	BGS
Sand Pack	38'-50'	BGS
Riser Pipe	+3' - 40'	BGS
Screen	40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
S/G SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-11	MW-11

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 1, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 1, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.7 -71 11 59.75

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.91	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20						2.0' - 30.0' Medium sand with occasional gravel (<5%) tan/ beige, well sorted, dry, medium dense	~S~
25							
30						30.0' - 50.0' Fine sand, white/ beige, well sorted, dry, loose to medium dense	~S~
35							
40							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		SUMMARY	
	BGS	Overburden (linear ft.):	50
0'-35'	BGS	Feet of rock core/air hammer:	0
	BGS	Well solid riser pipe length:(ft)	43
35'-38'	BGS	Well standpipe height ags:	3
38'-50'	BGS	Well diameter (in.):	2
+3' - 40'	BGS	Screen length (ft.):	10
40' - 50'	BGS	Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- ~C~ CLAY
- ~S/G~ SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-11	MW-11

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 1, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 1, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.7 -71 11 59.75

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	40.91	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☑ Roadbox ☐ Standpipe ☐ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40						30.0' - 50.0' Fine sand, white/ beige, well sorted, dry, loose to medium dense	~S~
45							
50							
55							
60							

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		SUMMARY	
	BGS	Overburden (linear ft.):	50
0'-35'	BGS	Feet of rock core/air hammer:	0
	BGS	Well solid riser pipe length:(ft)	43
35'-38'	BGS	Well standpipe height ags:	3
38'-50'	BGS	Well diameter (in.):	2
+3' - 40'	BGS	Screen length (ft.):	10
40' - 50'	BGS	Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-12	MW-12

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 1, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 1, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.4 -71 12 0.21

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.30	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0							
	S-1	3	17/24			0.0 - 0.3' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
		3				0.3' - 1.6' Medium - fine sand, beige/ orange, well sorted, dry, very loose	~S~
		3					
		4				1.6' - 28.0' Medium sand with occasional gravel (<5%) tan/ beige, well	
	S-2	4	16/24			sorted, dry, medium dense	
		5					
		6					
		6					
5	S-3	4	14/24				
		5					
		7					
		6					
	S-4	11	18/24				
		7					
		8					
		10					
	S-5	5	13/24				
		8					
		8					
10		7					
	S-6	5	16/24				S/G
		6					
		8					
		10					
	S-7	13	21/24				
		7					
		7					
		8					
15	S-8	5	14/24				
		9					
		7					
		7					
	S-9	10	18/24				
		9					
		9					
		8					
	S-10	4	15/24				
		4					
		4					
20		5					

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

	INTERVAL (FT)	
Concrete		BGS
Backfill	0'-35'	BGS
Grout		BGS
Bentonite	35'-38'	BGS
Sand Pack	38'-50'	BGS
Riser Pipe	+3' - 40'	BGS
Screen	40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C~ CLAY
S/G SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-12	MW-12

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 1, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 1, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.4 -71 12 0.21

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.30	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☑ Roadbox ☐ Standpipe ☐ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20	S-11	4 6 6 7	15/24			1.6' - 28.0' Medium sand with occasional gravel (<5%) tan/ beige, well sorted, dry, medium dense	
	S-12	8 4 7 8	19/24				
25	S-13	5 5 7 7	16/24				~S~
	S-14	9 11 10 10	19/24				
	S-15	6 9 10 11	17/24			28.0' - 50.0' Fine sand, white/ beige, well sorted, dry, loose to medium dense	
30	S-16	3 9 9 10	15/24				
	S-17	8 9 9 9	20/24				~S~
35	S-18	8 9 12 12	20/24				
	S-19	11 7 9 9	20/24				
	S-20	6 6 8 8	17/24				
40							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

Concrete, Backfill, Grout, Bentonite, Sand Pack, Riser Pipe, Screen

INTERVAL (FT)		
	BGS	Overburden (linear ft.):
0'-35'	BGS	Feet of rock core/air hammer:
	BGS	Well solid riser pipe length:(ft)
35'-38'	BGS	Well standpipe height ags:
38'-50'	BGS	Well diameter (in.):
+3' - 40'	BGS	Screen length (ft.):
40' - 50'	BGS	Screen slot size:

SUMMARY	
Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND, SL SILT, C CLAY, SAGR SAND & GRAVEL, TILL, FILL, R/C ROCK / COMPETENT, R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-12	MW-12

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 1, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 1, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.4 -71 12 0.21

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.30	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☑ Roadbox ☐ Standpipe ☐ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40							
	S-21	3	19/24			28.0' - 50.0' Fine sand, white/ beige, well sorted, dry, loose to	
		3				medium dense	
		4					
		6					
	S-22	3	24/24				
		6					
		8					
		11					
45	S-23	10	24/24				~S~
		10					
		10					
		27					
	NS					Standard penetration test could not be completed beyond 46 feet bgs	
						due to flowing sands entering the borehole. 8.25" diameter hollow stem	
						augers were advanced to a terminal depth of 50 feet bgs.	
	NS						
50							
55							
60							

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		SUMMARY	
	BGS	Overburden (linear ft.):	50
0'-35'	BGS	Feet of rock core/air hammer:	0
	BGS	Well solid riser pipe length:(ft)	43
35'-38'	BGS	Well standpipe height ags:	3
38'-50'	BGS	Well diameter (in.):	2
+3' - 40'	BGS	Screen length (ft.):	10
40' - 50'	BGS	Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES:

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-13	MW-13

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 2, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 2, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.32 -71 12 0.58

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.80	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.6' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.6' - 5.0' Medium - fine sand, beige/ orange, well sorted, dry, very loose	~S~
						5.0' - 28.0' Medium sand with occasional gravel (<5%) tan/ beige, well sorted, dry, medium dense	S/G
5							
10							
15							
20							

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

	INTERVAL (FT)	
Concrete		BGS
Backfill	0'-35'	BGS
Grout		BGS
Bentonite	35'-38'	BGS
Sand Pack	38'-50'	BGS
Riser Pipe	+3' - 40'	BGS
Screen	40' - 50'	BGS

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND	TILL
SL SILT	FILL
C CLAY	R/C ROCK / COMPETENT
S/G SAND & GRAVEL	R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-13	MW-13

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 2, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 2, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.32 -71 12 0.58

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.80	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☑ Roadbox ☐ Standpipe ☐ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20						5.0' - 28.0' Medium sand with occasional gravel (<5%) tan/ beige, well sorted, dry, medium dense	~S~
25							
30						28.0' - 50.0' Fine sand, white/ beige, well sorted, dry, loose to medium dense	~S~
35							
40							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		SUMMARY	
	BGS	Overburden (linear ft.):	50
0'-35'	BGS	Feet of rock core/air hammer:	0
	BGS	Well solid riser pipe length:(ft)	43
35'-38'	BGS	Well standpipe height ags:	3
38'-50'	BGS	Well diameter (in.):	2
+3' - 40'	BGS	Screen length (ft.):	10
40' - 50'	BGS	Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- ~C~ CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-13	MW-13

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 2, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 2, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.32 -71 12 0.58

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.80	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☑ Roadbox ☐ Standpipe ☐ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40						28.0' - 50.0' Fine sand, white/ beige, well sorted, dry, loose to medium dense	~S~
45							
50							
55							
60							

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		SUMMARY	
	BGS	Overburden (linear ft.):	50
0'-35'	BGS	Feet of rock core/air hammer:	0
	BGS	Well solid riser pipe length:(ft)	43
35'-38'	BGS	Well standpipe height ags:	3
38'-50'	BGS	Well diameter (in.):	2
+3' - 40'	BGS	Screen length (ft.):	10
40' - 50'	BGS	Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-14	MW-14

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 2, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 2, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.56 -71 12 0.39

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.52	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.6' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.6' - 28.0' Medium sand with occasional gravel (<5%) tan/ beige, well sorted, dry, medium dense	
5							
10							S/G
15							
20							

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

	Concrete
	Backfill
	Grout
	Bentonite
	Sand Pack
	Riser Pipe
	Screen

INTERVAL (FT)		
	BGS	Overburden (linear ft.): 50
0'-35'	BGS	Feet of rock core/air hammer: 0
	BGS	Well solid riser pipe length:(ft) 43
35'-38'	BGS	Well standpipe height ags: 3
38'-50'	BGS	Well diameter (in.): 2
+3' - 40'	BGS	Screen length (ft.): 10
40' - 50'	BGS	Screen slot size: 0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
~C~ CLAY
S/G SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-14	MW-14

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 2, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 2, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.56 -71 12 0.39

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.52	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☑ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20						0.6' - 28.0' Medium sand with occasional gravel (<5%) tan/ beige, well sorted, dry, medium dense	~S~
25							
30						28.0' - 50.0' Fine sand, white/ beige, well sorted, dry, loose to medium dense	~S~
35							
40							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		
	BGS	Overburden (linear ft.):
0'-35'	BGS	Feet of rock core/air hammer:
	BGS	Well solid riser pipe length:(ft)
35'-38'	BGS	Well standpipe height ags:
38'-50'	BGS	Well diameter (in.):
+3' - 40'	BGS	Screen length (ft.):
40' - 50'	BGS	Screen slot size:

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-14	MW-14

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 2, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 2, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.56 -71 12 0.39

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.52	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☑ Roadbox ☐ Standpipe ☐ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40						28.0' - 50.0' Fine sand, white/ beige, well sorted, dry, loose to medium dense	~S~
45							
50							
55							
60							

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		SUMMARY	
	BGS	Overburden (linear ft.):	50
0'-35'	BGS	Feet of rock core/air hammer:	0
	BGS	Well solid riser pipe length:(ft)	43
35'-38'	BGS	Well standpipe height ags:	3
38'-50'	BGS	Well diameter (in.):	2
+3' - 40'	BGS	Screen length (ft.):	10
40' - 50'	BGS	Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-15	MW-15

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 8, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 8, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.85 -71 12 0.39

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.18	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☑ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.5' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.5' - 3.0' Medium - fine sand, beige/ orange, well sorted, dry, very loose	~S~
						3.0' - 30.0' Medium sand with occasional gravel (<5%) tan/ beige, well sorted, dry, medium dense	S/G
5							
10							
15							
20							

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

	Concrete
	Backfill
	Grout
	Bentonite
	Sand Pack
	Riser Pipe
	Screen

INTERVAL (FT)		
	BGS	Overburden (linear ft.): 50
0'-35'	BGS	Feet of rock core/air hammer: 0
	BGS	Well solid riser pipe length:(ft) 43
35'-38'	BGS	Well standpipe height ags: 3
38'-50'	BGS	Well diameter (in.): 2
+3' - 40'	BGS	Screen length (ft.): 10
40' - 50'	BGS	Screen slot size: 0.01

LITHOLOGIC DESCRIPTION

~S~ SAND	TILL
SL SILT	FILL
C CLAY	R/C ROCK / COMPETENT
S/G SAND & GRAVEL	R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-15	MW-15

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 8, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 8, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.85 -71 12 0.39

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.18	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☑ Roadbox ☐ Standpipe ☐ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
20						3.0' - 30.0' Medium sand with occasional gravel (<5%) tan/ beige, well sorted, dry, medium dense	
25							S/G
30						30.0' - 50.0' Fine sand, white/ beige, well sorted, dry, loose to medium dense	
35							~S~
40							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		
	BGS	Overburden (linear ft.):
0'-35'	BGS	Feet of rock core/air hammer:
	BGS	Well solid riser pipe length:(ft)
35'-38'	BGS	Well standpipe height ags:
38'-50'	BGS	Well diameter (in.):
+3' - 40'	BGS	Screen length (ft.):
40' - 50'	BGS	Screen slot size:

SUMMARY

Overburden (linear ft.):	50
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	43
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- S/G SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-15	MW-15

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 8, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 8, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.85 -71 12 0.39

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	41.18	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☑ Roadbox
- ☐ Standpipe
- ☐ None

Well Development

- ☐ Air Lift
- ☐ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
40						30.0' - 50.0' Fine sand, white/ beige, well sorted, dry, loose to medium dense	~S~
45							
50							
55							
60							

NON-COHESIVE SOILS

BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE
4 - 10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	CONSISTENCY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		SUMMARY	
	BGS	Overburden (linear ft.):	50
0'-35'	BGS	Feet of rock core/air hammer:	0
	BGS	Well solid riser pipe length:(ft)	43
35'-38'	BGS	Well standpipe height ags:	3
38'-50'	BGS	Well diameter (in.):	2
+3' - 40'	BGS	Screen length (ft.):	10
40' - 50'	BGS	Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-16	MW-16

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 8, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 8, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 11.7 -71 12 2.08

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	3.09	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

- ☐ Truck
- ☑ ATV
- ☐ Tripod
- ☑ Hollow Stem Auger
- ☐ Cable Tool
- ☐ Drive & Wash
- ☐ Mud Rotary
- ☐ Dual Rotary
- ☐ Direct Push

Protective Casing

- ☐ Roadbox
- ☐ Standpipe
- ☑ None

Well Development

- ☐ Air Lift
- ☐ Bailer
- ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.5' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.5' - 20.0' Medium - fine sand, beige/ orange, well sorted, saturated, very loose	
5							
10							~S~
15							
20							

NON-COHESIVE SOILS		COHESIVE SOILS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

- Concrete
- Backfill
- Grout
- Bentonite
- Sand Pack
- Riser Pipe
- Screen

INTERVAL (FT)		
	BGS	
0' - 5'	BGS	
	BGS	
5' -8'	BGS	
8'-20'	BGS	
+3' - 10'	BGS	
10' - 20'	BGS	

SUMMARY

Overburden (linear ft.):	20
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	13
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

- ~S~ SAND
- SL SILT
- C CLAY
- SAND & GRAVEL
- TILL
- FILL
- R/C ROCK / COMPETENT
- R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-17	MW-17

Page 1 of 1

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 9, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 9, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 12.43 -71 12 2.41

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	3.33	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.5' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.5' - 20.0' Medium - fine sand, beige/ orange, well sorted, saturated, very loose	
5							
10							~S~
15							
20							

NON-COHESIVE SOILS BLOWS/FT	CONSISTENCY	COHESIVE SOILS BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

	INTERVAL (FT)	
Concrete		BGS
Backfill	0' - 5'	BGS
Grout		BGS
Bentonite	5' -8'	BGS
Sand Pack	8'-20'	BGS
Riser Pipe	+3' - 10'	BGS
Screen	10' - 20'	BGS

SUMMARY

Overburden (linear ft.):	20
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	13
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-18	MW-18

Page 1 of 1

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 9, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 9, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 12.89 -71 12 2.41

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	3.33	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.5' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.5' - 20.0' Medium - fine sand, beige/ orange, well sorted, saturated, very loose	
5							
10							~S~
15							
20							

NON-COHESIVE SOILS BLOWS/FT	CONSISTENCY	COHESIVE SOILS BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

	INTERVAL (FT)	
Concrete		BGS
Backfill	0' - 5'	BGS
Grout		BGS
Bentonite	5' -8'	BGS
Sand Pack	8'-20'	BGS
Riser Pipe	+3' - 10'	BGS
Screen	10' - 20'	BGS

SUMMARY

Overburden (linear ft.):	20
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	13
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

SOIL BORING LOG & WELL DIAGRAM

BORING NO.:	WELL ID:
MW-19	MW-19

Page 1 of 1

PROJECT	Pinetree Power - Rapid Infiltration Basin	**HORIZONS FILE NO.**	18859
LOCATION	Tamworth, New Hampshire	**PROJECT MGR.**	Joel F. Banaszak
CLIENT	ENGIE - Pinetree Power	**FIELD REP.**	Joel F. Banaszak, P.G.
CONTRACTOR	Geosearch, Inc. - Sterling, MA	**DATE STARTED**	November 9, 2018
DRILLER	Joseph Keenan	**DATE COMPLETED**	November 9, 2018

Elevation: ft. **Datum:** Assumed **Boring Location:** 43 50 13.38 -71 12 2.79

GROUNDWATER READINGS

Date	Depth (ft)	Reference
11/14/18	3.16	TOC

SAMPLER

Type: None
Hammer (lb): 140
Fall (in): 30

Rig Make & Model: Central Mining Equipment 55

☐ Truck ☑ ATV ☐ Tripod
☑ Hollow Stem Auger ☐ Cable Tool ☐ Drive & Wash
☐ Mud Rotary ☐ Dual Rotary ☐ Direct Push

Protective Casing: ☐ Roadbox ☐ Standpipe ☑ None

Well Development: ☐ Air Lift ☐ Bailer ☐ Peristaltic

DEPTH (FT)	SAMPLE ID	BLOWS PER 6 IN	REC / PEN (IN)	FIELD SCREENING (ppm)	WELL DETAIL	SAMPLE DESCRIPTION	LITHOLOGIC DESCRIPTION
0						0.0 - 0.5' Topsoil/ vegetative debris, dark brown, silty, moist, medium dense	SL
						0.5' - 20.0' Medium - fine sand, beige/ orange, well sorted, saturated, very loose	
5							
10							~S~
15							
20							

NON-COHESIVE SOILS BLOWS/FT	CONSISTENCY	COHESIVE SOILS BLOWS/FT	CONSISTENCY
0 - 4	V. LOOSE	<2	V. SOFT
4 - 10	LOOSE	2 - 4	SOFT
10 - 30	M. DENSE	4 - 8	M. STIFF
30 - 50	DENSE	8 - 15	STIFF
>50	V. DENSE	15 - 30	V. STIFF
		>30	HARD

LEGEND

	INTERVAL (FT)	
Concrete		BGS
Backfill	0' - 5'	BGS
Grout		BGS
Bentonite	5' -8'	BGS
Sand Pack	8'-20'	BGS
Riser Pipe	+3' - 10'	BGS
Screen	10' - 20'	BGS

SUMMARY

Overburden (linear ft.):	20
Feet of rock core/air hammer:	0
Well solid riser pipe length:(ft)	13
Well standpipe height ags:	3
Well diameter (in.):	2
Screen length (ft.):	10
Screen slot size:	0.01

LITHOLOGIC DESCRIPTION

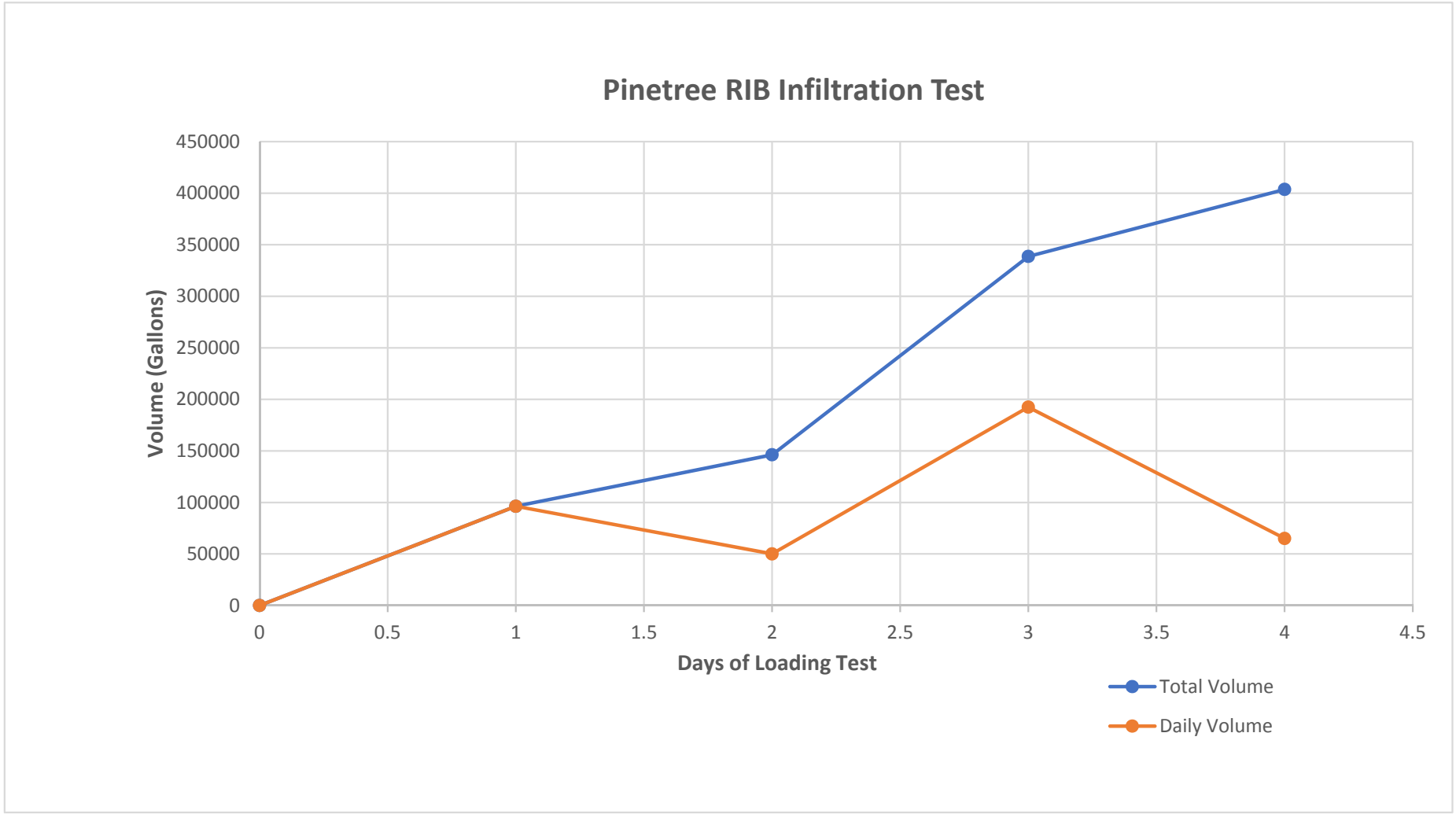
~S~ SAND
SL SILT
C CLAY
SAND & GRAVEL
TILL
FILL
R/C ROCK / COMPETENT
R/W ROCK / WEATHERED

NOTES: Lithology logged from auger cuttings

APPENDIX E
Load Test I, Basin Loading Log

Date	Time		Dilution	Volume	Total Volume	Volume per Day	Volume of Effluent
1/8/2019	8:30	1/08/19 08:30:00	.25 Circ	5000	5000		
1/8/2019	8:45	1/08/19 08:45:00	.25 Circ	4200	9200		
1/8/2019	9:00	1/08/19 09:00:00	.25 Circ	5000	14200		
1/8/2019	9:30	1/08/19 09:30:00	.25 Circ	4200	18400		
1/8/2019	9:45	1/08/19 09:45:00	.25 Circ	5000	23400		
1/8/2019	10:07	1/08/19 10:07:00	.25 Circ	4200	27600		
1/8/2019	10:15	1/08/19 10:15:00	.25 Circ	5000	32600		
1/8/2019	10:40	1/08/19 10:40:00	.25 Circ	4200	36800		
1/8/2019	10:50	1/08/19 10:50:00	.25 Circ	5000	41800		
1/8/2019	11:15	1/08/19 11:15:00	.25 Circ	4200	46000		
1/8/2019	11:30	1/08/19 11:30:00	.25 Circ	5000	51000		
1/8/2019	11:47	1/08/19 11:47:00	.25 Circ	4200	55200		
1/8/2019	12:00	1/08/19 12:00:00	.25 Circ	5000	60200		
1/8/2019	12:17	1/08/19 12:17:00	.25 Circ	4200	64400		
1/8/2019	12:30	1/08/19 12:30:00	.25 Circ	5000	69400		
1/8/2019	12:50	1/08/19 12:50:00	.25 Circ	4200	73600		
1/8/2019	13:10	1/08/19 13:10:00	.25 Circ	5000	78600		
1/8/2019	13:22	1/08/19 13:22:00	.25 Circ	4200	82800		
1/8/2019	13:35	1/08/19 13:35:00	.25 Circ	5000	87800		
1/8/2019	13:47	1/08/19 13:47:00	.25 Circ	4200	92000		
1/8/2019	14:17	1/08/19 14:17:00	.25 Circ	4200	96200	96200	24050
1/9/2019	8:00	1/09/19 08:00:00	.25 Circ	5000	101200		
1/9/2019	8:35	1/09/19 08:35:00	.25 Circ	5000	106200		
1/9/2019	9:10	1/09/19 09:10:00	.25 Circ	5000	111200		
1/9/2019	9:44	1/09/19 09:44:00	.25 Circ	5000	116200		
1/9/2019	10:19	1/09/19 10:19:00	.25 Circ	5000	121200		
1/9/2019	10:51	1/09/19 10:51:00	.25 Circ	5000	126200		
1/9/2019	11:23	1/09/19 11:23:00	.25 Circ	5000	131200		
1/9/2019	11:54	1/09/19 11:54:00	.25 Circ	5000	136200		
1/9/2019	12:25	1/09/19 12:25:00	.25 Circ	5000	141200		
1/9/2019	12:59	1/09/19 12:59:00	.25 Circ	5000	146200	50000	12500
1/10/2019	7:53	1/10/19 07:53:00	.25 Circ	4200	150400		
1/10/2019	8:13	1/10/19 08:13:00	.25 Circ	5000	155400		
1/10/2019	8:15	1/10/19 08:15:00	.25 Circ	4200	159600		
1/10/2019	8:34	1/10/19 08:34:00	.25 Circ	5000	164600		
1/10/2019	8:36	1/10/19 08:36:00	.25 Circ	4200	168800		
1/10/2019	8:58	1/10/19 08:58:00	.25 Circ	5000	173800		
1/10/2019	9:00	1/10/19 09:00:00	.25 Circ	4200	178000		
1/10/2019	9:21	1/10/19 09:21:00	.25 Circ	5000	183000		
1/10/2019	9:22	1/10/19 09:22:00	.25 Circ	4200	187200		
1/10/2019	9:43	1/10/19 09:43:00	.25 Circ	4200	191400		
1/10/2019	9:44	1/10/19 09:44:00	.25 Circ	5000	196400		
1/10/2019	10:05	1/10/19 10:05:00	.25 Circ	4200	200600		
1/10/2019	10:06	1/10/19 10:06:00	.25 Circ	5000	205600		
1/10/2019	10:26	1/10/19 10:26:00	.25 Circ	4200	209800		
1/10/2019	10:28	1/10/19 10:28:00	.25 Circ	5000	214800		
1/10/2019	10:49	1/10/19 10:49:00	.25 Circ	5000	219800		
1/10/2019	10:51	1/10/19 10:51:00	.25 Circ	4200	224000		
1/10/2019	11:09	1/10/19 11:09:00	.25 Circ	4200	228200		
1/10/2019	11:10	1/10/19 11:10:00	.25 Circ	5000	233200		
1/10/2019	11:31	1/10/19 11:31:00	.25 Circ	4200	237400		
1/10/2019	11:32	1/10/19 11:32:00	.25 Circ	5000	242400		
1/10/2019	11:53	1/10/19 11:53:00	.25 Circ	4200	246600		
1/10/2019	12:16	1/10/19 12:16:00	.25 Circ	5000	251600		
1/10/2019	12:17	1/10/19 12:17:00	.25 Circ	4200	255800		
1/10/2019	12:37	1/10/19 12:37:00	.25 Circ	4200	260000		
1/10/2019	12:38	1/10/19 12:38:00	.25 Circ	5000	265000		

Date	Time		Dilution	Volume	Total Volume	Volume per Day	Volume of Effluent
1/10/2019	13:00	1/10/19 13:00:00	.25 Circ	4200	269200		
1/10/2019	13:01	1/10/19 13:01:00	.25 Circ	5000	274200		
1/10/2019	13:21	1/10/19 13:21:00	.25 Circ	4200	278400		
1/10/2019	13:23	1/10/19 13:23:00	.25 Circ	5000	283400		
1/10/2019	13:43	1/10/19 13:43:00	.25 Circ	5000	288400		
1/10/2019	13:45	1/10/19 13:45:00	.25 Circ	4200	292600		
1/10/2019	14:08	1/10/19 14:08:00	.25 Circ	5000	297600		
1/10/2019	14:09	1/10/19 14:09:00	.25 Circ	4200	301800		
1/10/2019	14:32	1/10/19 14:32:00	.25 Circ	5000	306800		
1/10/2019	14:33	1/10/19 14:33:00	.25 Circ	4200	311000		
1/10/2019	14:53	1/10/19 14:53:00	.25 Circ	4200	315200		
1/10/2019	14:54	1/10/19 14:54:00	.25 Circ	5000	320200		
1/10/2019	15:16	1/10/19 15:16:00	.25 Circ	5000	325200		
1/10/2019	15:17	1/10/19 15:17:00	.25 Circ	4200	329400		
1/10/2019	15:43	1/10/19 15:43:00	.25 Circ	5000	334400	188200	47050
1/11/2019	8:20	1/11/19 08:20:00	.25 Circ	5000	339400		
1/11/2019	8:45	1/11/19 08:45:00	.25 Circ	5000	344400		
1/11/2019	9:09	1/11/19 09:09:00	.25 Circ	5000	349400		
1/11/2019	9:38	1/11/19 09:38:00	.25 Circ	5000	354400		
1/11/2019	10:03	1/11/19 10:03:00	.25 Circ	5000	359400		
1/11/2019	10:26	1/11/19 10:26:00	.25 Circ	5000	364400		
1/11/2019	10:50	1/11/19 10:50:00	.25 Circ	5000	369400		
1/11/2019	11:15	1/11/19 11:15:00	.25 Circ	5000	374400		
1/11/2019	11:36	1/11/19 11:36:00	.25 Circ	5000	379400		
1/11/2019	12:00	1/11/19 12:00:00	.25 Circ	5000	384400		
1/11/2019	12:24	1/11/19 12:24:00	.25 Circ	5000	389400		
1/11/2019	12:48	1/11/19 12:48:00	.25 Circ	5000	394400		
1/11/2019	13:17	1/11/19 13:17:00	.25 Circ	5000	399400	65000	16250
					Total Volume	399400	99850


Pinetree RIB Infiltration Test
Volume (Gallons)
450000
400000
350000
300000
250000
200000
150000
100000
50000
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
Days of Loading Test
Total Volume
Daily Volume

ROBERT
978-660-3980

JOEL - HORIZONS
603-616-1334

Pinetree Power - RIB Infiltration Test

Pg.

Date:

Time	Volume (gal)	Dilution Ratio	Notes	Initials
830	5000	25%	1/8/19	RC.
	"	"	8/19	RC
	"	"	18/19	RC
	"	"	"	RC
	"	"	"	RC
	"	"	"	RC
	"	"		RC
	"	"	"	RC
	"	"	"	RC
3:00	5000	"	"	RC.
	50,000			

Pinetree Power - RIB Infiltration Test

Pg.

Date:

Time	Volume (gal)	Dilution Ratio	Notes	Initials
8:00	5000	25/1	1/9/19	RC
8:35	"	"	"	RC
9:10		"	"	RC
9:44		"	"	RC
10:19		"	"	RC
10:51		"	"	RC
11:23		"	"	RC
11:59		"	"	RC
12:26		"	"	RC
12:59	5000	"	"	RC
			50,000 gal	

Pinetree Power - RIB Infiltration Test

Pg.

Date:

Time	Volume (gal)	Dilution Ratio	Notes	Initials
8:13	5000	25%		STB
8:34				STB
8:58				STB
9:21				STB
9:43				STB
10:06				STB
10:28				STB
10:49				STB
11:10				STB
11:32				STB
12:16				STB
12:38				STB
1:00				STB
1:23				STB
1:43				STB
2:09				STB
2:32				STB
2:54				STB
3:16				STB
3:43	↓	↓	100,000 gal	STB

8:20 5000 25%

8:45

9:09

9:38

10:03

10:26

10:50

11:15

11:36

12:00

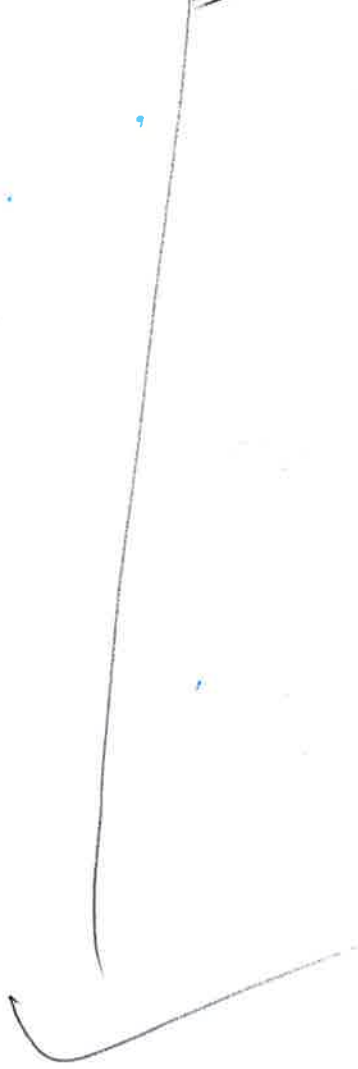
12:24

12:48

1:17

65,000

SB



Robert
978-660-3480

JOEL - Horizons
603-616-1334

Pinetree Power - RIB Infiltration Test

Pg.

Date:

Time	Volume (gal)	Dilution Ratio	Notes	Initials
8:45	4000	25% - 75%	1/8/19	J.C
9:30	4000	25% 75%		J.C
10:07	4000	25 - 75%		J.C
10:40	4000	25 - 75%		J.C
11:15	4000	25 - 75%		J.C
11:47	4000	25% - 75%		J.C
12:17	4000	25% - 75%		J.C
12:50	4000	25% - 75%		J.C
1:22	4000	25% - 75%		J.C
1:47	4000	25% 75%		J.C
2:17	4000	25% 75%		J.C
7:53	4200	25 - 75	1/10/19	J.C
8:15	4200	25 - 75%		J.C
8:36	4200	25% 75%		J.C
9:00	4200	25% 75%		J.C
9:21	4200	25% - 75%		J.C
9:43	4200	25% - 75%		J.C
10:05	4200	25% - 75%		J.C
10:26	4200	25% - 75%		J.C
10:51	4200	25% - 75%		J.C
11:09	4200	25% - 75%		J.C
11:31	4200	25% 75%		J.C
11:53	4200	25% - 75%		J.C
12:17	4200	25% - 75%		J.C
12:37	4200	25% - 75%		J.C
1:00	4200	25% - 75%		J.C
1:21	4200	25% - 75%		J.C
1:45	4200	25% - 75%		J.C

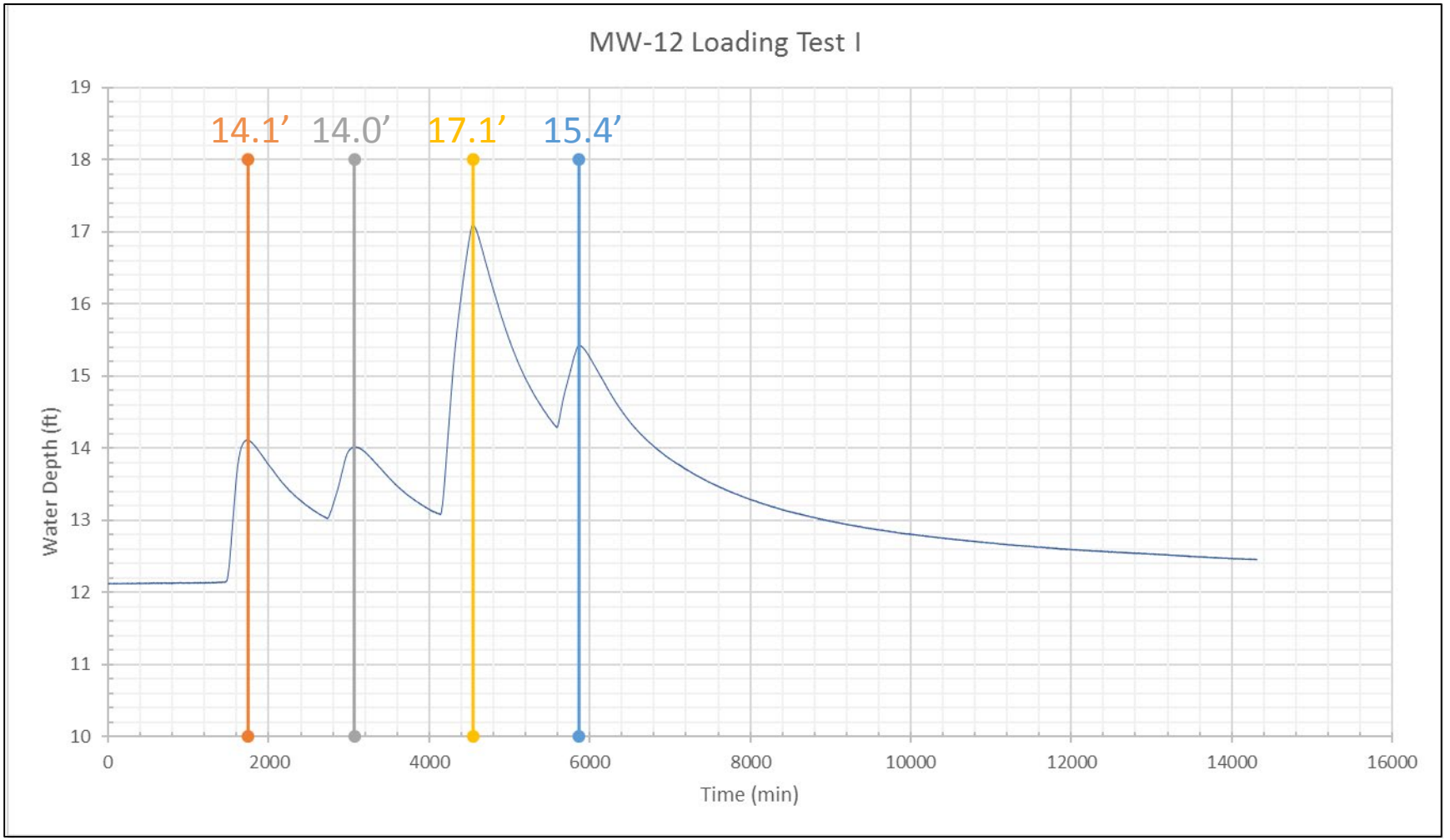
,netree Power - RIB Infiltration Test

Pg.

Date:

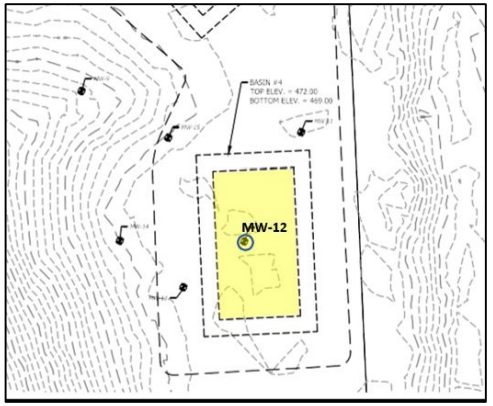
Time	Volume (gal)	Dilution Ratio	Notes	Initials
2:09	4200	25% - 75%	11/10/19	J.C
2:32	4200	25% - 75%	↓	J.C
2:53	4200	25% - 75%		J.C
3:17	4200	25% - 75%		J.C

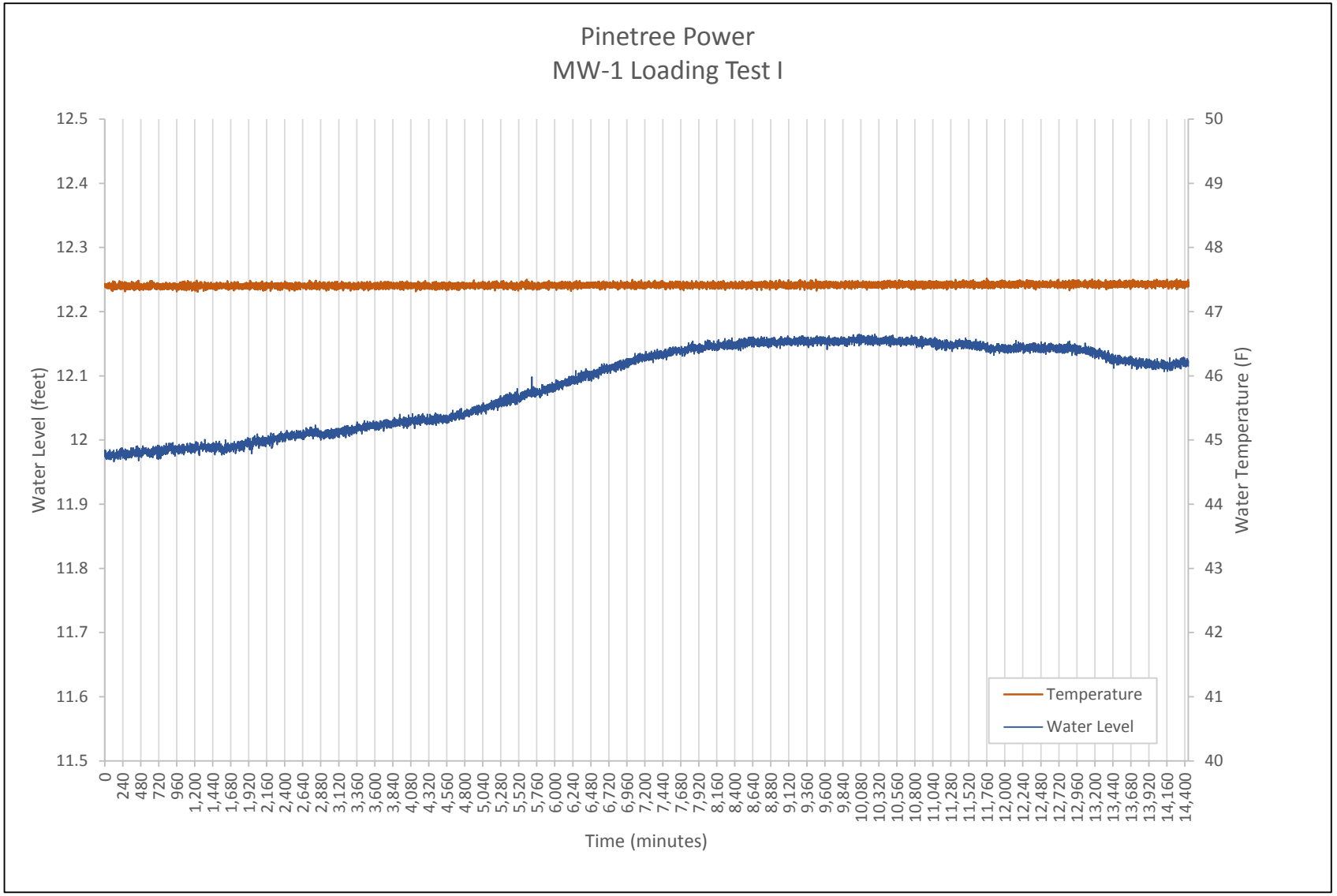
APPENDIX F
Load Test I, Water Level Graphs

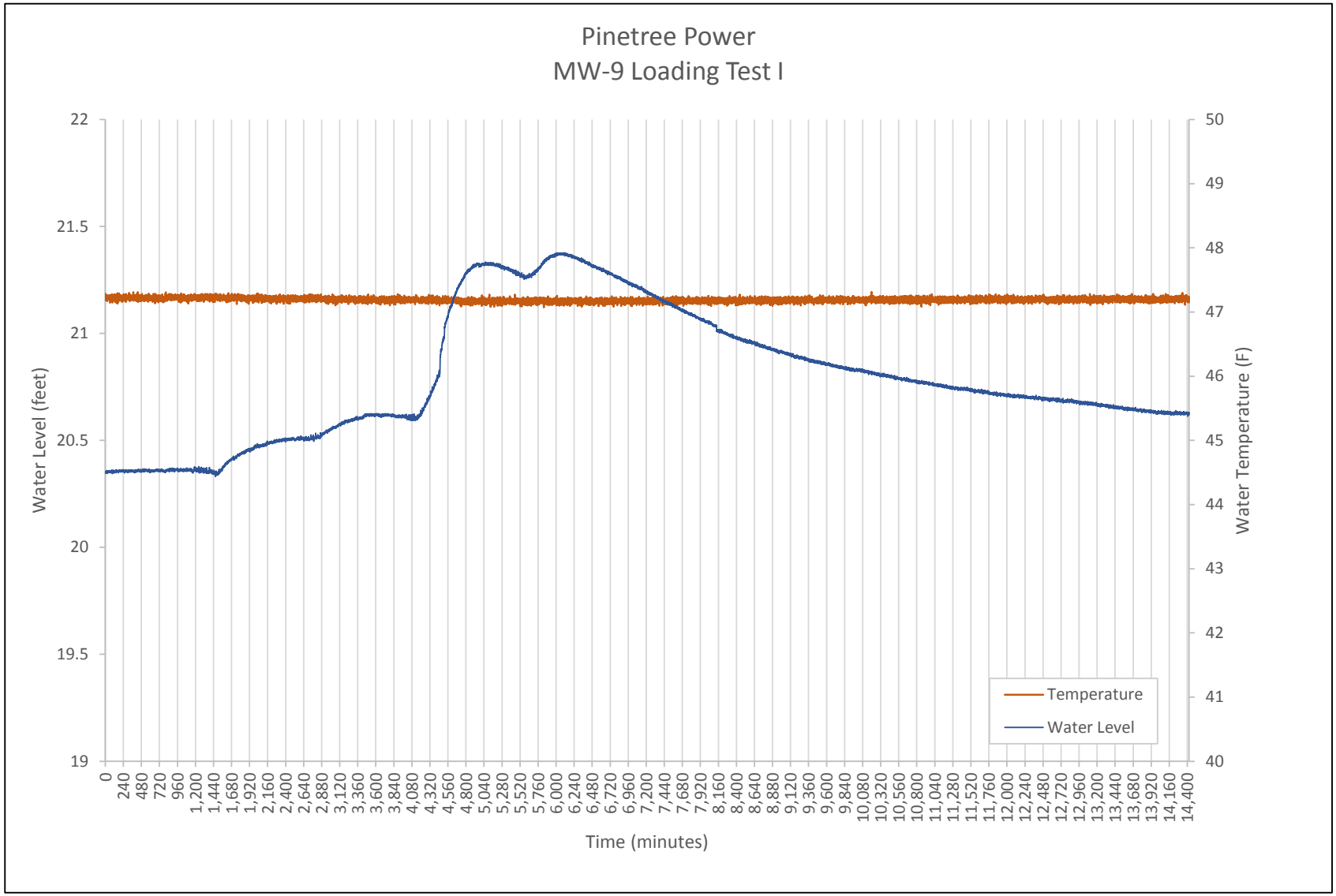


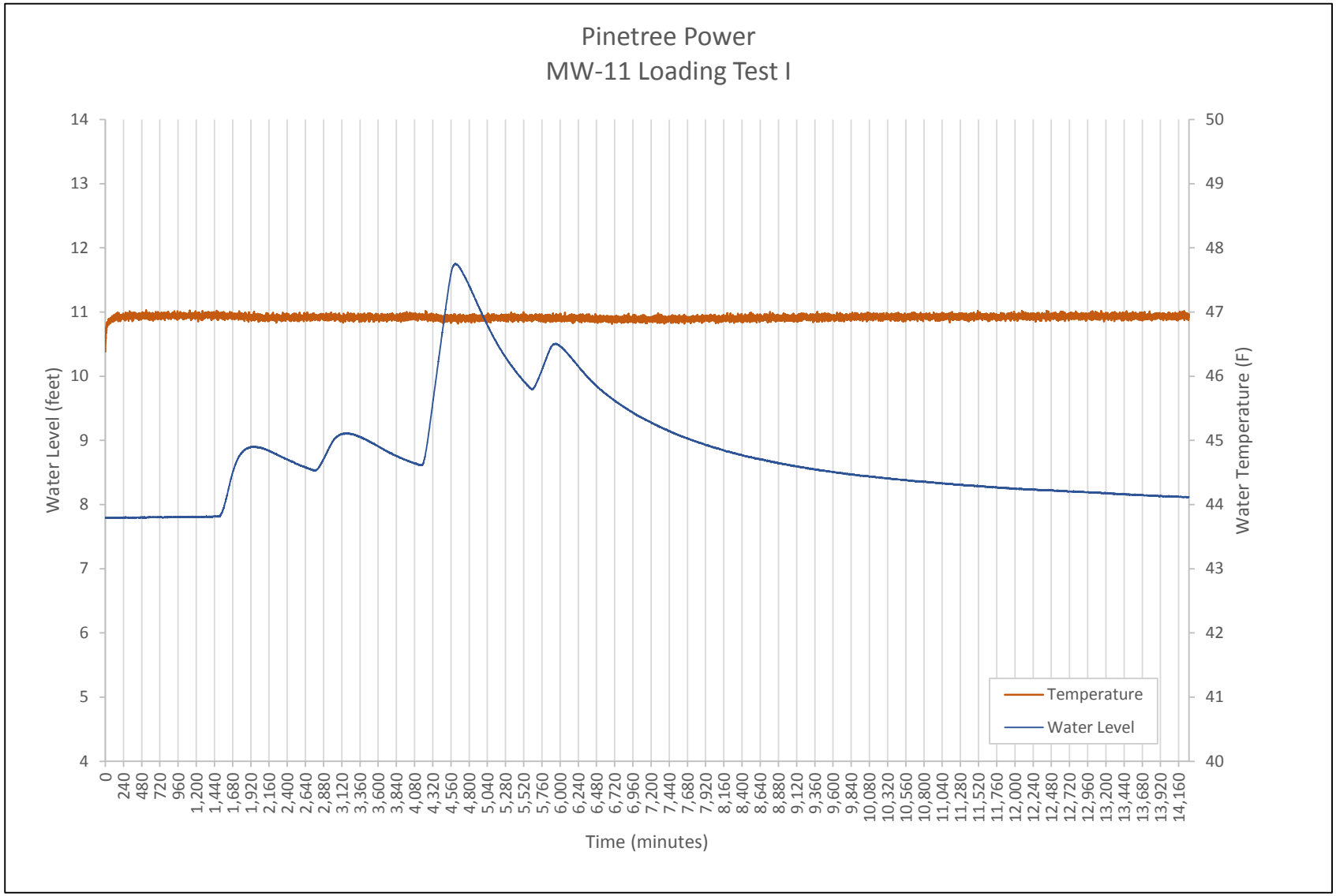
MW-12 Loading Test Peak Water Column Values:

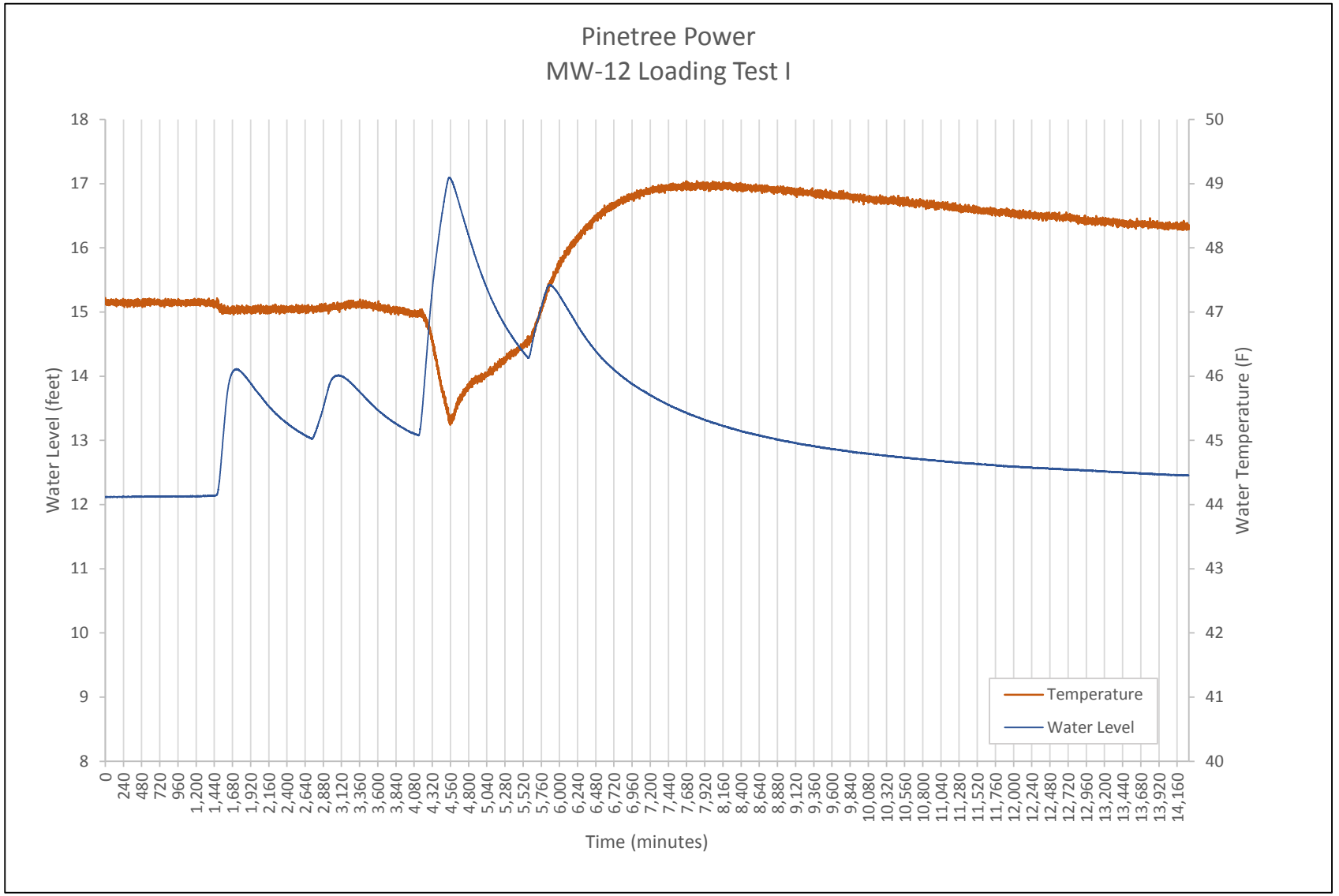
1/8/2019 17:46 (1743min): 14.1’
1/9/2019 15:48 (3065min): 14.0’
1/10/2019 16:29 (4546min): 17.1’
1/11/2019 14:29 (5866min): 15.4’

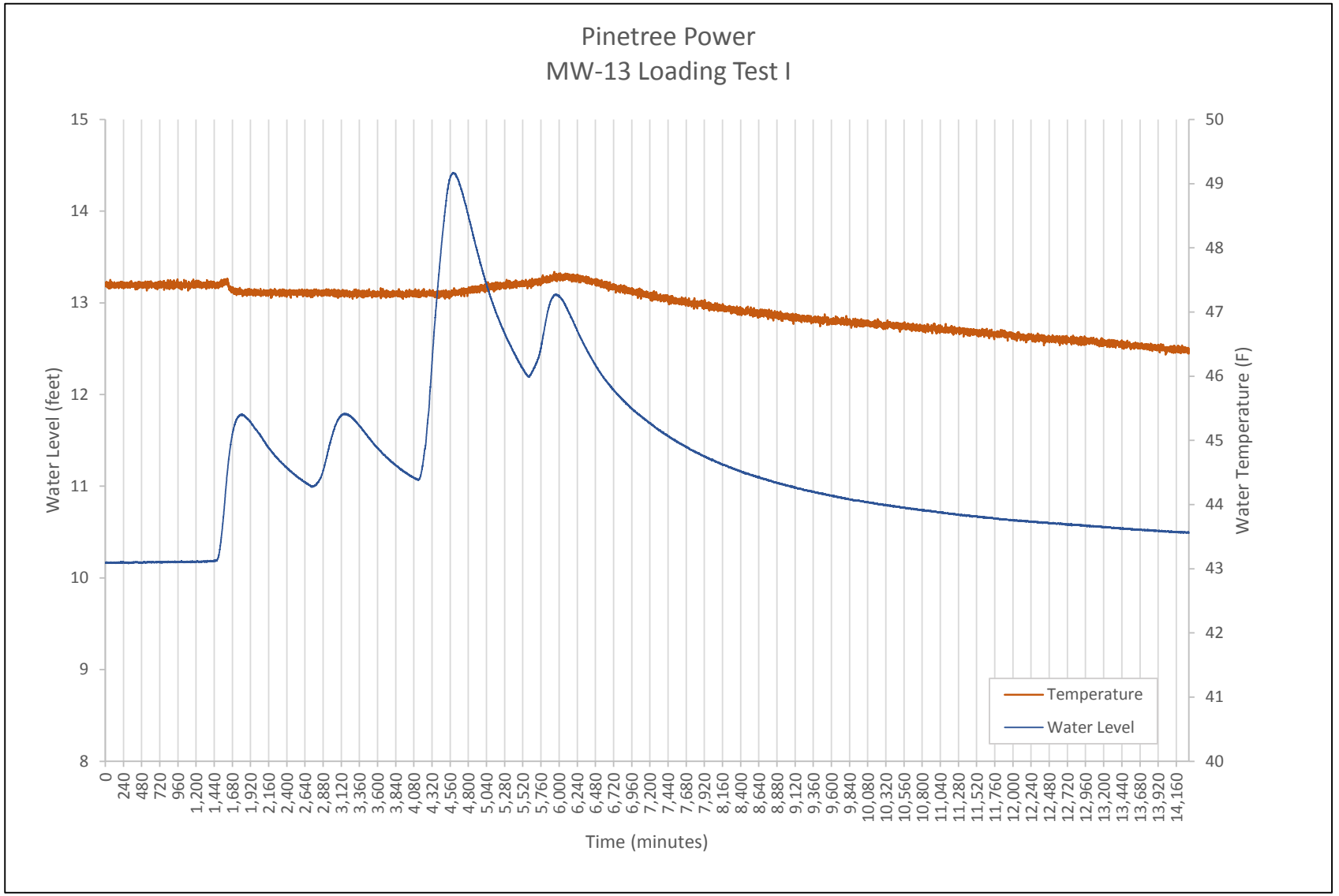


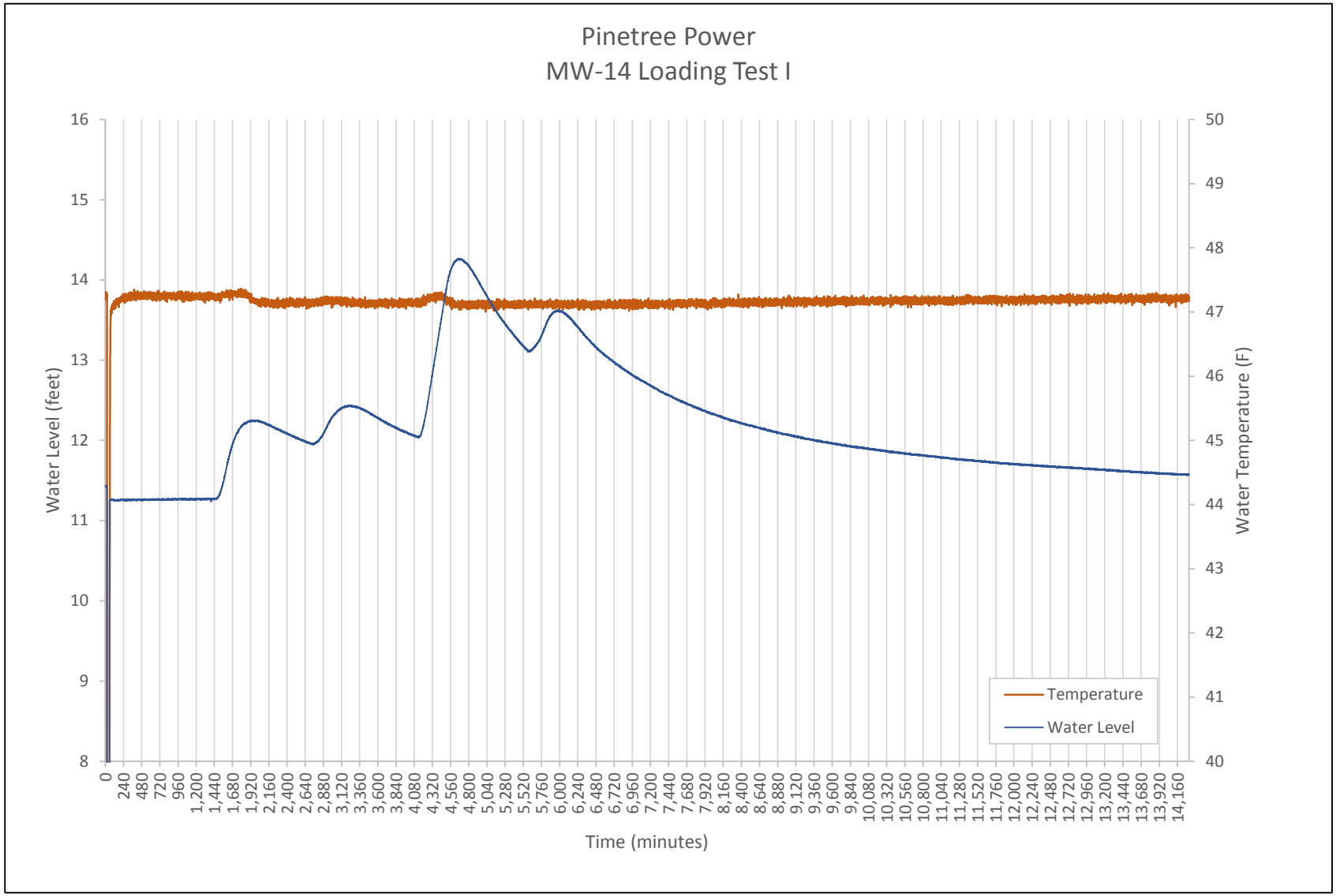

Pinetree Power
MW-1 Loading Test I
Water Level (feet)
Water Temperature (F)
Time (minutes)
Temperature
Water Level
12.5
12.4
12.3
12.2
12.1
12
11.9
11.8
11.7
11.6
11.5
50
49
48
47
46
45
44
43
42
41
40
0
240
480
720
960
1,200
1,440
1,680
1,920
2,160
2,400
2,640
2,880
3,120
3,360
3,600
3,840
4,080
4,320
4,560
4,800
5,040
5,280
5,520
5,760
6,000
6,240
6,480
6,720
6,960
7,200
7,440
7,680
7,920
8,160
8,400
8,640
8,880
9,120
9,360
9,600
9,840
10,080
10,320
10,560
10,800
11,040
11,280
11,520
11,760
12,000
12,240
12,480
12,720
12,960
13,200
13,440
13,680
13,920
14,160
14,400

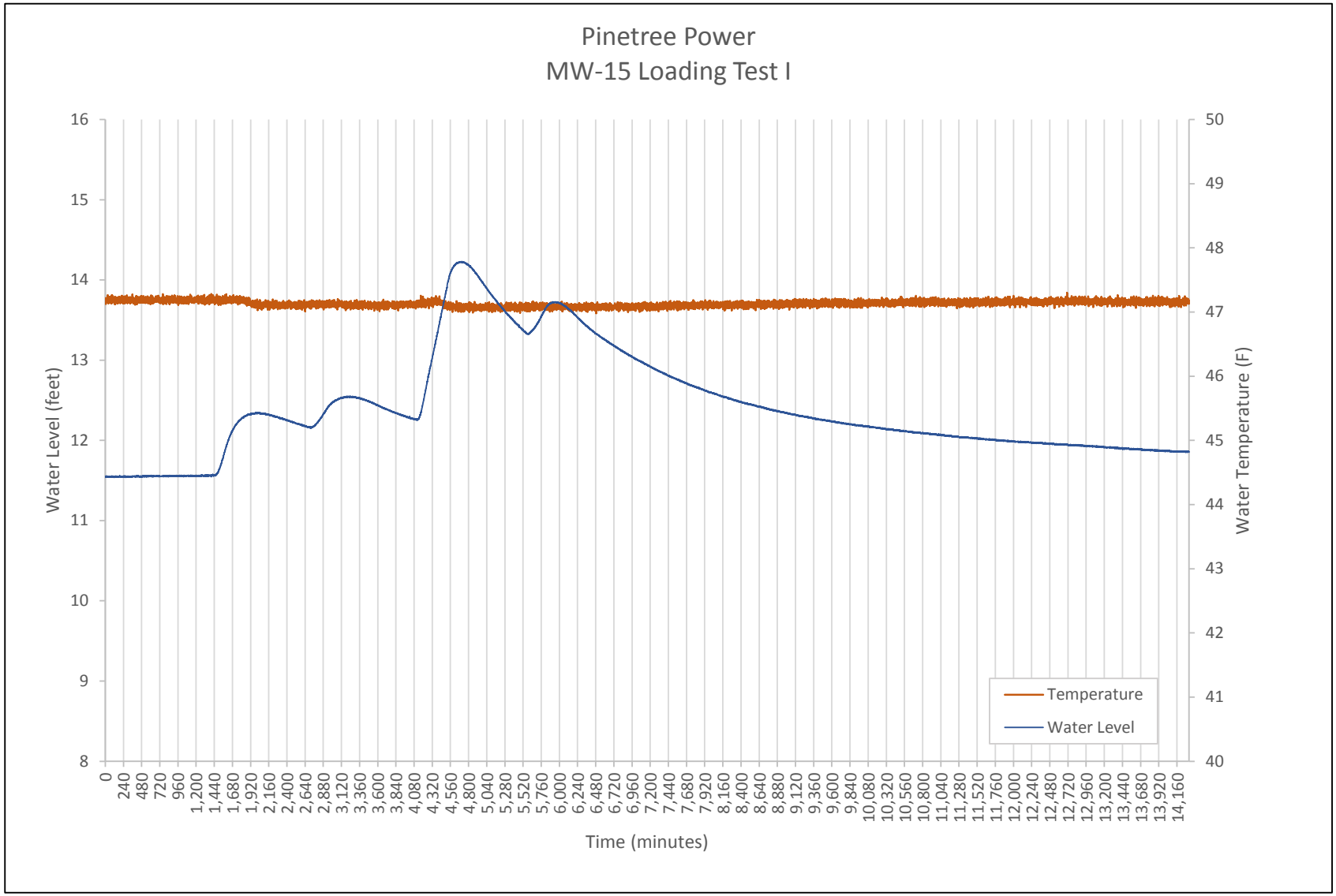

Pinetree Power
MW-9 Loading Test I
Water Level (feet)
Water Temperature (F)
Time (minutes)
Temperature
Water Level
22
21.5
21
20.5
20
19.5
19
50
49
48
47
46
45
44
43
42
41
40
0
240
480
720
960
1,200
1,440
1,680
1,920
2,160
2,400
2,640
2,880
3,120
3,360
3,600
3,840
4,080
4,320
4,560
4,800
5,040
5,280
5,520
5,760
6,000
6,240
6,480
6,720
6,960
7,200
7,440
7,680
7,920
8,160
8,400
8,640
8,880
9,120
9,360
9,600
9,840
10,080
10,320
10,560
10,800
11,040
11,280
11,520
11,760
12,000
12,240
12,480
12,720
12,960
13,200
13,440
13,680
13,920
14,160
14,400

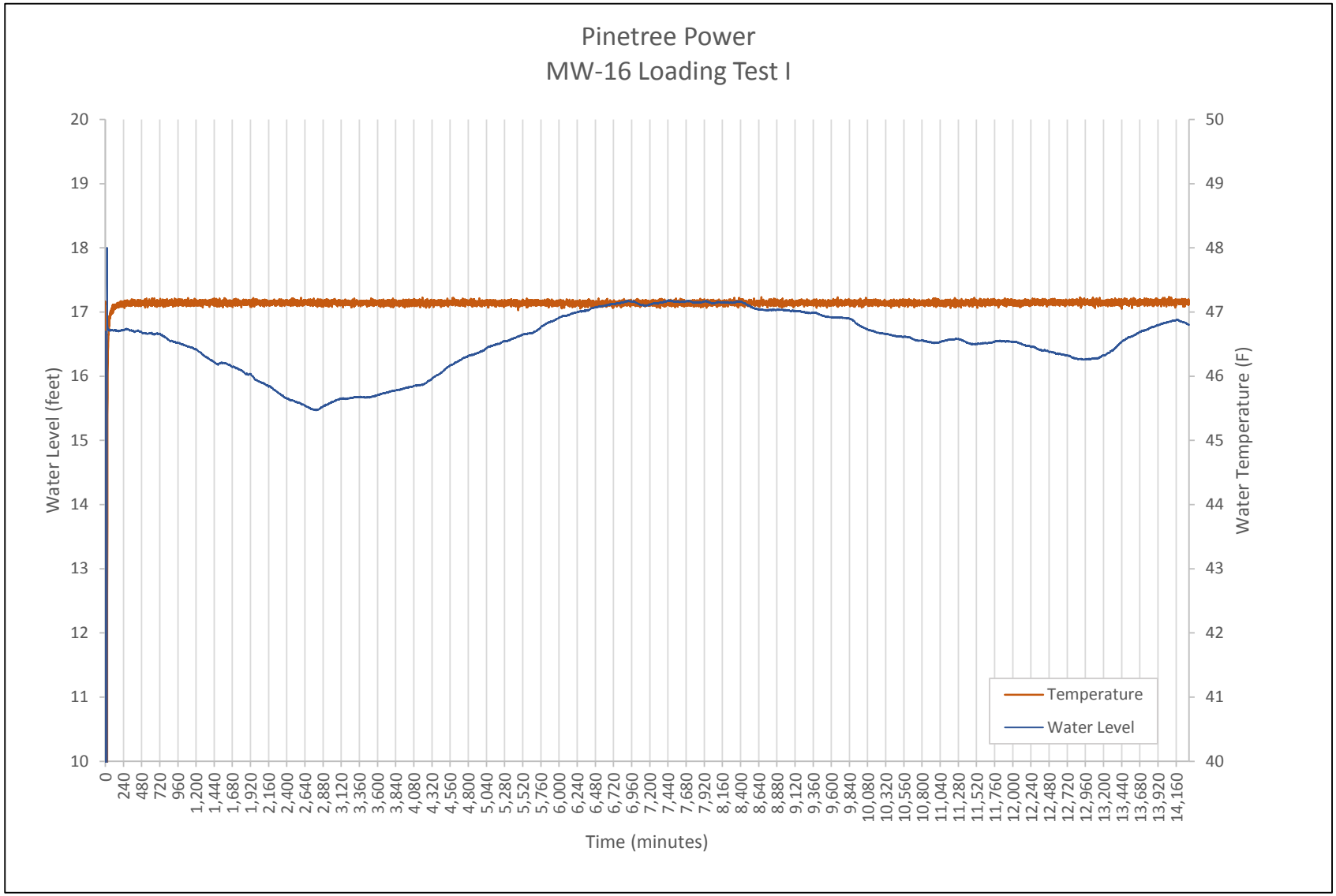

Pinetree Power
MW-11 Loading Test I
Water Level (feet)
Water Temperature (F)
Time (minutes)
Temperature
Water Level
14
13
12
11
10
9
8
7
6
5
4
50
49
48
47
46
45
44
43
42
41
40
0
240
480
720
960
1,200
1,440
1,680
1,920
2,160
2,400
2,640
2,880
3,120
3,360
3,600
3,840
4,080
4,320
4,560
4,800
5,040
5,280
5,520
5,760
6,000
6,240
6,480
6,720
6,960
7,200
7,440
7,680
7,920
8,160
8,400
8,640
8,880
9,120
9,360
9,600
9,840
10,080
10,320
10,560
10,800
11,040
11,280
11,520
11,760
12,000
12,240
12,480
12,720
12,960
13,200
13,440
13,680
13,920
14,160

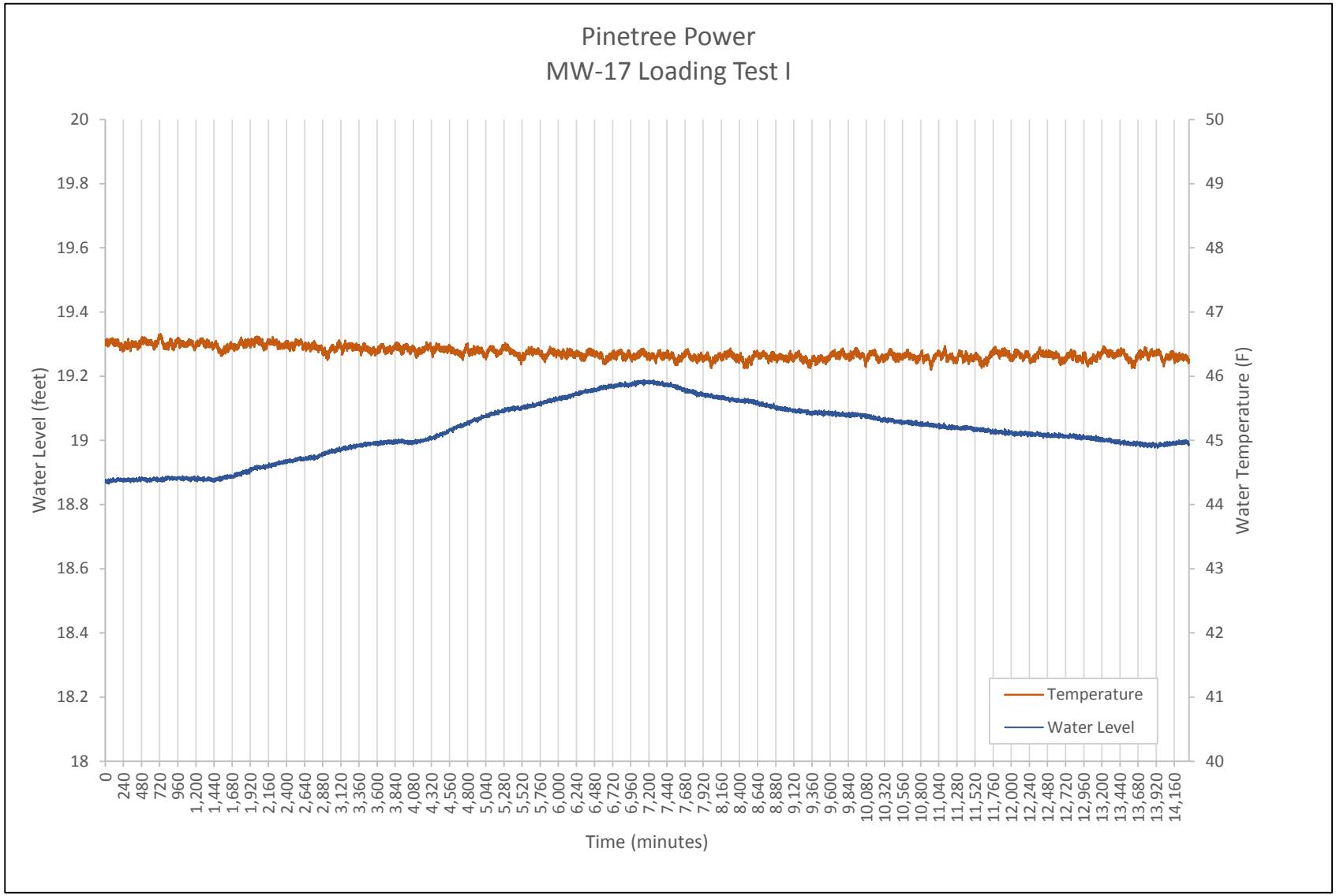

Pinetree Power
MW-12 Loading Test I
Water Level (feet)
Water Temperature (F)
Time (minutes)
Temperature
Water Level
18
17
16
15
14
13
12
11
10
9
8
50
49
48
47
46
45
44
43
42
41
40
0
240
480
720
960
1,200
1,440
1,680
1,920
2,160
2,400
2,640
2,880
3,120
3,360
3,600
3,840
4,080
4,320
4,560
4,800
5,040
5,280
5,520
5,760
6,000
6,240
6,480
6,720
6,960
7,200
7,440
7,680
7,920
8,160
8,400
8,640
8,880
9,120
9,360
9,600
9,840
10,080
10,320
10,560
10,800
11,040
11,280
11,520
11,760
12,000
12,240
12,480
12,720
12,960
13,200
13,440
13,680
13,920
14,160


Pinetree Power
MW-13 Loading Test I
Water Level (feet)
Water Temperature (F)
Time (minutes)
Temperature
Water Level
15
14
13
12
11
10
9
8
50
49
48
47
46
45
44
43
42
41
40
0
240
480
720
960
1,200
1,440
1,680
1,920
2,160
2,400
2,640
2,880
3,120
3,360
3,600
3,840
4,080
4,320
4,560
4,800
5,040
5,280
5,520
5,760
6,000
6,240
6,480
6,720
6,960
7,200
7,440
7,680
7,920
8,160
8,400
8,640
8,880
9,120
9,360
9,600
9,840
10,080
10,320
10,560
10,800
11,040
11,280
11,520
11,760
12,000
12,240
12,480
12,720
12,960
13,200
13,440
13,680
13,920
14,160


Pinetree Power
MW-14 Loading Test I
Water Level (feet)
Water Temperature (F)
Time (minutes)
Temperature
Water Level
16
15
14
13
12
11
10
9
8
50
49
48
47
46
45
44
43
42
41
40
0
240
480
720
960
1,200
1,440
1,680
1,920
2,160
2,400
2,640
2,880
3,120
3,360
3,600
3,840
4,080
4,320
4,560
4,800
5,040
5,280
5,520
5,760
6,000
6,240
6,480
6,720
6,960
7,200
7,440
7,680
7,920
8,160
8,400
8,640
8,880
9,120
9,360
9,600
9,840
10,080
10,320
10,560
10,800
11,040
11,280
11,520
11,760
12,000
12,240
12,480
12,720
12,960
13,200
13,440
13,680
13,920
14,160


Pinetree Power
MW-15 Loading Test I
Water Level (feet)
Water Temperature (F)
Time (minutes)
Temperature
Water Level
16
15
14
13
12
11
10
9
8
50
49
48
47
46
45
44
43
42
41
40
0
240
480
720
960
1,200
1,440
1,680
1,920
2,160
2,400
2,640
2,880
3,120
3,360
3,600
3,840
4,080
4,320
4,560
4,800
5,040
5,280
5,520
5,760
6,000
6,240
6,480
6,720
6,960
7,200
7,440
7,680
7,920
8,160
8,400
8,640
8,880
9,120
9,360
9,600
9,840
10,080
10,320
10,560
10,800
11,040
11,280
11,520
11,760
12,000
12,240
12,480
12,720
12,960
13,200
13,440
13,680
13,920
14,160

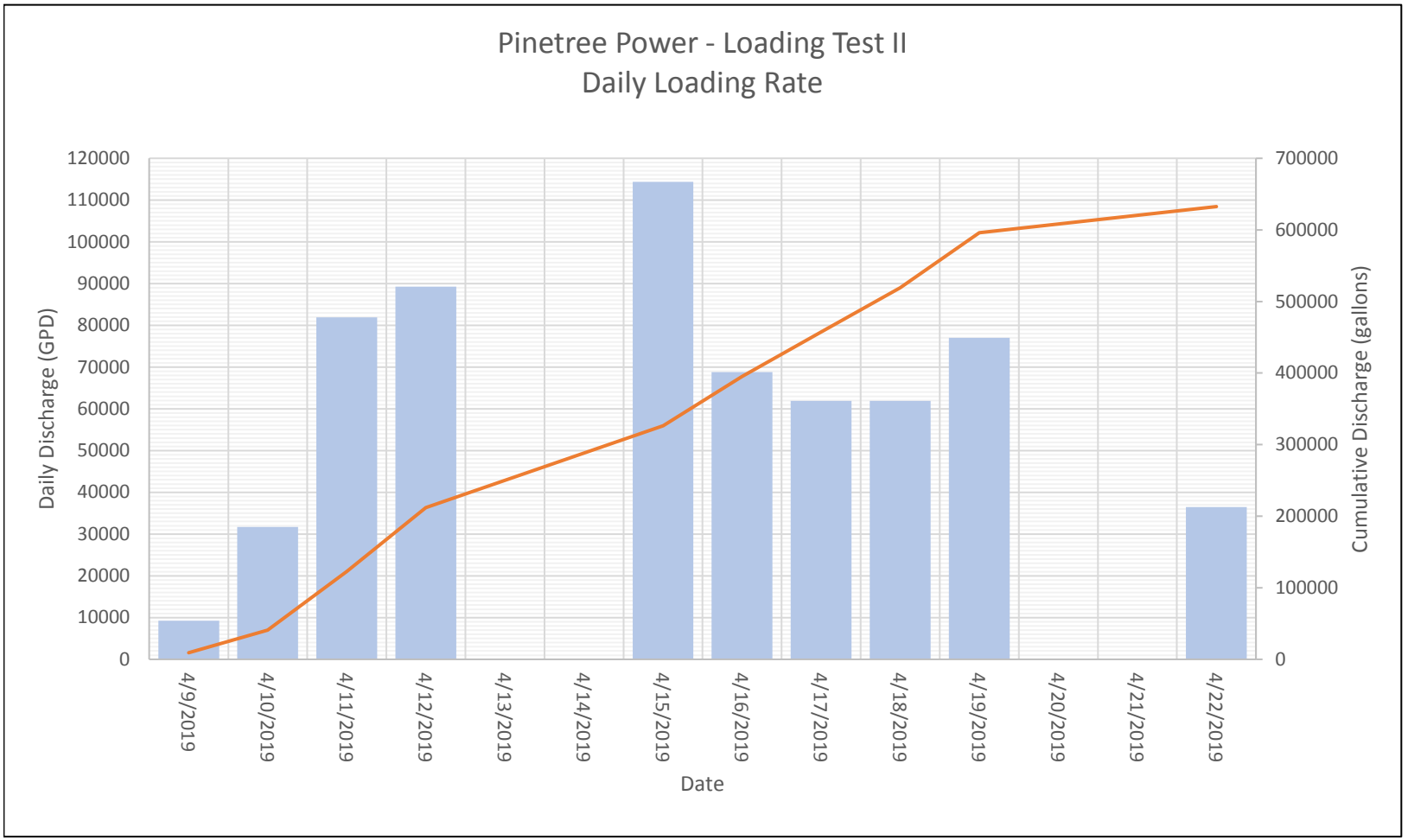

Pinetree Power
MW-16 Loading Test I
Water Level (feet)
Water Temperature (F)
Time (minutes)
Temperature
Water Level
20
19
18
17
16
15
14
13
12
11
10
50
49
48
47
46
45
44
43
42
41
40
0
240
480
720
960
1,200
1,440
1,680
1,920
2,160
2,400
2,640
2,880
3,120
3,360
3,600
3,840
4,080
4,320
4,560
4,800
5,040
5,280
5,520
5,760
6,000
6,240
6,480
6,720
6,960
7,200
7,440
7,680
7,920
8,160
8,400
8,640
8,880
9,120
9,360
9,600
9,840
10,080
10,320
10,560
10,800
11,040
11,280
11,520
11,760
12,000
12,240
12,480
12,720
12,960
13,200
13,440
13,680
13,920
14,160


Pinetree Power
MW-17 Loading Test I
Water Level (feet)
Water Temperature (F)
Time (minutes)
Temperature
Water Level
20
19.8
19.6
19.4
19.2
19
18.8
18.6
18.4
18.2
18
50
49
48
47
46
45
44
43
42
41
40
0
240
480
720
960
1,200
1,440
1,680
1,920
2,160
2,400
2,640
2,880
3,120
3,360
3,600
3,840
4,080
4,320
4,560
4,800
5,040
5,280
5,520
5,760
6,000
6,240
6,480
6,720
6,960
7,200
7,440
7,680
7,920
8,160
8,400
8,640
8,880
9,120
9,360
9,600
9,840
10,080
10,320
10,560
10,800
11,040
11,280
11,520
11,760
12,000
12,240
12,480
12,720
12,960
13,200
13,440
13,680
13,920
14,160

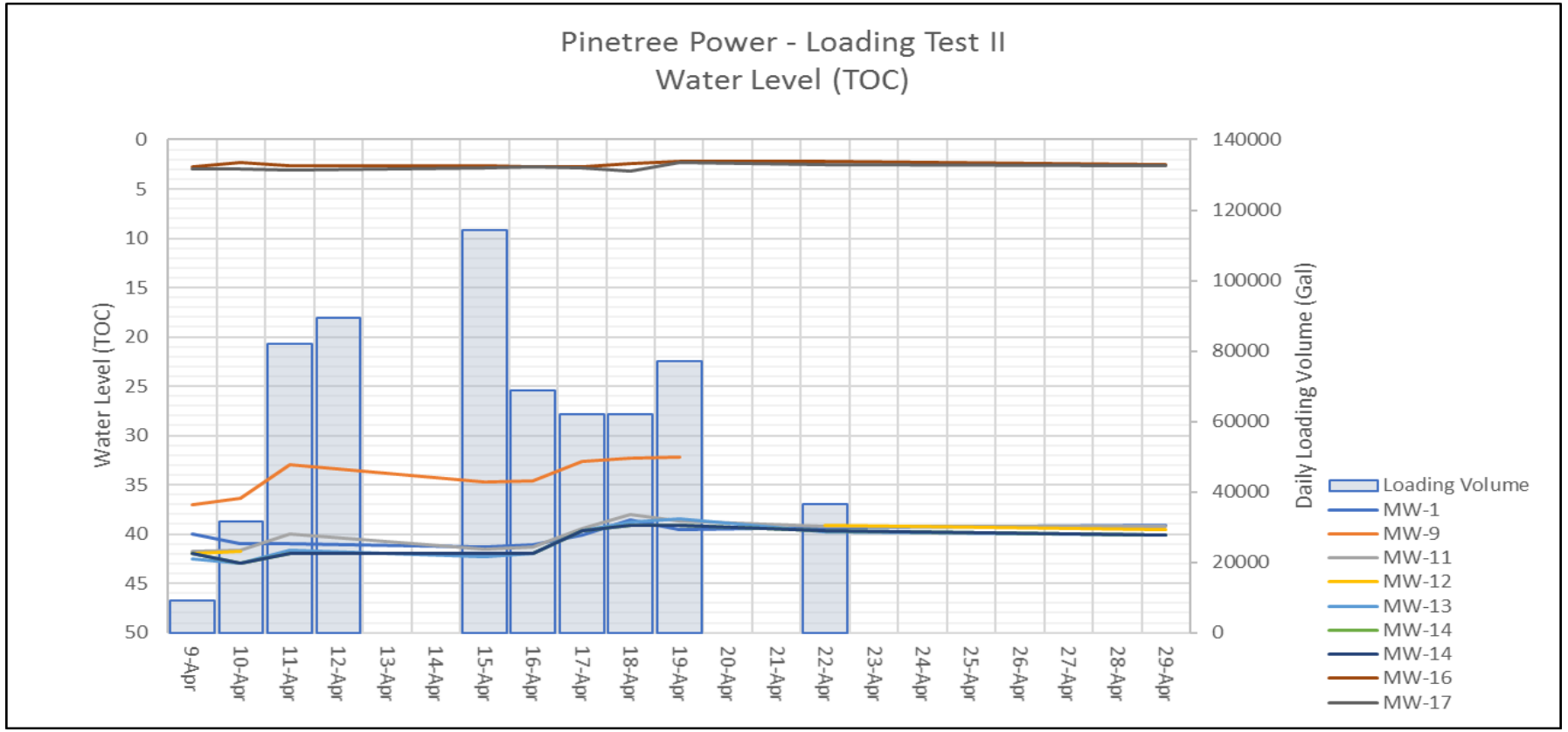
APPENDIX G
Load Test II, Basin Loading Log

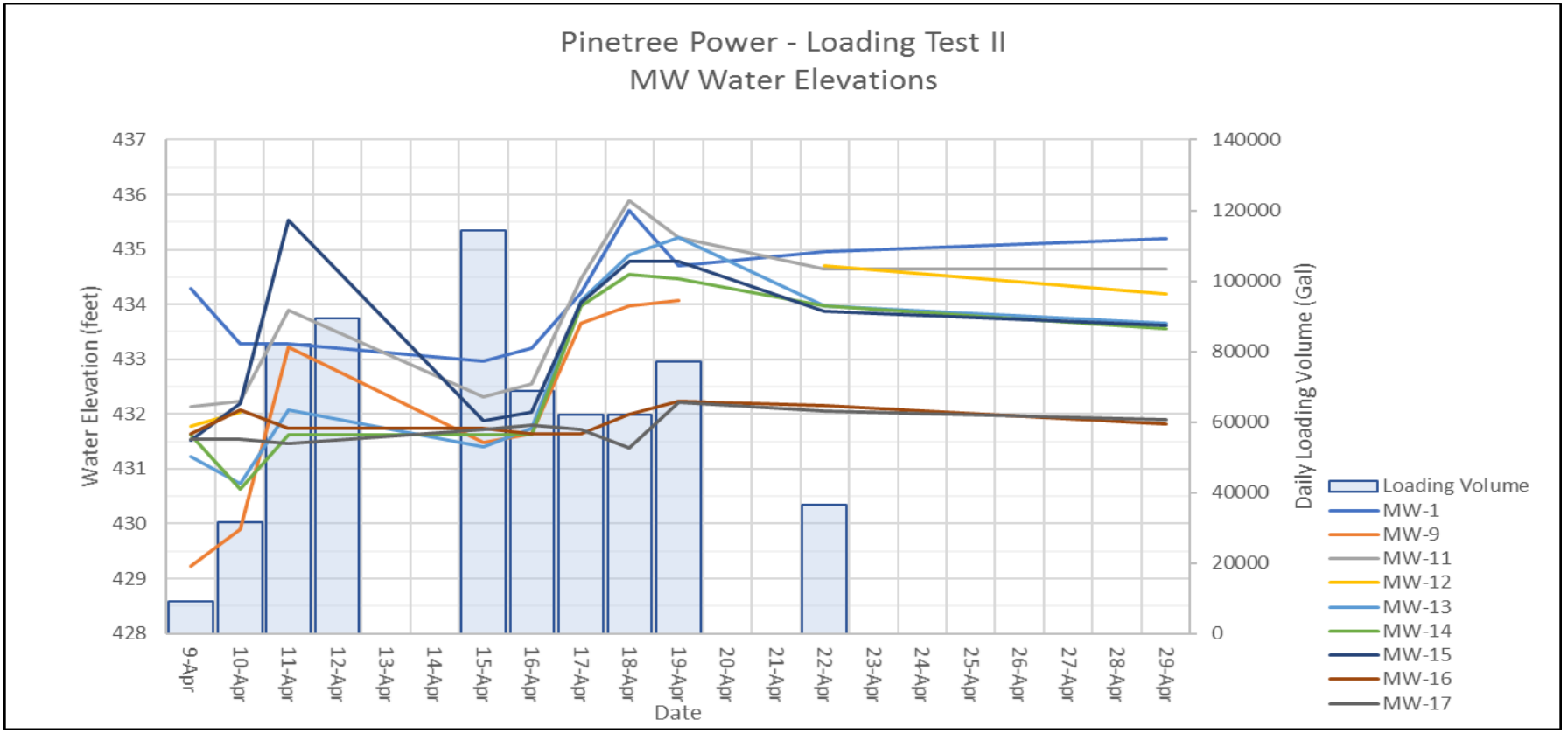
Pinetree Power - RIB Loading - Pumping Sheet

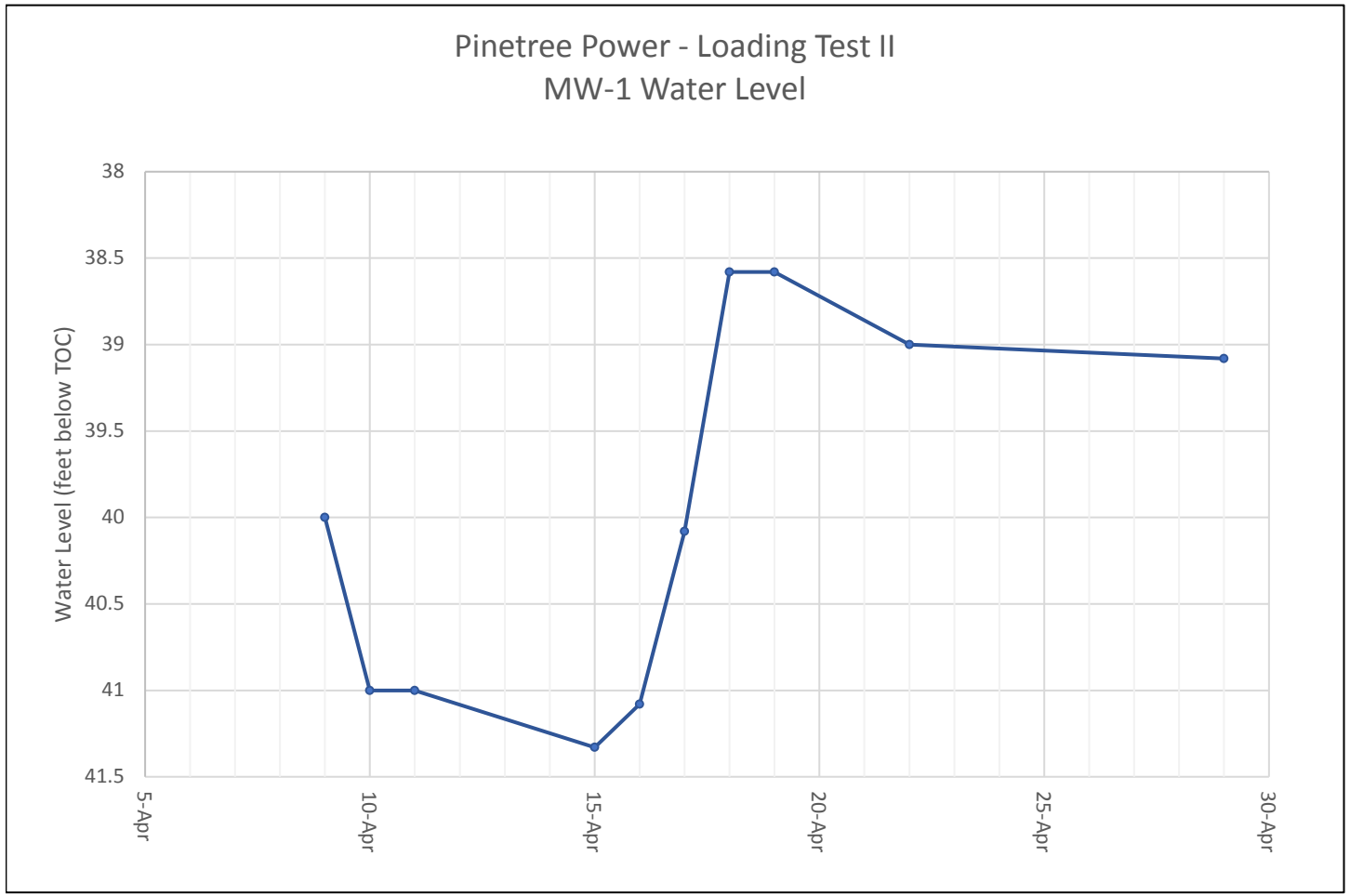
Date	Time	Height (in)	Volume (gal)	Running Total	Notes	Initials
9-Apr	1406-1500	48	9243	9243	SV30 blended with SV25 50/50	RL
10-Apr	0840-0936	70	11791	21034	SV30 blended with SV25 50/50	RL
10-Apr	1115-1355	104	19900	40934	SV25 blended 50/50	RL
11-Apr	0948-1228	109	20844	61778	SV36 pumped at 100/0	RL
11-Apr		92	16669	78447	Added SV27 into SV36 at 100/0	RL
11-Apr	1332-1724	58	13506	91953	SV36 with FTS blend 10/90	RL
11-Apr		112	21357	113310	added SV25 into SV36 with FTS blend 10/90	RL
11-Apr		49	9559	122869	added SV27 into SV36 with FTS blend 10/90	RL
12-Apr	0850-1120	83	15867	138736	SV36 with FTS blend 10/90	RL
12-Apr		60	10516	149252	added SV27 into SV36 with FTS blend 10/90	RL
12-Apr	1235-1740	111	21186	170438	SV36 with FTS blend 10/90	RL
12-Apr		109	20844	191282	added SV25 into SV36 with FTS blend 10/90	RL
12-Apr		109	20844	212126	added SV27 into SV36 with FTS blend 10/90	RL
15-Apr	0840-1405	82	15672	227798	SV36 with FTS blend 10/90	RL
15-Apr		112	20451	248249	added SV27 into SV36 with FTS blend 10/90	RL
15-Apr		112	21357	269606	added SV25 into SV36 with FTS blend 10/90	RL
15-Apr	1430-1815	112	20451	290057	SV36 with FTS blend 10/90	RL
15-Apr		82	15563	305620	added SV27 into SV36 with FTS blend 10/90	RL
15-Apr		109	20844	326464	SV25 with FTS blend 10/90	RL
16-Apr	1028-1045	30	4888	331352	SV36 with FTS blend 10/90	RL
16-Apr	1255-1445	112	21357	352709	SV36 with UST blend 45/55	RL
16-Apr	1450-1600	117	21183	373892	SV27 with UST blend 45/55	RL
16-Apr	1645-1830	112	21357	395249	SV36 with UST blend 45/55	RL
17-Apr	1020-1205	110	21018	416267	SV36 with UST blend 45/55	RL
17-Apr	1210-1407	106	19540	435807	SV27 with UST blend 45/55	RL
17-Apr	1412-1610	112	21360	457167	SV36 with UST blend 45/55	RL
18-Apr	1030-1220	110	21018	478185	SV36 with UST blend 45/55	RL
18-Apr	1225-1420	115	20885	499070	SV27 with UST blend 45/55	RL
18-Apr	1421-	107	20031	519101	SV36 with UST blend 45/55	RL
19-Apr	0835-1045	109	20844	539945	SV25 with UST blend 45/55	RL
19-Apr	1047-1252	103	19757	559702	SV36 with UST blend 45/55	RL
19-Apr	255-1502	110	20152	579854	SV25 with UST blend 45/55	RL
19-Apr	1506-1700	85	16257	596111	SV36 with UST blend 45/55	RL
22-Apr	0838-1000	73	15087	611198	SV36 with UST blend 45/55	RL
22-Apr	1004-1350	112	21367	632565	SV25 with UST blend 45/55	RL
				632565		
				632565		
				632565		
				632565		
				632565		

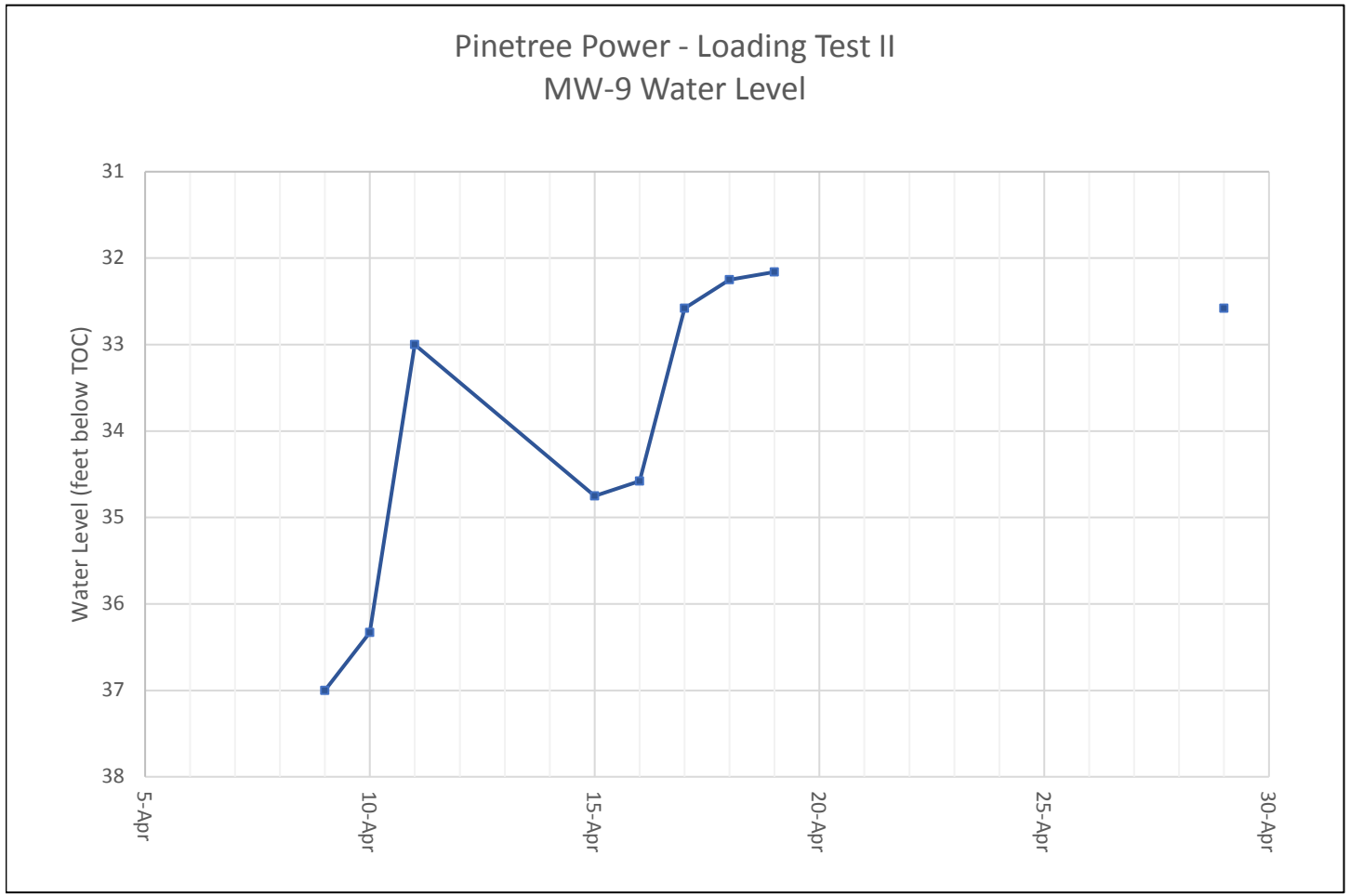

Pinetree Power - Loading Test II
Daily Loading Rate
Daily Discharge (GPD)
Cumulative Discharge (gallons)
120000
110000
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
700000
600000
500000
400000
300000
200000
100000
0
4/9/2019
4/10/2019
4/11/2019
4/12/2019
4/13/2019
4/14/2019
4/15/2019
4/16/2019
4/17/2019
4/18/2019
4/19/2019
4/20/2019
4/21/2019
4/22/2019
Date

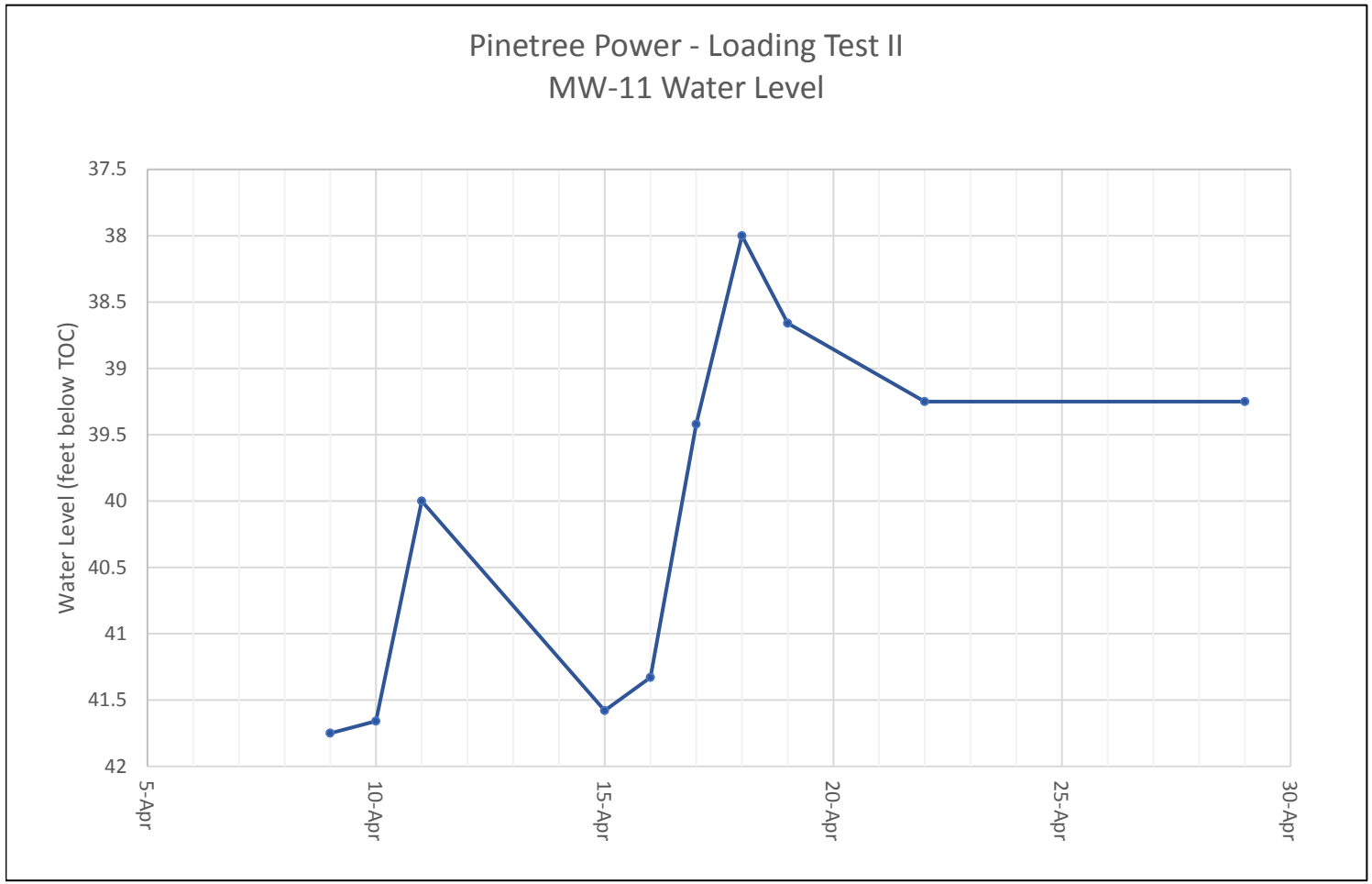
APPENDIX H
Load Test II, Water Level Graphs

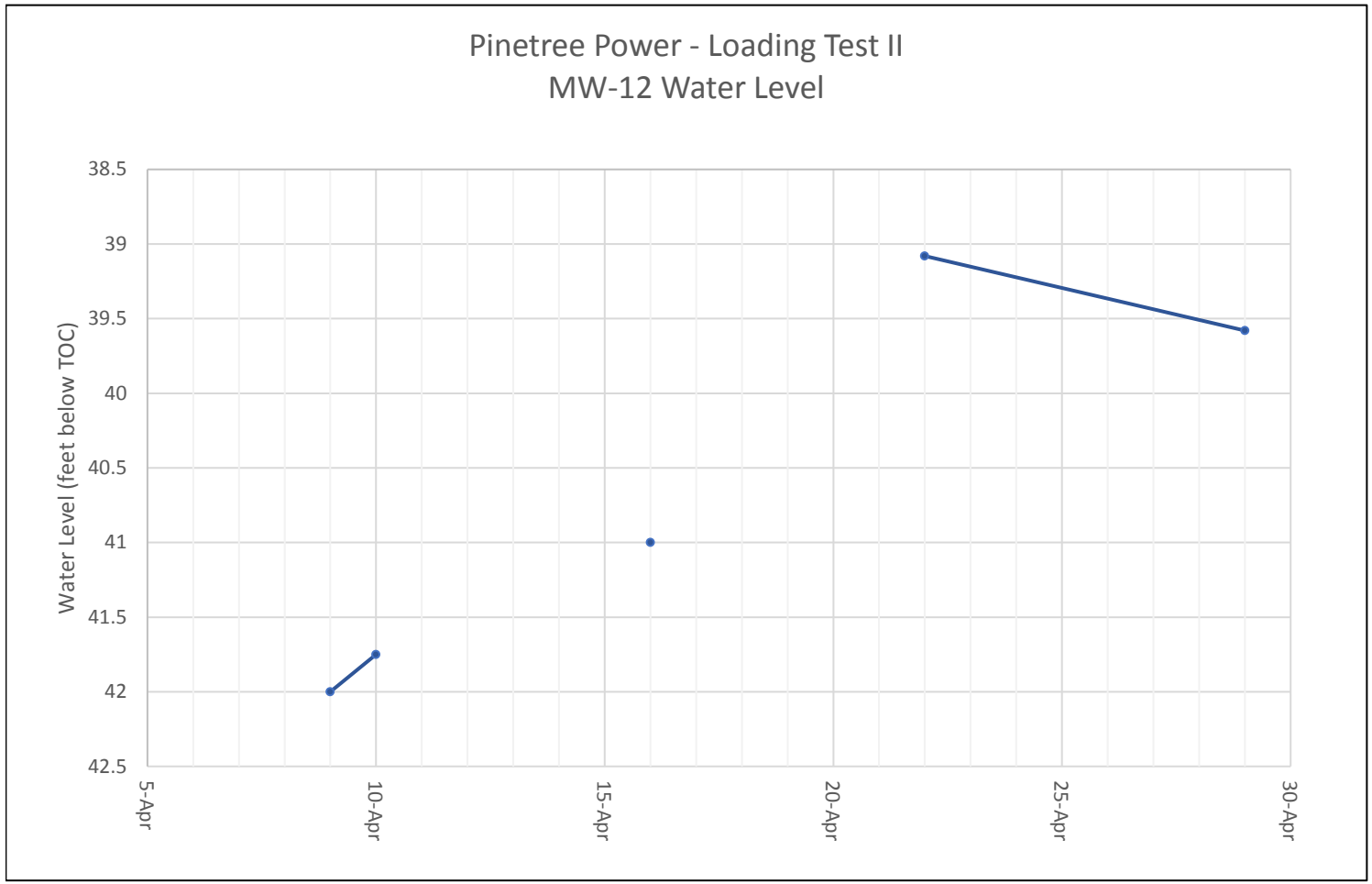

Pinetree Power - Loading Test II
Water Level (TOC)
Water Level (TOC)
Daily Loading Volume (Gal)
0
5
10
15
20
25
30
35
40
45
50
140000
120000
100000
80000
60000
40000
20000
0
9-Apr
10-Apr
11-Apr
12-Apr
13-Apr
14-Apr
15-Apr
16-Apr
17-Apr
18-Apr
19-Apr
20-Apr
21-Apr
22-Apr
23-Apr
24-Apr
25-Apr
26-Apr
27-Apr
28-Apr
29-Apr
Loading Volume
MW-1
MW-9
MW-11
MW-12
MW-13
MW-14
MW-14
MW-16
MW-17

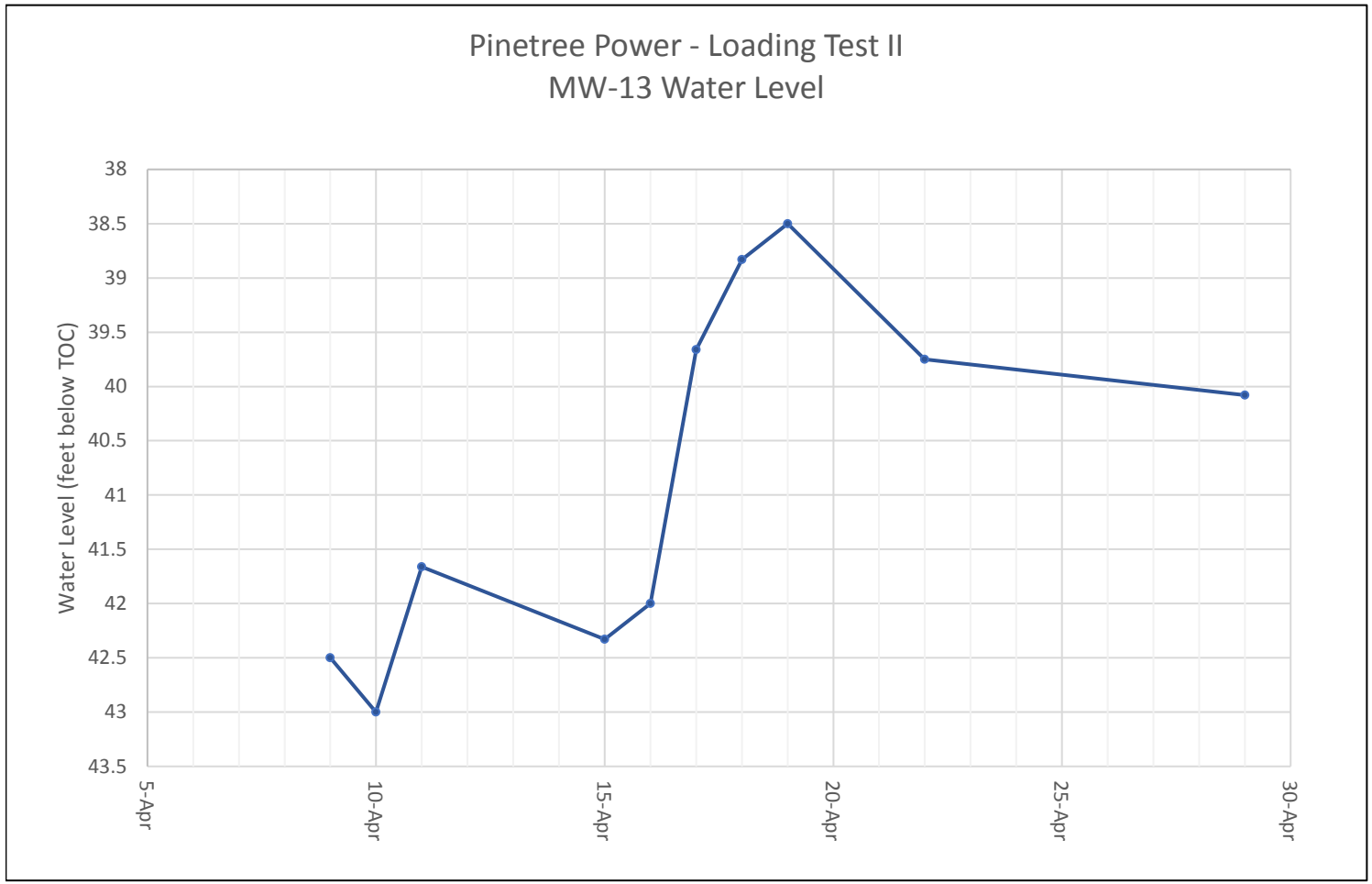

Pinetree Power - Loading Test II
MW Water Elevations
Water Elevation (feet)
Daily Loading Volume (Gal)
Date
437
436
435
434
433
432
431
430
429
428
140000
120000
100000
80000
60000
40000
20000
0
9-Apr
10-Apr
11-Apr
12-Apr
13-Apr
14-Apr
15-Apr
16-Apr
17-Apr
18-Apr
19-Apr
20-Apr
21-Apr
22-Apr
23-Apr
24-Apr
25-Apr
26-Apr
27-Apr
28-Apr
29-Apr
Loading Volume
MW-1
MW-9
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
MW-17

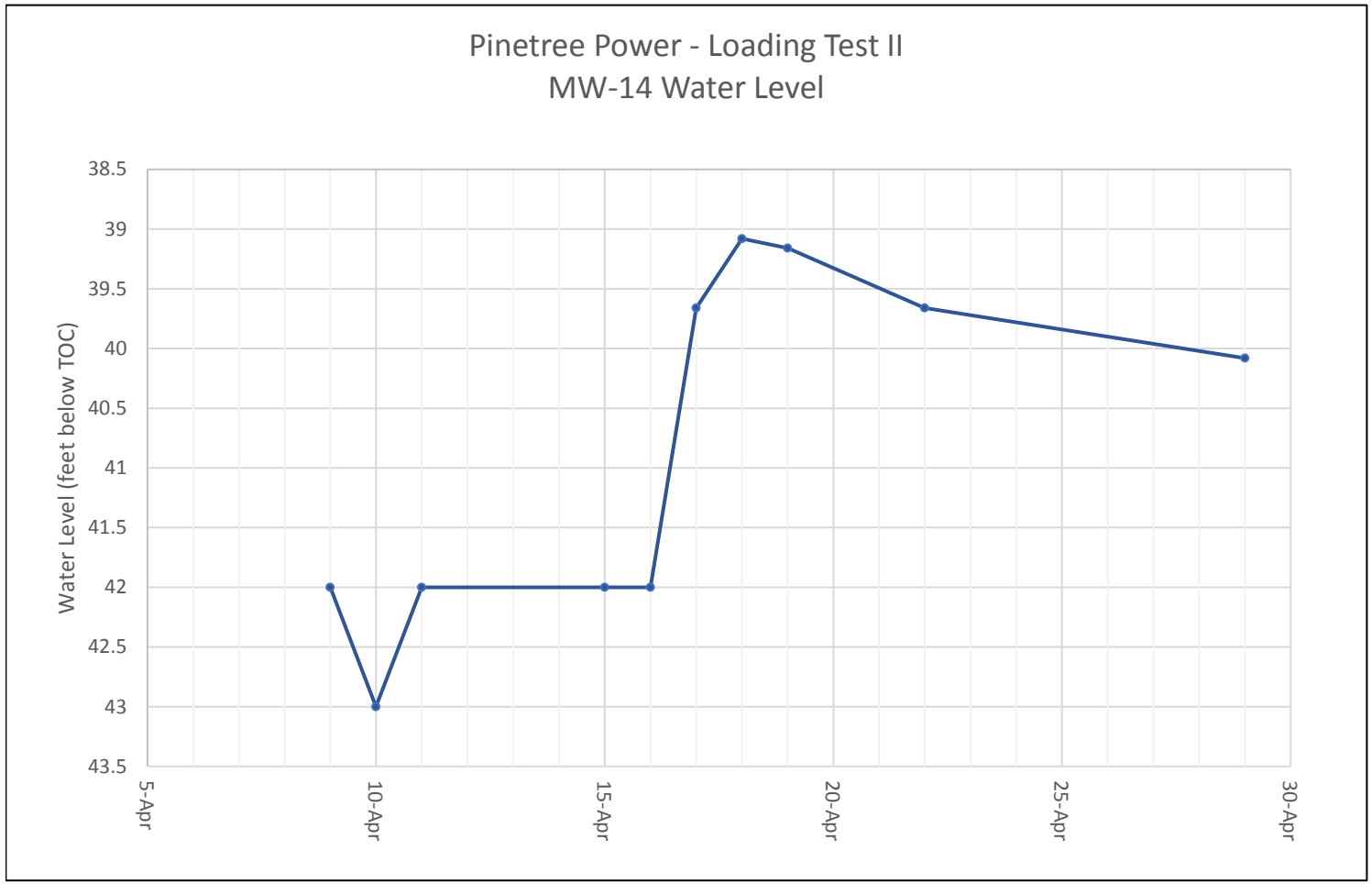

Pinetree Power - Loading Test II
MW-1 Water Level
Water Level (feet below TOC)
38
38.5
39
39.5
40
40.5
41
41.5
5-Apr
10-Apr
15-Apr
20-Apr
25-Apr
30-Apr

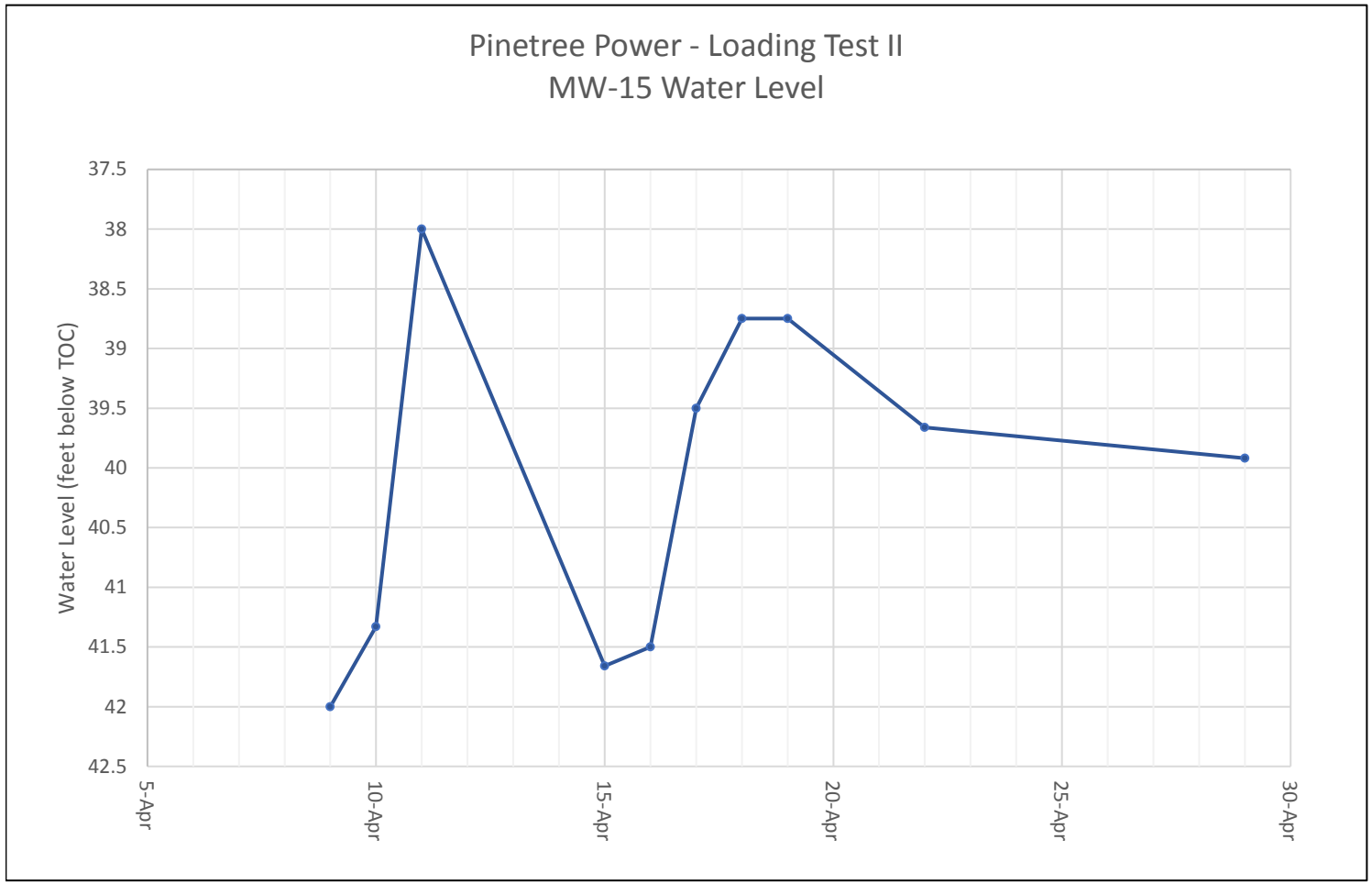

Pinetree Power - Loading Test II
MW-9 Water Level
Water Level (feet below TOC)
31
32
33
34
35
36
37
38
5-Apr
10-Apr
15-Apr
20-Apr
25-Apr
30-Apr

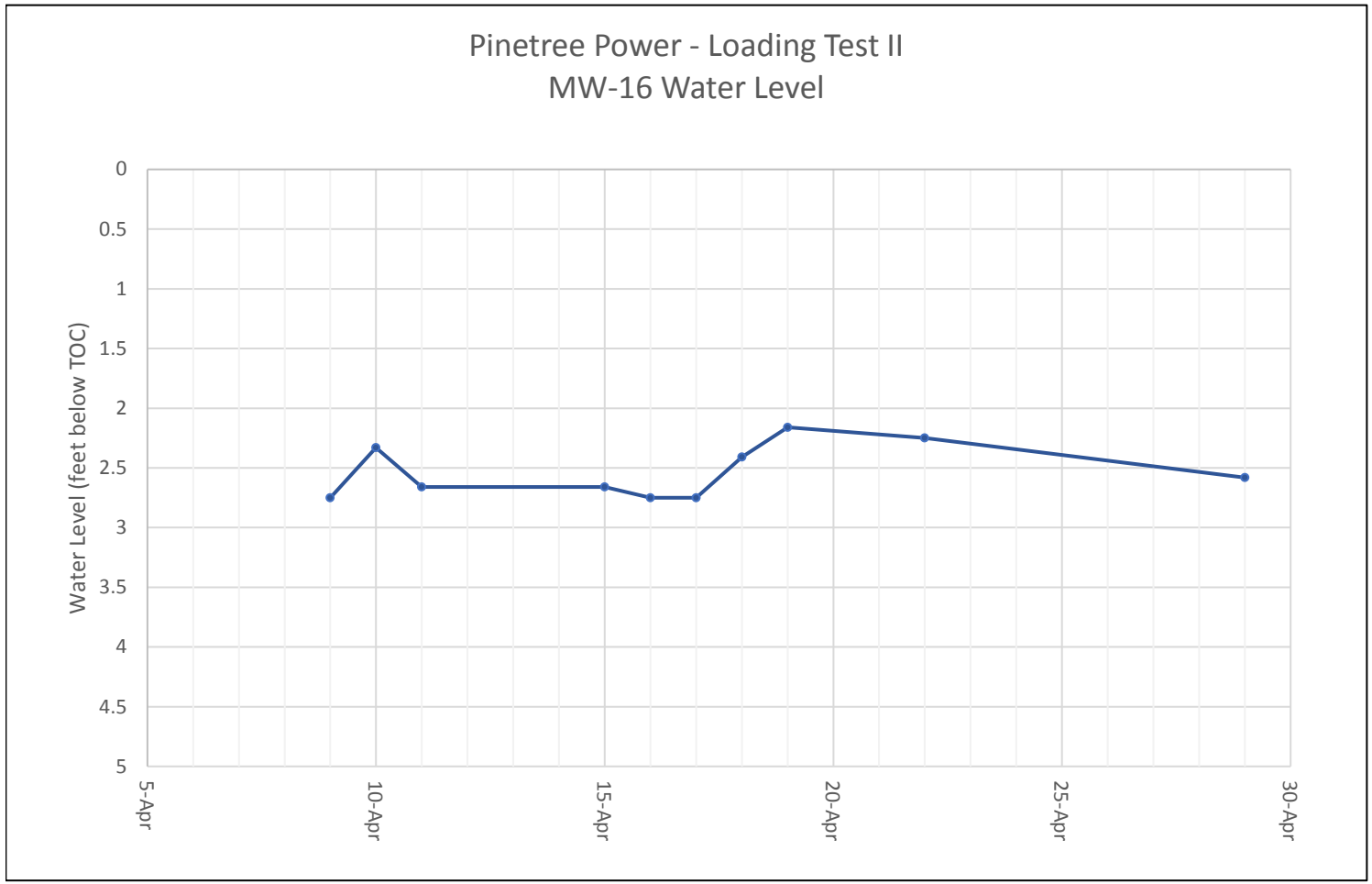

Pinetree Power - Loading Test II
MW-11 Water Level
Water Level (feet below TOC)
37.5
38
38.5
39
39.5
40
40.5
41
41.5
42
5-Apr
10-Apr
15-Apr
20-Apr
25-Apr
30-Apr

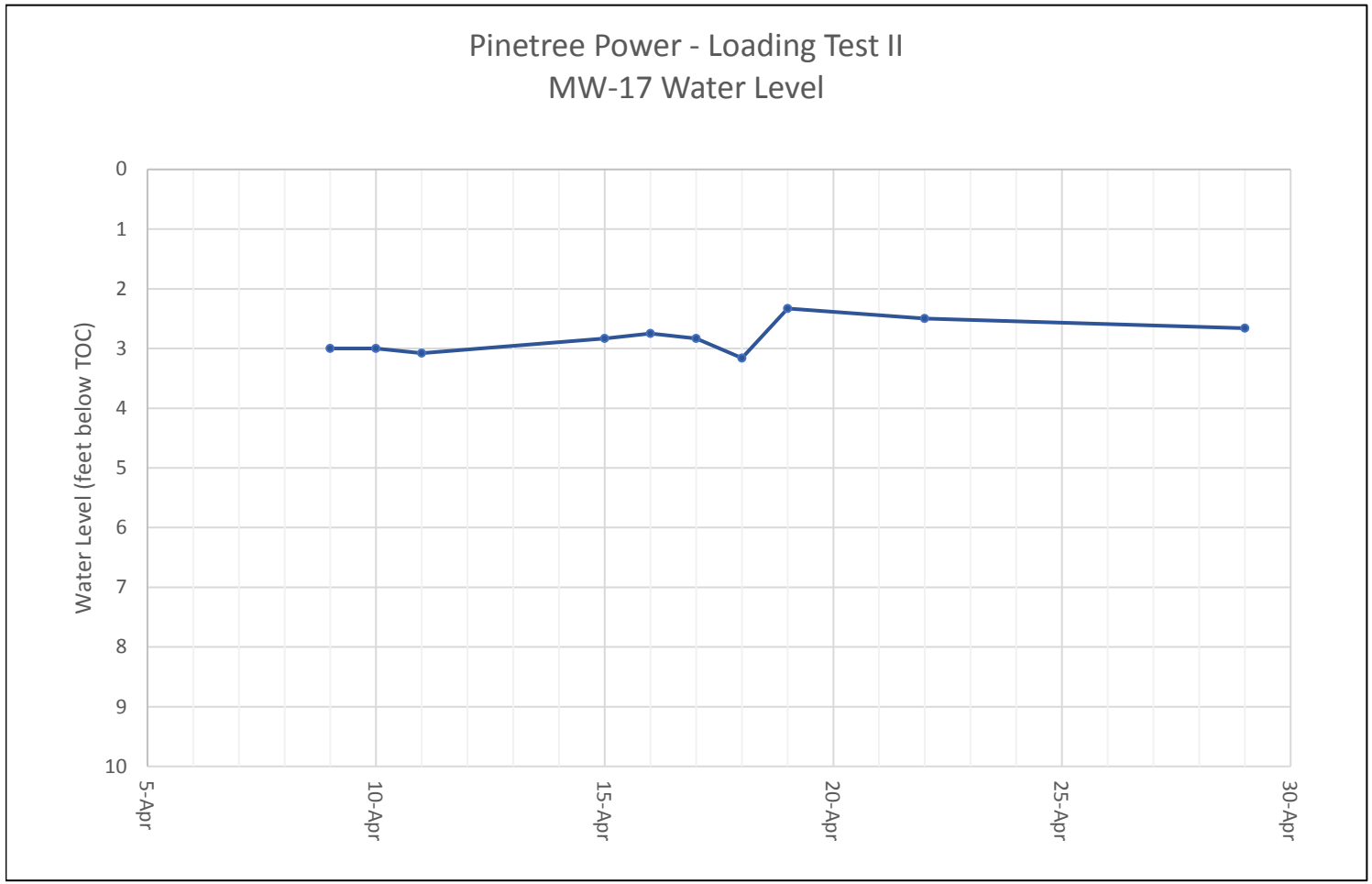

Pinetree Power - Loading Test II
MW-12 Water Level
Water Level (feet below TOC)
38.5
39
39.5
40
40.5
41
41.5
42
42.5
5-Apr
10-Apr
15-Apr
20-Apr
25-Apr
30-Apr


Pinetree Power - Loading Test II
MW-13 Water Level
Water Level (feet below TOC)
38
38.5
39
39.5
40
40.5
41
41.5
42
42.5
43
43.5
5-Apr
10-Apr
15-Apr
20-Apr
25-Apr
30-Apr


Pinetree Power - Loading Test II
MW-14 Water Level
Water Level (feet below TOC)
38.5
39
39.5
40
40.5
41
41.5
42
42.5
43
43.5
5-Apr
10-Apr
15-Apr
20-Apr
25-Apr
30-Apr


Pinetree Power - Loading Test II
MW-15 Water Level
Water Level (feet below TOC)
37.5
38
38.5
39
39.5
40
40.5
41
41.5
42
42.5
5-Apr
10-Apr
15-Apr
20-Apr
25-Apr
30-Apr


Pinetree Power - Loading Test II
MW-16 Water Level
Water Level (feet below TOC)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5-Apr
10-Apr
15-Apr
20-Apr
25-Apr
30-Apr


Pinetree Power - Loading Test II
MW-17 Water Level
Water Level (feet below TOC)
0
1
2
3
4
5
6
7
8
9
10
5-Apr
10-Apr
15-Apr
20-Apr
25-Apr
30-Apr

APPENDIX I
Water Sample Analytical Results

SAMPLE ID:		Circulation Water 09/21/2017	Circulation Water 12/10/2018	Circulation Water 01/07/2019	Circulation Water 01/08/2019	Circulation Water 01/10/2019	Circulation Water 01/11/2019	Circulation Water 01/22/2019	Circulation Water 01/24/2019	UST 04/04/19	SV2 04/04/19	FTS 04/04/19	SV2-7 04/08/19	SV3 04/08/19
Compound	**AGQS (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**
Antimony	6	<5	1.1	<1	<1	<1	<1	<1	<1	1.2	<1	1.3	<1	<1
Arsenic	**10**	<10	**40**	**29**	**24**	**18**	**17**	**22**	**15**	**21**	**13**	**65**	5.6	8.8
Beryllium	4	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	2.8	<1	<1
Cadmium	5	<5	<1	<1	<1	<1	<1	<1	<1	<1	1.3	1.4	<1	<1
Calcium	NS	660,000	230,000	180,000	150,000	120,000	120,000	130,000	100,000	150,000	91,000	540,000	33,000	71,000
Chromium	100	10	12	9	5.3	4.6	4.2	5	3.7	5.2	6.9	32	3.3	4.4
Copper	1,300	35	26	12	10	8.3	8.4	7.2	5.7	79	22	46	19	34
Iron	NS	300	<50	<100	<100	<100	<100	<50	<100	640	1,200	1,000	1,500	630
Magnesium	NS	41,000	21,000	21,000	16,000	13,000	13,000	16,000	12,000	14,000	11,000	74,000	3,500	9,200
Manganese	**840**	390	**1,500**	230	190	110	65	<5	5	6	700	120	650	300
Mercury	2	<1	0.15	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	<0.2	<0.2	0.21	<0.2	<0.2
Molybdenum	NS	190	44	31	25	19	18	20	12	24	13	95	4.6	11
Nickel	100	19	5	3.8	2.2	2.2	1.8	2.3	1.3	2.9	5.3	6.1	2.5	2.2
Potassium	**160,000**	**210,000**	53,000	42,000	32,000	25,000	25,000	27,000	21,000	32,000	16,000	120,000	3,900	13,000
Selenium	50	<10	7	7.1	5	4	3	4.8	2.4	3.2	4.9	22	1.7	<1
Sodium	NS	8,900,000	1,100	810,000	620,000	490,000	470,000	510,000	380,000	640,000	320,000	2,500,000	32,000	250,000
Zinc	NS	33	<5	<5	<5	23	10	<5	<5	28	78	50	63	44
Total Hardness (as $CaCO_3$)	NS	1,800,000	670,000	550,000	NA	NA	NA	400,000	300,000	440,000	270,000	1,600,000	97,000	210,000
COD	NS	390,000	81,000	34,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	NS	7.9 SU	8.18 SU	8.27 SU	NA	NA	NA	8.19 SU	8.16 SU	8.64 SU	7.65 SU	7.81 SU	7.44 SU	7.08 SU
Ammonia	NS	110	120	66	NA	NA	NA	<50	<50	<5	340	170	310	140
Nitrite	1000	500	<500	<500	<500	<500	<500	<100	<500	<500	<500	<500	<500	<500
Nitrate	**10,000**	**100,000**	5,200	7,700	6,600	1,300	1,900	8,400	6,100	8,600	3,900	**29,000**	<500	3,000
TKN	NS	23,000	2,700	980	NA	NA	NA	550	620	920	3,400	2,500	700	1,300
Specific Conductance	NS	47,000 uS/cm	7,600 uS/cm	4 uS/cm	NA	NA	NA	3,900 uS/cm	2,400 uS/cm	4,800	2,600	19,000	350	1,600
Chloride	NS	9,200,000	1,500,000	NA	NA	NA	NA	850,000	600,000	950,000	470,000	4,200,000	59,000	430
Total Phosphorus	NS	320	27,000	760	NA	NA	NA	1,500	1,700	750	4,100	5,700	3500	2,600
Perfluorobutanoate (PFBA)	NS	NA	NA	0.0097	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	**500,000**	**6,000,000**	**510,000**	270,000	NA	NA	NA	120,000	71,000	300,000	140,000	**1,200,000**	22,000	110,000
				Loading Test I						Loading Test II				

NS = No Standard
NA = Not Analyzed
Bold and Shaded = Detection of compound above respective AGQS

SAMPLE ID:		Influent Well C 01/25/2018	Influent Well C 01/07/2019	Influent Well C 06/10/2019
Compound	**AGQS (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**
Antimony	6	NA	<1	NA
Arsenic (Dissolved)	10	<1	<1	<1
Arsenic (Total)	10	NA	NA	<1
Barium	2000	7	NA	NA
Beryllium	4	NA	<1	NA
Cadmium	5	<1	<1	NA
Calcium	NS	NA	5,500	NA
Chromium	100	<1	<1	NA
Copper	1,300	NA	<1	NA
Iron	NS	NA	56	NA
Lead	15	6	4.3	NA
Magnesium	NS	NA	740	NA
Manganese	840	NA	17	NA
Mercury	2	<0.1	<0.1	NA
Molybdenum	NS	NA	<1	NA
Nickel	100	NA	1.4	NA
Potassium	160,000	NA	1,200	NA
Selenium	50	<1	<1	NA
Sodium	NS	NA	23,000	NA
Zinc	NS	NA	8.1	NA
Uranium	NS	NA	0.2	NA
Total Hardness (as $CaCO_3$)	NS	19,000	18,000	NA
Silica (Calculated)	NS	12,000	NA	NA
COD	NS	NA	<10,000	NA
pH	NS	NA	6.28 SU	NA
Ammonia	NS	NA	<50	NA
Nitrate	10,000	600	<500	NA
TKN	NS	NA	<500	NA
Specific Conductance	NS	170 uS/cm	160 uS/cm	NA
Total Phosphorus	NS	NA	<10	NA
Chloride	NS	NA	39,000	NA
Sulfate	500,000	3,000	2,400	NA

NS = No Standard
NA = Not Analyzed
Bold and Shaded = Detection of compound above respective AGQS

SAMPLE ID:		MW-11 01/07/2019	MW-11 01/17/2019	MW-11 05/16/2019	MW-11 05/24/2019	MW-11 06/03/2019	MW-14 01/07/2019	MW-14 01/17/2019	MW-14 05/16/2019	MW-14 05/24/2019	MW-14 06/03/2019	MW-14 06/10/2019	MW-16 01/07/2019	MW-16 01/17/2019	MW-16 05/16/2019	MW-16 05/24/2019	MW-16 06/03/2019
Compound	**AGQS (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**
Antimony	6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic	**10**	<1	3.3	**40**	<1	<1	<1	2.5	**26**	**11**	**14**	2.2	<1	<1	1.1	<1	<1
Beryllium	4	<1	1.2	<1	<1	<1	<1	1.7	2.7	2.4	1.5	<1	<1	<1	<1	<1	<1
Cadmium	5	<1	1.9	<1	<1	<1	<1	1.5	<1	2	<1	<1	<1	<1	<1	<1	<1
Calcium	NS	4,800	20,000	1,600	21,000	2,900	13,000	21,000	61,000	54,000	31,000	13,000	5,800	6,400	6,400	7,300	9,400
Chromium	100	<1	<1	16	<1	<1	<1	<1	9.7	<1	<1	<1	<1	<1	<1	<1	<1
Copper	1,300	<1	4.2	2.2	9.4	1.3	1.3	2.9	1.2	2.8	<1	<1	<1	4.3	<1	3	<1
Magnesium	NS	780	2,800	340	310	450	2,100	2,900	8,600	7,800	4,500	1,900	750	820	760	860	1,200
Manganese	840	14	51	6.6	6	7	37	27	37	43	26	12	110	91	16	20	17
Mercury	2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	NS	<1	<0.1	<1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.5	<1	<1	<1	<1
Potassium	160,000	1,200	3,100	1,300	740	970	1,800	2,900	7,600	6,100	3,800	2,000	880	900	1,000	970	1,100
Selenium	50	<1	8.5	<1	<1	<1	<1	7.2	16	11	14	1.9	<1	<1	<1	<1	<1
Sodium	NS	18,000	53,000	<5	11,000	15,000	35,000	71,000	290,000	270,000	160,000	65,000	<5,000	5,300	8,500	11,000	13,000
Zinc	NS	6.4	13	11	12	<5	9	11	26	31	16	7	9.6	11.0	5.2	8.6	5.6
Uranium	NS	NA	NA	NA	NA	NA	4.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Hardness (as $CaCO_3$)	NS	17,000	61,000	NA	NA	NA	42,000	64,000	NA	NA	NA	NA	26,000	19,000	NA	NA	NA
COD	NS	<10,000	<10,000	NA	NA	NA	<10,000	<10,000	NA	NA	NA	NA	55,000	21,000	NA	NA	NA
pH	NS	5.59 SU	5.32 SU	NA	NA	NA	5.33 SU	5.19 SU	NA	NA	NA	NA	5.6 SU	5.69 SU	NA	NA	NA
Ammonia	NS	<56	<50	NA	NA	NA	<50	<50	NA	NA	NA	NA	<50	<50	NA	NA	NA
Nitrate	10,000	<500	<500	NA	NA	NA	<500	590	NA	NA	NA	NA	<500	<500	NA	NA	NA
TKN	NS	<500	600	NA	NA	NA	2,700	740	NA	NA	NA	NA	<500	<500	NA	NA	NA
Specific Conductance	NS	150 uS/cm	410 uS/cm	NA	NA	NA	300 uS/cm	530 uS/cm	NA	NA	NA	NA	69 uS/cm	71 uS/cm	NA	NA	NA
Total Phosphorus	NS	1,600	1,600	NA	NA	NA	1,600	1,300	NA	NA	NA	NA	5,000	3,800	NA	NA	NA
Sulfate	500,000	1,700	2,700	NA	NA	NA	<1,000	<1000	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA
Chloride	NS	41,000	110,000	NA	NA	NA	88,000	150,000	NA	NA	NA	NA	14,000	15,000	NA	NA	NA

NS = No Standard
NA = Not Analyzed
Bold and Shaded = Detection of compound above respective AGQS

SAMPLE ID:		MW-11 01/07/2019	MW-11 01/17/2019	MW-11 05/16/2019	MW-11 05/24/2019	MW-11 06/03/2019
Compound	**AGQS (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**
Antimony	6	<1	<1	<1	<1	<1
Arsenic	**10**	<1	3.3	**40**	<1	<1
Beryllium	4	<1	1.2	<1	<1	<1
Cadmium	5	<1	1.9	<1	<1	<1
Calcium	NS	4,800	20,000	1,600	21,000	2,900
Chromium	100	<1	<1	16	<1	<1
Copper	1,300	<1	4.2	2.2	9.4	1.3
Magnesium	NS	780	2,800	340	310	450
Manganese	840	14	51	6.6	6	7
Mercury	2	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	NS	<1	<0.1	<1	<0.1	<1
Nickel	100	<1	<1	<1	<1	<1
Potassium	160,000	1,200	3,100	1,300	740	970
Selenium	50	<1	8.5	<1	<1	<1
Sodium	NS	18,000	53,000	<5	11,000	15,000
Zinc	NS	6.4	13	11	12	<5
Total Hardness (as $CaCO_3$)	NS	17,000	61,000	NA	NA	NA
COD	NS	<10,000	<10,000	NA	NA	NA
pH	NS	5.59 SU	5.32 SU	NA	NA	NA
Ammonia	NS	<56	<50	NA	NA	NA
Nitrate	10,000	<500	<500	NA	NA	NA
TKN	NS	<500	600	NA	NA	NA
Specific Conductance	NS	150 uS/cm	410 uS/cm	NA	NA	NA
Total Phosphorus	NS	1,600	1,600	NA	NA	NA
Sulfate	500,000	1,700	2,700	NA	NA	NA
Chloride	NS	41,000	110,000	NA	NA	NA

NS = No Standard

NA = Not Analyzed

Bold and Shaded = Detection of compound above respective AGQS

SAMPLE ID:		MW-14 01/07/2019	MW-14 01/17/2019	MW-14 05/16/2019	MW-14 05/24/2019	MW-14 06/03/2019	MW-14 06/10/2019
Compound	**AGQS (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**
Antimony	6	<1	<1	<1	<1	<1	<1
Arsenic	**10**	<1	2.5	**26**	**11**	**14**	2.2
Beryllium	4	<1	1.7	2.7	2.4	1.5	<1
Cadmium	5	<1	1.5	<1	2	<1	<1
Calcium	NS	13,000	21,000	61,000	54,000	31,000	13,000
Chromium	100	<1	<1	9.7	<1	<1	<1
Copper	1,300	1.3	2.9	1.2	2.8	<1	<1
Magnesium	NS	2,100	2,900	8,600	7,800	4,500	1,900
Manganese	840	37	27	37	43	26	12
Mercury	2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	NS	<1	<1	<1	<1	<1	<1
Nickel	100	<1	<1	<1	<1	<1	<1
Potassium	160,000	1,800	2,900	7,600	6,100	3,800	2,000
Selenium	50	<1	7.2	16	11	14	1.9
Sodium	NS	35,000	71,000	290,000	270,000	160,000	65,000
Uranium	NS	4.9	NA	26	31	16	7
Zinc	NS	9	11	NA	NA	NA	NA
Total Hardness (as $CaCO_3$)	NS	42,000	64,000	NA	NA	NA	NA
COD	NS	<10,000	<10,000	NA	NA	NA	NA
pH	NS	5.33 SU	5.19 SU	NA	NA	NA	NA
Ammonia	NS	<50	<50	NA	NA	NA	NA
Nitrate	10,000	<500	590	NA	NA	NA	NA
TKN	NS	2,700	740	NA	NA	NA	NA
Specific Conductance	NS	300 uS/cm	530 uS/cm	NA	NA	NA	NA
Total Phosphorus	NS	1,600	1,300	NA	NA	NA	NA
Sulfate	500,000	<1,000	<1000	NA	NA	NA	NA
Chloride	NS	88,000	150,000	NA	NA	NA	NA

NS = No Standard

NA = Not Analyzed

Bold and Shaded = Detection of compound above respective AGQS

SAMPLE ID:		MW-16 01/07/2019	MW-16 01/17/2019	MW-16 05/16/2019	MW-16 05/24/2019	MW-16 06/03/2019
Compound	**AGQS (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**	**Concentration (µg/L)**
Antimony	6	<1	<1	<1	<1	<1
Arsenic	10	<1	<1	1.1	<1	<1
Beryllium	4	<1	<1	<1	<1	<1
Cadmium	5	<1	<1	<1	<1	<1
Calcium	NS	5,800	6,400	6,400	7,300	9,400
Chromium	100	<1	<1	<1	<1	<1
Copper	1,300	<1	4.3	<1	3	<1
Magnesium	NS	750	820	760	860	1,200
Manganese	840	110	91	16	20	17
Mercury	2	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	NS	<1	<1	<1	<1	<1
Nickel	100	1.5	<1	<1	<1	<1
Potassium	160,000	880	900	1,000	970	1,100
Selenium	50	<1	<1	<1	<1	<1
Sodium	NS	<5,000	5,300	8,500	11,000	13,000
Zinc	NS	9.6	11.0	5.2	8.6	5.6
Total Hardness (as $CaCO_3$)	NS	26,000	19,000	NA	NA	NA
COD	NS	55,000	21,000	NA	NA	NA
pH	NS	5.6 SU	5.69 SU	NA	NA	NA
Ammonia	NS	<50	<50	NA	NA	NA
Nitrate	10,000	<500	<500	NA	NA	NA
TKN	NS	<500	<500	NA	NA	NA
Specific Conductance	NS	69 uS/cm	71 uS/cm	NA	NA	NA
Total Phosphorus	NS	5,000	3,800	NA	NA	NA
Sulfate	500,000	<1,000	<1,000	NA	NA	NA
Chloride	NS	14,000	15,000	NA	NA	NA

NS = No Standard
NA = Not Analyzed
Bold and Shaded = Detection of compound above respective AGQS

Eastern Analytical, Inc.

professional laboratory and drilling services

PRELIMINARY ANALYTICAL RESULTS ATTACHED

The attached .pdf file contains results that have not been subjected to a final QA/QC review. If you have any questions, please contact us at customerservice@easternanalytical.com or call 1-800-287-0525.

Chain-of-Custody

As a reminder, please fill out chain-of-custody forms completely when submitting samples to the lab.

Information most often missing on COCs-

- Relinquishing signature, date and time
- Sample ID, Date of Collection and Time of Collection *(should match sample containers)*
- Analyses

If you have any questions when completing the COC, please call us at 800-287-0525. We'd be happy to assist you!

Order Containers for Spring Sampling

Spring is here – and that means Spring sampling rounds are too! By ordering your container kits now, you'll be prepared for when your groundwater and industrial monitoring projects are scheduled.

Drilling

EAI offers direct push drilling services, to complement those of our laboratory.

The EAI drilling crew is licensed and 40-hour OSHA certified. Our field team is ready to meet your drilling needs for the most challenging of job sites in New Hampshire, Massachusetts, Vermont and Maine.

If you have questions regarding our drilling capabilities or would like to schedule an upcoming project, please call us at 1-800-287-0525, email customerservice@easternanalytical.com or visit EasternAnalytical.com.

LABORATORY REPORT

EAI ID#: **193800**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID:	UST	SV2	FTS					
Lab Sample ID:	193800.01	193800.02	193800.03					
Matrix:	aqueous	aqueous	aqueous					
Date Sampled:	4/4/19	4/4/19	4/4/19					
Date Received:	4/4/19	4/4/19	4/4/19	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Antimony	**0.0012**	< 0.001	**0.0013**	AqTot	mg/L	4/5/19	200.8	DS
Arsenic	**0.021**	**0.013**	**0.065**	AqTot	mg/L	4/5/19	200.8	DS
Beryllium	< 0.001	< 0.001	**0.0028**	AqTot	mg/L	4/5/19	200.8	DS
Calcium	**150**	**91**	**540**	AqTot	mg/L	4/5/19	200.8	DS
Cadmium	< 0.001	**0.0013**	**0.0014**	AqTot	mg/L	4/5/19	200.8	DS
Chromium	**0.0052**	**0.0069**	**0.032**	AqTot	mg/L	4/5/19	200.8	DS
Copper	**0.079**	**0.022**	**0.046**	AqTot	mg/L	4/5/19	200.8	DS
Iron	**0.64**	**1.2**	**1.0**	AqTot	mg/L	4/5/19	200.8	DS
Lead	**0.040**	**0.0047**	**0.0036**	AqTot	mg/L	4/5/19	200.8	DS
Magnesium	**14**	**11**	**74**	AqTot	mg/L	4/5/19	200.8	DS
Manganese	**0.060**	**0.70**	**0.12**	AqTot	mg/L	4/5/19	200.8	DS
Mercury	< 0.0002	< 0.0002	**0.00021**	AqTot	mg/L	4/5/19	200.8	DS
Molybdenum	**0.024**	**0.013**	**0.095**	AqTot	mg/L	4/5/19	200.8	DS
Nickel	**0.0029**	**0.0053**	**0.0061**	AqTot	mg/L	4/5/19	200.8	DS
Potassium	**32**	**16**	**120**	AqTot	mg/L	4/5/19	200.8	DS
Selenium	**0.0032**	**0.0049**	**0.022**	AqTot	mg/L	4/5/19	200.8	DS
Silver	< 0.001	< 0.001	< 0.001	AqTot	mg/L	4/5/19	200.8	DS
Sodium	**640**	**320**	**2500**	AqTot	mg/L	4/5/19	200.8	DS
Thallium	< 0.001	< 0.001	< 0.001	AqTot	mg/L	4/5/19	200.8	DS
Zinc	**0.028**	**0.078**	**0.050**	AqTot	mg/L	4/5/19	200.8	DS
Total Hardness (as CaCO3)	**440**	**270**	**1600**	AqTot	mg/L	4/5/19	200.8	DS

Eastern Analytical, Inc.

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PRELIMINARY ANALYTICAL RESULTS ATTACHED

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- Relinquishing signature, date and time
- Sample ID, Date of Collection and Time of Collection *(should match sample containers)*
- Analyses

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The EAI drilling crew is licensed and 40-hour OSHA certified. Our field team is ready to meet your drilling needs for the most challenging of job sites in New Hampshire, Massachusetts, Vermont and Maine.

If you have questions regarding our drilling capabilities or would like to schedule an upcoming project, please call us at 1-800-287-0525, email customerservice@easternanalytical.com or visit EasternAnalytical.com.

LABORATORY REPORT

EAI ID#: **193800**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID:	UST	SV2	FTS					
Lab Sample ID:	193800.01	193800.02	193800.03					
Matrix:	aqueous	aqueous	aqueous					
Date Sampled:	4/4/19	4/4/19	4/4/19					
Date Received:	4/4/19	4/4/19	4/4/19	**Units**	**Analysis Date**	**Time**	**Method**	**Analyst**
Sulfate	**300**	**140**	**1200**	mg/L	4/10/19	9:25	300.0	KD
Chloride	**950**	**470**	**4200**	mg/L	4/05/19	15:40	4500CLE-11	KD
Nitrite-N	< 0.5	< 0.5	< 0.5	mg/L	4/05/19	14:53	353.2	KD
Nitrate-N	**8.6**	**3.9**	**29**	mg/L	4/05/19	14:53	353.2	KD
Ammonia-N	< 0.05	**0.34**	**0.17**	mg/L	4/05/19	11:47	TM NH3-001	SEL
TKN	**0.92**	**3.4**	**2.5**	mg/L	4/05/19	14:37	4500N_{org}C/N	SEL
Total Phosphorus-P	**0.75**	**4.1**	**5.7**	mg/L	4/08/19	12:01	365.1	SEL
pH	**8.64**	**7.65**	**7.81**	SU	4/04/19	16:45	4500H+B-11	KL
Specific Conductance	**4800**	**2600**	**19000**	uS/cm	4/10/19	10:30	120.1	SEL

Eastern Analytical, Inc.

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Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

ACCREDITED IN ACCORDANCE WITH nelac

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 193881
Client Identification: Pinetree Power
Date Received: 4/8/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw — Lorraine Olashaw, Lab Director

4.12.19 — Date

4 — # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **193881**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Temperature upon receipt (°C): 13.1 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
193881.01	SV 2-7	4/8/19	4/8/19	aqueous		Adheres to Sample Acceptance Policy
193881.02	SV 3	4/8/19	4/8/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **193881**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: SV 2-7

Lab Sample ID: 193881.01
Matrix: aqueous
Date Sampled: 4/8/19
Date Received: 4/8/19

		Analysis			
		Units	Date	Time	Method	Analyst
Sulfate	**22**	mg/L	04/10/19	4:36	300.0	KD
Chloride	**59**	mg/L	04/09/19	8:09	4500CLE-11	KD
Nitrite-N	< 0.5	mg/L	04/09/19	8:09	353.2	KD
Nitrate-N	< 0.5	mg/L	04/09/19	8:09	353.2	KD
Ammonia-N	**0.31**	mg/L	04/10/19	10:57	TM NH3-001	SEL
TKN	**0.7**	mg/L	04/09/19	15:41	$4500N_{org}C/N$	SEL
Total Phosphorus-P	**3.5**	mg/L	04/12/19	12:32	365.1	SEL
pH	**7.44**	SU	04/08/19	16:35	4500H+B-11	KL
Specific Conductance	**350**	uS/cm	04/10/19	10:30	120.1	SEL

Sample ID: SV 3

Lab Sample ID: 193881.02
Matrix: aqueous
Date Sampled: 4/8/19
Date Received: 4/8/19

		Analysis			
		Units	Date	Time	Method	Analyst
Sulfate	**110**	mg/L	04/10/19	10:25	300.0	KD
Chloride	**430**	mg/L	04/09/19	8:40	4500CLE-11	KD
Nitrite-N	< 0.5	mg/L	04/09/19	8:11	353.2	KD
Nitrate-N	**3.0**	mg/L	04/09/19	8:11	353.2	KD
Ammonia-N	**0.14**	mg/L	04/10/19	11:15	TM NH3-001	SEL
TKN	**1.3**	mg/L	04/09/19	15:43	$4500N_{org}C/N$	SEL
Total Phosphorus-P	**2.6**	mg/L	04/12/19	12:33	365.1	SEL
pH	**7.08**	SU	04/08/19	16:35	4500H+B-11	KL
Specific Conductance	**1600**	uS/cm	04/10/19	10:30	120.1	SEL

LABORATORY REPORT

EAI ID#: **193881**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID:	SV 2-7	SV 3					
Lab Sample ID:	193881.01	193881.02					
Matrix:	aqueous	aqueous					
Date Sampled:	4/8/19	4/8/19	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Date Received:	4/8/19	4/8/19					
Antimony	< 0.001	< 0.001	AqTot	mg/L	4/9/19	200.8	DS
Arsenic	**0.0056**	**0.0088**	AqTot	mg/L	4/9/19	200.8	DS
Beryllium	< 0.001	< 0.001	AqTot	mg/L	4/9/19	200.8	DS
Calcium	**33**	**71**	AqTot	mg/L	4/9/19	200.8	DS
Cadmium	< 0.001	< 0.001	AqTot	mg/L	4/9/19	200.8	DS
Chromium	**0.0033**	**0.0044**	AqTot	mg/L	4/9/19	200.8	DS
Copper	**0.019**	**0.034**	AqTot	mg/L	4/9/19	200.8	DS
Iron	**1.5**	**0.63**	AqTot	mg/L	4/9/19	200.8	DS
Lead	**0.0045**	**0.0026**	AqTot	mg/L	4/9/19	200.8	DS
Magnesium	**3.5**	**9.2**	AqTot	mg/L	4/9/19	200.8	DS
Manganese	**0.65**	**0.30**	AqTot	mg/L	4/9/19	200.8	DS
Mercury	< 0.0002	< 0.0002	AqTot	mg/L	4/9/19	200.8	DS
Molybdenum	**0.0046**	**0.011**	AqTot	mg/L	4/9/19	200.8	DS
Nickel	**0.0025**	**0.0022**	AqTot	mg/L	4/9/19	200.8	DS
Potassium	**3.9**	**13**	AqTot	mg/L	4/9/19	200.8	DS
Selenium	**0.0017**	< 0.001	AqTot	mg/L	4/9/19	200.8	DS
Silver	< 0.001	< 0.001	AqTot	mg/L	4/9/19	200.8	DS
Sodium	**32**	**250**	AqTot	mg/L	4/9/19	200.8	DS
Thallium	< 0.001	< 0.001	AqTot	mg/L	4/9/19	200.8	DS
Zinc	**0.063**	**0.044**	AqTot	mg/L	4/9/19	200.8	DS
Total Hardness (as CaCO3)	**97**	**210**	AqTot	mg/L	4/9/19	200.8	DS

Eastern Analytical, Inc. CHAIN-OF-CUSTODY RECORD

193881

Sample IDs	Date/Time *Composites need start and stop dates/times*	Matrix	Parameters and Sample Notes	# of containers
SV2-7 SV3	4/8/19 0800	aqueous Grab or Comp	AqTot/SO4/Cl/NO3/NO2/NH3/TKN/TPhos/pH/SpecCon/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K.Ag.Na.Tl.Zn.HardTot	

☐ **Sampler confirms ID and parameters are accurate** *Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE Dissolved Sample Field Filtered ☐

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID 5260
Project Name Pinetree Power
State NH
Client (Pro Mgr) Joel Banaszak
Customer Horizons Engineering, Inc. (NL)
Address 176 Newport Road
City ATTN: Accounts NH 03257
Phone 603-877-0116 **Fax**
Email: jbanaszak@horizonsengineering.com
Direct 877-0116

Results Needed by: Preferred date 4/10/19
Notes:

QC deliverables
☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ MA MCP

ReportingOptions
☐ HC ☐ NO FAX
☒ EDD PDF ☐ Partial FAX
☒ EDD email ☒ PDF Invoice
☒ PDF prelim, NO FAX ☐ EQUIS
☒ e-mail Login Confirmation

PO# Verbal
Quote#: 101623(
Temp 1.5 °C
Ice Y ☒ N ☐

Samples Collected by:

Relinquished by	Date/Time	Received by
* with USB AS	4/8/19 1540	

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 196120
Client Identification: Pinetree Power
Date Received: 6/3/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

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The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director | 6.7.19 Date | 4 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **196120**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Temperature upon receipt (°C): 2.5 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
196120.01	MW-11	6/3/19	6/3/19	aqueous		Adheres to Sample Acceptance Policy
196120.02	MW-14	6/3/19	6/3/19	aqueous		Adheres to Sample Acceptance Policy
196120.03	MW-16	6/3/19	6/3/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **196120**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID:	MW-11	MW-14	MW-16					
Lab Sample ID:	196120.01	196120.02	196120.03					
Matrix:	aqueous	aqueous	aqueous					
Date Sampled:	6/3/19	6/3/19	6/3/19					
Date Received:	6/3/19	6/3/19	6/3/19	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Antimony	< 0.001	< 0.001	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Arsenic	< 0.001	**0.014**	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Beryllium	< 0.001	**0.0015**	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Calcium	**2.9**	**31**	**9.4**	AqDis	mg/L	6/4/19	200.8	DS
Cadmium	< 0.001	< 0.001	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Chromium	< 0.001	< 0.001	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Copper	**0.0013**	< 0.001	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Iron	< 0.05	< 0.05	< 0.05	AqDis	mg/L	6/4/19	200.8	DS
Lead	< 0.001	< 0.001	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Magnesium	**0.45**	**4.5**	**1.2**	AqDis	mg/L	6/4/19	200.8	DS
Manganese	**0.0065**	**0.026**	**0.017**	AqDis	mg/L	6/4/19	200.8	DS
Mercury	< 0.0001	< 0.0001	< 0.0001	AqDis	mg/L	6/4/19	200.8	DS
Molybdenum	< 0.001	< 0.001	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Nickel	< 0.001	< 0.001	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Potassium	**0.97**	**3.8**	**1.1**	AqDis	mg/L	6/4/19	200.8	DS
Selenium	< 0.001	**0.014**	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Silver	< 0.001	< 0.001	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Sodium	**15**	**160**	**13**	AqDis	mg/L	6/4/19	200.8	DS
Thallium	< 0.001	< 0.001	< 0.001	AqDis	mg/L	6/4/19	200.8	DS
Zinc	< 0.005	**0.016**	**0.0056**	AqDis	mg/L	6/4/19	200.8	DS

CHAIN-OF-CUSTODY RECORD

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

196120

3

SAMPLE I.D.	SAMPLING DATE/TIME *IF COMPOSITE, INDICATE BOTH START & FINISH DATE/TIME	MATRIX (SEE BELOW)	GRAB/*COMPOSITE	VOC: 524.2 / 524.2 BTEX / 524.2 MTBE ONLY	VOC: 8260 624 VTICs 1, 4 DIOXANE	VOC: 8021 BTEX HALOS	VOC: 8015 GRO MAVPH	SVOC: 8270 625 SVTICs EDB DBCP ABN A BN PAH	SVOC: TPH8100 L1 L2	SVOC: 8015 DRO MAEPH	SVOC: PEST 608 PCB 608 PEST 8081 PCB 8082	SVOC: OIL & GREASE 1664 TPH 1664	TCLP: TCLP 1311 ABN METALS VOC PEST HERB	METALS: DISSOLVED METALS (LIST BELOW)	METALS: TOTAL METALS (LIST BELOW)	INORGANICS: TS TSS TDS SPEC. CON.	INORGANICS: Br Cl F SO_4 NO_2 NO_3 NO_3NO_2	INORGANICS: BOD CBOD T. ALK.	INORGANICS: TKN NH_3 T. PHOS. O. PHOS.	INORGANICS: pH T. RES. CHLORINE	INORGANICS: COD PHENOLS TOC DOC	INORGANICS: TOTAL CYANIDE TOTAL SULFIDE	INORGANICS: REACTIVE CYANIDE REACTIVE SULFIDE FLASHPOINT IGNITABILITY	MICRO: TOTAL COLIFORM E. COLI FECAL COLIFORM	MICRO: ENTEROCOCCI HETEROTROPHIC PLATE COUNT	OTHER	OTHER	OTHER	# OF CONTAINERS	NOTES MeOH VIAL #
MW-11	3June19 / 1130	GW												X															1	
MW-14	1155													X															1	
MW-16	1220													X															1	

MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER

PRESERVATIVE: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

PROJECT MANAGER: Joel Bancszak
COMPANY: Horizons Engineering
ADDRESS: 176 Newport Rd.
CITY: New London STATE: NH ZIP: 03257
PHONE: 603-616-1334 EXT.:
FAX:
E-MAIL: JBancszek@horizonsengineering.com
SITE NAME: Pinetree Power
PROJECT #:
STATE: NH MA ME VT OTHER:
REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR GWP, OIL FUND, BROWNFIELD OR OTHER:
QUOTE #: PO #:

DATE NEEDED: RUSH 5DAY

TEMP. 2.5 °C
ICE? (YES) NO

QA/QC REPORTING LEVEL A B C OR MA MCP

REPORTING OPTIONS
PRELIMS: (YES) OR NO

ELECTRONIC OPTIONS
(E-MAIL) (PDF) EQUIS EXCEL

SAMPLER(S): Adam Carr

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
[signature]	6-3-19	1510	[signature]

METALS: 8 RCRA 13 PP FE, MN PB, CU
OTHER METALS:
SAMPLES FIELD FILTERED? ☒ YES ☐ NO
NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT)
SAME AS Previous Pinetree Metals

SITE HISTORY:
SUSPECTED CONTAMINATION:
FIELD READINGS:

Eastern Analytical, Inc.
professional laboratory and drilling services
25 CHENELL DRIVE | CONCORD, NH 03301 | TEL: 603.228.0525 | 1.800.287.0525 | E-MAIL: CUSTOMERSERVICE@EASTERNANALYTICAL.COM | WWW.EASTERNANALYTICAL.COM

(WHITE: ORIGINAL GREEN: PROJECT MANAGER)

Eastern Analytical, Inc.

19620

Quotation 1016231

Quotation Date: 1/25/2019

Project ID: Pinetree Power

EAI Project ID: 5260

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

Dear Mr. Banaszak:

Thank you for the opportunity to provide this quotation.

Qty.	Description
1	Sulfate
1	Chloride
1	Nitrite
1	Nitrate
1	Ammonia
1	TKN
1	Total Phosphorus
1	pH
1	Specific Conductance
1	Metals Aqueous Prep
1	Antimony
1	Arsenic
1	Beryllium
1	Calcium
1	Cadmium
1	Chromium
1	Copper
1	Iron
1	Lead
1	Magnesium
1	Manganese
1	Mercury
1	Molybdenum
1	Nickel
1	Potassium
1	Selenium
1	Silver
1	Sodium
1	Thallium
1	Zinc
1	Hardness, Total

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

ACCREDITED IN ACCORDANCE WITH nelac

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	196405
Client Identification:	Pinetree Power
Date Received:	6/6/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw — Lorraine Olashaw, Lab Director

6.12.19 — Date

4 — # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **196405**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Temperature upon receipt (°C): 2.5 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
196405.01	CT Basin	6/6/19	6/6/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **196405**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: CT Basin

Lab Sample ID: 196405.01

Matrix: aqueous

Date Sampled: 6/6/19

Date Received: 6/6/19

		Analysis			
	Units	**Date**	**Time**	**Method**	**Analyst**
Sulfate	**190**	mg/L	6/11/19	10:43	300.0	KD
Chloride	**880**	mg/L	6/11/19	10:43	300.0	KD
Nitrite-N	< 0.5	mg/L	6/07/19	9:14	353.2	SEL
Nitrate-N	**5.6**	mg/L	6/07/19	9:14	353.2	SEL
Ammonia-N	**0.45**	mg/L	6/07/19	15:54	TM NH3-001	SEL
TKN	**2.2**	mg/L	6/10/19	15:14	$4500N_{org}C/N$	SEL
Total Phosphorus-P	**5.2**	mg/L	6/10/19	14:55	365.1	SEL
pH	**8.01**	SU	6/06/19	17:15	4500H+B-11	AMB
Specific Conductance	**3800**	uS/cm	6/11/19	14:00	120.1	SEL

LABORATORY REPORT

EAI ID#: **196405**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: CT Basin

Lab Sample ID: 196405.01
Matrix: aqueous
Date Sampled: 6/6/19
Date Received: 6/6/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Antimony	< 0.001	AqTot	mg/L	6/7/19	200.8	DS
Arsenic	**0.025**	AqDis	mg/L	6/7/19	200.8	DS
Arsenic	**0.026**	AqTot	mg/L	6/7/19	200.8	DS
Beryllium	**0.0019**	AqTot	mg/L	6/7/19	200.8	DS
Calcium	**130**	AqTot	mg/L	6/7/19	200.8	DS
Cadmium	< 0.001	AqTot	mg/L	6/7/19	200.8	DS
Chromium	**0.013**	AqTot	mg/L	6/7/19	200.8	DS
Copper	**0.039**	AqTot	mg/L	6/7/19	200.8	DS
Iron	**0.07**	AqTot	mg/L	6/7/19	200.8	DS
Lead	< 0.001	AqTot	mg/L	6/7/19	200.8	DS
Magnesium	**15**	AqTot	mg/L	6/7/19	200.8	DS
Manganese	**0.83**	AqTot	mg/L	6/7/19	200.8	DS
Mercury	< 0.0001	AqTot	mg/L	6/7/19	200.8	DS
Molybdenum	**0.022**	AqTot	mg/L	6/7/19	200.8	DS
Nickel	**0.0068**	AqTot	mg/L	6/7/19	200.8	DS
Potassium	**26**	AqTot	mg/L	6/7/19	200.8	DS
Selenium	**0.003**	AqTot	mg/L	6/7/19	200.8	DS
Silver	< 0.001	AqTot	mg/L	6/7/19	200.8	DS
Sodium	**520**	AqTot	mg/L	6/7/19	200.8	DS
Thallium	< 0.001	AqTot	mg/L	6/7/19	200.8	DS
Zinc	**0.011**	AqTot	mg/L	6/7/19	200.8	DS
Total Hardness (as CaCO3)	**390**	AqTot	mg/L	6/7/19	200.8	DS

Eastern Analytical, Inc. CHAIN-OF-CUSTODY RECORD

196405

Sample IDs	Date/Time *Composites need start and stop dates/times*	Matrix	Parameters and Sample Notes	# of containers
CT Basin Tail	6-6-19 945 TM	aqueous Grab or Comp	AqTot/SO4/Cl/NO3/NO2/NH3/TKN/TPhos/pH/SpecCon/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K.Ag.Na.Tl.Zn.HardTot	

☐ Sampler confirms ID and parameters are accurate

Circle preservative/s: HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE

Dissolved Sample Field Filtered ☐

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID 5260

Project Name Pinetree Power

State NH

Client (Pro Mgr) Joel Banaszak

Customer Horizons Engineering, Inc. (NL)

Address 176 Newport Road

City ATTN: Accounts NH 03257

Phone 603-877-0116 Fax

Email: jbanaszak@horizonsengineering.com

Direct 877-0116

Results Needed by: Preferred date _____

Notes:

QC deliverables

☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ MA MCP

ReportingOptions

☐ HC	☐ NO FAX	PO# Verbal
☒ EDD PDF	☐ Partial FAX	Quote#:
☒ EDD email	☒ PDF Invoice	
☒ PDF prelim, NO FAX	☐ EQUIS	Temp 2.5 °C
☒ e-mail Login Confirmation		Ice Y ☑ N ☐

Samples Collected by: C. Stevens

Relinquished by	Date/Time	Received by
	06/06/19 0948	
	6-6-19 1355	

Relinquished by	Date/Time	Received by

Eastern Analytical, Inc.
professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 196490
Client Identification: Pinetree Power
Date Received: 6/10/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

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The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director | 6.14.19 Date | 4 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **196490**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Temperature upon receipt (°C): 23.5 **Received on ice or cold packs (Yes/No): N**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
196490.01	Well C	6/10/19	6/10/19	aqueous		Adheres to Sample Acceptance Policy
196490.02	MW-14	6/10/19	6/10/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.
All results contained in this report relate only to the above listed samples.
References include:
1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **196490**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: Well C

Lab Sample ID: 196490.01
Matrix: aqueous
Date Sampled: 6/10/19
Date Received: 6/10/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Arsenic	< 0.001	AqDis	mg/L	6/12/19	200.8	DS
Arsenic	< 0.001	AqTot	mg/L	6/12/19	200.8	DS

LABORATORY REPORT

EAI ID#: **196490**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: MW-14

Lab Sample ID: 196490.02
Matrix: aqueous
Date Sampled: 6/10/19
Date Received: 6/10/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Antimony	< 0.001	AqDis	mg/L	6/12/19	200.8	DS
Arsenic	**0.0022**	AqDis	mg/L	6/12/19	200.8	DS
Beryllium	< 0.001	AqDis	mg/L	6/12/19	200.8	DS
Calcium	**13**	AqDis	mg/L	6/12/19	200.8	DS
Cadmium	< 0.001	AqDis	mg/L	6/12/19	200.8	DS
Chromium	< 0.001	AqDis	mg/L	6/12/19	200.8	DS
Copper	< 0.001	AqDis	mg/L	6/12/19	200.8	DS
Iron	< 0.05	AqDis	mg/L	6/12/19	200.8	DS
Lead	< 0.001	AqDis	mg/L	6/12/19	200.8	DS
Magnesium	**1.9**	AqDis	mg/L	6/12/19	200.8	DS
Manganese	**0.012**	AqDis	mg/L	6/12/19	200.8	DS
Mercury	< 0.0001	AqDis	mg/L	6/12/19	200.8	DS
Molybdenum	< 0.001	AqDis	mg/L	6/12/19	200.8	DS
Nickel	< 0.001	AqDis	mg/L	6/12/19	200.8	DS
Potassium	**2.0**	AqDis	mg/L	6/12/19	200.8	DS
Selenium	**0.0019**	AqDis	mg/L	6/12/19	200.8	DS
Silver	< 0.001	AqDis	mg/L	6/12/19	200.8	DS
Sodium	**65**	AqDis	mg/L	6/12/19	200.8	DS
Thallium	< 0.001	AqDis	mg/L	6/12/19	200.8	DS
Zinc	**0.0065**	AqDis	mg/L	6/12/19	200.8	DS

Page 1 of 1

CHAIN-OF-CUSTODY RECORD

FOR LAB USE ONLY

196490

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

SAMPLE I.D.	SAMPLING DATE / TIME *IF COMPOSITE, INDICATE BOTH START & FINISH DATE / TIME	MATRIX (SEE BELOW)	GRAB / *COMPOSITE	VOC: 524.2 BTEX 524.2 MTBE ONLY	VOC: 8260 624 VTICs 1, 4 DIOXANE	VOC: 8021 BTEX HALOS	VOC: 8015 GRO MAVPH	SVOC: 8270 625 SVTICs EDB DBCP ABN A BN PAH	SVOC: TPH8100 L1 L2	SVOC: 8015 DRO MAEPH	SVOC: PEST 608 PCB 608 PEST 8081 PCB 8082	SVOC: OIL & GREASE 1664 TPH 1664	TCLP: TCLP 1311 ABN METALS VOC PEST HERB	METALS: DISSOLVED METALS (LIST BELOW)	METALS: TOTAL METALS (LIST BELOW)	INORGANICS: TS TSS TDS SPEC. CON.	INORGANICS: BR CL F SO_4 NO_2 NO_3 NO_2NO_3	INORGANICS: BOD CBOD T. ALK.	INORGANICS: TKN NH_3 T. PHOS. O. PHOS.	INORGANICS: PH T. RES. CHLORINE	INORGANICS: COD PHENOLS TOC DOC	INORGANICS: TOTAL CYANIDE TOTAL SULFIDE	INORGANICS: REACTIVE CYANIDE REACTIVE SULFIDE FLASHPOINT IGNITABILITY	INORGANICS: TOTAL COLIFORM E. COLI FECAL COLIFORM	INORGANICS: ENTEROCOCCI HETEROTROPHIC PLATE COUNT	# OF CONTAINERS	NOTES MEOH VIAL #
Well C	10 June 19 / 1045		/											X	X											2	
MW-14	1 1130		/											X												1	

MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER

PRESERVATIVE: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

PROJECT MANAGER: Joel Banaszak

COMPANY: Horizons Engineering

ADDRESS: 176 Newport Rd

CITY: New London STATE: NH ZIP: 03257

PHONE: 603-877-0116 EXT.:

FAX:

E-MAIL: JBanaszak@horizonsengineering.com

SITE NAME: Pinetree Power

PROJECT #:

STATE: NH MA ME VT OTHER:

REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR GWP, OIL FUND, BROWNFIELD OR OTHER:

QUOTE #: PO #:

DATE NEEDED: Rush (5-Day)

QA/QC REPORTING LEVEL

A B C

OR

MA MCP

REPORTING OPTIONS

PRELIMS: (YES) OR NO

ELECTRONIC OPTIONS

(E-MAIL) (PDF) EQUIS EXCEL

TEMP. 23.5 °C

ICE? YES (NO)

SAMPLER(S): Adam Carr

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
	6-10-19	1350	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:

METALS: 8 RCRA 13 PP FE, MN PB, CU

OTHER METALS: As

SAMPLES FIELD FILTERED? ☒ YES ☐ NO

NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT)

MW-14: Full Pinetree list

Well C: only Arsenic

SITE HISTORY:

SUSPECTED CONTAMINATION:

FIELD READINGS:

Eastern Analytical, Inc.
professional laboratory and drilling services

25 CHENELL DRIVE | CONCORD, NH 03301 | TEL: 603.228.0525 | 1.800.287.0525 | E-MAIL: CUSTOMERSERVICE@EASTERNANALYTICAL.COM | WWW.EASTERNANALYTICAL.COM

(WHITE: ORIGINAL GREEN: PROJECT MANAGER)

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	190893
Client Identification:	Pinetree
Date Received:	1/7/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

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Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

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The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Jenna Jewett for — Lorraine Olashaw, Lab Director

1·8·19 — Date

4 — # of pages (excluding cover letter)

25 Chenell Drive • Concord, NH 03301 • 800-287-0525 • www.easternanalytical.com

SAMPLE CONDITIONS PAGE

EAI ID#: **190893**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree**

Temperature upon receipt (°C): 11.8 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
190893.01	Circulation Water	1/7/19	1/7/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **190893**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree**

Sample ID: Circulation Water

Lab Sample ID:	190893.01
Matrix:	aqueous
Date Sampled:	1/7/19
Date Received:	1/7/19

		Analysis			
	Units	**Date**	**Time**	**Method**	**Analyst**
Nitrite-N	< 0.5	mg/L	1/07/19	12:06	353.2	KD
Nitrate-N	**7.7**	mg/L	1/07/19	12:06	353.2	KD

LABORATORY REPORT

EAI ID#: **190893**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree**

Sample ID: Circulation Water

Lab Sample ID: 190893.01
Matrix: aqueous
Date Sampled: 1/7/19
Date Received: 1/7/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Antimony	< 0.001	AqTot	mg/L	1/8/19	200.8	DS
Arsenic	**0.029**	AqTot	mg/L	1/8/19	200.8	DS
Beryllium	< 0.001	AqTot	mg/L	1/8/19	200.8	DS
Calcium	**180**	AqTot	mg/L	1/8/19	200.8	DS
Cadmium	< 0.001	AqTot	mg/L	1/8/19	200.8	DS
Chromium	**0.0090**	AqTot	mg/L	1/8/19	200.8	DS
Copper	**0.012**	AqTot	mg/L	1/8/19	200.8	DS
Iron	< 0.1	AqTot	mg/L	1/8/19	200.8	DS
Lead	< 0.001	AqTot	mg/L	1/8/19	200.8	DS
Magnesium	**21**	AqTot	mg/L	1/8/19	200.8	DS
Manganese	**0.23**	AqTot	mg/L	1/8/19	200.8	DS
Mercury	< 0.0001	AqTot	mg/L	1/8/19	200.8	DS
Molybdenum	**0.031**	AqTot	mg/L	1/8/19	200.8	DS
Nickel	**0.0038**	AqTot	mg/L	1/8/19	200.8	DS
Potassium	**42**	AqTot	mg/L	1/8/19	200.8	DS
Selenium	**0.0071**	AqTot	mg/L	1/8/19	200.8	DS
Silver	< 0.001	AqTot	mg/L	1/8/19	200.8	DS
Sodium	**810**	AqTot	mg/L	1/8/19	200.8	DS
Thallium	< 0.001	AqTot	mg/L	1/8/19	200.8	DS
Zinc	< 0.005	AqTot	mg/L	1/8/19	200.8	DS
Total Hardness (as CaCO3)	**550**	AqTot	mg/L	1/8/19	200.8	DS

Page 1 of 1

CHAIN-OF-CUSTODY RECORD

190893

4

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

Sample I.D.	Sampling Date/Time *If Composite, Indicate Both Start & Finish Date/Time	Matrix (see below)	Grab/*Composite	VOC: 524.2 / 524.2 BTEX / 524.2 MTBE only	VOC: 8260 624 VTICs 1, 4 Dioxane	VOC: 8021 BTEX HALOS	VOC: 8015 GRO MAVPH	SVOC: 8270 625 SVTICs EDB DBCP ABN A BN PAH	SVOC: TPH8100 L1 L2	SVOC: 8015 DRO MAEPH	SVOC: PEST 608 PCB 608 PEST 8081 PCB 8082	SVOC: Oil & Grease 1664 TPH 1664	TCLP: TCLP 1311 ABN Metals VOC Pest Herb	Metals: Dissolved Metals (List Below)	Metals: Total Metals (List Below)	Inorganics: TS TSS TDS Spec. Con.	Inorganics: Br Cl F SO_4 NO_2 NO_3 NO_3NO_2	Inorganics: BOD CBOD T. Alk.	Inorganics: TKN NH_3 T. Phos. O. Phos.	Inorganics: pH T. Res. Chlorine	Inorganics: COD Phenols TOC DOC	Inorganics: Total Cyanide Total Sulfide	Inorganics: Reactive Cyanide Reactive Sulfide Flashpoint Ignitability	Micro: Total Coliform E. Coli Fecal Coliform	Micro: Enterococci Heterotrophic Plate Count	Other	Other	Other	# of Containers	Notes MeOH Vial #
Circulation Water	1/7/19 0530	WW	G												✓		✓ (NO_2, NO_3 circled)													

MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER

PRESERVATIVE: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

PROJECT MANAGER: Joel Banaszak
COMPANY: Horizons Engineering
ADDRESS: 176 Newport Rd.
CITY: New London STATE: NH ZIP: 03257
PHONE: 603-616-1374 EXT.:
FAX:
E-MAIL: jbanaszak@horizonsengineering
SITE NAME: [illegible]
PROJECT #:
STATE: (NH circled) MA ME VT OTHER:
REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR GWP, OIL FUND, BROWNFIELD OR OTHER: NA
QUOTE #: PO #:

DATE NEEDED:

QA/QC REPORTING LEVEL A B C OR MA MCP

REPORTING OPTIONS PRELIMS: YES OR NO

ELECTRONIC OPTIONS E-MAIL PDF EQUIS EXCEL

TEMP. 11.8 °C
ICE? (YES circled) NO

SAMPLER(S): Joel Banaszak

Relinquished By:	Date:	Time:	Received By:
[signature]	1/7/19	0745	[signature]

METALS: 8 RCRA 13 PP Fe, Mn Pb, Cu

OTHER METALS:

SAMPLES FIELD FILTERED? ☐ YES ☐ NO

NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT) Antimony, Arsenic, Beryllium, Iron, Lead, Cadmium, Chromium, Copper, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Hardness*, Zinc*, Thallium*, Sodium*, Selenium*, Silver*, Calcium

SITE HISTORY:
SUSPECTED CONTAMINATION: *per J. Banaszak
FIELD READINGS: JB

Eastern Analytical, Inc.
professional laboratory and drilling services
25 Chenell Drive | Concord, NH 03301 | Tel: 603.228.0525 | 1.800.287.0525 | E-Mail: CustomerService@EasternAnalytical.com | www.EasternAnalytical.com

(WHITE: ORIGINAL GREEN: PROJECT MANAGER)

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

ACCREDITED IN ACCORDANCE WITH nelac

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 191018
Client Identification: Pinetree Power
Date Received: 1/8/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director | 1·11·19 Date | 4 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **191018**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Temperature upon receipt (°C): 2.3 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
191018.01	Cooling Tower	1/8/19	1/8/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **191018**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: Cooling Tower

Lab Sample ID:	191018.01
Matrix:	aqueous
Date Sampled:	1/8/19
Date Received:	1/8/19

		Analysis			
	Units	Date	Time	Method	Analyst
Nitrite-N	< 0.5	mg/L	1/10/19	9:41	353.2	KD
Nitrate-N	**6.6**	mg/L	1/10/19	9:41	353.2	KD

LABORATORY REPORT

EAI ID#: **191018**

Client: **Horizons Engineering, inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: Cooling Tower

Lab Sample ID: 191018.01
Matrix: aqueous
Date Sampled: 1/8/19
Date Received: 1/8/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Antimony	< 0.001	AqTot	mg/L	1/10/19	200.8	DS
Arsenic	**0.024**	AqTot	mg/L	1/10/19	200.8	DS
Beryllium	< 0.001	AqTot	mg/L	1/10/19	200.8	DS
Calcium	**150**	AqTot	mg/L	1/10/19	200.8	DS
Cadmium	< 0.001	AqTot	mg/L	1/10/19	200.8	DS
Chromium	**0.0053**	AqTot	mg/L	1/10/19	200.8	DS
Copper	**0.010**	AqTot	mg/L	1/10/19	200.8	DS
Iron	< 0.1	AqTot	mg/L	1/10/19	200.8	DS
Lead	< 0.001	AqTot	mg/L	1/10/19	200.8	DS
Magnesium	**16**	AqTot	mg/L	1/10/19	200.8	DS
Manganese	**0.19**	AqTot	mg/L	1/10/19	200.8	DS
Mercury	< 0.0001	AqTot	mg/L	1/10/19	200.8	DS
Molybdenum	**0.025**	AqTot	mg/L	1/10/19	200.8	DS
Nickel	**0.0022**	AqTot	mg/L	1/10/19	200.8	DS
Potassium	**32**	AqTot	mg/L	1/10/19	200.8	DS
Selenium	**0.005**	AqTot	mg/L	1/10/19	200.8	DS
Silver	< 0.001	AqTot	mg/L	1/10/19	200.8	DS
Sodium	**620**	AqTot	mg/L	1/10/19	200.8	DS
Thallium	< 0.001	AqTot	mg/L	1/10/19	200.8	DS
Zinc	< 0.005	AqTot	mg/L	1/10/19	200.8	DS

Page ______ of ______

Chain-of-Custody Record

191018

Bold Fields Required. Please Circle Requested Analysis.

Sample I.D.	Sampling Date / Time *If Composite, Indicate Both Start & Finish Date / Time	Matrix (see below)	Grab / *Composite	VOC: 524.2 / 524.2 BTEX / 524.2 MTBE only	VOC: 8260 / 624 / VTICs / 1,4 Dioxane	VOC: 8021 BTEX HALOS	VOC: 8015 GRO MAVPH	SVOC: 8270 625 SVTICs EDB DBCP / ABN A BN PAH	SVOC: TPH8100 L1 L2	SVOC: 8015 DRO MAEPH	SVOC: PEST 608 PCB 608 / PEST 8081 PCB 8082	SVOC: Oil & Grease 1664 TPH 1664	TCLP: TCLP 1311 ABN Metals / VOC Pest Herb	Metals: Dissolved Metals (List Below)	Metals: Total Metals (List Below)	Inorganics: TS TSS TDS Spec. Con.	Inorganics: Br Cl F SO_4 / NO_2 NO_3 (NO_3NO_2)	Inorganics: BOD CBOD T. Alk.	Inorganics: TKN NH_3 T. Phos. O. Phos.	Inorganics: pH T. Res. Chlorine	Inorganics: COD Phenols TOC DOC	Inorganics: Total Cyanide Total Sulfide	Inorganics: Reactive Cyanide Reactive Sulfide / Flashpoint Ignitability	Micro: Total Coliform E. Coli / Fecal Coliform	Micro: Enterococci / Heterotrophic Plate Count	Other	Other	Other	# of Containers	Notes MeOH Vial #
Cooling Tower	1/8/19 14:45		X												X		X												2	

Matrix: A-Air; S-Soil; GW-Ground Water; SW-Surface Water; DW-Drinking Water; WW-Waste water

Preservative: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

Project Manager: Joel Banaszak
Company: Horizons Engineering
Address: 176 Newport Rd.
City: New London, NH State: ______ Zip: 03257
Phone: 603-877-0116 Ext.: ______
Fax: ______
E-Mail: ~~Joel~~ ~~Banasz~~ Jbanaszak@Horizonsengineering.com
Site Name: Pinetree
Project #: Pinetree Power
State: (NH) MA ME VT Other: ______
Regulatory Program: NPDES: RGP POTW Stormwater or GWP, Oil Fund, Brownfield or Other: ______
Quote #: ______ PO #: ______

Date Needed: ______

QA/QC Reporting Level A B C or MA MCP

Reporting Options Prelims: (Yes) or No

Electronic Options (E-Mail) (PDF) Equis Excel

Temp. 2.3 °C
Ice? (Yes) No

Sampler(s): Adam Carr

Relinquished By	Date	Time	Received By
Adam Carr	1/8/19	1609	[signature]

Metals: 8 RCRA *13 PP Fe, Mn Pb, Cu
Other Metals: As, Se, Sb, Be, Ca, Cd, Cr, Cu, Fe, Pb, Mg, Mn, Hg, Mo, Ni, K, Ag, Na, Tl, Zn
Samples Field Filtered? ☐ Yes ☒ No
Notes: (ie: Special Detection Limits, Billing Info, If Different)
*Per J. Banaszak JN 1/10/19

Site History: ______
Suspected Contamination: ______
Field Readings: ______

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(White: Original Green: Project Manager)

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

ACCREDITED IN ACCORDANCE WITH nelac

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	191145
Client Identification:	Pinetree / Pintree RIB
Date Received:	1/10/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

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The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw — 1.15.19 — 4

Lorraine Olashaw, Lab Director | Date | # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **191145**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree / Pinetree RIB**

Temperature upon receipt (°C): 1.5 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
191145.01	Cooling Tower	1/10/19	1/10/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **191145**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree / Pinetree RIB**

Sample ID: Cooling Tower

Lab Sample ID:	191145.01
Matrix:	aqueous
Date Sampled:	1/10/19
Date Received:	1/10/19

		Analysis			
	Units	**Date**	**Time**	**Method**	**Analyst**
Nitrite-N	< 0.5	mg/L	1/11/19	12:38	353.2	KD
Nitrate-N	**1.3**	mg/L	1/11/19	12:38	353.2	KD

Eastern Analytical, Inc. www.easternanalytical.com | 800.287.0525 | customerservice@easternanalytical.com

LABORATORY REPORT

EAI ID#: **191145**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree / Pinetree RIB**

Sample ID: Cooling Tower

Lab Sample ID: 191145.01
Matrix: aqueous
Date Sampled: 1/10/19
Date Received: 1/10/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Antimony	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Arsenic	**0.018**	AqTot	mg/L	1/14/19	200.8	DS
Beryllium	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Calcium	**120**	AqTot	mg/L	1/14/19	200.8	DS
Cadmium	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Chromium	**0.0046**	AqTot	mg/L	1/14/19	200.8	DS
Copper	**0.0083**	AqTot	mg/L	1/14/19	200.8	DS
Iron	< 0.1	AqTot	mg/L	1/14/19	200.8	DS
Lead	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Magnesium	**13**	AqTot	mg/L	1/14/19	200.8	DS
Manganese	**0.11**	AqTot	mg/L	1/14/19	200.8	DS
Mercury	< 0.0002	AqTot	mg/L	1/14/19	200.8	DS
Molybdenum	**0.019**	AqTot	mg/L	1/14/19	200.8	DS
Nickel	**0.0022**	AqTot	mg/L	1/14/19	200.8	DS
Potassium	**25**	AqTot	mg/L	1/14/19	200.8	DS
Selenium	**0.004**	AqTot	mg/L	1/14/19	200.8	DS
Silver	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Sodium	**490**	AqTot	mg/L	1/14/19	200.8	DS
Thallium	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Zinc	**0.023**	AqTot	mg/L	1/14/19	200.8	DS

Page ______ of ______

Chain-of-Custody Record

Bold Fields Required. Please Circle Requested Analysis.

191145

Sample I.D.	Sampling Date/Time *If Composite, Indicate Both Start & Finish Date/Time	Matrix (see below)	Grab/*Composite	VOC: 524.2 / 524.2 BTEX / 524.2 MTBE only	VOC: 8260 624 VTICs 1, 4 Dioxane	VOC: 8021 BTEX HALOS	VOC: 8015 GRO MAVPH	SVOC: 8270 625 SVTICs EDB DBCP ABN A BN PAH	SVOC: TPH8100 L1 L2	SVOC: 8015 DRO MAEPH	SVOC: PEST 608 PCB 608 PEST 8081 PCB 8082	SVOC: Oil & Grease 1664 TPH 1664	TCLP: TCLP 1311 ABN Metals VOC Pest Herb	Metals: Dissolved Metals (List Below)	Metals: Total Metals (List Below)	Inorganics: TS TSS TDS Spec. Con.	Inorganics: Br Cl F SO_4 NO_2 NO_3 NO_3NO_2	Inorganics: BOD CBOD T. Alk.	Inorganics: TKN NH_3 T. Phos. O. Phos.	Inorganics: pH T. Res. Chlorine	Inorganics: COD Phenols TOC DOC	Inorganics: Total Cyanide Total Sulfide	Inorganics: Reactive Cyanide Reactive Sulfide Flashpoint Ignitability	Micro: Total Coliform E. Coli Fecal Coliform	Micro: Enterococci Heterotrophic Plate Count	Other	Other	Other	# of Containers	Notes MeOH Vial #
Cooling Tower	1/10/19 15:00		✓												X		X												2	

Matrix: A-Air; S-Soil; GW-Ground Water; SW-Surface Water; DW-Drinking Water; WW-Waste water

Preservative: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

Project Manager: Joel Banaszak
Company: Horizons Engineering
Address: 176 Newport Rd
City: New London State: NH Zip: 03257
Phone: 603-877-0116 Ext.:
Fax:
E-Mail: Jbanaszak@Horizonsengineering.com
Site Name: Pinetree
Project #: Pinetree RIB
State: (NH) MA ME VT Other:
Regulatory Program: NPDES: RGP POTW Stormwater or GWP, Oil Fund, Brownfield or Other:
Quote #: PO #:

Date Needed: Rush Please - 5 Days

Temp. 1.5 °C
ICE? (Yes) No

QA/QC Reporting Level
A B C
OR
MA MCP

Reporting Options
(Prelims:) Yes or No

Electronic Options
(E-Mail) (PDF) Equis Excel

Sampler(s): Adam Carr

Relinquished By:	Date:	Time:	Received By:
[signature]	1/10/19	1630	[signature]

Metals: 8 RCRA 13 PP Fe, Mn Pb, Cu
Other Metals: Below ↓
Samples Field Filtered? ☐ Yes ☒ No
Notes: (e.g. Special Detection Limits, Billing Info, If Different)
As, ~~Sr~~, Sb, Be, Ca, Cd, Cr, Cu, Fe, Pb, Mg, Mn, Hg, Mo, Ni, K, As, Na, Tl, Zn
*per J. Banaszak JLL 1/11/19
Site History:
Suspected Contamination:
Field Readings:

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(WHITE: Original GREEN: Project Manager)

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

ACCREDITED IN ACCORDANCE WITH nelac

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	191180
Client Identification:	Pinetree / Pinetree RIB
Date Received:	1/11/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw — 1.15.19 — 4

Lorraine Olashaw, Lab Director | Date | # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **191180**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree / Pinetree RIB**

Temperature upon receipt (°C): 3.0 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
191180.01	Cooling Tower	1/11/19	1/11/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.
All results contained in this report relate only to the above listed samples.
References include:
1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **191180**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree / Pinetree RIB**

Sample ID: Cooling Tower

Lab Sample ID:	191180.01
Matrix:	aqueous
Date Sampled:	1/11/19
Date Received:	1/11/19

		Analysis			
	Units	**Date**	**Time**	**Method**	**Analyst**
Nitrite-N	< 0.5	mg/L	1/11/19	20:10	300.0	KD
Nitrate-N	**1.9**	mg/L	1/11/19	20:10	300.0	KD

LABORATORY REPORT

EAI ID#: **191180**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree / Pinetree RIB**

Sample ID: Cooling Tower

Lab Sample ID: 191180.01
Matrix: aqueous
Date Sampled: 1/11/19
Date Received: 1/11/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Antimony	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Arsenic	**0.017**	AqTot	mg/L	1/14/19	200.8	DS
Beryllium	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Calcium	**120**	AqTot	mg/L	1/14/19	200.8	DS
Cadmium	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Chromium	**0.0042**	AqTot	mg/L	1/14/19	200.8	DS
Copper	**0.0084**	AqTot	mg/L	1/14/19	200.8	DS
Iron	< 0.1	AqTot	mg/L	1/14/19	200.8	DS
Lead	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Magnesium	**13**	AqTot	mg/L	1/14/19	200.8	DS
Manganese	**0.065**	AqTot	mg/L	1/14/19	200.8	DS
Mercury	< 0.0002	AqTot	mg/L	1/14/19	200.8	DS
Molybdenum	**0.018**	AqTot	mg/L	1/14/19	200.8	DS
Nickel	**0.0018**	AqTot	mg/L	1/14/19	200.8	DS
Potassium	**25**	AqTot	mg/L	1/14/19	200.8	DS
Selenium	**0.003**	AqTot	mg/L	1/14/19	200.8	DS
Silver	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Sodium	**470**	AqTot	mg/L	1/14/19	200.8	DS
Thallium	< 0.001	AqTot	mg/L	1/14/19	200.8	DS
Zinc	**0.010**	AqTot	mg/L	1/14/19	200.8	DS

Page _____ of _____

CHAIN-OF-CUSTODY RECORD

191180

4

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

SAMPLE I.D.	SAMPLING DATE / TIME *IF COMPOSITE, INDICATE BOTH START & FINISH DATE / TIME	MATRIX (SEE BELOW)	GRAB & COMPOSITE	VOC: 524.2 BTEX	VOC: 524.2 MTBE ONLY	VOC: 524.2 VTICS	VOC: 8260 624 1, 4 DIOXANE	VOC: 8021 BTEX HALOS	VOC: 8015 GRO MAVPH	SVOC: 8270 625 SVTICS EDB DBCP ABN A BN PAH	SVOC: TPH8100 LI L2	SVOC: 8015 DRO MAEPH	SVOC: PEST 608 PCB 608 PEST 8081 PCB 8082	SVOC: OIL & GREASE 1664 TPH 1664	TCLP: TCLP 1311 VOC ABN METALS PEST HERB	DISSOLVED METALS (LIST BELOW)	TOTAL METALS (LIST BELOW)	INORGANICS: TS TSS TDS SPEC. CON.	INORGANICS: BR CL F SO4 NO2 NO3 NO2-NO3	INORGANICS: BOD CBOD T. ALK.	INORGANICS: TKN NH3 T. PHOS. O. PHOS.	INORGANICS: pH T. RES. CHLORINE	INORGANICS: COD PHENOLS TOC DOC	INORGANICS: TOTAL CYANIDE TOTAL SULFIDE	INORGANICS: REACTIVE CYANIDE REACTIVE SULFIDE FLASHPOINT IGNITABILITY	MICRO: TOTAL COLIFORM E. COLI FECAL COLIFORM	MICRO: ENTEROCOCCI HETEROTROPHIC PLATE COUNT	OTHER	# OF CONTAINERS	NOTES MEOH VIAL #
Cooling Tower	1/11/19 1325		X														X		X										2	

MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER

PRESERVATIVE: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

PROJECT MANAGER: Joel Bransack

COMPANY: Horizons Engineering

ADDRESS: 176 Newport Rd

CITY: New London STATE: NH ZIP: 03527

PHONE: 603-877-0116 EXT.:

FAX:

E-MAIL: JBransack@HorizonsEngineering.com

SITE NAME: Pinetree

PROJECT #: Pinetree RIB

STATE: (NH) MA ME VT OTHER:

REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR GWP, OIL FUND, BROWNFIELD OR OTHER:

QUOTE #: PO #:

DATE NEEDED: Rush please

QA/QC REPORTING LEVEL: A B C OR MA MCP

REPORTING OPTIONS: PRELIMS: (YES) OR NO

ELECTRONIC OPTIONS: (E-MAIL) (PDF) EQUIS EXCEL

TEMP. 3.0 °C

ICE? (YES) NO

SAMPLER(S): Adam Carr

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
	1/11/19	15:47	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:

METALS: 8 RCRA 13 PP FE, MN PB, CU

OTHER METALS: Below ↓

SAMPLES FIELD FILTERED? ☐ YES ☐ NO

NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT)

As, Sb, Be, Ca, Cd, Cr, Cu, Fe, Pb, Mg, Mn, Hg, Mo, Ni, K, As, Na, Tl, Zn

SITE HISTORY:

SUSPECTED CONTAMINATION:

FIELD READINGS:

Eastern Analytical, Inc.
professional laboratory and drilling services
25 CHENELL DRIVE | CONCORD, NH 03301 | TEL: 603.228.0525 | 1.800.287.0525 | E-MAIL: CUSTOMERSERVICE@EASTERNANALYTICAL.COM | WWW.EASTERNANALYTICAL.COM

(WHITE: ORIGINAL GREEN: PROJECT MANAGER)

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

ACCREDITED IN ACCORDANCE WITH nelac

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	191408
Client Identification:	Pinetree Power
Date Received:	1/22/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw — 1.28.19 — 4

Lorraine Olashaw, Lab Director | Date | # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **191408**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Temperature upon receipt (°C): 17.1 **Received on ice or cold packs (Yes/No): N**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
191408.01	Circulation Water	1/22/19	1/22/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **191408**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: Circulation Water

Lab Sample ID:	191408.01
Matrix:	aqueous
Date Sampled:	1/22/19
Date Received:	1/22/19

		Analysis			
	Units	**Date**	**Time**	**Method**	**Analyst**
Sulfate	**120**	mg/L	1/23/19	18:18	300.0	KD
Chloride	**850**	mg/L	1/23/19	18:18	300.0	KD
Nitrite-N	< 1	mg/L	1/23/19	18:18	300.0	KD
Nitrate-N	**8.4**	mg/L	1/23/19	16:54	300.0	KD
Ammonia-N	< 0.05	mg/L	1/23/19	12:45	TM NH3-001	SEL
TKN	**0.55**	mg/L	1/24/19	15:09	4500N_{org}C/N	SEL
Total Phosphorus-P	**1.5**	mg/L	1/24/19	11:32	365.1	SEL
pH	**8.19**	SU	1/22/19	15:45	4500H+B-11	KL
Specific Conductance	**3900**	uS/cm	1/23/19	16:30	120.1	KL

LABORATORY REPORT

EAI ID#: **191408**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: Circulation Water

Lab Sample ID:	191408.01
Matrix:	aqueous
Date Sampled:	1/22/19
Date Received:	1/22/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Antimony	< 0.001	AqTot	mg/L	1/23/19	200.8	DS
Arsenic	**0.022**	AqTot	mg/L	1/23/19	200.8	DS
Beryllium	< 0.001	AqTot	mg/L	1/23/19	200.8	DS
Calcium	**130**	AqTot	mg/L	1/23/19	200.8	DS
Cadmium	< 0.001	AqTot	mg/L	1/23/19	200.8	DS
Chromium	**0.0050**	AqTot	mg/L	1/23/19	200.8	DS
Copper	**0.0072**	AqTot	mg/L	1/23/19	200.8	DS
Iron	< 0.05	AqTot	mg/L	1/23/19	200.8	DS
Lead	< 0.001	AqTot	mg/L	1/23/19	200.8	DS
Magnesium	**16**	AqTot	mg/L	1/23/19	200.8	DS
Manganese	< 0.005	AqTot	mg/L	1/23/19	200.8	DS
Mercury	< 0.0001	AqTot	mg/L	1/23/19	200.8	DS
Molybdenum	**0.020**	AqTot	mg/L	1/23/19	200.8	DS
Nickel	**0.0023**	AqTot	mg/L	1/23/19	200.8	DS
Potassium	**27**	AqTot	mg/L	1/23/19	200.8	DS
Selenium	**0.0048**	AqTot	mg/L	1/23/19	200.8	DS
Silver	< 0.001	AqTot	mg/L	1/23/19	200.8	DS
Sodium	**510**	AqTot	mg/L	1/23/19	200.8	DS
Thallium	< 0.001	AqTot	mg/L	1/23/19	200.8	DS
Zinc	< 0.005	AqTot	mg/L	1/23/19	200.8	DS
Total Hardness (as CaCO3)	**400**	AqTot	mg/L	1/23/19	200.8	DS

Eastern Analytical, Inc. CHAIN-OF-CUSTODY RECORD

191408

4

Sample IDs	Date/Time Composites need start and stop dates/times	Matrix	Parameters and Sample Notes	# of containers
Circulation Water	11/22/19 1240	aqueous Grab or Comp	AqTot/SO4/Cl/NO3/NO2/NH3/TKN/TPhos/pH/SpecCon/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K. Ag.Na.Tl.Zn.HardTot	

☑ Sampler confirms ID and parameters are accurate

Circle preservative/s: HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE

Dissolved Sample Field Filtered ☐

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID 5260
Project Name Pinetree Power
State NH
Client (Pro Mgr) Joel Banaszak
Customer Horizons Engineering, Inc. (NL)
Address 176 Newport Road
City ATTN: Accounts NH 03257
Phone 603-877-0116 Fax
Email: jbanaszak@horizonsengineering.com
Direct 877-0116

Results Needed by: Preferred date _____
Notes:

QC deliverables
☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ MA MCP

ReportingOptions
☐ HC ☐ NO FAX
☒ EDD PDF ☐ Partial FAX
☒ EDD email ☒ PDF Invoice
☒ PDF prelim, NO FAX ☐ EQUIS
☒ e-mail Login Confirmation

PO# Verbal
Quote#:
Temp 17.1 °C
Ice Y ☐ N ☒

Samples Collected by: Joel Banaszak

Relinquished by	Date/Time	Received by
	11/22/19 1410	

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

ACCREDITED IN ACCORDANCE WITH nelac

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 191509
Client Identification: Pinetree Power
Date Received: 1/24/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director | 2.1.19 Date | 4 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **191509**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Temperature upon receipt (°C): 3.5 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
191509.01	Circ Water	1/24/19	1/24/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.
All results contained in this report relate only to the above listed samples.
References include:
1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **191509**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: Circ Water

Lab Sample ID: 191509.01

Matrix: aqueous

Date Sampled: 1/24/19

Date Received: 1/24/19

		Analysis			
	Units	**Date**	**Time**	**Method**	**Analyst**
Sulfate	**71**	mg/L	1/28/19	10:15	300.0	KD
Chloride	**600**	mg/L	1/28/19	10:15	300.0	KD
Nitrite-N	< 0.5	mg/L	1/25/19	9:24	353.2	KD
Nitrate-N	**6.1**	mg/L	1/25/19	9:24	353.2	KD
Ammonia-N	< 0.05	mg/L	1/28/19	11:47	TM NH3-001	SEL
TKN	**0.62**	mg/L	1/30/19	12:32	$4500N_{org}C/N$	SEL
Total Phosphorus-P	**1.7**	mg/L	1/29/19	12:30	365.1	SEL
pH	**8.16**	SU	1/24/19	16:30	4500H+B-11	KL
Specific Conductance	**2400**	uS/cm	1/30/19	10:15	120.1	AMB

LABORATORY REPORT

EAI ID#: **191509**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: Circ Water

Lab Sample ID: 191509.01
Matrix: aqueous
Date Sampled: 1/24/19
Date Received: 1/24/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Antimony	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Arsenic	**0.015**	AqTot	mg/L	1/29/19	200.8	DS
Beryllium	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Calcium	**100**	AqTot	mg/L	1/29/19	200.8	DS
Cadmium	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Chromium	**0.0037**	AqTot	mg/L	1/29/19	200.8	DS
Copper	**0.0057**	AqTot	mg/L	1/29/19	200.8	DS
Iron	< 0.1	AqTot	mg/L	1/29/19	200.8	DS
Lead	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Magnesium	**12**	AqTot	mg/L	1/29/19	200.8	DS
Manganese	< 0.005	AqTot	mg/L	1/29/19	200.8	DS
Mercury	< 0.0001	AqTot	mg/L	1/29/19	200.8	DS
Molybdenum	**0.012**	AqTot	mg/L	1/29/19	200.8	DS
Nickel	**0.0013**	AqTot	mg/L	1/29/19	200.8	DS
Potassium	**21**	AqTot	mg/L	1/29/19	200.8	DS
Selenium	**0.0024**	AqTot	mg/L	1/29/19	200.8	DS
Silver	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Sodium	**380**	AqTot	mg/L	1/29/19	200.8	DS
Thallium	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Zinc	< 0.005	AqTot	mg/L	1/29/19	200.8	DS
Total Hardness (as CaCO3)	**300**	AqTot	mg/L	1/29/19	200.8	DS

Eastern Analytical, Inc. CHAIN-OF-CUSTODY RECORD

191509

Sample IDs	Date/Time *Composites need start and stop dates/times*	Matrix	Parameters and Sample Notes	# of containers
CIRC WATER	1-24-19 0800	aqueous (Grab or Comp)	AqTot/SO4/Cl/NO3/NO2/NH3/TKN/TPhos/pH/SpecCon/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K. Ag.Na.Tl.Zn.HardTot	

☑ Sampler confirms ID and parameters are accurate

Circle preservative/s: HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE

Dissolved Sample Field Filtered ☐

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID 5260

Project Name Pinetree Power

State NH

Client (Pro Mgr) Joel Banaszak

Customer Horizons Engineering, Inc. (NL)

Address 176 Newport Road

City ATTN: Accounts NH 03257

Phone 603-877-0116 Fax

Email: jbanaszak@horizonsengineering.com

Direct 877-0116

Results Needed by: Preferred date _____

Notes:

QC deliverables

☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ MA MCP

ReportingOptions

☐ HC	☐ NO FAX	PO# Verbal
☒ EDD PDF	☐ Partial FAX	Quote#:
☒ EDD email	☒ PDF Invoice	
☒ PDF prelim, NO FAX	☐ EQUIS	Temp 35 °C
☒ e-mail Login Confirmation		Ice Y ☒ N ☐

Samples Collected by: JASON JOUBERT

Relinquished by	Date/Time	Received by
	1-24-19 10:30	
	1-24-19 14:45	

Relinquished by Date/Time Received by

Eastern Analytical, Inc.

professional laboratory and drilling services

PRELIMINARY ANALYTICAL RESULTS ATTACHED

The attached .pdf file contains results that have not been subjected to a final QA/QC review. If you have any questions, please contact us at customerservice@easternanalytical.com or call 1-800-287-0525.

EAI's Winter Drilling Calendar - Dates Available!

The cold weather doesn't slow down our drilling crew. Now is a great time to schedule your drilling projects while there are plenty of dates available.

To schedule, call 800-287-0525, email customerservice@easternanalytical.com or visit www.EasternAnalytical.com.

EAI's Consultant Nuts & Bolts Training Seminar - Limited Space Still Available

We invite you to attend our last *free* informal and informative laboratory and sample collection training sessions this winter. For new employees or seasoned veterans, our training offers a variety of material including pre-project planning, sample collection, sample delivery and analyses, final reporting, available resources, and more.

- Training is held at our laboratory in Concord, NH.
- Each session begins at 9:00 a.m. and ends at noon.

Tuesday, February 12th Environmental Consultant Sessions (3 TCHs)

*In addition to the nuts and bolts training, guest speaker **Brandon Kernen**, with the NHDES Drinking Water and Groundwater Bureau, will present **"PFAS in New Hampshire's Environment: NH's Response to an Evolving Challenge".***

To reserve your seat, call us at 1-800-287-0525 or email customerservice@easternanalytical.com.

LABORATORY REPORT

EAI ID#: **191509**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: Circ Water

Lab Sample ID: 191509.01
Matrix: aqueous
Date Sampled: 1/24/19
Date Received: 1/24/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Antimony	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Arsenic	**0.015**	AqTot	mg/L	1/29/19	200.8	DS
Beryllium	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Calcium	**100**	AqTot	mg/L	1/29/19	200.8	DS
Cadmium	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Chromium	**0.0037**	AqTot	mg/L	1/29/19	200.8	DS
Copper	**0.0057**	AqTot	mg/L	1/29/19	200.8	DS
Iron	< 0.1	AqTot	mg/L	1/29/19	200.8	DS
Lead	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Magnesium	**12**	AqTot	mg/L	1/29/19	200.8	DS
Manganese	< 0.005	AqTot	mg/L	1/29/19	200.8	DS
Mercury	< 0.0001	AqTot	mg/L	1/29/19	200.8	DS
Molybdenum	**0.012**	AqTot	mg/L	1/29/19	200.8	DS
Nickel	**0.0013**	AqTot	mg/L	1/29/19	200.8	DS
Potassium	**21**	AqTot	mg/L	1/29/19	200.8	DS
Selenium	**0.0024**	AqTot	mg/L	1/29/19	200.8	DS
Silver	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Sodium	**380**	AqTot	mg/L	1/29/19	200.8	DS
Thallium	< 0.001	AqTot	mg/L	1/29/19	200.8	DS
Zinc	< 0.005	AqTot	mg/L	1/29/19	200.8	DS
Total Hardness (as CaCO3)	**300**	AqTot	mg/L	1/29/19	200.8	DS

LABORATORY REPORT

EAI ID#: **191509**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID: Circ Water

Lab Sample ID: 191509.01

Matrix: aqueous

Date Sampled: 1/24/19

Date Received: 1/24/19

		Analysis			
	Units	**Date**	**Time**	**Method**	**Analyst**
Sulfate	**71**	mg/L	1/28/19	10:15	300.0	KD
Chloride	**600**	mg/L	1/28/19	10:15	300.0	KD
Nitrite-N	< 0.5	mg/L	1/25/19	9:24	353.2	KD
Nitrate-N	**6.1**	mg/L	1/25/19	9:24	353.2	KD
Ammonia-N	< 0.05	mg/L	1/28/19	11:47	TM NH3-001	SEL
TKN	**0.62**	mg/L	1/30/19	12:32	$4500N_{org}C/N$	SEL
Total Phosphorus-P	**1.7**	mg/L	1/29/19	12:30	365.1	SEL
pH	**8.16**	SU	1/24/19	16:30	4500H+B-11	KL
Specific Conductance	**2400**	uS/cm	1/30/19	10:15	120.1	AMB

Eastern Analytical, Inc.
professional laboratory and drilling services

Robert Lussier
Engie
469 Plains Road
Tamworth , NH 03886

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 173780
Client Identification: Pinetree Power Tamworth Water
Date Received: 9/22/2017

Dear Mr. Lussier :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.eailabs.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:
Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269) and Vermont (VT1012).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director — 10.5.17 Date — 10 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **173780**

Client: **Engie**

Client Designation: **Pinetree Power Tamworth Water**

Temperature upon receipt (°C): 2.7 & 2.1 **Received on ice or cold packs (Yes/No):** Y

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
173780.01	Circ Wtr	9/22/17	9/21/17	aqueous		Adheres to Sample Acceptance Policy Sample temperature 2.7° upon receipt.
173780.02	Trip Blank - 8260	9/22/17	8/25/17	aqueous		Adheres to Sample Acceptance Policy Sample temperature 2.7° upon receipt.
173780.03	Trip Blank - 1,4 diox	9/22/17	8/16/17	aqueous		Adheres to Sample Acceptance Policy Sample temperature 2.7° upon receipt.
173780.04	Aq	9/29/17	9/29/17	aqueous		Adheres to Sample Acceptance Policy Sample temperature 2.1° upon receipt.

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.
All results contained in this report relate only to the above listed samples.
References include:
1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater,20th Edition, 1998 and 22nd Edition, 2012
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 2nd edition, 1992

LABORATORY REPORT

EAI ID#: **173780**

Client: **Engie**

Client Designation: **Pinetree Power Tamworth Water**

Sample ID:	Circ Wtr	Trip Blank - 8260
Lab Sample ID:	173780.01	173780.02
Matrix:	aqueous	aqueous
Date Sampled:	9/21/17	8/25/17
Date Received:	9/22/17	9/22/17
Units:	ug/L	ug/L
Date of Analysis:	9/26/17	9/26/17
Analyst:	BML	BML
Method:	8260C	8260C
Dilution Factor:	1	1
Dichlorodifluoromethane	< 5	< 5
Chloromethane	< 2	< 2
Vinyl chloride	< 2	< 2
Bromomethane	< 2	< 2
Chloroethane	< 5	< 5
Trichlorofluoromethane	< 5	< 5
Diethyl Ether	< 5	< 5
Acetone	< 10	< 10
1,1-Dichloroethene	< 1	< 1
tert-Butyl Alcohol (TBA)	< 30	< 30
Methylene chloride	< 5	< 5
Carbon disulfide	< 2	< 2
Methyl-t-butyl ether(MTBE)	< 1	< 1
Ethyl-t-butyl ether(ETBE)	< 5	< 5
Isopropyl ether(DIPE)	< 5	< 5
tert-amyl methyl ether(TAME)	< 5	< 5
trans-1,2-Dichloroethene	< 1	< 1
1,1-Dichloroethane	< 1	< 1
2,2-Dichloropropane	< 1	< 1
cis-1,2-Dichloroethene	< 1	< 1
2-Butanone(MEK)	< 10	< 10
Bromochloromethane	< 1	< 1
Tetrahydrofuran(THF)	< 10	< 10
Chloroform	< 1	< 1
1,1,1-Trichloroethane	< 1	< 1
Carbon tetrachloride	< 1	< 1
1,1-Dichloropropene	< 1	< 1
Benzene	< 1	< 1
1,2-Dichloroethane	< 1	< 1
Trichloroethene	< 1	< 1
1,2-Dichloropropane	< 1	< 1
Dibromomethane	< 1	< 1
Bromodichloromethane	< 0.5	< 0.5
1,4-Dioxane	< 50	< 50
4-Methyl-2-pentanone(MIBK)	< 10	< 10
cis-1,3-Dichloropropene	< 0.5	< 0.5
Toluene	< 1	< 1
trans-1,3-Dichloropropene	< 0.5	< 0.5
1,1,2-Trichloroethane	< 1	< 1
2-Hexanone	< 10	< 10
Tetrachloroethene	< 1	< 1
1,3-Dichloropropane	< 1	< 1
Dibromochloromethane	< 1	< 1
1,2-Dibromoethane(EDB)	< 2	< 2
Chlorobenzene	< 1	< 1
1,1,1,2-Tetrachloroethane	< 1	< 1
Ethylbenzene	< 1	< 1

LABORATORY REPORT

EAI ID#: **173780**

Client: **Engie**

Client Designation: **Pinetree Power Tamworth Water**

Sample ID:	Circ Wtr	Trip Blank - 8260
Lab Sample ID:	173780.01	173780.02
Matrix:	aqueous	aqueous
Date Sampled:	9/21/17	8/25/17
Date Received:	9/22/17	9/22/17
Units:	ug/L	ug/L
Date of Analysis:	9/26/17	9/26/17
Analyst:	BML	BML
Method:	8260C	8260C
Dilution Factor:	1	1
mp-Xylene	< 1	< 1
o-Xylene	< 1	< 1
Styrene	< 1	< 1
Bromoform	< 2	< 2
IsoPropylbenzene	< 1	< 1
Bromobenzene	< 1	< 1
1,1,2,2-Tetrachloroethane	< 1	< 1
1,2,3-Trichloropropane	< 0.5	< 0.5
n-Propylbenzene	< 1	< 1
2-Chlorotoluene	< 1	< 1
4-Chlorotoluene	< 1	< 1
1,3,5-Trimethylbenzene	< 1	< 1
tert-Butylbenzene	< 1	< 1
1,2,4-Trimethylbenzene	< 1	< 1
sec-Butylbenzene	< 1	< 1
1,3-Dichlorobenzene	< 1	< 1
p-Isopropyltoluene	< 1	< 1
1,4-Dichlorobenzene	< 1	< 1
1,2-Dichlorobenzene	< 1	< 1
n-Butylbenzene	< 1	< 1
1,2-Dibromo-3-chloropropane	< 2	< 2
1,3,5-Trichlorobenzene	< 1	< 1
1,2,4-Trichlorobenzene	< 1	< 1
Hexachlorobutadiene	< 0.5	< 0.5
Naphthalene	< 5	< 5
1,2,3-Trichlorobenzene	< 1	< 1
4-Bromofluorobenzene (surr)	**99 %R**	**100 %R**
1,2-Dichlorobenzene-d4 (surr)	**101 %R**	**101 %R**
Toluene-d8 (surr)	**98 %R**	**98 %R**
1,2-Dichloroethane-d4 (surr)	**101 %R**	**100 %R**

Hexachlorobutadiene exhibited recovery outside acceptance limits in the Quality Control sample(s). The analyte(s) were not detected in the sample(s).

Circ Wtr: The sample vial contained air bubbles upon receipt. A sample result bias may be present.

LABORATORY REPORT

EAI ID#: **173780**

Client: **Engie**

Client Designation: **Pinetree Power Tamworth Water**

Sample ID:	Circ Wtr	Trip Blank - 1,4 diox
Lab Sample ID:	173780.01	173780.03
Matrix:	aqueous	aqueous
Date Sampled:	9/21/17	8/16/17
Date Received:	9/22/17	9/22/17
Units:	ug/L	ug/L
Date of Analysis:	10/2/17	10/2/17
Analyst:	VG	VG
Method:	8260B SIM	8260B SIM
Dilution Factor:	1	1
1,4-Dioxane	< 0.25	< 0.25
4-Bromofluorobenzene (surr)	**98 %R**	**100 %R**
Toluene-d8 (surr)	**97 %R**	**98 %R**

LABORATORY REPORT

EAI ID#: **173780**

Client: **Engie**

Client Designation: **Pinetree Power Tamworth Water**

Sample ID:	Circ Wtr
Lab Sample ID:	173780.01
Matrix:	aqueous
Date Sampled:	9/21/17
Date Received:	9/22/17
Units:	ug/L
Date of Extraction/Prep:	9/25/17
Date of Analysis:	9/25/17
Analyst:	JMR
Method:	8011/504
Dilution Factor:	1

1,2-Dibromoethane(EDB)	< 0.02
Dibromochloropropane (DBCP)	< 0.02
1,1,1,2-Tetrachloroethane (surr)	**108 %R**

LABORATORY REPORT

EAI ID#: **173780**

Client: **Engie**

Client Designation: **Pinetree Power Tamworth Water**

Sample ID: Circ Wtr

Lab Sample ID: 173780.01
Matrix: aqueous
Date Sampled: 9/21/17
Date Received: 9/22/17

		Analysis			
	Units	Date	Time	Method	Analyst
Solids Suspended **27**	mg/L	09/27/17	14:00	2540D-97	ATA
Solids Dissolved **25000**	mg/L	09/25/17	14:15	2540C-97	SCW
Sulfate **6000**	mg/L	10/03/17	12:00	300.0	KD
Chloride **9200**	mg/L	09/22/17	15:28	4500ClE-97	KD
Nitrite-N **0.5**	mg/L	09/22/17	15:11	353.2	KD
Nitrate-N **100**	mg/L	09/22/17	15:18	353.2	KD
Ammonia-N **0.11**	mg/L	09/28/17	12:00	TM NH3-001	SEL
TKN **23**	mg/L	09/25/17	14:58	4500N_{org}C/N	SEL
Total Phosphorus-P **0.32**	mg/L	10/02/17	13:39	365.1	SEL
BOD < 6	mg/L	09/22/17	15:55	5210B-01	SCW
COD **390**	mg/L	10/02/17	10:33	H8000	JCS
pH **7.9**	SU	09/22/17	15:40	4500H+B-00	TMS
Specific Conductance **47000**	uS/cm	09/27/17	10:30	120.1	AMB

Sample ID: Aq

Lab Sample ID: 173780.04
Matrix: aqueous
Date Sampled: 9/29/17
Date Received: 9/29/17

		Analysis			
	Units	Date	Time	Method	Analyst
Total Phenols < 0.05	mg/L	10/02/17	9:15	420.1	ATA

Circ Wtr: The matrix spike duplicate for TKN associated with this sample exhibited recovery outside the acceptance criteria. The matrix spike and all other batch QC were in control. The presence of high nitrates in a sample may cause a negative interference for TKN.

LABORATORY REPORT

EAI ID#: **173780**

Client: **Engie**

Client Designation: **Pinetree Power Tamworth Water**

Sample ID: Circ Wtr

Lab Sample ID: 173780.01
Matrix: aqueous
Date Sampled: 9/21/17
Date Received: 9/22/17

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Arsenic	< 0.01	AqTot	mg/L	9/27/17	200.7	JCS
Selenium	< 0.01	AqTot	mg/L	9/27/17	200.7	JCS
Antimony	< 0.005	AqTot	mg/L	10/3/17	200.8	DS
Beryllium	< 0.005	AqTot	mg/L	10/3/17	200.8	DS
Calcium	**660**	AqTot	mg/L	10/3/17	200.8	DS
Cadmium	< 0.005	AqTot	mg/L	10/3/17	200.8	DS
Chromium	**0.010**	AqTot	mg/L	10/3/17	200.8	DS
Copper	**0.035**	AqTot	mg/L	10/3/17	200.8	DS
Iron	**0.3**	AqTot	mg/L	10/3/17	200.8	DS
Lead	< 0.005	AqTot	mg/L	10/3/17	200.8	DS
Magnesium	**41**	AqTot	mg/L	10/3/17	200.8	DS
Manganese	**0.39**	AqTot	mg/L	10/3/17	200.8	DS
Mercury	< 0.001	AqTot	mg/L	10/3/17	200.8	DS
Molybdenum	**0.19**	AqTot	mg/L	10/3/17	200.8	DS
Nickel	**0.019**	AqTot	mg/L	10/3/17	200.8	DS
Potassium	**210**	AqTot	mg/L	10/3/17	200.8	DS
Silver	< 0.005	AqTot	mg/L	10/3/17	200.8	DS
Sodium	**8900**	AqTot	mg/L	10/3/17	200.8	DS
Thallium	< 0.005	AqTot	mg/L	10/3/17	200.8	DS
Zinc	**0.033**	AqTot	mg/L	10/3/17	200.8	DS
Total Hardness (as CaCO3)	**1800**	AqTot	mg/L	10/3/17	200.8	DS

Page 1 of 2

CHAIN-OF-CUSTODY RECORD

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

173780

SAMPLE I.D.	SAMPLING DATE/TIME *IF COMPOSITE, INDICATE BOTH START & FINISH DATE/TIME	MATRIX (SEE BELOW)	GRAB/*COMPOSITE	VOC: 524.2 BTEX; 524.2 MTBE ONLY; 524.2 VTICS; 8260 624 1,4 DIOXANE; 8021 BTEX HALOS; 8015 GRO MAVPH	SVOC: 8270 625 ABN A BN; SVTICS EDB PAH; TPH8100 LI L2; 8015 DRO MAEPH; PEST 608 PCB 608; PEST 8081 PCB 8082; OIL & GREASE 1664 TPH 1664	TCLP: TCLP 1311 VOC; ABN METALS PEST HERB	METALS: DISSOLVED METALS (LIST BELOW); TOTAL METALS (LIST BELOW)	INORGANICS: TS TSS TDS SPEC. CON.; BR CL F SO_4 NO_2 NO_3 NO_3NO_2; BOD CBOD T. ALK.; TKN NH_3 T. PHOS. O. PHOS.; pH T. RES. CHLORINE; COD PHENOLS TOC DOC; TOTAL CYANIDE TOTAL SULFIDE; REACTIVE CYANIDE REACTIVE SULFIDE FLASHPOINT IGNITABILITY	MICRO: TOTAL COLIFORM E. COLI FECAL COLIFORM; ENTEROCOCCI HETEROTROPHIC PLATE COUNT	OTHER: # OF CONTAINERS	NOTES MEOH VIAL #
Circ Wtr	9/21/17 8:02										

MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER

PRESERVATIVE: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

PROJECT MANAGER: Robert Lussier

COMPANY:

ADDRESS:

CITY: **STATE:** **ZIP:**

PHONE: **EXT.:**

FAX:

E-MAIL:

SITE NAME: Pinetree Power Tamworth Water

PROJECT #:

STATE: NH MA ME VT **OTHER:**

REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR GWP, OIL FUND, BROWNFIELD OR OTHER:

QUOTE #: **PO #:**

DATE NEEDED:

QA/QC REPORTING LEVEL

A B C

OR

PRESUMPTIVE CERTAINTY

REPORTING OPTIONS

PRELIMS: YES OR NO

ELECTRONIC OPTIONS

E-MAIL PDF EQUIS EXCEL

TEMP. 2.7 °C

ICE? (YES) NO

METALS: 8 RCRA 13 PP FE, MN PB, CU

OTHER METALS:

SAMPLES FIELD FILTERED? ☐ YES ☐ NO

NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT)

Bottle Order
4261

Trip Blanks - EAT
8260 - 8/25/17 15:00
624 - 8/16/17 9:00

SITE HISTORY:

SUSPECTED CONTAMINATION:

FIELD READINGS: PM 9/26/17

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
[signature]	09/22/17	12:26	[signature]
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
[signature]	9-22-17	1425	[signature]
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:

Eastern Analytical, Inc.
professional laboratory and drilling services
25 CHENELL DRIVE | CONCORD, NH 03301 | TEL: 603.228.0525 | 1.800.287.0525 | E-MAIL: CUSTOMERSERVICE@EASTERNANALYTICAL.COM | WWW.EASTERNANALYTICAL.COM

(WHITE: ORIGINAL GREEN: PROJECT MANAGER)

173780

Eastern Analytical, Inc.

Bottle Order # 4261

Questions with your bottle order? call 800-287-0525

Attention: Robert Lussier

Customer: Engie

Address: 469 Plains Road

City: Tamworth NH 03886

Comments

Delivery Date Needed: 9/19/2017

Shipped by: UPS Ground

Prepared GMBecker

CoolerID S-116

Quote No. [ ] **EAI Project ID** [ ]

Project ID: Pinetree Power Tamworth Water NH

Qty.	IDs	Parameters	Container/Preservation
1	Aq	AqTot / Solids Dissolved / Sulfate / Chloride / pH / Specific Conductance (µS)	16 oz Plastic Bottle Unpreserved
1	Aq	AqTot / Metals by ICP	4 oz Plastic Bottle Nitric Acid CAUTION Do not spill
1	Aq	AqTot / Total Phosphorus / Ammonia / TKN / COD	4 oz Plastic Bottle Sulfuric Acid CAUTION Do not spill
1	Aq	AqTot / Nitrite / Nitrate / BOD / Solids Suspended	1 L Plastic Bottle Unpreserved - Cool and **return to lab ASAP** - 48 HOUR HOLD TIME
1	Aq	AqTot / Volatiles by 8260C	VOA Vials (40 mL) Hydrochloric Acid CAUTION Do not Spill - Collect in Duplicate - No bubbles
1	Aq	AqTot / EDB and DBCP by Semivolatiles	2 - 40 ml VOC Vials Sodium Thiosulfate, Collect in Duplicate - No bubbles
1	Aq	AqTot / Volatiles SIM 8260 1,4-Dioxane	2 - 40 ml VOC Vials Unpreserved - Collect in duplicate with no bubbles
1	Trip Blank - 8260	AqTot / Trip Blank	VOA Vials (40 mL) Hydrochloric Acid CAUTION Do not Spill - Collect in Duplicate - No bubbles
1	Trip Blank - 1,4 diox	AqTot / Trip Blank	2 - 40 ml VOC Vials Unpreserved - Collect in duplicate with no bubbles

Prepared by_____ Date_____ ☐ Temperature Blank Included ☐ D/O scheduled in courier book ☐ P/U scheduled in courier book

Via: (circle one) UPS next day UPS Air Saver UPS Std EAI Courier EAI Sampling Customer p/u EAI employee

Cooler ID_____ Cooler ID_____ Cooler ID_____ Cooler ID_____ Cooler ID_____

Eastern Analytical, Inc. CHAIN-OF-CUSTODY RECORD

173780

ENG

Sample IDs	Date/Time *Composites need start and stop dates/times*	Matrix	Parameters and Sample Notes	# of containers
Aq	9/22/17 8:00	aqueous Grab or Comp	AqTot/TPhenols	

☐ **Sampler confirms ID and parameters are accurate** *Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE Dissolved Sample Field Filtered ☐

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID

Project Name Pinetree Power Tamworth Water

State NH

Client (Pro Mgr) Robert Lussier

Customer Engie

Address 469 Plains Road

City Tamworth NH 03886

Phone 603-323-8187 **Fax**

Email: Robert.Lussier@na.engie.com

Direct

Results Needed by: Preferred date _____

Notes:

QC deliverables

☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ PC

ReportingOptions

☐ HC	☐ NO FAX
☒ EDD PDF	☐ Partial FAX
☒ EDD email	☒ PDF Invoice
☒ PDF prelim, NO FAX	☐ EQUIS
☐ e-mail Login Confirmation	

PO# Credit Ap

Quote#:

Temp 2.1 °C

Ice Y ☒ N ☐

Samples Collected by: Chris Stevens

Relinquished by	Date/Time	Received by
	09/27/17 13:20	
	9-27-17 1520	
Relinquished by	**Date/Time**	**Received by**

Invoice

174721

Eastern Analytical, Inc.
25 Chenell Drive
Concord, NH 03301

(603)-228-0525
1-800-287-0525
FAX: (603)-228-4591

Job Description **173780**

Site Name: Pinetree Power Tamworth Water
Contact: Robert Lussier
Date Received: 9/22/2017

Engie
469 Plains Road
Tamworth NH 03886
ATTN: Accounts Payable

Invoice Date	Your Order Number	Terms
10/5/2017	Verbal	1:Net 30

Quantity	Item Description	Discountable	List Price	Extended Price Gross
1	Solids, Total Suspended	N	15.00	15.00
1	Solids, Total Dissolved	N	15.00	15.00
1	Sulfate	N	15.00	15.00
1	Chloride	N	15.00	15.00
1	Nitrite	N	15.00	15.00
1	Nitrate	N	15.00	15.00
1	Ammonia	N	25.00	25.00
1	TKN	N	40.00	40.00
1	Total Phosphorus	N	25.00	25.00
1	BOD	N	40.00	40.00
1	COD	N	25.00	25.00
1	Phenols, Total	N	55.00	55.00
1	pH	N	5.00	5.00
1	Specific Conductance	N	10.00	10.00
1	Metals Aqueous Prep	N	10.00	10.00
1	Metals * (16 metals list)	N	240.00	240.00
1	EDB and DBCP 504	N	85.00	85.00
1	VOCs 8260B SIM 1,4 Dioxane	N	100.00	100.00
2	Trip Blank	N	0.00	0.00
1	VOCs 8260C NH	N	165.00	165.00
1	Calcium	N	15.00	15.00
1	Magnesium	N	15.00	15.00
1	Potassium	N	15.00	15.00
1	Sodium	N	15.00	15.00
1	Hardness, Total	N	15.00	15.00

Gross Invoice Amount $990.00

Please pay this amount: **$990.00**

Thank you for this opportunity to be of service

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 190154
Client Identification: Pinetree Power | 18859
Date Received: 12/11/2018

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director | 12.17.18 Date | 4 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **190154**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power | 18859**

Temperature upon receipt (°C): 1.8 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
190154.01	Circ Water	12/11/18	12/10/18	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.
All results contained in this report relate only to the above listed samples.
References include:
1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **190154**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power | 18859**

Sample ID: Circ Water

Lab Sample ID: 190154.01

Matrix: aqueous

Date Sampled: 12/10/18

Date Received: 12/11/18

		Analysis			
	Units	Date	Time	Method	Analyst
Sulfate	**510**	mg/L	12/13/18	8:36	300.0	KD
Chloride	**1500**	mg/L	12/12/18	14:55	4500CLE-11	KD
Nitrite-N	< 0.5	mg/L	12/11/18	15:24	353.2	KD
Nitrate-N	**5.2**	mg/L	12/11/18	15:24	353.2	KD
Ammonia-N	**0.12**	mg/L	12/12/18	9:34	TM NH3-001	SEL
TKN	**2.7**	mg/L	12/12/18	13:20	4500N_{org}C/N	SEL
Total Phosphorus-P	**2.7**	mg/L	12/13/18	12:06	365.1	SEL
BOD	< 6	mg/L	12/12/18	9:39	5210B-11	ATA
COD	**81**	mg/L	12/11/18	9:40	H8000	JCS
pH	**8.18**	SU	12/11/18	15:20	4500H+B-11	KL
Specific Conductance	**7600**	uS/cm	12/12/18	17:20	120.1	KL

LABORATORY REPORT

EAI ID#: **190154**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power | 18859**

Sample ID: Circ Water

Lab Sample ID: 190154.01
Matrix: aqueous
Date Sampled: 12/10/18
Date Received: 12/11/18

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Antimony	**0.0011**	AqTot	mg/L	12/12/18	200.8	DS
Arsenic	**0.040**	AqTot	mg/L	12/12/18	200.8	DS
Beryllium	< 0.001	AqTot	mg/L	12/12/18	200.8	DS
Calcium	**230**	AqTot	mg/L	12/12/18	200.8	DS
Cadmium	< 0.001	AqTot	mg/L	12/12/18	200.8	DS
Chromium	**0.012**	AqTot	mg/L	12/12/18	200.8	DS
Copper	**0.026**	AqTot	mg/L	12/12/18	200.8	DS
Iron	< 0.05	AqTot	mg/L	12/12/18	200.8	DS
Lead	< 0.001	AqTot	mg/L	12/12/18	200.8	DS
Magnesium	**21**	AqTot	mg/L	12/12/18	200.8	DS
Manganese	**1.5**	AqTot	mg/L	12/12/18	200.8	DS
Mercury	**0.00015**	AqTot	mg/L	12/12/18	200.8	DS
Molybdenum	**0.044**	AqTot	mg/L	12/12/18	200.8	DS
Nickel	**0.0050**	AqTot	mg/L	12/12/18	200.8	DS
Potassium	**53**	AqTot	mg/L	12/12/18	200.8	DS
Selenium	**0.007**	AqTot	mg/L	12/12/18	200.8	DS
Silver	< 0.001	AqTot	mg/L	12/12/18	200.8	DS
Sodium	**1100**	AqTot	mg/L	12/12/18	200.8	DS
Thallium	< 0.001	AqTot	mg/L	12/12/18	200.8	DS
Zinc	< 0.005	AqTot	mg/L	12/12/18	200.8	DS
Total Hardness (as CaCO3)	**670**	AqTot	mg/L	12/12/18	200.8	DS

Page _____ of _____

CHAIN-OF-CUSTODY RECORD

190154

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

SAMPLE I.D.	SAMPLING DATE/TIME *IF COMPOSITE, INDICATE BOTH START & FINISH DATE/TIME	MATRIX (SEE BELOW)	GRAB/*COMPOSITE	VOC: 524.2 BTEX 524.2 MTBE ONLY	8260 624 VTICs 1, 4 DIOXANE	8021 BTEX HALOS	8015 GRO MAVPH	SVOC: 8270 625 SVTICs EDB DBCP ABN A BN PAH	TPH8100 L1 L2	8015 DRO MAEPH	PEST 608 PCB 608 PEST 8081 PCB 8082	OIL & GREASE 1664 TPH 1664	TCLP 1311 ABN METALS VOC PEST HERB	DISSOLVED METALS (LIST BELOW)	TOTAL METALS (LIST BELOW)	INORGANICS: TS TSS TDS SPEC. CON.	BR CL F SO4 NO2 NO3 NO2NO3	T. ALK. CBOD	O. PHOS. T. PHOS NH3 TKN	T. RES. CHLORINE pH	PHENOLS TOC DOC COD	TOTAL CYANIDE TOTAL SULFIDE	REACTIVE CYANIDE REACTIVE SULFIDE FLASHPOINT IGNITABILITY	MICRO: TOTAL COLIFORM E. COLI FECAL COLIFORM	ENTEROCOCCI HETEROTROPHIC PLATE COUNT	OTHER: Total Hardness CaCO3			# OF CONTAINERS	NOTES MEOH VIAL #
Circ Water	10 Dec 2018 / 12:35 hrs	WW													X	X	X	X	X	X	X	X	X					X			4	

MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER

PRESERVATIVE: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

PROJECT MANAGER: Joel Banaszak

COMPANY: Horizons Engineering

ADDRESS: 176 Newport Rd

CITY: New London STATE: NH ZIP: 03257

PHONE: _____ EXT.: _____

FAX: _____

E-MAIL: _____

SITE NAME: Pinetree Tower

PROJECT #: 18859

STATE: (NH) MA ME VT OTHER: _____

REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR GWP, OIL FUND, BROWNFIELD OR OTHER: _____

QUOTE #: _____ PO #: _____

DATE NEEDED: 12/13/2018

QA/QC

REPORTING LEVEL

A B C

OR

MA MCP

REPORTING OPTIONS

PRELIMS: (YES) OR NO

ELECTRONIC OPTIONS

E-MAIL PDF EQUIS EXCEL

TEMP. 1.8 °C

ICE? (YES) NO

SAMPLER(S): _____

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
Adam Carr	11 Dec 2018	811	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:

METALS: (8 RCRA) (13 PP) (Fe, Mn) (Pb, Cu)

OTHER METALS: * See Email from customer

SAMPLES FIELD FILTERED? ☐ YES ☒ NO

NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO IF DIFFERENT)

PA - 12/12/18

48 hr Turn.

SITE HISTORY: _____

SUSPECTED CONTAMINATION: _____

FIELD READINGS: _____

Eastern Analytical, Inc.
professional laboratory and drilling services

25 CHENELL DRIVE | CONCORD, NH 03301 | TEL: 603.228.0525 | 1.800.287.0525 | E-MAIL: CUSTOMERSERVICE@EASTERNANALYTICAL.COM | WWW.EASTERNANALYTICAL.COM

(WHITE: ORIGINAL GREEN: PROJECT MANAGER)

Eastern Analytical, Inc.
professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	190927
Client Identification:	None
Date Received:	1/7/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director | 1.18.19 Date | 24 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **190927**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **None**

Temperature upon receipt (°C): 3.3 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
190927.01	Cooling Tower	1/7/19	1/7/19	aqueous		Adheres to Sample Acceptance Policy
190927.02	Well C	1/7/19	1/7/19	aqueous		Adheres to Sample Acceptance Policy
190927.03	MW-14	1/7/19	1/7/19	aqueous		Adheres to Sample Acceptance Policy
190927.04	MW-11	1/7/19	1/7/19	aqueous		Adheres to Sample Acceptance Policy
190927.05	MW-16	1/7/19	1/7/19	aqueous		Adheres to Sample Acceptance Policy
190927.06	Trip Blank - 1,4 diox	1/7/19	11/13/18	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.
All results contained in this report relate only to the above listed samples.
References include:
1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **190927**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **None**

Sample ID:	Cooling Tower	Well C	MW-14	Trip Blank - 1,4 diox
Lab Sample ID:	190927.01	190927.02	190927.03	190927.06
Matrix:	aqueous	aqueous	aqueous	aqueous
Date Sampled:	1/7/19	1/7/19	1/7/19	11/13/18
Date Received:	1/7/19	1/7/19	1/7/19	1/7/19
Units:	ug/L	ug/L	ug/L	ug/L
Date of Analysis:	1/9/19	1/9/19	1/9/19	1/9/19
Analyst:	VG	VG	VG	VG
Method:	8260B SIM	8260B SIM	8260B SIM	8260B SIM
Dilution Factor:	1	1	1	1
1,4-Dioxane	< 0.2	< 0.2	< 0.2	< 0.2
4-Bromofluorobenzene (surr)	**112 %R**	**111 %R**	**111 %R**	**112 %R**
Toluene-d8 (surr)	**106 %R**	**106 %R**	**105 %R**	**106 %R**

LABORATORY REPORT

EAI ID#: **190927**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **None**

Sample ID:	Cooling Tower
Lab Sample ID:	190927.01
Matrix:	aqueous
Date Sampled:	1/7/19
Date Received:	1/7/19

		Analysis			
	Units	Date	Time	Method	Analyst
Sulfate	**270**	mg/L	01/09/19	1:50	300.0	KD
Ammonia-N	**0.066**	mg/L	01/08/19	15:50	TM NH3-001	SEL
TKN	**0.98**	mg/L	01/10/19	12:09	$4500N_{org}C/N$	SEL
Total Phosphorus-P	**0.76**	mg/L	01/09/19	13:25	365.1	SEL
COD	**34**	mg/L	01/08/19	9:35	H8000	JCS
pH	**8.27**	SU	01/07/19	18:30	4500H+B-11	KL
Specific Conductance	**4.0**	uS/cm	01/07/19	16:00	120.1	KL

Sample ID:	Well C	MW-14	MW-11	MW-16
Lab Sample ID:	190927.02	190927.03	190927.04	190927.05
Matrix:	aqueous	aqueous	aqueous	aqueous
Date Sampled:	1/7/19	1/7/19	1/7/19	1/7/19
Date Received:	1/7/19	1/7/19	1/7/19	1/7/19

					Analysis			
				Units	Date	Time	Method	Analyst
Sulfate	**2.4**	< 1	**1.7**	< 1	mg/L	01/08/19	19:10	300.0	KD
Chloride	**39**	**88**	**41**	**14**	mg/L	01/08/19	19:10	300.0	KD
Nitrite-N	< 0.5	< 0.5	< 0.5	< 0.5	mg/L	01/08/19	19:10	300.0	KD
Nitrate-N	< 0.5	< 0.5	< 0.5	< 0.5	mg/L	01/08/19	19:10	300.0	KD
Ammonia-N	< 0.05	< 0.05	< 0.05	< 0.05	mg/L	01/08/19	15:56	TM NH3-001	SEL
TKN	< 0.5	< 0.5	< 0.5	< 0.5	mg/L	01/10/19	12:12	$4500N_{org}C/N$	SEL
Total Phosphorus-P	< 0.01	**1.6**	**1.6**	**5.0**	mg/L	01/09/19	13:26	365.1	SEL
BOD	< 6	< 6	< 6	< 6	mg/L	01/09/19	10:25	5210B-11	ATA
COD	< 10	< 10	< 10	**55**	mg/L	01/08/19	9:35	H8000	JCS
pH	**6.28**	**5.33**	**5.59**	**5.6**	SU	01/07/19	18:30	4500H+B-11	KL
Specific Conductance	**160**	**300**	**150**	**69**	uS/cm	01/07/19	16:00	120.1	KL

LABORATORY REPORT

EAI ID#: **190927**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **None**

Sample ID: Well C

Lab Sample ID: 190927.02
Matrix: aqueous
Date Sampled: 1/7/19
Date Received: 1/7/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Total Hardness (as CaCO3)	**18**	AqTot	mg/L	1/8/19	200.8	DS
Uranium	**0.2**	AqTot	ug/L	1/14/19	200.8	DS

LABORATORY REPORT

EAI ID#: **190927**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **None**

Sample ID: MW-14

Lab Sample ID: 190927.03
Matrix: aqueous
Date Sampled: 1/7/19
Date Received: 1/7/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Total Hardness (as CaCO3)	**42**	AqTot	mg/L	1/8/19	200.8	DS
Antimony	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Arsenic	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Beryllium	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Calcium	**13**	AqDis	mg/L	1/8/19	200.8	DS
Cadmium	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Chromium	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Copper	**0.0013**	AqDis	mg/L	1/8/19	200.8	DS
Iron	< 0.05	AqDis	mg/L	1/8/19	200.8	DS
Lead	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Magnesium	**2.1**	AqDis	mg/L	1/8/19	200.8	DS
Manganese	**0.037**	AqDis	mg/L	1/8/19	200.8	DS
Mercury	< 0.0001	AqDis	mg/L	1/8/19	200.8	DS
Molybdenum	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Nickel	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Potassium	**1.8**	AqDis	mg/L	1/8/19	200.8	DS
Selenium	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Silver	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Sodium	**35**	AqDis	mg/L	1/8/19	200.8	DS
Thallium	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Zinc	**0.0092**	AqDis	mg/L	1/8/19	200.8	DS
Uranium	**4.9**	AqTot	ug/L	1/14/19	200.8	DS

LABORATORY REPORT

EAI ID#: **190927**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **None**

Sample ID:	MW-11	MW-16					
Lab Sample ID:	190927.04	190927.05					
Matrix:	aqueous	aqueous					
Date Sampled:	1/7/19	1/7/19					
Date Received:	1/7/19	1/7/19					
			Analytical Matrix	**Units**	**Date of Analysis**	**Method**	**Analyst**
Total Hardness (as CaCO3)	**17**	**26**	AqTot	mg/L	1/8/19	200.8	DS
Antimony	< 0.001	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Arsenic	< 0.001	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Beryllium	< 0.001	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Calcium	**4.8**	**5.8**	AqDis	mg/L	1/8/19	200.8	DS
Cadmium	< 0.001	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Chromium	< 0.001	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Copper	< 0.001	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Iron	< 0.05	< 0.05	AqDis	mg/L	1/8/19	200.8	DS
Lead	< 0.001	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Magnesium	**0.78**	**0.75**	AqDis	mg/L	1/8/19	200.8	DS
Manganese	**0.014**	**0.11**	AqDis	mg/L	1/8/19	200.8	DS
Mercury	< 0.0001	< 0.0001	AqDis	mg/L	1/8/19	200.8	DS
Molybdenum	< 0.001	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Nickel	< 0.001	**0.0015**	AqDis	mg/L	1/8/19	200.8	DS
Potassium	**1.2**	**0.88**	AqDis	mg/L	1/8/19	200.8	DS
Selenium	< 0.001	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Silver	< 0.001	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Sodium	**18**	< 5	AqDis	mg/L	1/8/19	200.8	DS
Thallium	< 0.001	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Zinc	**0.0064**	**0.0096**	AqDis	mg/L	1/8/19	200.8	DS

January 17, 2019

Vista Work Order No. 1900084

Ms. Jennifer Laramie
Eastern Analytical, Inc.
25 Chennell Drive
Concord, NH 03301

Dear Ms. Laramie,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on January 09, 2019 under your Project Name '190927 NH'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 1900084
Case Narrative

Sample Condition on Receipt:

Three aqueous samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

PFAS Isotope Dilution Method

Sample "MW-14" contained particulate and was centrifuged prior to extraction.

The samples were extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method (Modified EPA Method 537). The results for PFHxS, PFOA, and PFOS include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1900084-01	Cooling Tower	07-Jan-19 10:35	09-Jan-19 11:01	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1900084-02	Well C	07-Jan-19 10:25	09-Jan-19 11:01	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1900084-03	MW-14	07-Jan-19 13:30	09-Jan-19 11:01	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Eastern Analytical, Inc.
Project: 190927 NH
Matrix: Aqueous

Laboratory Data

Lab Sample: B9A0082-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	4.00		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
PFPeA	2706-90-3	ND	4.00		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
PFBS	375-73-5	ND	4.00		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
PFHxA	307-24-4	ND	4.00		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
PFHpA	375-85-9	ND	4.00		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
PFHxS	355-46-4	ND	4.00		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
PFOA	335-67-1	ND	4.00		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
PFNA	375-95-1	ND	4.00		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
PFOS	1763-23-1	ND	4.00		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	99.7	60 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
13C3-PFPeA	IS	102	60 - 150		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
13C3-PFBS	IS	114	60 - 150		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
13C2-PFHxA	IS	104	70 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
13C4-PFHpA	IS	102	60 - 150		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
18O2-PFHxS	IS	101	60 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
13C2-PFOA	IS	90.1	60 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
13C5-PFNA	IS	77.9	50 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1
13C8-PFOS	IS	94.7	60 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:59	1

RL - Reporting limit

Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR — **PFAS Isotope Dilution Method**

Client Data

Name: Eastern Analytical, Inc.
Project: 190927 NH
Matrix: Aqueous

Laboratory Data

Lab Sample: B9A0082-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	79.2	80.0	99.0	70 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
PFPeA	2706-90-3	79.7	80.0	99.6	70 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
PFBS	375-73-5	79.1	80.0	98.9	70 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
PFHxA	307-24-4	81.8	80.0	102	70 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
PFHpA	375-85-9	80.9	80.0	101	70 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
PFHxS	355-46-4	79.2	80.0	99.0	70 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
PFOA	335-67-1	80.6	80.0	101	70 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
PFNA	375-95-1	83.7	80.0	105	70 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
PFOS	1763-23-1	79.7	80.0	99.6	70 - 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	100	60- 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
13C3-PFPeA	IS	101	60- 150		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
13C3-PFBS	IS	127	60- 150		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
13C2-PFHxA	IS	98.6	70- 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
13C4-PFHpA	IS	88.8	60- 150		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
18O2-PFHxS	IS	95.3	60- 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
13C2-PFOA	IS	96.6	60- 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
13C5-PFNA	IS	84.2	50- 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1
13C8-PFOS	IS	90.8	60- 130		B9A0082	11-Jan-19	0.125 L	14-Jan-19 19:48	1

Sample ID: Cooling Tower — **PFAS Isotope Dilution Method**

Client Data				Laboratory Data			
Name:	Eastern Analytical, Inc.	Matrix:	Aqueous	Lab Sample:	1900084-01	Column:	BEH C18
Project:	190927 NH	Date Collected:	07-Jan-19 10:35	Date Received:	09-Jan-19 11:01		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	9.27	4.35		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
PFPeA	2706-90-3	ND	4.35		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
PFBS	375-73-5	ND	4.35		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
PFHxA	307-24-4	ND	4.35		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
PFHpA	375-85-9	ND	4.35		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
PFHxS	355-46-4	ND	4.35		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
PFOA	335-67-1	ND	4.35		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
PFNA	375-95-1	ND	4.35		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
PFOS	1763-23-1	ND	4.35		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.2	60 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
13C3-PFPeA	IS	95.1	60 - 150		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
13C3-PFBS	IS	95.3	60 - 150		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
13C2-PFHxA	IS	97.1	70 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
13C4-PFHpA	IS	102	60 - 150		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
18O2-PFHxS	IS	95.2	60 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
13C2-PFOA	IS	96.4	60 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
13C5-PFNA	IS	88.6	50 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1
13C8-PFOS	IS	98.9	60 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:41	1

RL - Reporting limit

Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: Well C

PFAS Isotope Dilution Method

Client Data

Name: Eastern Analytical, Inc.
Project: 190927 NH
Matrix: Aqueous
Date Collected: 07-Jan-19 10:25

Laboratory Data

Lab Sample: 1900084-02
Date Received: 09-Jan-19 11:01
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	4.34		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
PFPeA	2706-90-3	ND	4.34		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
PFBS	375-73-5	ND	4.34		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
PFHxA	307-24-4	ND	4.34		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
PFHpA	375-85-9	ND	4.34		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
PFHxS	355-46-4	ND	4.34		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
PFOA	335-67-1	ND	4.34		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
PFNA	375-95-1	ND	4.34		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
PFOS	1763-23-1	ND	4.34		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	99.3	60 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
13C3-PFPeA	IS	104	60 - 150		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
13C3-PFBS	IS	100	60 - 150		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
13C2-PFHxA	IS	98.7	70 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
13C4-PFHpA	IS	94.0	60 - 150		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
18O2-PFHxS	IS	96.2	60 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
13C2-PFOA	IS	95.7	60 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
13C5-PFNA	IS	84.4	50 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1
13C8-PFOS	IS	105	60 - 130		B9A0082	11-Jan-19	0.115 L	14-Jan-19 20:52	1

RL - Reporting limit

Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: MW-14

PFAS Isotope Dilution Method

Client Data

Name: Eastern Analytical, Inc.
Project: 190927 NH
Matrix: Aqueous
Date Collected: 07-Jan-19 13:30

Laboratory Data

Lab Sample: 1900084-03
Date Received: 09-Jan-19 11:01
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	4.28		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
PFPeA	2706-90-3	ND	4.28		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
PFBS	375-73-5	ND	4.28		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
PFHxA	307-24-4	ND	4.28		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
PFHpA	375-85-9	ND	4.28		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
PFHxS	355-46-4	ND	4.28		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
PFOA	335-67-1	ND	4.28		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
PFNA	375-95-1	ND	4.28		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
PFOS	1763-23-1	ND	4.28		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	99.9	60 - 130		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
13C3-PFPeA	IS	105	60 - 150		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
13C3-PFBS	IS	103	60 - 150		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
13C2-PFHxA	IS	101	70 - 130		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
13C4-PFHpA	IS	92.3	60 - 150		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
18O2-PFHxS	IS	102	60 - 130		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
13C2-PFOA	IS	88.5	60 - 130		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
13C5-PFNA	IS	74.6	50 - 130		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1
13C8-PFOS	IS	89.5	60 - 130		B9A0082	11-Jan-19	0.117 L	14-Jan-19 21:02	1

RL - Reporting limit

Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
D	Dilution
DL	Detection limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limits of Detection
LOQ	Limits of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
NA	Not applicable
ND	Not Detected
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	18-008-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207718
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-009
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-18-9
Virginia Department of General Services	9618
Washington Department of Ecology	C584-18
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

CHAIN-OF-CUSTODY RECORD

Eastern Analytical, Inc.
professional laboratory and drilling services

EAI ID# **190927** Page 1

1900084 0.0°C

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
Cooling Tower	1/7/2019 10:35	aqueous	Subcontract - Perfluorinated Compounds EPA Method 537	
Well C	1/7/2019 10:25	aqueous	Subcontract - Perfluorinated Compounds EPA Method 537	
MW-14	1/7/2019 13:30	aqueous	Subcontract - Perfluorinated Compounds EPA Method 537	

ASAP without surcharge

EAI ID# **190927** **Project State:** NH

Project ID:

Company Vista Analytical Laboratory
Address 1104 Windfield Way
Address El Dorado Hills, CA 95762
Account #
Phone # (916) 673-1520

Results Needed: **Preferred Date: Standard**
RUSH Due Date: _____

QC Deliverables
☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ MA MCP

Notes about project:
Email login confirmation, pdf of results and invoice to customerservice@easternanalytical.com.

9 Compounds

PO #: 49422 **EAI ID#** **190927**

Data Deliverable (circle)
Excel **NH EMD** **EQuIS** **ME EGAD**

Call prior to analyzing, if RUSH charges will be applied.

Samples Collected by: _____

Relinquished by	Date/Time	Received by
[signature]	1/8/19 1500	UPS
UPS	01/09/19 1101	[signature]
Relinquished by	**Date/Time**	**Received by**

P 1/8/19

Vista Analytical Laboratory

Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1900084 TAT 14 days

Samples Arrival:	**Date/Time** 01/09/19 1101	**Initials:** AH	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 01/09/19 1336	**Initials:** LWS	**Location:** WR-2 **Shelf/Rack:** B-3, C-3

Delivered By:	FedEx	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	Ice		Blue Ice		Dry Ice		None

Temp °C: 0.1	(uncorrected)	Probe used: Y / N	Thermometer ID: IR-4
Temp °C: 0.0	(corrected)		

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?		✓	✓
Shipping Documentation Present?	✓		
Airbill Trk # 12 746 599 01934 0129	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?		✓	✓

If Chlorinated or Drinking Water Samples, Acceptable Preservation?							✓
Preservation Documented:	$Na_2S_2O_3$ Other	Trizma	None			Yes	No	NA
Shipping Container	Vista		Client	Retain	Return		Dispose	

Comments: ~~Sample~~ LWS 01/09/19 all samples reconciled per handwritten label.

1 of 2 Ps- 1/8/19

Eastern Analytical, Inc. CHAIN-OF-CUSTODY RECORD **190927**

HENN1 23

Sample IDs	Date/Time *Composites need start and stop dates/times*	Matrix	Parameters and Sample Notes	# of containers
Cooling Tower	1/7/19 10:35	aqueous Grab or Comp	AqTot/~~ICPMets.Sb.As.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K.Ag.Se.Na.Tl.Zn.U.~~ AWB ~~HardTot~~/COD/pH/NH3/NO2/NO3/TKN/SpecCon/TPhos/SO4/PFCsSubVAL/V8260SIM14DIOXANE AWB	
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
Well C	1/7/19 10:25	aqueous Grab or Comp	AqTot/SO4/Cl/NO2/NO3/NH3/TKN/TPhos/BOD/COD/pH/SpecCon/ICPMets.U. HardTot/PFCsSubVAL/V8260SIM14DIOXANE ~~AqDis/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K.Ag.Na.Tl.Zn~~ AWB unfiltered - ARC	
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
MW-14	1/7/19 13:30	aqueous Grab or Comp	AqTot/SO4/Cl/NO2/NO3/NH3/TKN/TPhos/BOD/COD/pH/SpecCon/ICPMets.U. ✓ HardTot/PFCsSubVAL/V8260SIM14DIOXANE ✓ AqDis/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K.Ag.Na.Tl.Zn ✓ unfiltered - ARC	
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
MW-11	1/7/19 12:00	aqueous Grab or Comp	AqTot/SO4/Cl/NO2/NO3/NH3/TKN/TPhos/BOD/COD/pH/SpecCon/ICPMets.HardTot AqDis/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K.Ag.Na.Tl.Zn unfiltered ARC	
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID

Project Name None

State NH

Client (Pro Mgr) Joel Banaszak

Customer Horizons Engineering, Inc. (NL)

Address

City

Phone 603-877-0116 Fax

Email: jbanaszak@horizonsengineering.com

Direct 877-0116

Results Needed by: Preferred date _____

Notes:

QC deliverables

☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ MA MCP

ReportingOptions

☐ HC ☐ NO FAX

☒ EDD PDF ☐ Partial FAX

☒ EDD email ☒ PDF Invoice

☒ PDF prelim, NO FAX ☐ EQUIS

☒ e-mail Login Confirmation

PO# Verbal

Quote#:

Temp 3.3 °C

Ice Y ☑ N ☐

Samples Collected by: Adam Carr

Relinquished by	Date/Time	Received by
	7Jan2018 1640	
Relinquished by	Date/Time	Received by

2 of 2

Eastern Analytical, Inc.

CHAIN-OF-CUSTODY RECORD

190927

HEnh1

24

Sample IDs	Date/Time *Composites need start and stop dates/times*	Matrix	Parameters and Sample Notes	# of containers
MW-16	1/7/19 14:10	aqueous Grab or Comp	AqTot/SO4/Cl/NO2/NO3/NH3/TKN/TPhos/BOD/COD/pH/SpecCon/ICPMets.HardTot AqDis/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K.Ag.Na.Tl.Zn unfiltered-ARC	☐
☐ **Sampler confirms ID and parameters are accurate**			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
Trip Blank - 1,4 diox	11/13/18 9:30 EAI	aqueous Grab or Comp	AqTot/V8260SIM14DIOXANE	☐
☐ **Sampler confirms ID and parameters are accurate**			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID

Project Name None

State NH

Client (Pro Mgr) Joel Banaszak

Customer Horizons Engineering, Inc. (NL)

Address

City

Phone 603-877-0116 **Fax**

Email: jbanaszak@horizonsengineering.com

Direct 877-0116

Results Needed by: Preferred date ________

Notes:

QC deliverables

☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ MA MCP

ReportingOptions

☐ HC
☒ EDD PDF
☒ EDD email
☒ PDF prelim, NO FAX
☒ e-mail Login Confirmation

☐ NO FAX
☐ Partial FAX
☒ PDF Invoice
☐ EQUIS

PO# Verbal

Quote#:

Temp 3.3 °C

Ice Y ☒ N ☐

Samples Collected by: Adam Carr

Relinquished by	Date/Time	Received by
[signature]	7 Jan 2019 1640	[signature]

Eastern Analytical, Inc. www.easternanalytical.com | 800.287.0525 | customerservice@easternanalytical.com

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	190930
Client Identification:	None
Date Received:	1/7/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director — 1.11.19 Date — 3 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **190930**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **None**

Temperature upon receipt (°C): 3.3 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
190930.01	Well C	1/7/19	1/7/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.
All results contained in this report relate only to the above listed samples.
References include:
1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **190930**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **None**

Sample ID: Well C

Lab Sample ID: 190930.01
Matrix: aqueous
Date Sampled: 1/7/19
Date Received: 1/7/19

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Antimony	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Arsenic	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Beryllium	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Calcium	**5.5**	AqDis	mg/L	1/8/19	200.8	DS
Cadmium	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Chromium	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Copper	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Iron	**0.056**	AqDis	mg/L	1/8/19	200.8	DS
Lead	**0.0043**	AqDis	mg/L	1/8/19	200.8	DS
Magnesium	**0.74**	AqDis	mg/L	1/8/19	200.8	DS
Manganese	**0.017**	AqDis	mg/L	1/8/19	200.8	DS
Mercury	< 0.0001	AqDis	mg/L	1/8/19	200.8	DS
Molybdenum	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Nickel	**0.0014**	AqDis	mg/L	1/8/19	200.8	DS
Potassium	**1.2**	AqDis	mg/L	1/8/19	200.8	DS
Selenium	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Silver	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Thallium	< 0.001	AqDis	mg/L	1/8/19	200.8	DS
Zinc	**0.0081**	AqDis	mg/L	1/8/19	200.8	DS
Sodium	**23**	AqDis	mg/L	1/10/19	200.8	DS

Eastern Analytical, Inc. CHAIN-OF-CUSTODY RECORD **190930** 3

Sample IDs	Date/Time (Composites need start and stop dates/times)	Matrix	Parameters and Sample Notes	# of containers
~~Cooling Tower~~	~~1/7/19~~ 10:35	aqueous Grab or Comp	~~AqTot/ICPMets.Sb.As.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K.Ag.Se.Na.Tl.Zn.U HardTot/COD/pH/NH3/NO2/NO3/TKN/SpecCon/TPhos/SO4/PFCsSubVAL/8260SIM14DIOXANE~~ * RUB	
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
Well C	1/7/19 10:25	aqueous Grab or Comp	~~AqTot/SO4/Cl/NO2/NO3/NH3/TKN/TPhos/BOD/COD/pH/SpecCon/ICPMets.U HardTot/PFCsSubVAL/V8260SIM14DIOXANE~~ RUB * AqDis/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K.Ag.Na.Tl.Zn Unfiltered - ARC	
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
~~MW-14~~	~~1/7/19~~ 13:30	aqueous Grab or Comp	~~AqTot/SO4/Cl/NO2/NO3/NH3/TKN/TPhos/BOD/COD/pH/SpecCon/ICPMets.U HardTot/PFCsSubVAL/V8260SIM14DIOXANE AqDis/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K.Ag.Na.Tl.Zn~~ RUB * Unfiltered - ARC	
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐
~~MW-11~~	~~1/7/19~~ 12:00	aqueous Grab or Comp	~~AqTot/SO4/Cl/NO2/NO3/NH3/TKN/TPhos/BOD/COD/pH/SpecCon/ICPMets.HardTot AqDis/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mg.Mn.Hg.Mo.Ni.K.Ag.Na.Tl.Zn~~ RUB * Unfiltered ARC	
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☐

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID

Project Name None

State NH

Client (Pro Mgr) Joel Banaszak

Customer Horizons Engineering, Inc. (NL)

Address

City

Phone 603-877-0116 Fax

Email: jbanaszak@horizonsengineering.com

Direct 877-0116

Results Needed by: Preferred date _____

Notes:

* See EAI 190927 for other samples RUB 1/8/19

QC deliverables

☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ MA MCP

ReportingOptions

☐ HC ☐ NO FAX

☒ EDD PDF ☐ Partial FAX

☒ EDD email ☒ PDF Invoice

☒ PDF prelim, NO FAX ☐ EQUIS

☒ e-mail Login Confirmation

PO# Verbal

Quote#:

Temp 3.3 °C

Ice Y ☒ N ☐

Samples Collected by: Adam Carr

Relinquished by	Date/Time	Received by
	7 Jan 2019 16:45	
Relinquished by	Date/Time	Received by

Eastern Analytical, Inc.
professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

Subject: Laboratory Report
Eastern Analytical, Inc. ID: 178262
Client Identification: Pinetree Power - Tamworth
Date Received: 1/29/2018

Report revision/reissue: Revision, replaces report dated February 9, 2018

Revision information: Report revised to include sulfate analysis.

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.eailabs.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:
Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

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The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director — 2.15.18 — 4

Lorraine Olashaw, Lab Director | Date | # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **178262**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power - Tamworth**

Temperature upon receipt (°C): 1.2 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
178262.01	Influent - Well-C	1/29/18	1/25/18	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.
All results contained in this report relate only to the above listed samples.
References include:
1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater,20th Edition, 1998 and 22nd Edition, 2012
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 2nd edition, 1992

LABORATORY REPORT

EAI ID#: **178262**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power - Tamworth**

Sample ID: Influent - Well-C

Lab Sample ID: 178262.01

Matrix: aqueous

Date Sampled: 1/25/18

Date Received: 1/29/18

		Analysis			
	Units	**Date**	**Time**	**Method**	**Analyst**
Solids Dissolved **82**	mg/L	1/30/18	11:25	2540C-97	ATA
Nitrate/Nitrite-N **0.6**	mg/L	1/31/18	13:35	300.0	KD
Specific Conductance **170**	uS/cm	2/06/18	12:30	120.1	AMB
Sulfate **3**	mg/L	2/13/18	12:05	300.0	KD

LABORATORY REPORT

EAI ID#: **178262**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power - Tamworth**

Sample ID: Influent - Well-C

Lab Sample ID:	178262.01
Matrix:	aqueous
Date Sampled:	1/25/18
Date Received:	1/29/18

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Arsenic	< 0.001	AqDis	mg/L	1/30/18	200.8	DS
Barium	**0.007**	AqDis	mg/L	1/30/18	200.8	DS
Cadmium	< 0.001	AqDis	mg/L	1/30/18	200.8	DS
Chromium	< 0.001	AqDis	mg/L	1/30/18	200.8	DS
Lead	**0.006**	AqDis	mg/L	1/30/18	200.8	DS
Mercury	< 0.0001	AqDis	mg/L	1/30/18	200.8	DS
Selenium	< 0.001	AqDis	mg/L	1/30/18	200.8	DS
Silver	< 0.001	AqDis	mg/L	1/30/18	200.8	DS
Total Hardness (as CaCO3)	**19**	AqTot	mg/L	1/30/18	200.8	DS
Silica (calculated)	**12**	AqDis	mg/L	2/2/18	200.8	DS

Silica (calculated): Silicon (Si) was analyzed by Method 200.8 and converted to silica (SiO_2) by calculation. All the silicon was assumed to be tied up as silica therefore the silicon concentration in mg/L was multiplied by 2.139 to convert to silica. mg/L silicon * 2.139 = mg/L silica.

Page 1 of 1

CHAIN-OF-CUSTODY RECORD

178262

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

SAMPLE I.D.	SAMPLING DATE/TIME *IF COMPOSITE, INDICATE BOTH START & FINISH DATE/TIME	MATRIX (SEE BELOW)	GRAB/*COMPOSITE	VOC: 524.2 BTEX 524.2 MTBE ONLY; 8260 624 BTEX VTICS 1, 4 DIOXANE; 8021 BTEX HALOS; 8015 GRO MAVPH	SVOC: 8270 625 SVTICS EDB DBCP ABN A BN PAH; TPH8100 LI L2; 8015 DRO MAEPH; PEST 608 PCB 608 PEST 8081 PCB 8082; OIL & GREASE 1664 TPH 1664	TCLP: TCLP 1311 ABN METALS VOC PEST HERB	METALS: DISSOLVED METALS (LIST BELOW); TOTAL METALS (LIST BELOW)	INORGANICS: TS TSS (TDS) SPEC. CON.; BR CL F SO4 NO2 NO2-NO3; BOD CBOD T. ALK.; TKN NH3 T. PHOS. O. PHOS.; PH T. RES. CHLORINE; COD PHENOLS TOC DOC; TOTAL CYANIDE TOTAL SULFIDE; REACTIVE CYANIDE REACTIVE SULFIDE FLASHPOINT IGNITABILITY	MICRO: TOTAL COLIFORM FECAL COLIFORM; ENTEROCOCCI HETEROTROPHIC PLATE COUNT	OTHER: HARDNESS CALC	# OF CONTAINERS	NOTES MEOH VIAL #
INFLUENT- WELL-C	1/25/18 1130		X				X	X		X		1	

MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER

PRESERVATIVE: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

PROJECT MANAGER: JOEL BANASZIAK
COMPANY: HORIZONS ENGINEERING
ADDRESS: 176 NEWPORT RD.
CITY: NEW LONDON **STATE:** NH **ZIP:** 03257
PHONE: 814-330-3310 **EXT.:**
FAX:
E-MAIL: jbanaszak@horizonsengineering.com
SITE NAME: PINETREE POWER- TAMWORTH
PROJECT #:
STATE: (NH) MA ME VT **OTHER:**
REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR GWP, OIL FUND, BROWNFIELD OR OTHER: NA
QUOTE #: **PO #:**

DATE NEEDED:

QA/QC REPORTING LEVEL
(A) B C
OR
PRESUMPTIVE CERTAINTY

REPORTING OPTIONS
PRELIMS: YES OR (NO)

ELECTRONIC OPTIONS
(E-MAIL) PDF EQUIS EXCEL

TEMP. 2 °C
ICE? (YES) NO

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
Joel Banaszak	1/29/18	0910	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:

METALS: (8 RCRA) 13 PP FE, MN PB, CU
OTHER METALS: SILICA
SAMPLES FIELD FILTERED? ☐ YES ☐ NO
NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT)

SO4 added per client on 2/12/18

SITE HISTORY:
SUSPECTED CONTAMINATION:
FIELD READINGS:

Eastern Analytical, Inc.
professional laboratory and drilling services
25 CHENELL DRIVE | CONCORD, NH 03301 | TEL: 603.228.0525 | 1.800.287.0525 | E-MAIL: CUSTOMERSERVICE@EASTERNANALYTICAL.COM | WWW.EASTERNANALYTICAL.COM

(WHITE: ORIGINAL GREEN: PROJECT MANAGER)

Eastern Analytical, Inc.
professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	191366
Client Identification:	Groundwater
Date Received:	1/17/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

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< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

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If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director | 1·28·19 Date | 4 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **191366**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Groundwater**

Temperature upon receipt (°C): 0.5 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
191366.01	MW-11	1/17/19	1/17/19	aqueous		Adheres to Sample Acceptance Policy
191366.02	MW-14	1/17/19	1/17/19	aqueous		Adheres to Sample Acceptance Policy
191366.03	MW-16	1/17/19	1/17/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.
All results contained in this report relate only to the above listed samples.
References include:
1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **191366**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Groundwater**

Sample ID:	MW-11	MW-14	MW-16					
Lab Sample ID:	191366.01	191366.02	191366.03					
Matrix:	aqueous	aqueous	aqueous					
Date Sampled:	1/17/19	1/17/19	1/17/19					
Date Received:	1/17/19	1/17/19	1/17/19					
					Analysis			
				Units	**Date**	**Time**	**Method**	**Analyst**
Sulfate	**2.7**	< 1	< 1	mg/L	1/23/19	15:31	300.0	KD
Chloride	**110**	**150**	**15**	mg/L	1/18/19	16:05	4500CLE-11	KD
Nitrite-N	< 0.5	< 0.5	< 0.5	mg/L	1/18/19	15:36	353.2	KD
Nitrate-N	< 0.5	**0.59**	< 0.5	mg/L	1/18/19	15:36	353.2	KD
Ammonia-N	< 0.05	< 0.05	< 0.05	mg/L	1/23/19	12:02	TM NH3-001	SEL
TKN	**0.60**	**0.74**	< 0.5	mg/L	1/24/19	13:34	4500N_{org}C/N	SEL
Total Phosphorus-P	**1.6**	**1.3**	**3.8**	mg/L	1/24/19	11:29	365.1	SEL
BOD	< 6	< 6	< 6	mg/L	1/18/19	10:31	5210B-11	ATA
COD	< 10	< 10	**21**	mg/L	1/23/19	9:10	H8000	JCS
pH	**5.32**	**5.19**	**5.69**	SU	1/18/19	15:10	4500H+B-11	KL
Specific Conductance	**410**	**530**	**71**	uS/cm	1/23/19	15:15	120.1	KL

LABORATORY REPORT

EAI ID#: **191366**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Groundwater**

Sample ID:	MW-11	MW-14	MW-16					
Lab Sample ID:	191366.01	191366.02	191366.03					
Matrix:	aqueous	aqueous	aqueous					
Date Sampled:	1/17/19	1/17/19	1/17/19					
Date Received:	1/17/19	1/17/19	1/17/19	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Antimony	< 0.001	< 0.001	< 0.001	AqDis	mg/L	1/23/19	200.8	DS
Arsenic	**0.0033**	**0.0025**	< 0.001	AqDis	mg/L	1/23/19	200.8	DS
Beryllium	**0.0012**	**0.0017**	< 0.001	AqDis	mg/L	1/23/19	200.8	DS
Calcium	**20**	**21**	**6.4**	AqDis	mg/L	1/23/19	200.8	DS
Cadmium	**0.0019**	**0.0015**	< 0.001	AqDis	mg/L	1/23/19	200.8	DS
Chromium	< 0.001	< 0.001	< 0.001	AqDis	mg/L	1/23/19	200.8	DS
Copper	**0.0042**	**0.0029**	**0.0043**	AqDis	mg/L	1/23/19	200.8	DS
Iron	< 0.05	< 0.05	< 0.05	AqDis	mg/L	1/23/19	200.8	DS
Lead	< 0.001	< 0.001	< 0.001	AqDis	mg/L	1/23/19	200.8	DS
Magnesium	**2.8**	**2.9**	**0.82**	AqDis	mg/L	1/23/19	200.8	DS
Manganese	**0.051**	**0.027**	**0.091**	AqDis	mg/L	1/23/19	200.8	DS
Mercury	< 0.0001	< 0.0001	< 0.0001	AqDis	mg/L	1/23/19	200.8	DS
Molybdenum	< 0.001	< 0.001	< 0.001	AqDis	mg/L	1/23/19	200.8	DS
Nickel	< 0.001	< 0.001	< 0.001	AqDis	mg/L	1/23/19	200.8	DS
Potassium	**3.1**	**2.9**	**0.90**	AqDis	mg/L	1/23/19	200.8	DS
Selenium	**0.0085**	**0.0072**	< 0.001	AqDis	mg/L	1/23/19	200.8	DS
Silver	< 0.001	< 0.001	< 0.001	AqDis	mg/L	1/23/19	200.8	DS
Sodium	**53**	**71**	**5.3**	AqDis	mg/L	1/23/19	200.8	DS
Thallium	< 0.001	< 0.001	< 0.001	AqDis	mg/L	1/23/19	200.8	DS
Zinc	**0.013**	**0.011**	**0.011**	AqDis	mg/L	1/23/19	200.8	DS
Total Hardness (as CaCO3)	**61**	**64**	**19**	AqDis	mg/L	1/23/19	200.8	DS

Eastern Analytical, Inc. CHAIN-OF-CUSTODY RECORD **191366** 4

Sample IDs	Date/Time *Composites need start and stop dates/times*	Matrix	Parameters and Sample Notes	# of containers
MW-11	1/17/2019 11:10	aqueous Grab or Comp	AqTot/SO4/Cl/NO2/NO3/TKN/NH3/TPhos/BOD/~~CBOD~~/pH/SpecCon (COD Only) AqDis/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mn.Mo.Mg.Hg.Ni.K.Ag.Na.Tl.Zn.HardTot	3
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☒
MW-14	1/17/2019 12:35	aqueous Grab or Comp	AqTot/SO4/Cl/NO2/NO3/TKN/NH3/TPhos/BOD/~~CBOD~~/pH/SpecCon (COD Only) AqDis/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mn.Mo.Mg.Hg.Ni.K.Ag.Na.Tl.Zn.HardTot	3
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☒
MW-16	1/17/2019 13:25	aqueous Grab or Comp	AqTot/SO4/Cl/NO2/NO3/TKN/NH3/TPhos/BOD/~~CBOD~~/pH/SpecCon (COD Only) AqDis/ICPMets.As.Se.Sb.Be.Ca.Cd.Cr.Cu.Fe.Pb.Mn.Mo.Mg.Hg.Ni.K.Ag.Na.Tl.Zn.HardTot	3
☐ Sampler confirms ID and parameters are accurate			*Circle preservative/s:* HCL HNO_3 H_2SO_4 NaOH MEOH $Na_2S_2O_3$ ICE	Dissolved Sample Field Filtered ☒

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

EAI Project ID 0
Project Name Groundwater
State NH
Client (Pro Mgr) Joel Banaszak
Customer Horizons Engineering, Inc. (NL)
Address
City
Phone 603-877-0116 Fax
Email: jbanaszak@horizonsengineering.com
Direct 877-0116

Results Needed by: Preferred date _____
Notes:

QC deliverables
☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ MA MCP

ReportingOptions
☐ HC ☐ NO FAX
☒ EDD PDF ☐ Partial FAX
☒ EDD email ☒ PDF Invoice
☒ PDF prelim, NO FAX ☐ EQUIS
☒ e-mail Login Confirmation

PO# Verbal
Quote#:
Temp 0.5°C
Ice Y ☒ N ☐

Samples Collected by: Adam Carr

Relinquished by	Date/Time	Received by
	1/17/19 1700	
Relinquished by	Date/Time	Received by

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

ACCREDITED IN ACCORDANCE WITH nelac

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	195545
Client Identification:	None
Date Received:	5/16/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw — Lorraine Olashaw, Lab Director

5.23.19 — Date

3 — # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **195545**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **None**

Temperature upon receipt (°C): 3.7 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
195545.01	MW-11	5/16/19	5/16/19	aqueous		Adheres to Sample Acceptance Policy
195545.02	MW-14	5/16/19	5/16/19	aqueous		Adheres to Sample Acceptance Policy
195545.03	MW-16	5/16/19	5/16/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.

Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983

2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.

3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB

4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **195545**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **None**

Sample ID:	MW-11	MW-14	MW-16					
Lab Sample ID:	195545.01	195545.02	195545.03					
Matrix:	aqueous	aqueous	aqueous					
Date Sampled:	5/16/19	5/16/19	5/16/19	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Date Received:	5/16/19	5/16/19	5/16/19					
Antimony	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/17/19	200.8	DS
Arsenic	**0.040**	**0.026**	**0.0011**	AqDis	mg/L	5/17/19	200.8	DS
Beryllium	< 0.001	**0.0027**	< 0.001	AqDis	mg/L	5/17/19	200.8	DS
Calcium	**1.6**	**61**	**6.4**	AqDis	mg/L	5/17/19	200.8	DS
Cadmium	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/17/19	200.8	DS
Chromium	**0.016**	**0.0097**	**0.0061**	AqDis	mg/L	5/17/19	200.8	DS
Copper	**0.0022**	**0.0012**	< 0.001	AqDis	mg/L	5/17/19	200.8	DS
Iron	< 0.05	< 0.05	< 0.05	AqDis	mg/L	5/17/19	200.8	DS
Lead	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/17/19	200.8	DS
Magnesium	**0.34**	**8.6**	**0.76**	AqDis	mg/L	5/17/19	200.8	DS
Manganese	**0.0066**	**0.037**	**0.016**	AqDis	mg/L	5/17/19	200.8	DS
Mercury	< 0.0001	< 0.0001	< 0.0001	AqDis	mg/L	5/17/19	200.8	DS
Molybdenum	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/17/19	200.8	DS
Nickel	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/17/19	200.8	DS
Potassium	**1.3**	**7.6**	**1.0**	AqDis	mg/L	5/17/19	200.8	DS
Selenium	< 0.001	**0.016**	< 0.001	AqDis	mg/L	5/17/19	200.8	DS
Silver	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/17/19	200.8	DS
Sodium	< 5	**290**	**8.5**	AqDis	mg/L	5/17/19	200.8	DS
Thallium	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/17/19	200.8	DS
Zinc	**0.011**	**0.026**	**0.0052**	AqDis	mg/L	5/17/19	200.8	DS

Page _____ of _____

CHAIN-OF-CUSTODY RECORD

195545

3

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

SAMPLE I.D.	SAMPLING DATE/TIME *IF COMPOSITE, INDICATE BOTH START & FINISH DATE/TIME	MATRIX (SEE BELOW)	GRAB/*COMPOSITE	VOC: 524.2 BTEX 524.2 MTBE ONLY	VOC: 8260 624 VTICs 1, 4 DIOXANE	VOC: 8021 BTEX HALOS	VOC: 8015 GRO MAPH	SVOC: 8270 625 SVTICs EDB DBCP ABN A BN PAH	SVOC: TPH8100 L1 L2	SVOC: 8015 DRO MAEPH	SVOC: PEST 608 PCB 608 PEST 8081 PCB 8082	SVOC: OIL & GREASE 1664 TPH 1664	TCLP: TCLP 1311 ABN METALS VOC PEST HERB	METALS: DISSOLVED METALS (LIST BELOW)	METALS: TOTAL METALS (LIST BELOW)	INORGANICS: TS TSS TDS SPEC. CON.	INORGANICS: BR Cl F SO_4 NO_2 NO_3 NO_2NO_2	INORGANICS: BOD CBOD T. ALK.	INORGANICS: TKN NH_3 T. PHOS. O. PHOS.	INORGANICS: pH T. RES. CHLORINE	INORGANICS: COD PHENOLS TOC DOC	INORGANICS: TOTAL CYANIDE TOTAL SULFIDE	INORGANICS: REACTIVE CYANIDE REACTIVE SULFIDE FLASHPOINT IGNITABILITY	MICRO: TOTAL COLIFORM E. COLI FECAL COLIFORM	MICRO: ENTEROCOCCI HETEROTROPHIC PLATE COUNT	OTHER	OTHER	OTHER	# OF CONTAINERS	NOTES MEOH VIAL #
WELL 11	5-16-19 0910																													1	
WELL 14	5-16-19 0920																													1	
WELL 16	5-16-19 0925																													1	

MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER

PRESERVATIVE: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

PROJECT MANAGER: JOEL

COMPANY: HORIZON ENG.

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

PHONE: _____ EXT.: _____

FAX: _____

E-MAIL: _____

SITE NAME: _____

PROJECT #: _____

STATE: (NH) MA ME VT OTHER: _____

REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR GWP, OIL FUND, BROWNFIELD OR OTHER: _____

QUOTE #: _____ PO #: _____

DATE NEEDED: _____

QA/QC REPORTING LEVEL

A B C

OR

MA MCP

REPORTING OPTIONS

PRELIMS: YES OR NO

ELECTRONIC OPTIONS

E-MAIL PDF EQUIS EXCEL

TEMP. 3.7 °C

ICE? (YES) NO

SAMPLER(S): KEVIN BOWEN

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
[signature]	5-16-19	0930	[signature]
[signature]	5-16-19	1442	[signature]

1048

METALS: 8 RCRA 13 PP FE, MN PB, CU

OTHER METALS: _____

SAMPLES FIELD FILTERED? ☐ YES ☐ NO

NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT)

*dissolved metals- As, Se, Sb, Be, Ca, Cd, Cr, Cu, Fe, Pb, Mg, Mn, Hg, Mo, Ni, K, Ag, Na, Tl, Zn per Joel Banaszak JW 5/17/19

SITE HISTORY: _____

SUSPECTED CONTAMINATION: _____

FIELD READINGS: _____

Eastern Analytical, Inc.
professional laboratory and drilling services

25 CHENELL DRIVE | CONCORD, NH 03301 | TEL: 603.228.0525 | 1.800.287.0525 | E-MAIL: CUSTOMERSERVICE@EASTERNANALYTICAL.COM | WWW.EASTERNANALYTICAL.COM

(WHITE: ORIGINAL GREEN: PROJECT MANAGER)

Eastern Analytical, Inc.

professional laboratory and drilling services

Joel Banaszak
Horizons Engineering, Inc. (NL)
176 Newport Road
New London , NH 03257

ACCREDITED IN ACCORDANCE WITH nelac

Subject: Laboratory Report

Eastern Analytical, Inc. ID:	195860
Client Identification:	Pinetree Power
Date Received:	5/24/2019

Dear Mr. Banaszak :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.easternanalytical.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw — 5.31.19 — 3

Lorraine Olashaw, Lab Director | Date | # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **195860**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Temperature upon receipt (°C): 2.1 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
195860.01	MW-11	5/24/19	5/24/19	aqueous		Adheres to Sample Acceptance Policy
195860.02	MW-14	5/24/19	5/24/19	aqueous		Adheres to Sample Acceptance Policy
195860.03	MW-16	5/24/19	5/24/19	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 4th edition, 1992

LABORATORY REPORT

EAI ID#: **195860**

Client: **Horizons Engineering, Inc. (NL)**

Client Designation: **Pinetree Power**

Sample ID:	MW-11	MW-14	MW-16					
Lab Sample ID:	195860.01	195860.02	195860.03					
Matrix:	aqueous	aqueous	aqueous					
Date Sampled:	5/24/19	5/24/19	5/24/19					
Date Received:	5/24/19	5/24/19	5/24/19	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Antimony	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/28/19	200.8	DS
Arsenic	< 0.001	**0.011**	< 0.001	AqDis	mg/L	5/28/19	200.8	DS
Beryllium	< 0.001	**0.0024**	< 0.001	AqDis	mg/L	5/28/19	200.8	DS
Calcium	**2.1**	**54**	**7.3**	AqDis	mg/L	5/28/19	200.8	DS
Cadmium	< 0.001	**0.0020**	< 0.001	AqDis	mg/L	5/28/19	200.8	DS
Chromium	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/28/19	200.8	DS
Copper	**0.0094**	**0.0028**	**0.0030**	AqDis	mg/L	5/28/19	200.8	DS
Iron	< 0.05	< 0.05	< 0.05	AqDis	mg/L	5/28/19	200.8	DS
Lead	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/28/19	200.8	DS
Magnesium	**0.31**	**7.8**	**0.86**	AqDis	mg/L	5/28/19	200.8	DS
Manganese	**0.0055**	**0.043**	**0.020**	AqDis	mg/L	5/28/19	200.8	DS
Mercury	< 0.0001	< 0.0001	< 0.0001	AqDis	mg/L	5/28/19	200.8	DS
Molybdenum	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/28/19	200.8	DS
Nickel	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/28/19	200.8	DS
Potassium	**0.74**	**6.1**	**0.97**	AqDis	mg/L	5/28/19	200.8	DS
Selenium	< 0.001	**0.011**	< 0.001	AqDis	mg/L	5/28/19	200.8	DS
Silver	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/28/19	200.8	DS
Sodium	**11**	**270**	**11**	AqDis	mg/L	5/28/19	200.8	DS
Thallium	< 0.001	< 0.001	< 0.001	AqDis	mg/L	5/28/19	200.8	DS
Zinc	**0.012**	**0.031**	**0.0086**	AqDis	mg/L	5/28/19	200.8	DS

Page 1 of 1

CHAIN-OF-CUSTODY RECORD

195860

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

SAMPLE I.D.	SAMPLING DATE/TIME *IF COMPOSITE, INDICATE BOTH START & FINISH DATE/TIME	MATRIX (SEE BELOW)	GRAB/*COMPOSITE	VOC: 524.2 524.2 BTEX 524.2 MTBE ONLY	8260 624 VTICs 1, 4 DIOXANE	8021 BTEX HALOS	8015 GRO MAPH	SVOC: 8270 625 SVTICs EDB DBCP ABN A BN PAH	TPH8100 L1 L2	8015 DRO MAEPH	PEST 608 PCB 608 PEST 8081 PCB 8082	OIL & GREASE 1664 TPH 1664	TCLP 1311 ABN METALS VOC PEST HERB	METALS: DISSOLVED METALS (LIST BELOW)	TOTAL METALS (LIST BELOW)	INORGANICS: TS TSS TDS SPEC. CON.	BR CL F SO_4 NO_2 NO_3 NO_2NO_2	BOD CBOD T. ALK.	TKN NH_3 T. PHOS. O. PHOS.	PH T. RES. CHLORINE	COD PHENOLS TOC DOC	TOTAL CYANIDE TOTAL SULFIDE	REACTIVE CYANIDE REACTIVE SULFIDE FLASHPOINT IGNITABILITY	MICRO: TOTAL COLIFORM E. COLI FECAL COLIFORM	ENTEROCOCCI HETEROTROPHIC PLATE COUNT	OTHER	# OF CONTAINERS	NOTES MEOH VIAL #
MW-11	5/24/19 1150	GW	G											X													1	
MW-14	" " 1225	"	"											"													1	
MW-16	" " 1245	"	"											"													1	
MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER																												
PRESERVATIVE: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH														N														

PROJECT MANAGER: Joel Bambrak

COMPANY: Horizons Engineering

ADDRESS: 176 Newport Rd.

CITY: New London STATE: NH ZIP: 03257

PHONE: 603-616-1334 EXT.:

FAX:

E-MAIL:

SITE NAME: Pine Tree Power

PROJECT #:

STATE: NH MA ME VT OTHER:

REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR GWP, OIL FUND, BROWNFIELD OR OTHER:

QUOTE #: PO #:

DATE NEEDED:

QA/QC REPORTING LEVEL: A B C OR MA MCP

REPORTING OPTIONS: PRELIMS: YES OR NO

ELECTRONIC OPTIONS: E-MAIL PDF EQUIS EXCEL

TEMP. 2.1 °C ICE? (YES) NO

SAMPLER(S): Joel Bambrak			
RELINQUISHED BY: Joel Bambrak	DATE: 24 May 19	TIME: 1510	RECEIVED BY:
RELINQUISHED BY:	DATE: 5-24-19	TIME: 1600	RECEIVED BY:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:

METALS: 8 RCRA 13 PP FE, MN PB, CU

OTHER METALS:

SAMPLES FIELD FILTERED? ☑ YES ☐ NO

NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT)

SAME AS PREVIOUS

SITE HISTORY: Pine Tree

SUSPECTED CONTAMINATION:

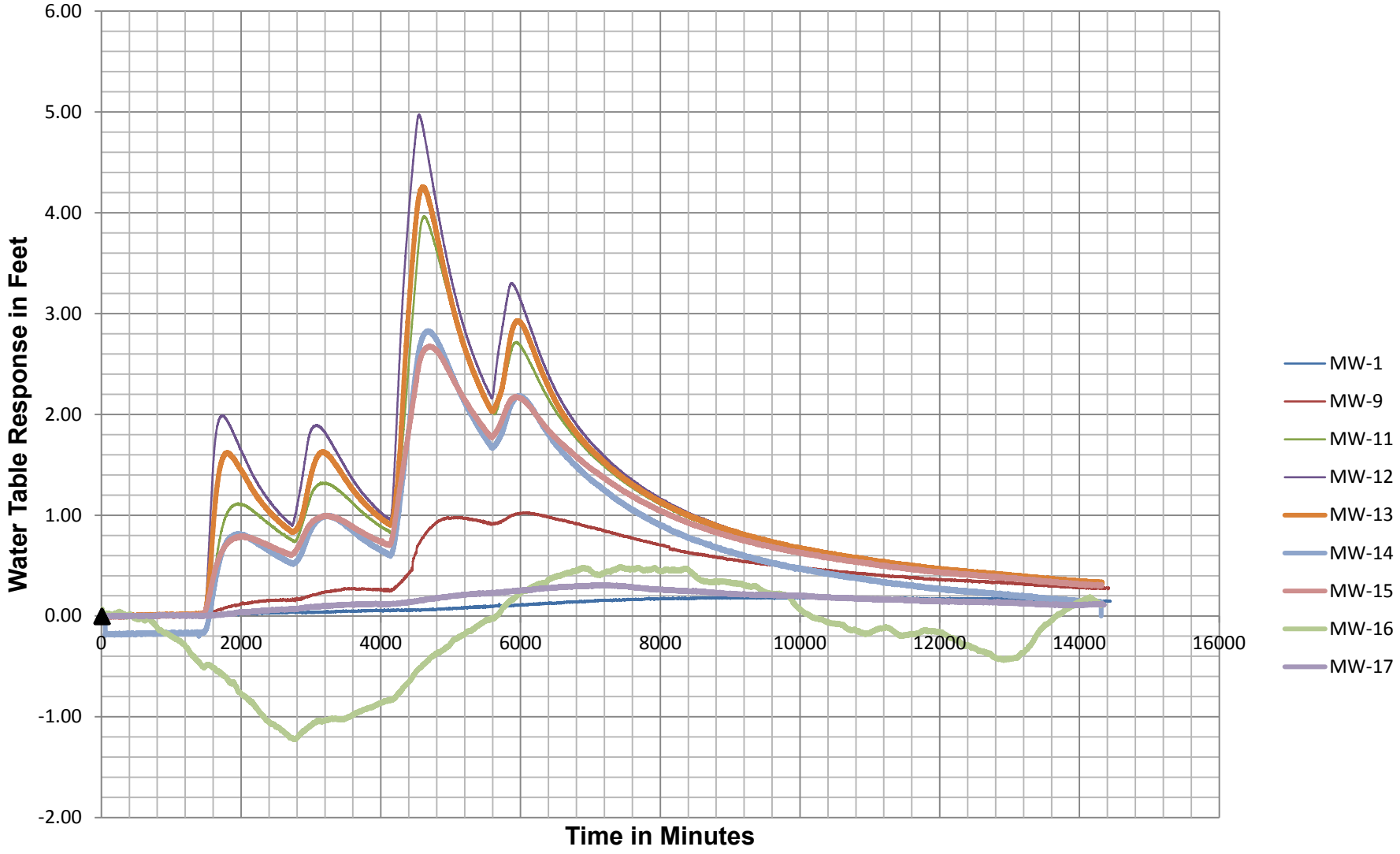
FIELD READINGS:

Eastern Analytical, Inc.
professional laboratory and drilling services
25 CHENELL DRIVE | CONCORD, NH 03301 | TEL: 603.228.0525 | 1.800.287.0525 | E-MAIL: CUSTOMERSERVICE@EASTERNANALYTICAL.COM | WWW.EASTERNANALYTICAL.COM

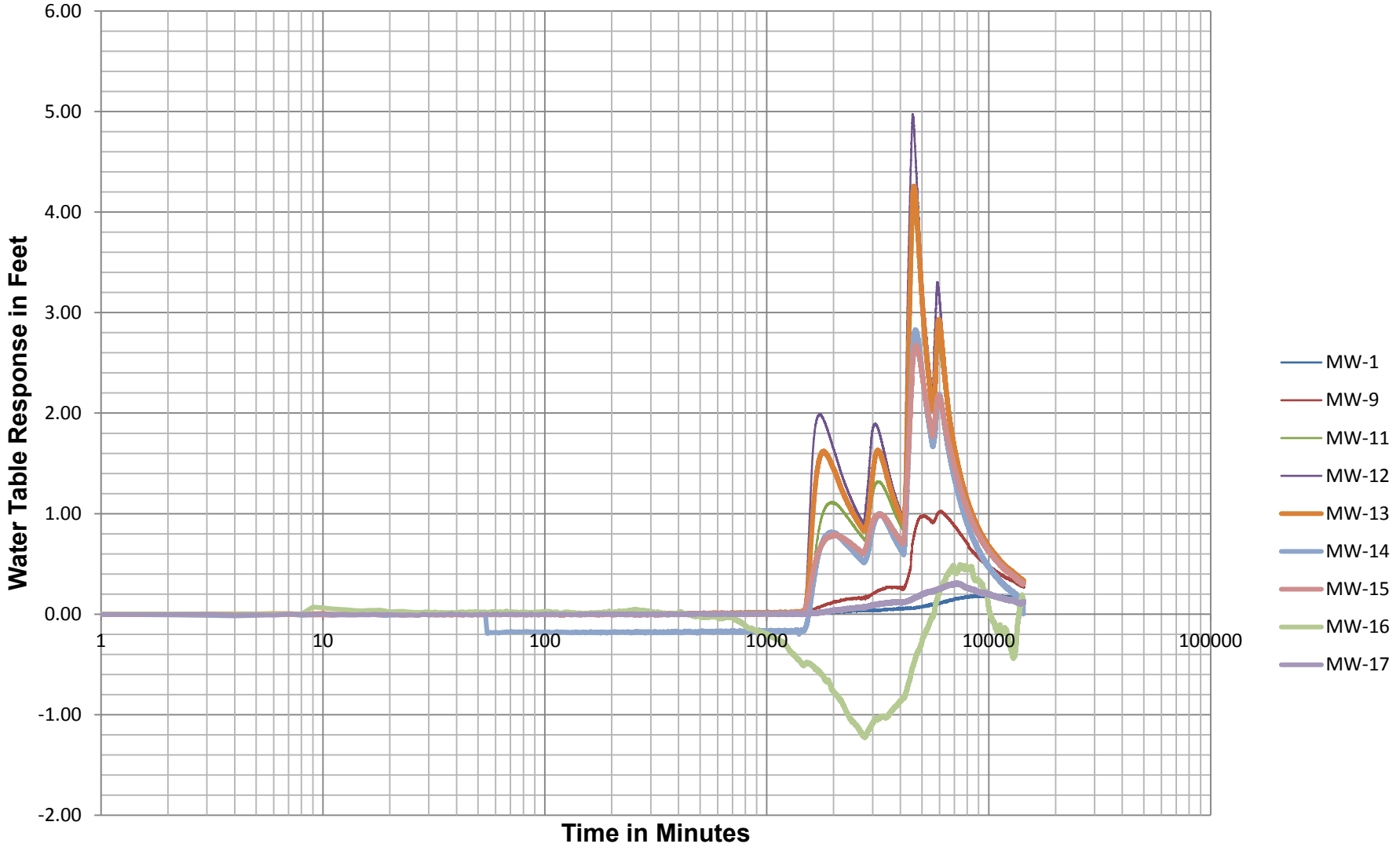
(WHITE: ORIGINAL GREEN: PROJECT MANAGER)

APPENDIX J
Loading Test I, Graphical Response

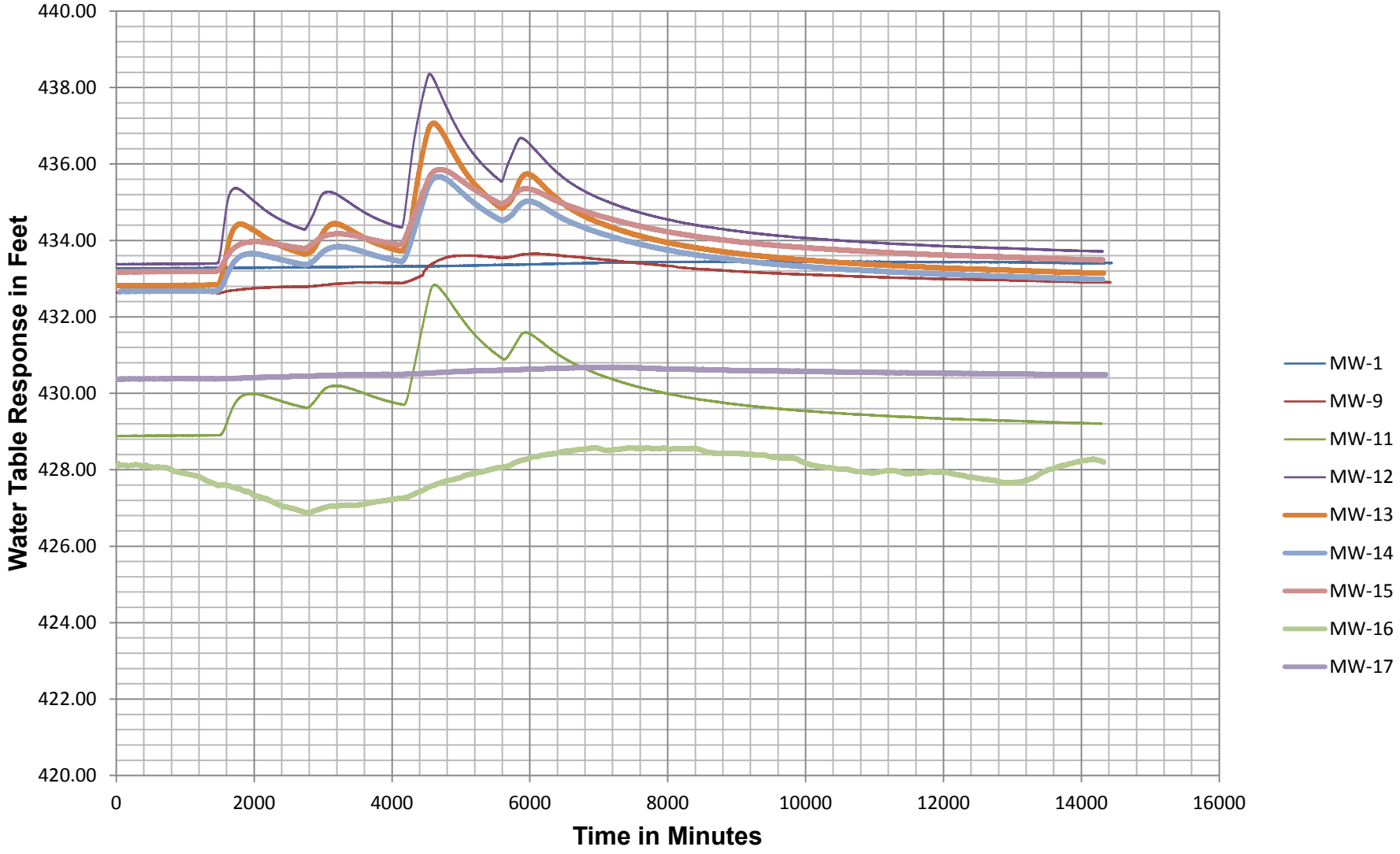
Pinetree Power Hydraulic Loading Test
Figure 1 - RIB Loading Test I; Basin 4 Response; Arithmetic



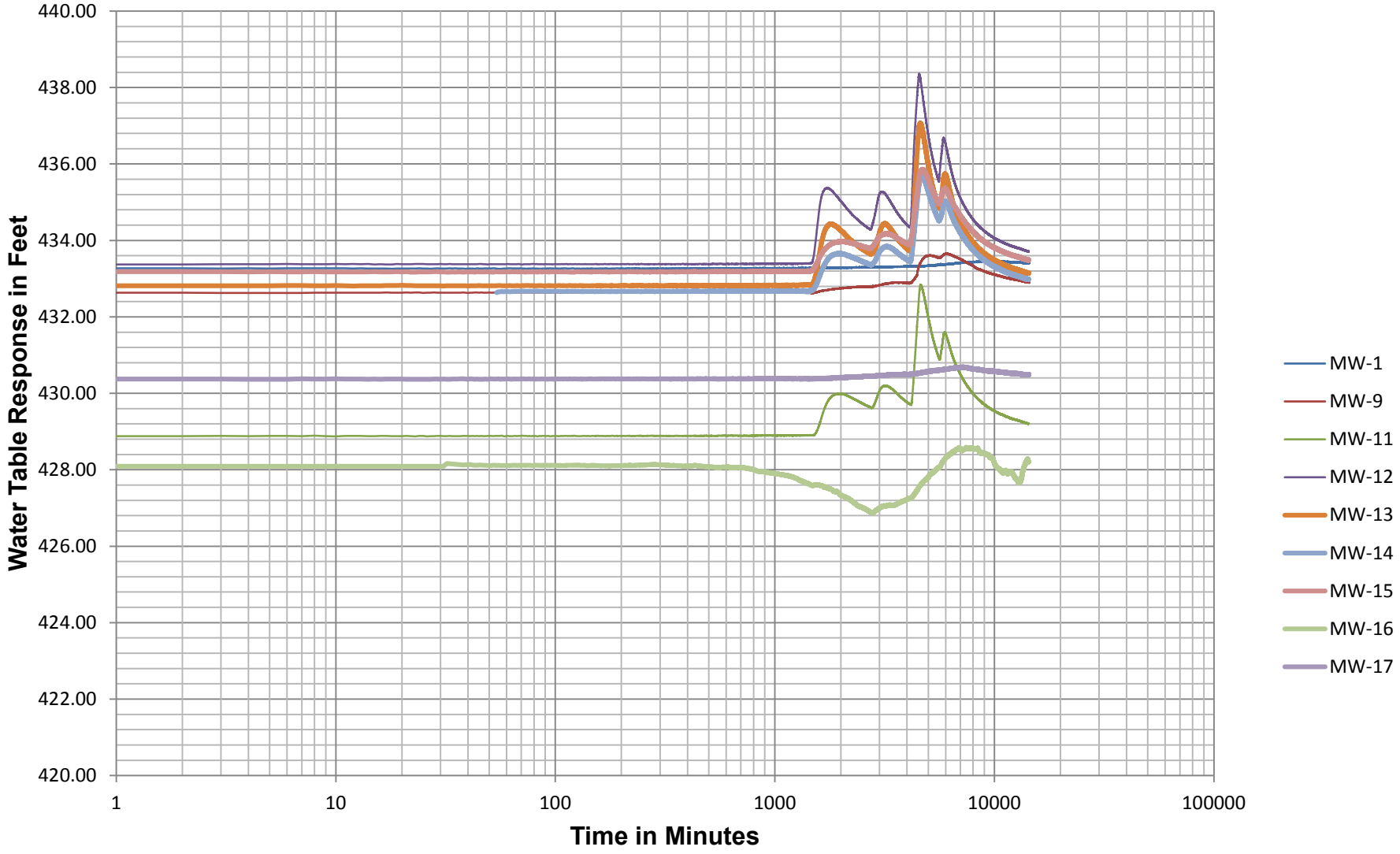
Pinetree Power Hydraulic Loading Test
Figure 2 - RIB Loading Test I; Basin 4 Response; Semi-Log



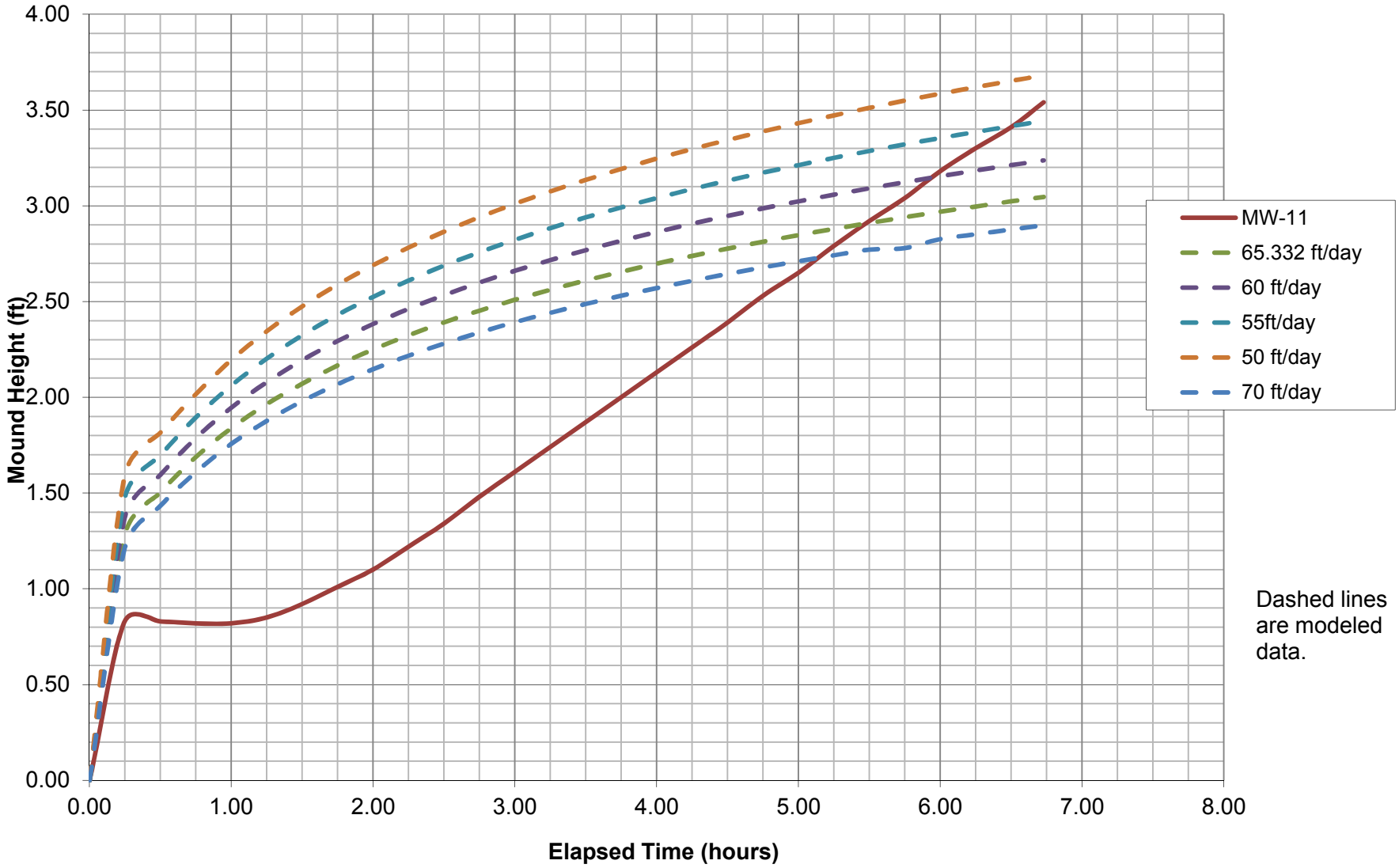
Pinetree Power Hydraulic Loading Test I
Figure 3 - RIB Loading Test; Basin 4
Elevation; Arithmetic



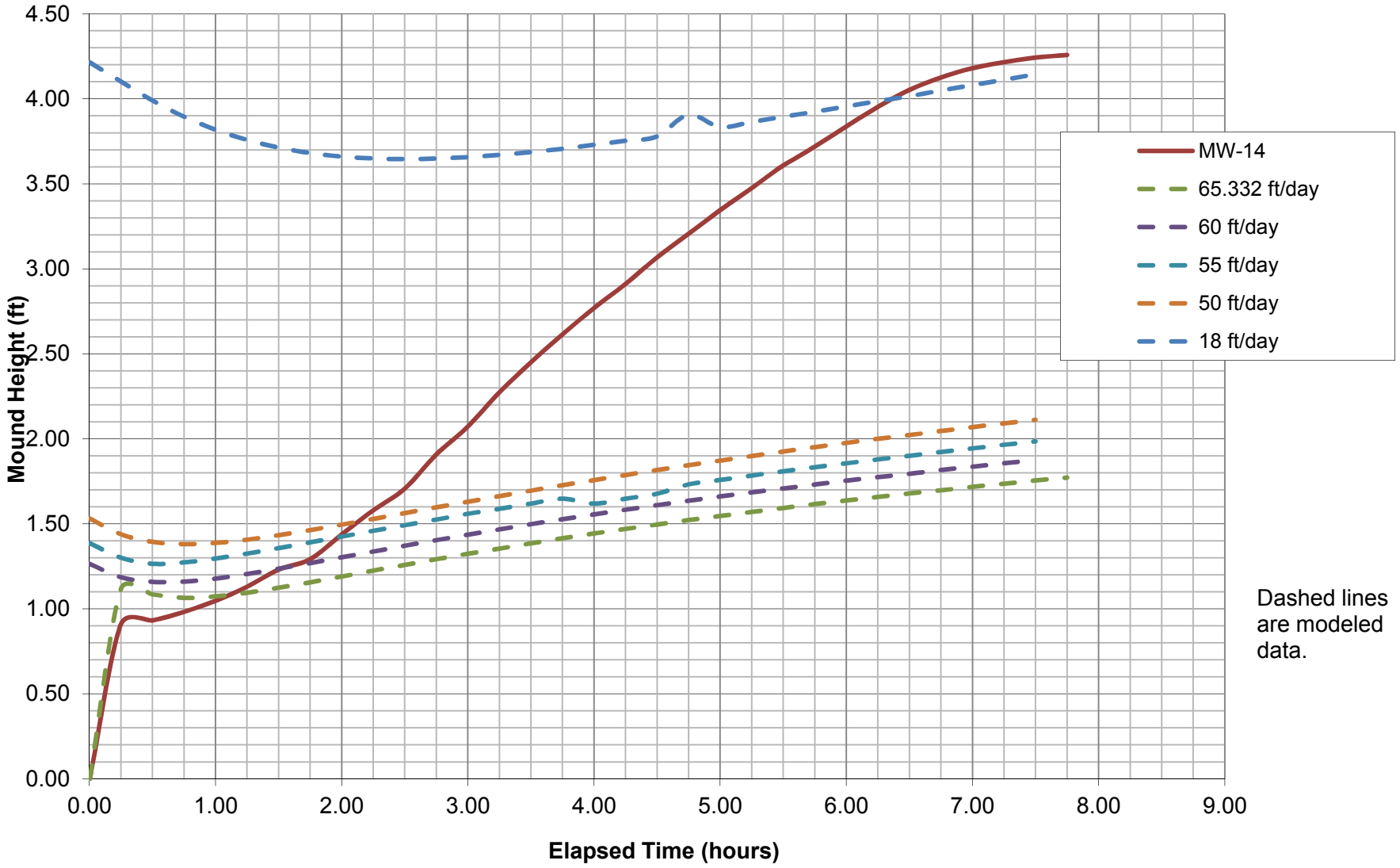
Pinetree Power Hydraulic Loading Test I
Figure 4 - RIB Loading Test; Basin 4
Elevation; Semi-Log



Pine Tree Power
Figure 5 - RIB Test Data
Modeled vs. Actual Mound Height ; MW-11

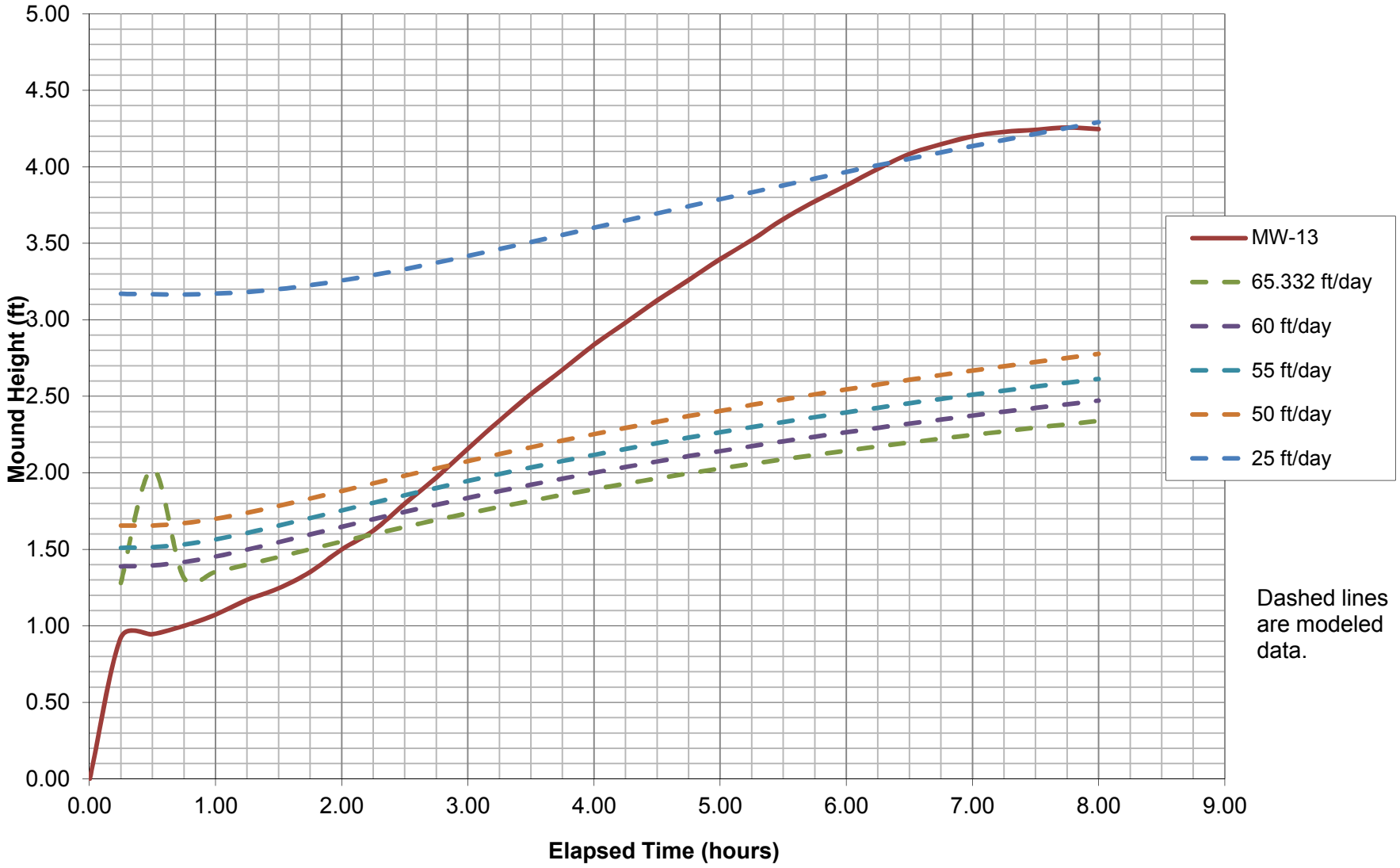


PineTree Power
Figure 6 - RIB Loading Test Data
Modeled vs. Actual Mound Height ; MW-14

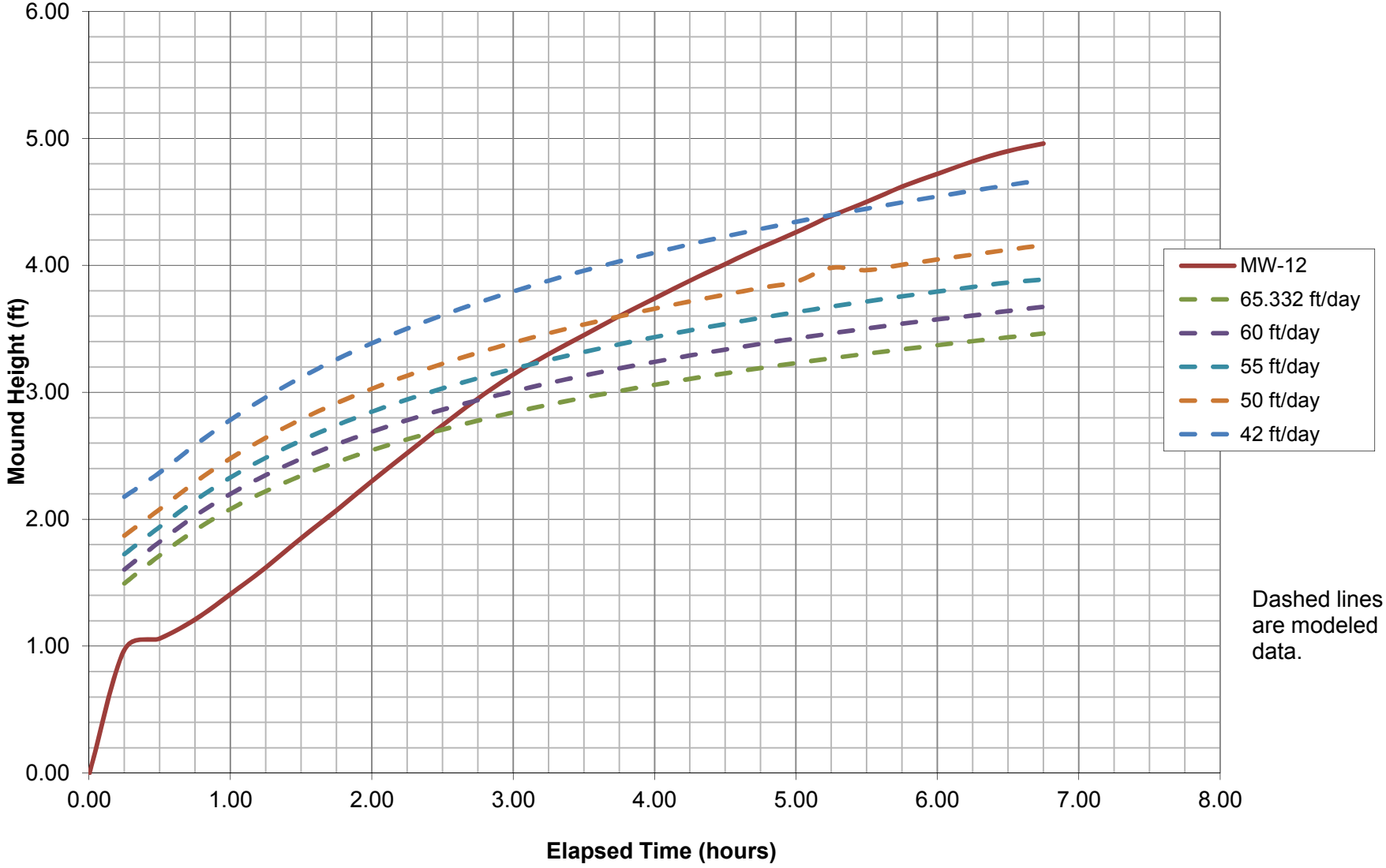


Dashed lines are modeled data.

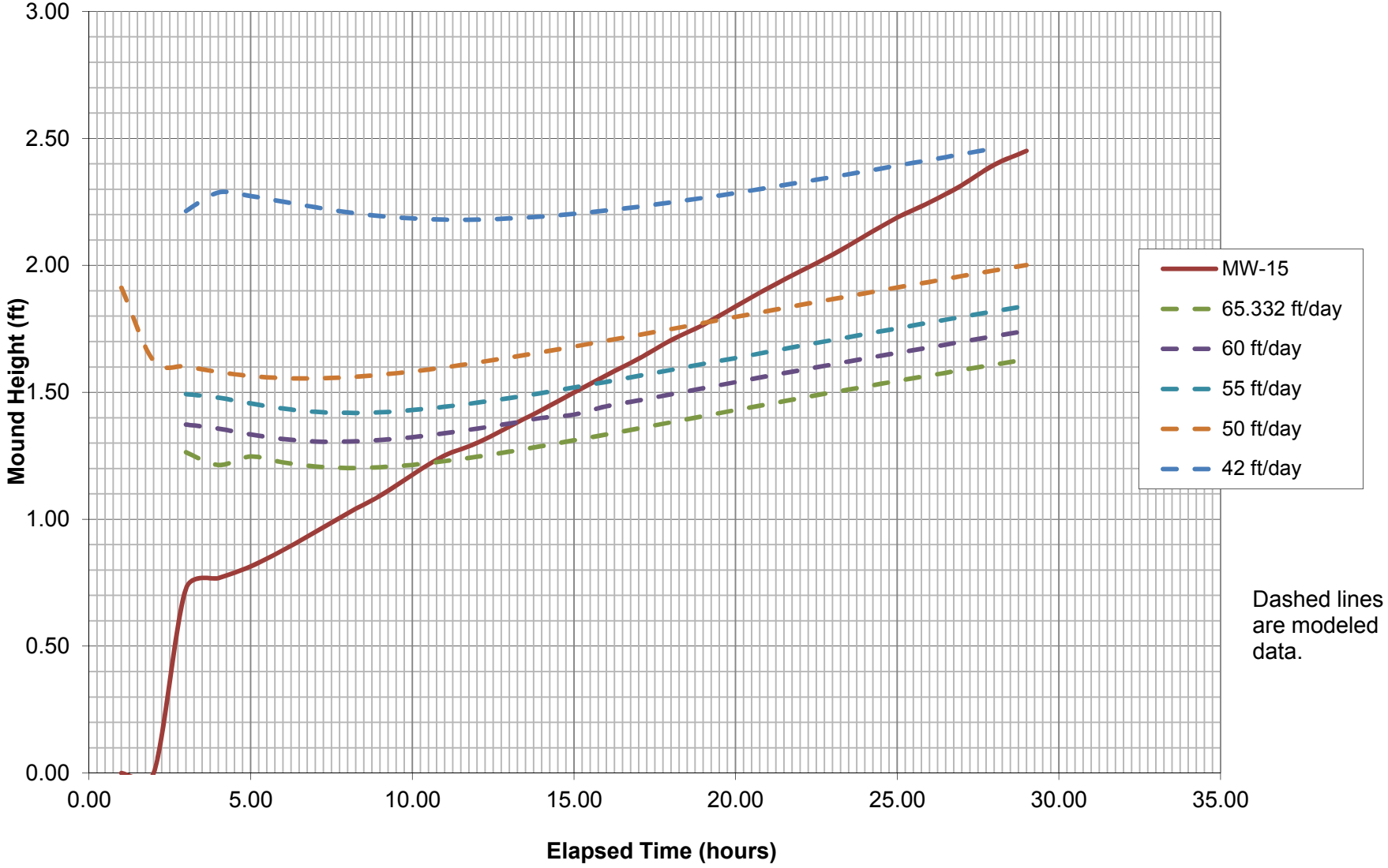
Pine Tree Power
Figure 7 - RIB Loading Test Data
Modeled vs. Actual Mound Height ; MW-13



Pine Tree Power
Figure 8 - RIB Loading Test Data
Modeled vs. Actual Mound Height; MW-12



Pine Tree Power
Figure 9 - RIB Loading Test Data
Modeled vs. Actual Mound Height; MW-15



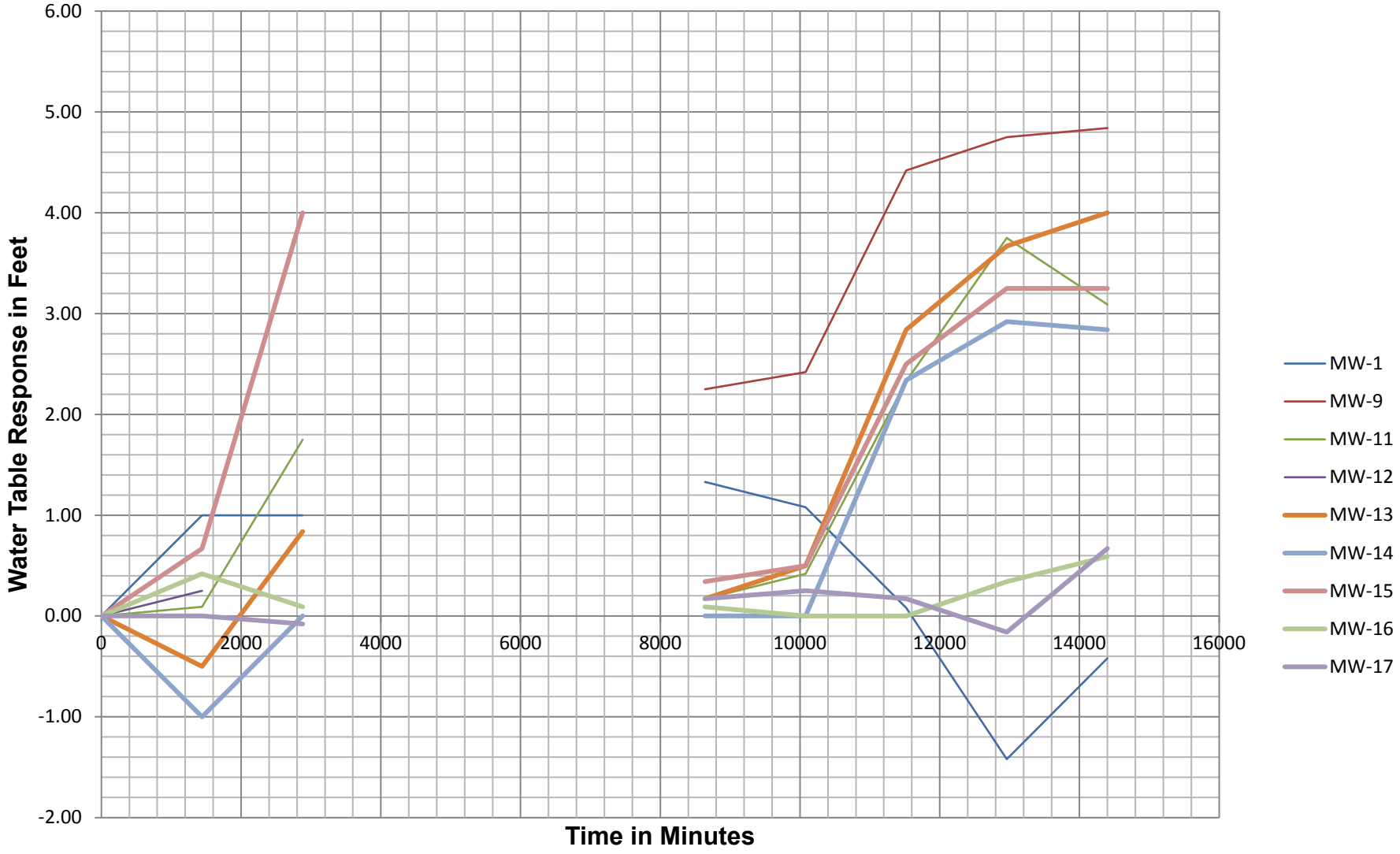
APPENDIX K
Loading Test II, NOAA Data and Graphical Response

Climatological Data for TAMWORTH 4, NH - April 2019

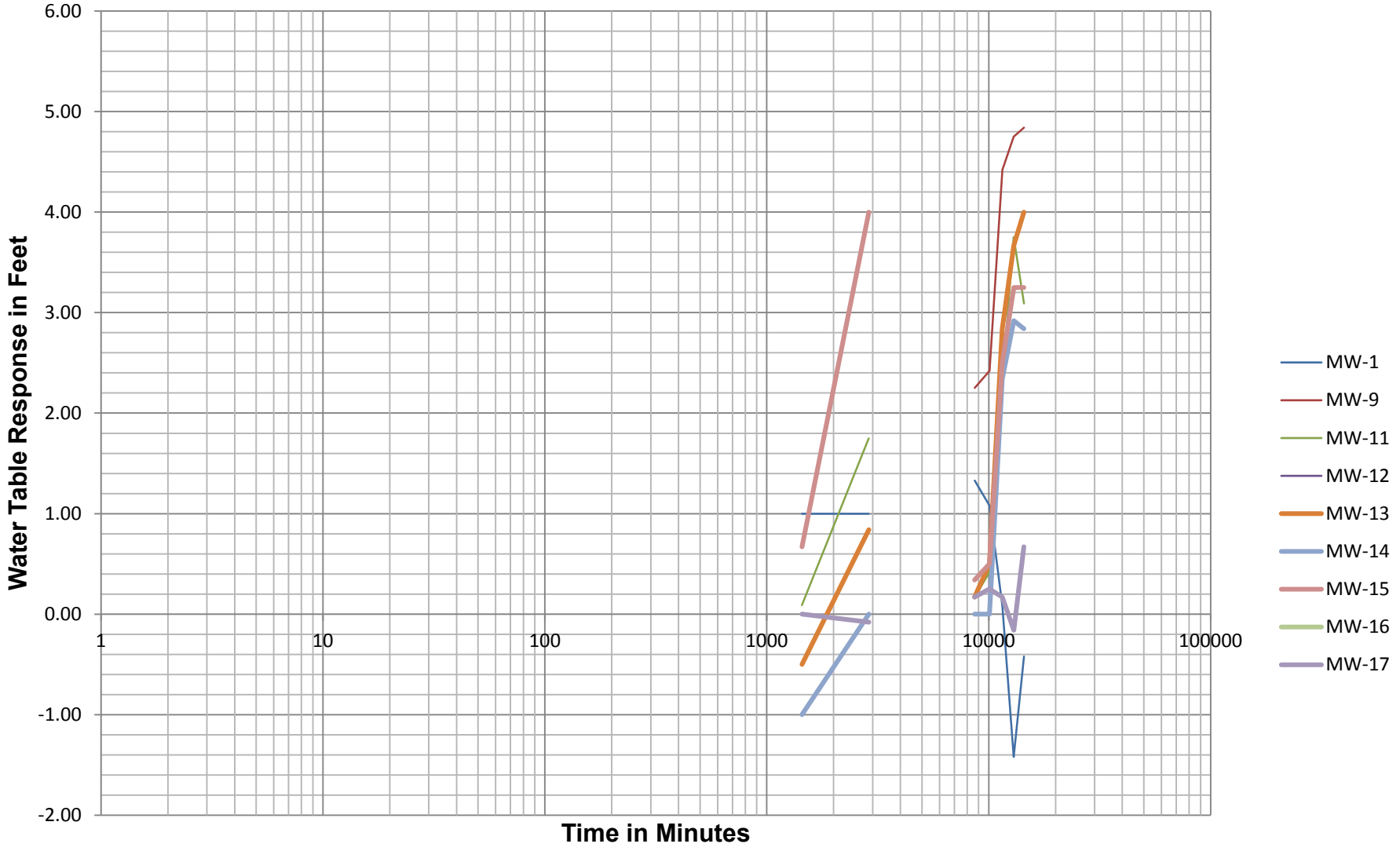
Date	Temperature				HDD	CDD	Precipitation	New Snow	Snow Depth
	Maximum	Minimum	Average	Departure					
2019-04-01	54	27	40.5	4.4	24	0	0.37	0.0	20
2019-04-02	37	15	26.0	-10.5	39	0	T	T	20
2019-04-03	47	16	31.5	-5.5	33	0	0.03	T	18
2019-04-04	54	28	41.0	3.6	24	0	T	T	17
2019-04-05	54	18	36.0	-1.9	29	0	0.00	0.0	16
2019-04-06	45	19	32.0	-6.3	33	0	0.22	0.7	16
2019-04-07	52	24	38.0	-0.7	27	0	0.00	0.0	13
2019-04-08	58	25	41.5	2.3	23	0	0.39	0.6	12
2019-04-09	31	26	28.5	-11.1	36	0	0.93	4.1	14
2019-04-10	31	26	28.5	-11.6	36	0	0.25	1.5	15
2019-04-11	38	21	29.5	-11.0	35	0	0.00	0.0	13
2019-04-12	49	25	37.0	-4.0	28	0	0.00	0.0	11
2019-04-13	44	30	37.0	-4.4	28	0	0.03	0.0	9
2019-04-14	68	31	49.5	7.6	15	0	0.00	0.0	7
2019-04-15	54	33	43.5	1.2	21	0	0.30	0.0	5
2019-04-16	51	34	42.5	-0.3	22	0	0.20	T	3
2019-04-17	45	26	35.5	-7.7	29	0	0.00	0.0	3
2019-04-18	58	24	41.0	-2.6	24	0	0.00	0.0	2
2019-04-19	43	27	35.0	-9.1	30	0	0.05	0.0	1
2019-04-20	64	41	52.5	8.0	12	0	0.22	0.0	T
2019-04-21	61	42	51.5	6.6	13	0	0.49	0.0	T
2019-04-22	65	38	51.5	6.2	13	0	0.01	0.0	T
2019-04-23	70	40	55.0	9.2	10	0	0.28	0.0	T
2019-04-24	53	39	46.0	-0.2	19	0	0.32	0.0	T
2019-04-25	50	29	39.5	-7.1	25	0	T	0.0	0
2019-04-26	60	33	46.5	-0.5	18	0	0.00	0.0	0
2019-04-27	42	36	39.0	-8.4	26	0	2.15	0.0	0
2019-04-28	48	33	40.5	-7.3	24	0	0.05	0.0	0
2019-04-29	51	31	41.0	-7.1	24	0	0.00	0.0	0
2019-04-30	53	36	44.5	-4.0	20	0	0.00	0.0	0
Sum	1530	873	-	-	740	0	6.29	6.9	-
Average	51.0	29.1	40.1	-2.3	-	-	-	-	7.2
Normal	54.3	30.6	42.4	-	678	1	4.66	M	-

Observations for each day cover the 24 hours ending at the time given below (Local Standard Time).
Max Temperature : 7am
Min Temperature : 7am
Precipitation : 7am
Snowfall : unknown
Snow Depth : 7am

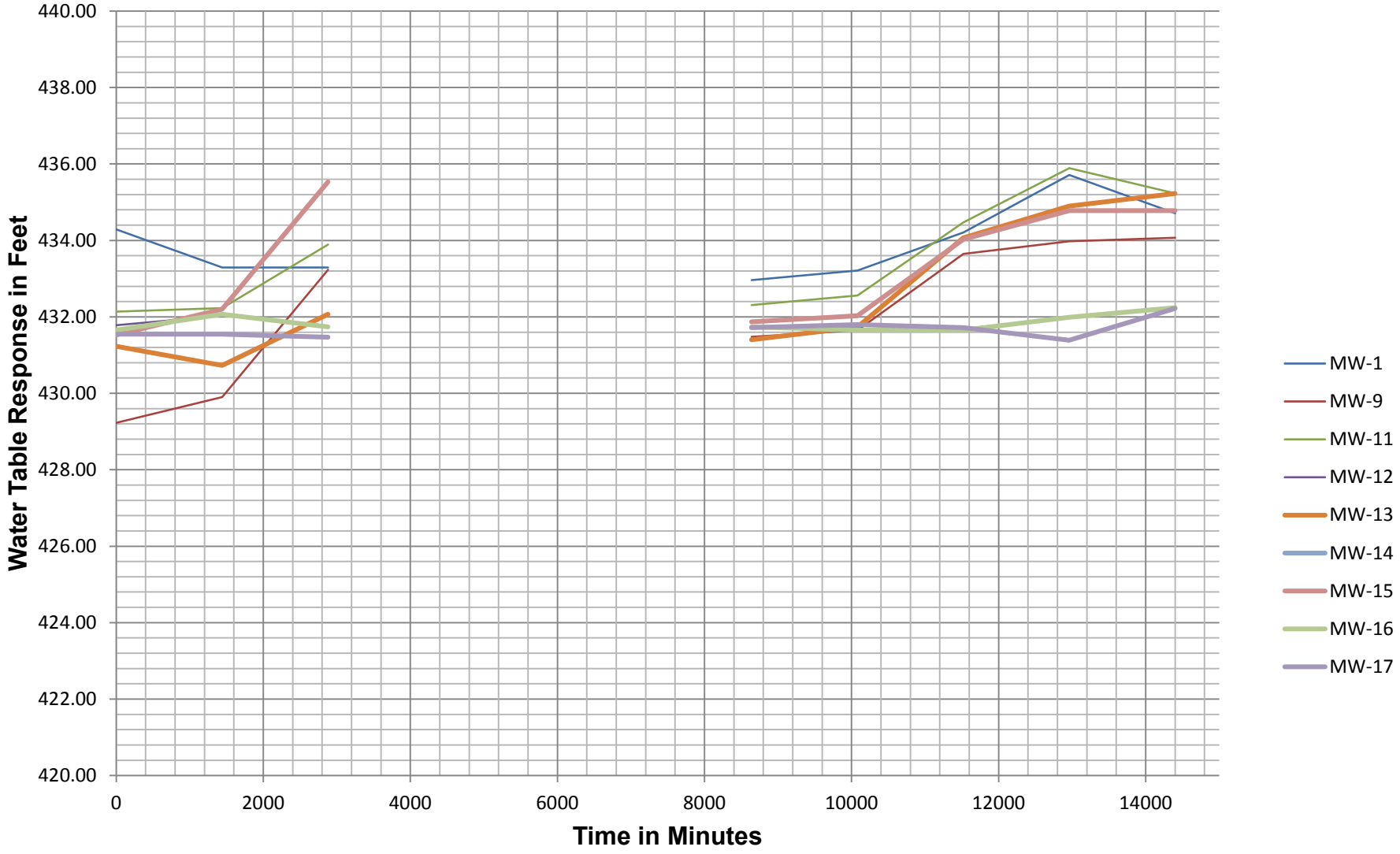
Pinetree Power Hydraulic Loading Test II
Figure 10 - RIB Loading Test I; Basin 4 Response; Arithmetic



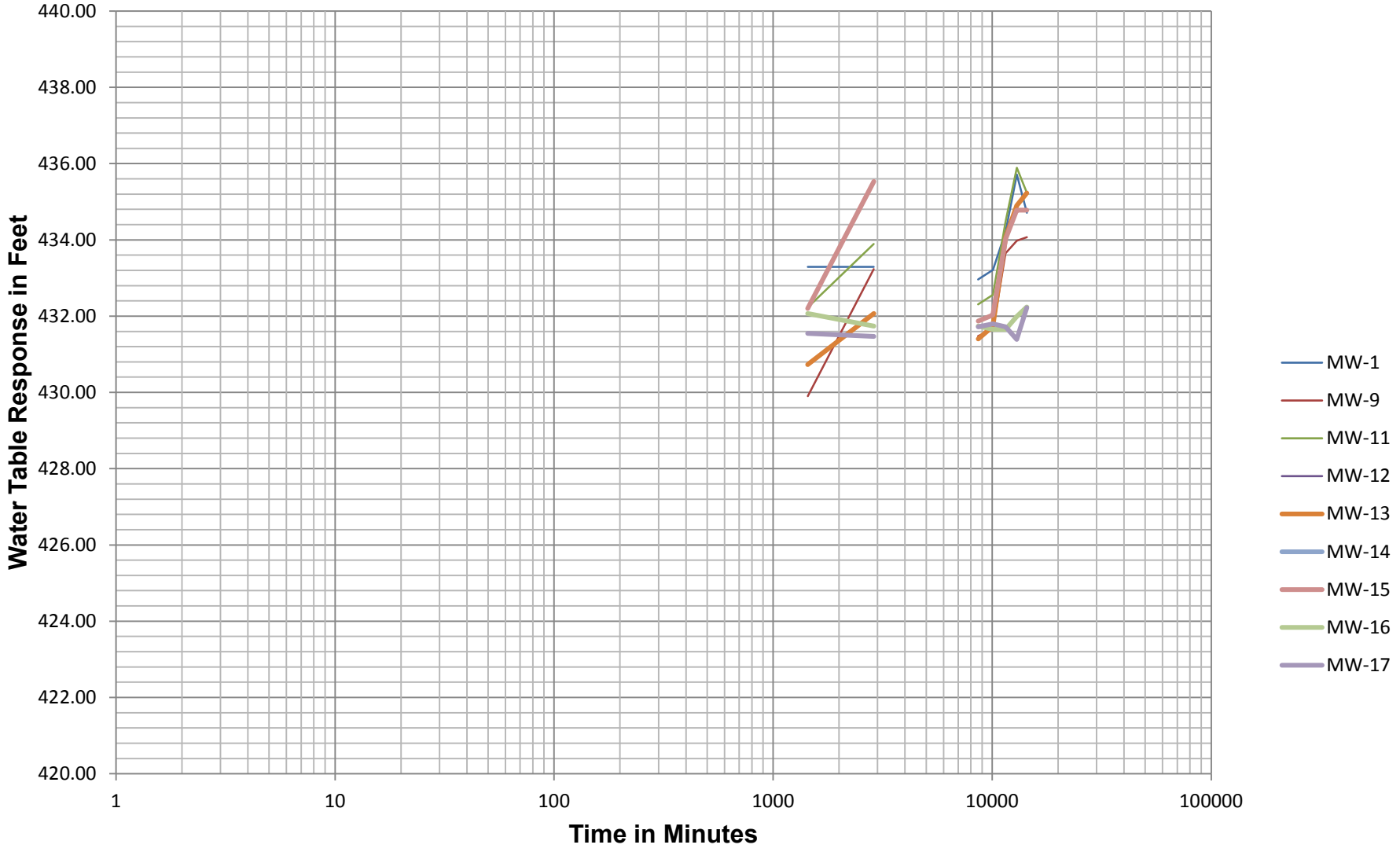
Pinetree Power Hydraulic Loading Test II
Figure 11 - RIB Loading Test II; Basin 4 Response; Semi-Log



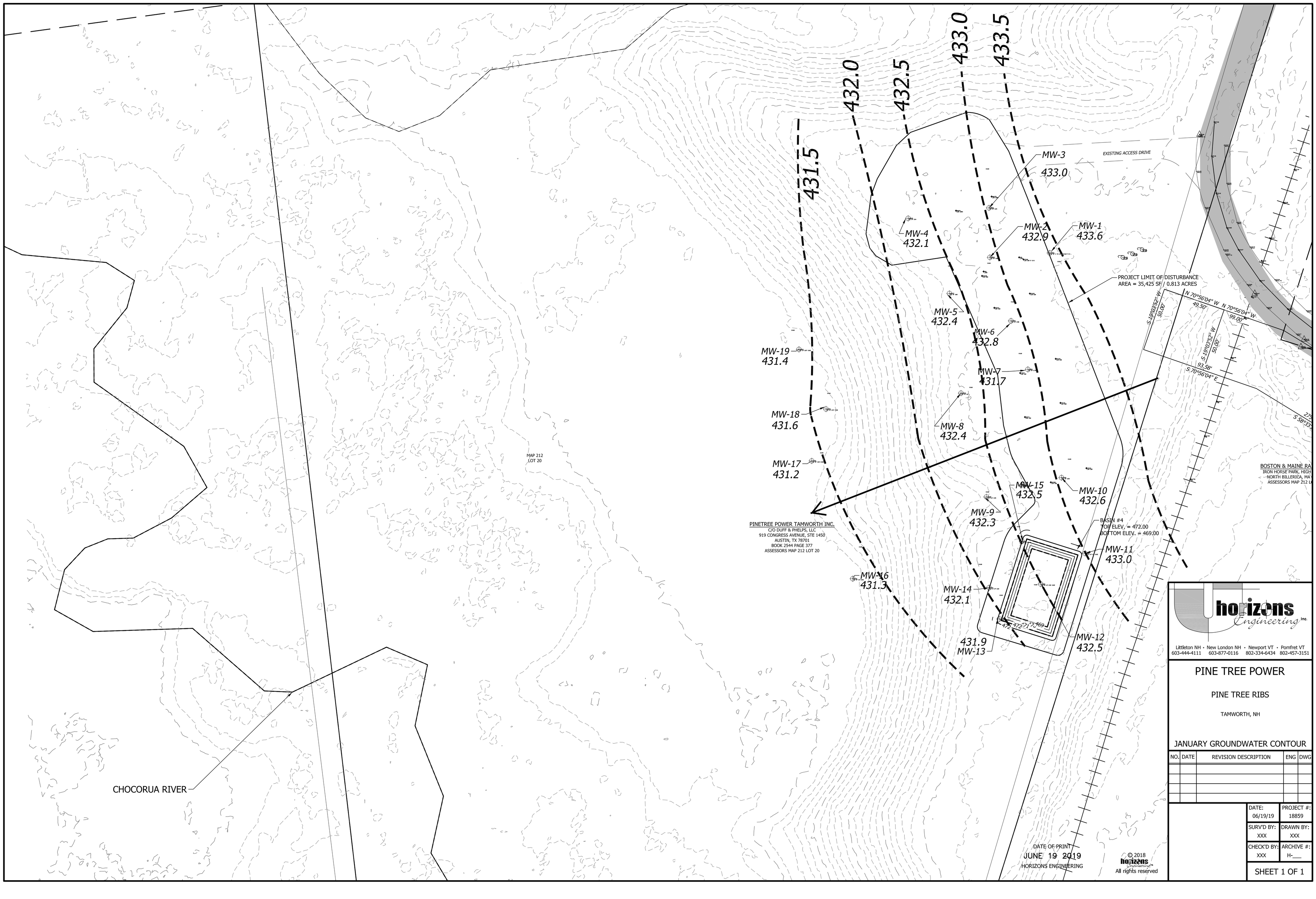
Pinetree Power Hydraulic Loading Test II
Figure 12 - RIB Loading Test; Basin 4
Elevation; Arithmetic



Pinetree Power Hydraulic Loading Test II
Figure 13 - RIB Loading Test; Basin 4
Elevation; Semi-Log



APPENDIX L
Groundwater Contour Plan



horizons Engineering Inc.

Littleton NH • New London NH • Newport VT • Pomfret VT
603-444-4111 603-877-0116 802-334-6434 802-457-3151

PINE TREE POWER

PINE TREE RIBS

TAMWORTH, NH

JANUARY GROUNDWATER CONTOUR

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: 06/19/19	PROJECT #: 18859
SURV'D BY: XXX	DRAWN BY: XXX
CHECK'D BY: XXX	ARCHIVE #: H-___

SHEET 1 OF 1

DATE OF PRINT
JUNE 19 2019
HORIZONS ENGINEERING

Appendix M
Groundwater Discharge Permit Application

GROUNDWATER DISCHARGE PERMIT FORM

Drinking Water and Groundwater Bureau
Groundwater Discharge Program

RSA/Rule: RSA 485-A:6, VII; 485:3, X; Env-Wq 402

The GROUNDWATER DISCHARGE PERMIT is a permit issued under RSA 485-A:13 and Env-Wq 402 for the discharge of wastewater to the ground or groundwater. Examples of facilities needing a groundwater discharge permit include rapid infiltration basins, unlined wastewater, septage and sludge lagoons, septic systems not meeting applicable nitrate setback requirements, spray irrigation using treated wastewater and facilities discharging wastewater containing regulated contaminants that are treated with Best Available Technology.

SUBMIT

- ☐ ONE SIGNED AND COMPLETED APPLICATION (Applicant shall provide a copy to town/city clerk)
- ☐ SUPPORTING INFORMATION
- ☐ $1,000 APPLICATION FEE (in the form of a check payable to the "Treasurer-State of NH". (State and local government including counties and political subdivisions are exempt)

TO: NHDES--Water Division
Groundwater Discharge Permit Coordinator
Drinking Water & Groundwater Bureau
P.O. Box 95
Concord, NH 03302-0095

If you have any questions, please contact the Groundwater Discharge Permit Coordinator at (603) 271-2858.

FOR STATE USE ONLY

Date Received:_____

Site No: _____

Rivers Coordinator Notified Date: _____

CERTIFICATION OF NOTICE TO LOCAL TOWN/CITY CLERK

In order to meet the requirements of Env-Wq 402.16(b), the undersigned certifies that on _____(date) a copy of this completed permit application was given to the Town/City Clerk of _____ (the town in which the facility for which a permit is needed or is proposed to be located).

Date: _____Signed: _____

Applicant

I. Activity Type

- ☐ Discharge from an unlined domestic wastewater lagoon.
- ☐ Discharge from an unlined septage or sludge lagoon.
- ☐ Land application of domestic wastewater.
- ☐ Discharge of domestic wastewater from a subsurface disposal system with a design flow equal to or greater than 20,000 gallons per day.
- ☐ Discharge of domestic wastewater from subsurface disposal systems with aggregate design flows equal to or greater than 1,000 gpd for a single lot where minimum nitrate setback distances are not met.
- ☒ Discharge of nondomestic wastewater which contains a regulated contaminant and which has received treatment by Best Available Technologies before discharge.

II. Applicant Information

Name: Pine Tree Power, Inc. Daytime Phone: _____
Mailing Address: 469 Plains Road
City: Tamworth State: New Hampshire Zip: 03886
Contact Person Name: Jason Joubert Email: jason.joubert@engie.com
Contact Person: Phone Number (603) 323-8187 Fax Number: _____

III. Facility Information

Name: Pine Tree Power, Inc.
Address: 469 Plains Road
City: Tamworth State: New Hampshire Zip: 03886
Property Tax Map: 212 Lot Number 20
Latitude & Longitude of discharge point(s) 43°50'13.00"N 71°12'1.50"W
Deed Reference (if applicable): County Carrol County Book and Page: Book 2544 Page 0377

IV. Facility Owner (complete only if different then Applicant)

Owner Name: _____ Daytime Phone: _____
Mailing Address _____
City/Town: _____ State: _____ ZIP: _____
Contact Person Name: _____ Email: _____
Contact Person: Phone Number: _____ Fax Number: _____

V Property Owner (complete only if different then Applicant)

Name: _____ Daytime Phone: _____
Mailing Address: _____
City: _____ State: _____ Zip: _____
Contact Person Name: _____ Email: _____
Contact Person: Phone Number: _____ Fax Number: _____

[* NOTE: The permit shall be obtained by the property owner unless a deeded easement, for a minimum of 20 years, has been granted by the property owner to the applicant for exclusive use of the groundwater as a receiving medium for discharged wastewater.]

VI. Facility Operator (complete only if different from facility owner)

Facility Operator Name: _____ Daytime Phone: _____
Mailing Address: _____
City: _____ State: _____ Zip: _____

VII. Facility Activity Information

Briefly describe the facility, its intended capacity and types of waste or wastewater handled, together with supporting information describing the process involved in the pretreatment, treatment, storage or disposal of the waste or wastewater (attach additional sheets as necessary).

See Attached Report

VIII. Discharge

A. Type of discharge (primary or secondary domestic wastewater effluent, septage, etc.). Attach analytical results, if available:
Volume of discharge (GPD): up to 100,000 Septage (GPY) 0
Proposed Discharge Schedule: Daily with cycling of basins
Total number of designed discharge points (i.e. leachfield, dry wells): (4) rapid infiltration basins
Latitude & Longitude of all Discharge Points: 43°50'8.32"N 71°12'2.36"W
Hydraulic loading rate(s) (attach calculations, if applicable): See Attached Report
Estimated construction time and projected start-up date (for new facilities only): 3 basins to be constructed and put into use upon permit approval

B. In the case of industries, all pertinent information relating to processes, production and associated waste streams and treatment shall be included with this application.

IX. Supporting Information

Use this check list as a guide to submitting all needed information, check "Y' (Yes), or "NA" (Not Applicable). If your activity is not directly described, submittal requirements will be determined on a case by case basis. If you check "NA" in the following checklist, please submit a comprehensive narrative of the activities to be permitted.

Y	N/A	
X		A. An original or color photocopy of a USGS map (7½ minute series if available) which clearly identifies the facility location or a map that depicts equivalent features at a similar scale.
	X	B. For discharges of domestic wastewater, a groundwater discharge zone map, using a tax map as a base, which identifies and locates the following:
	X	1. Groundwater discharge zone boundary;
	X	2. Deeded easements which restrict the use of the groundwater;
	X	3. Streets within 1,000 feet of the groundwater discharge zone;
	X	4. Properties (including tax map and lot, ownership and land use information) within 1,000 feet of the groundwater discharge zone;
	X	5. Surface water bodies within 1,000 feet of the groundwater discharge zone including their designated river classification;
	X	6. Boundary of the 100-year flood zone and identification of the 100-year base flood elevation if within 1,000 feet of the discharge area;
	X	7. Water supply sources (including type of use) within 1,000 feet of the groundwater discharge zone; and
	X	8. Source water protection areas within 1,000 feet of the groundwater discharge zone.
		C. Detailed scaled facility plan prepared in accordance with the following:
X		1. The plan shall include a title, a legend and a true north arrow;
X		2. The plan shall be drawn to scale and the scale shall be noted on the plan and include a graphic scale bar;
X		3. The base plan sources from which the facility plan was derived shall be noted on the plan;
X		4. The location, elevation and datum of a bench mark shall be included. If a bench mark referenced to the National Geodetic Vertical Datum (NGVD) is within 1,000 feet of the facility, the elevation shall be recorded using NGVD, and the source of the NGVD bench mark information shall be noted on the plan;
X		5. Ground surface spot elevations and appropriate contours shall be shown.
X		6. The facility plan shall identify and locate the following:
X		a. Wastewater application and unlined lagoon areas including total land area available and area to be used;
X		b. Existing/proposed groundwater monitoring wells/piezometers that will be monitored;
	X	c. Surface water sampling points;
X		d. Groundwater contours within 100 feet of the groundwater discharge zone;
X		e. Surface water bodies within 100 feet of the groundwater discharge zone;

Y	N/A	
☐	☒	f. Deeded easements which restrict the use of groundwater;
☒	☐	g. Groundwater discharge zone boundaries;
☒	☐	h. Land surface contours within 100 feet of the groundwater discharge zone;
☒	☐	i. A table of groundwater elevations from monitoring wells and piezometers used to develop the groundwater contours and/or used to develop groundwater contours and estimate mounding;
☒	☐	j. Soil borings and test pits within 100 feet of the groundwater discharge zone;
☒	☐	k. Physical structures and buildings associated with the facility;
☒	☐	l. Surface and underground storage tanks associated with the facility;
☒	☐	m. Underground utilities at the facility; and
☒	☐	n. Subsurface drains at the facility.
☒	☐	7. All plans and specifications shall be dated, signed, and sealed by the engineer of record, as that term is defined in RSA 310-A:2, III.
☒	☐	D. In addition to the facility plan, a copy of the plan scaled to fit on an 8½" x 11" or 11" x 17" sheet and modified to make the items in Part IX (C) above legible.
☐	☒	E. For existing facilities, a table summarizing all monitoring results from the existing monitoring points from 5 years previous to application date.
☒	☐	F. A list of reports on land use history, activities, water quality and hydrogeology associated with the property on which the facility is located.
☒	☐	G. A detailed proposal for a water quality monitoring program, including proposed monitoring schedule, parameters to be analyzed and monitoring locations, with supporting information justifying the locations, frequency and parameters selected.
☒	☐	H. A table of locational coordinates for monitoring wells and surface water quality points that are proposed in the water quality monitoring program for the facility, referenced to North American datum of 1983 (NAD83) or world geodetic systems of 1984 (WGS84) in degrees-minutes-seconds, decimal degrees or equivalent state plane coordinate units.
☐	☒	I. A nitrate migration study for domestic wastewater or a regulated contaminant movement study for a discharge of other than domestic wastewater.
☒	☐	J. For a new discharge site or an existing discharge site that is being expanded:
☒	☐	1. A site specific soil map of the proposed groundwater discharge zone prepared in accordance with the site specific soil mapping standards for New Hampshire and Vermont; and
☒	☐	2. A hydrogeologic site assessment and study that includes a description of the geology of the site, including a description of surficial geologic materials and thickness, estimates of hydraulic conductivity, hydraulic gradients, seepage velocity, groundwater flow, ambient groundwater quality, estimated infiltration rates, and intended loading rates; and
☒	☐	3. All supporting site specific data, documentation and calculation to support the estimates and descriptions provided.
☒	☐	K. Verification from the Department of Resources & Economic Development that no presence of threatened or endangered species exists on the site.
☒	☐	L. Test pit data and boring log data as outlined and in accordance with Env-Wq 402.15 (d) (1)-(3) including textural description, drilling methods, blow counts and water table observation.
☒	☐	M. Well construction details of existing monitoring wells, top of well casing elevations, measured depth to water table from top of casing.
☐	☒	N. Documentation, filed in the registry of deeds, which acknowledges that the use of groundwater within the groundwater discharge zone for drinking water wells shall be restricted by easement ownership rights, (if the applicant does not own all applicable land).
☐	☒	O. Status of Division approval of design plans and operations manual for the wastewater treatment system.
☐	☒	P. If a certified wastewater treatment plant operator is required under RSA 485-A, a copy of the certification or status or the operator/applicant.
☐	☒	Q. A copy of the permit, or application if a permit is not yet issued, for:
☐	☒	1. A site specific permit for drainage and erosion control measures;
☐	☒	2. A septage or sludge management permit; and
☐	☒	3. A dam permit for bermed or dammed structures.

X. Permit Issuance Information

A. Within 90 days from the receipt of a complete permit application the Department of Environmental Services (the department) shall issue a permit for a period of five years subject to renewal or deny the application. The department shall notify the applicant of its decision in writing.

B. The department shall place conditions upon a groundwater discharge permit as required to assure conformance with these rules.

C. The department may enter any permitted facility for the purpose of collecting information, examining records, collecting samples or undertaking other action associated with the permit.

D. The permittee shall submit to the department before facility start-up, an as-built site plan on an 8½" x 11" or 11" x 17" sheet, boring logs and well construction details of wells installed after permit issuance.

E. The permittee shall submit one complete set of water quality results to the department before facility start-up.

F. The permittee shall apply for the renewal of the permit 90 days prior to its expiration date. The permittee shall continue to comply with all conditions in the original permit until permit renewal or facility closure. (See Env-Wq 402.28 for renewal criteria and Env-Wq 800 for closure requirements).

G. A permittee may request a permit modification or permit termination by submitting a written request to the department, including the reasons for the modification or termination and a table (in a format prescribed by the department) summarizing all monitoring results to date from existing monitoring points. The department shall modify or terminate the permit or deny the request, stating the reasons for the denial in writing, within 90 days of receipt of the request. (See Env-Wq 402.29 for further information).

H. Prior to transfer of ownership of a facility, the permittee shall file a written request with the department for a transfer of the permit to the new owner. The request shall include a summary of all monitoring results to date in a format prescribed by the department. Within 90 days of receiving a request for transfer, the department shall notify the present permittee and the new permittee of its decision in writing. Within 90 days from the date of approval of transfer, the new permittee shall notify the department in writing of its acceptance of the permit. (See Env-Wq 402.30 for further information).

XI. Applicant/Owner Certification Statement and Signature

By signing this application the signer certifies that the information contained in or otherwise submitted with this application is true, complete and not misleading to the best of the signer's knowledge and belief.

By signing this application the signer understands that submission of false, incomplete or misleading information is grounds for:

- Denying the application;
- Revoking any application that is granted based on the information; and
- If the signer is acting as, or on behalf of, a listed engineer as defined in Env-C 502.10, debarring the listed engineer from the roster.

By signing the application, the signer and applicant agree to comply with all applicable rules and conditions of this permit and to not discharge to the holding tank(s) until written permission from the department has been received.

_____ _____

Signature of Facility Owner or Agent Date

No liability is incurred by the State by reason of any approval for a Groundwater Discharge Permit. Approval by the Department is based on information supplied by the applicant. No guarantee is intended or implied by reason of any advice given by the department or its staff.

dwgbinfo@des.nh.gov or phone (603) 271-2858
PO Box 95, Concord, NH 03302-0095
www.des.nh.gov

New Hampshire Natural Heritage Bureau

To: Andrew Godfrey
176 Newport Rd.
PO Box 1825
New London , NH 03257

Date: 6/19/2019

From: NH Natural Heritage Bureau

Re: Review by NH Natural Heritage Bureau of request dated 6/19/2019

VALID ONLY FOR NOTIFICTION OR MINIMUM EXPEDITED APPLICATIONS SUBMITTED TO THE NHDES WETLANDS BUREAU

NHB File ID: NHB19-1938 Applicant: Andrew Godfrey

Location: Tax Map(s)/Lot(s):
Tamworth

Project Description: Rapid infiltration basins to treat wastewater from power plant

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

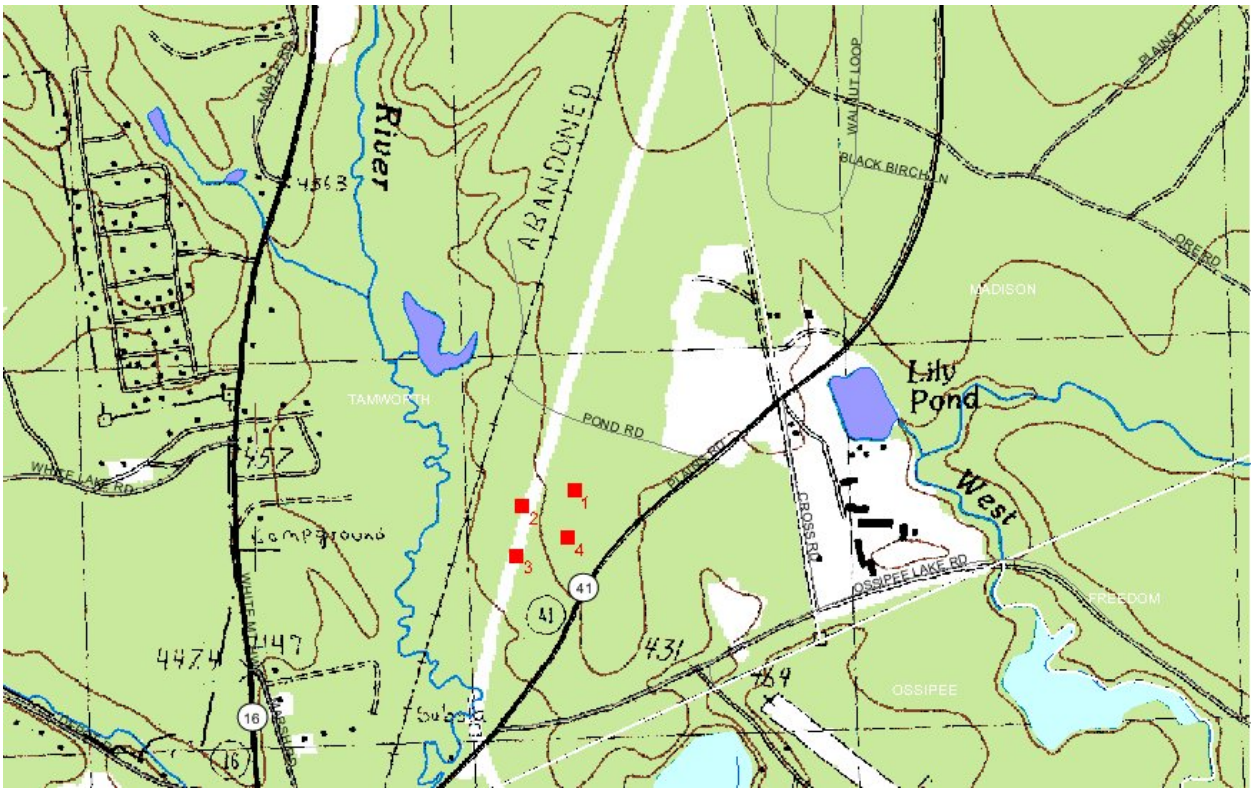
A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

This report is valid through 6/18/2020.

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Road
Concord NH 03301

MAP OF PROJECT BOUNDARIES FOR NHB FILE ID: NHB19-1938



Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Road
Concord NH 03301