GeoInsight
ENVIRONMENTAL STRATEGY & ENGINEERING

AQUIFER PROTECTION DISTRICT – HYDROGEOLOGIC STUDY REPORT
TUCK REALTY CORPORATION, PROPOSED CONDOMINIUM DEVELOPMENT
MAP 10, LOT 1
LAFAYETTE ROAD
RYE, NEW HAMPSHIRE

Prepared for:

Tuck Realty Corporation
P.O. Box 190
Exeter, New Hampshire 03833

Prepared By:

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June 17, 2021

June 17, 2021 GeoInsight Project 9212-007

Kimberly Reed
Town of Rye Planning & Zoning Administrator
10 Central Road
Rye, New Hampshire 03870

RE: Aquifer Protection District – Hydrogeologic Study Report
Tuck Realty Corporation, Proposed Condominium Development
Map 10, Lot 1, Lafayette Road
Rye, New Hampshire

Dear Ms Reed:

At the request of Tuck Realty Corporation (Tuck), GeoInsight, Inc. (GeoInsight) completed a Hydrogeologic Study of a vacant parcel of land adjacent to Lafayette Road (Route 1) in Rye, New Hampshire (the Property). The Property is identified by the Town of Rye as Map 10, Lot 1 and is a 9.56-acre parcel that was formerly known as 355 Lafayette Road (former Hector's Motel). The location of the Property is shown on Figure 1 and on the Rye Assessors map included in Attachment A. The Hydrogeologic Study was completed pursuant to Town of Rye General Code, §190-3.6 E(2) and F(1). Based upon the mapped limits of stratified-drift aquifers (June 2003 Town map in Attachment A), and according to Rye General Code, §190-3.6, the Property is located within the Town's Aquifer and Wellhead Protection Overlay District.

As you may be aware, a lot line revision is proposed which would separate the Property into two new parcels. Redevelopment efforts include the construction of a proposed 30-unit condominium (condo) development on the southern portion of the parcel by Tuck and construction of a senior living facility by Benchmark Senior Living (Benchmark) on the northern portion of Map 10, Lot 1, with future connection of the senior facility to Benchmark's Evolve Memory Care (Evolve) facility, located on the abutting parcel farther to the north. Current preliminary layouts of the Tuck condo development and proposed Benchmark assisted living facility are presented on Figures 2 and 3.

This Hydrogeologic Study Report addresses the Tuck condo development as it relates to the Town's Aquifer Protection District rules and requirements with a separate Hydrogeologic Study Report anticipated to be submitted under separate cover for Benchmark's proposed facility on the future northern portion of the subdivided lot. Soil boring and monitoring well data from the entire current parcel, and existing data from wells at the Evolve facility were considered in development of this Hydrogeologic Study.

PROPOSED DEVELOPMENT DETAILS

Tuck has proposed 10 residential condo buildings each comprised of three, 2-bedroom condo units. Each building will be served by on-site subsurface disposal systems ("leach fields"), 10 total,

with design flows of 320 gallons per day (GPD) per unit, or 960 GPD per field. GeoInsight understands stormwater will be managed in the development using porous pavement and sheet flow to vegetated/landscaped areas and roof line drip edges to minimize and manage runoff. A stormwater retention or infiltration basin to collect and manage collected stormwater runoff is not planned.

FIELD DATA COLLECTION ACTIVITIES AND RESULTS

As a part of the Hydrogeologic Study, on May 13 and 14, 2021, GeoInsight oversaw the drilling of six soil borings completed as groundwater monitoring wells at the Property (GEO-1 through GEO-6). Borings/wells GEO-2, GEO-3, GEO-4, were advanced on the Tuck condo development portion of the Property. Boring/well GEO-5 was located near the proposed future lot line separating the Tuck and Benchmark developments, and GEO-1 and GEO-6 are located on the proposed Benchmark (northern) part of the Property. These six borings/wells, along with pre-existing wells MW-3 and MW-6 associated with the Evolve facility to the north, were used in this Hydrogeologic Study. Boring/well completion logs for GEO-1 through GEO-6 are presented in Attachment B and the locations are illustrated on Figures 1 through 3.

On May 23 and 28, 2021, GeoInsight collected depth to groundwater measurements and water quality indicator parameter readings (pH, temperature, dissolved oxygen, specific conductance, and oxidation-reduction potential) in the eight wells (Tables 1 and 2, respectively). On May 28, 2021, wells GEO-1 through GEO-6 and MW-3 and MW-6 were surveyed relative to a local benchmark (see Figure 2) to establish wellhead elevations for use in determining groundwater flow calculations (Table 1).

Wells GEO-1 through GEO-6, and MW-3 and MW-6 were sampled on May 23, 2021, and samples were analyzed by a laboratory for ammonia-nitrogen, nitrate-nitrogen, and chloride. A copy of the laboratory analytical report is presented in Attachment C and the nitrogen and chloride data are presented in Table 2.

Nitrate and chloride concentrations reported in groundwater samples collected from wells GEO-1 through GEO-6 ranged from not detected above the laboratory reporting limit of 0.1 milligrams per liter (mg/L) to 2.9 mg/L (nitrate) and 3.9 mg/L to 240 mg/L (chloride). In wells MW-3 and MW-6 located at the Evolve facility and upgradient of the Property, reported nitrate and chloride concentrations were 0.9 mg/L and 1.3 mg/L (nitrate) and 420 mg/L and 430 mg/L (chloride).

On May 28, 2021, *in-situ* monitoring well/aquifer hydraulic conductivity testing ("slug tests") were performed at wells GEO-1 through GEO-6. Because the monitoring wells had screens intersecting the water table (not fully submerged), slug-out (falling head) tests were conducted. Hydraulic conductivity values from the slug tests ranged from 23 to 27 feet per day (ft/day). Note, that the aquifer responses recorded in wells GEO-3, GEO-4, and GEO-5 (and for the second test at GEO-2) were too rapid to provide useful data for calculating hydraulic conductivities. Slug test data and charts for wells GEO-1, GEO-2, and GEO-6 are presented in Attachment D.

Previous hydraulic conductivity testing by others in a February 2010 hydrogeologic study report for the Evolve facility to the north reported hydraulic conductivity values from 22 to 250 feet per day. The higher end range in values in that report appear to have been calculated using rapid slug

test response data, which tends to yield higher and unrepresentative calculated hydraulic conductivity values. The 22 ft/day value from the Evolve project correlates with the range of results from the GEO-1, GEO-2, and GEO-5 tests.

HYDROGEOLOGIC SETTING

The topography of the Property is approximately 110 feet to 116 feet above mean sea level (MSL). The Property is generally level with Lafayette Road. The area surrounding the Property is mixed residential and commercial and the Coakley Landfill, which is closed landfill and a USEPA Superfund Site, borders the Property to the west/southwest (see Assessors Map in Attachment A).

Based upon information obtained during the completion of the soil borings at the Property, native soil is primarily a glacial outwash deposit. The site stratigraphy was generally observed to consist of an upper coarse-grained layer (light brown to brown, fine to coarse sand, with some to trace amounts of gravel, and some to trace amounts of silt) and a lower fine-grained layer (fine sand and silt, with little to trace amounts of clay).

Based upon a review of the Bedrock Geologic Map of New Hampshire, bedrock underlying the Property consists of quartz-feldspar granitic gneiss and pegmatite intruded into the Rye formation and forming a migmatite. Outcrops were not observed on the Property and the borings completed did not encounter refusal to explorations depths up to 33 feet below ground surface (bgs; well GEO-6). Refusal on presumed bedrock (subsequently cored for confirmation) at the Evolve facility in borings completed for the 2010 hydrogeologic study for that project, was encountered at depths of 11 feet bgs (northeast part of the Evolve property) and 35 feet bgs (southwest part of Evolve property).

Depth to groundwater in the eight wells gauged on May 23 and 28, 2021 ranged from approximately 13.5 feet bgs (well GEO-2) to 24.5 feet bgs (well GEO-5), which equates to relative elevations of 96.5 feet MSL (well GEO-2) and 93.5 feet MSL (well GEO-5). Groundwater elevation contours were mapped on the development site plan for the Property (Figures 2 and 3). Groundwater was at an elevation of approximately 104 feet at the northeast part of the Property and slopes to an elevation of 93.5 feet at the southwest part of the Property. With respect to the proposed condo development on the southern portion of the Property, groundwater flow is generally directed westerly with a high groundwater elevation of 98 feet at the eastern Property line to 93.5 feet at the western property boundary.

COAKLEY LANDFILL SUMMARY

As previously mentioned, the Property (Map 10, Lot 1) abuts the Coakley Landfill Superfund site. While groundwater quality beneath the Property does not appear to be affected by conditions at the landfill, the Property is currently recorded in the Groundwater Management Zone (GMZ) for the Coakley site. A copy of the New Hampshire Department of Environmental Services (NHDES)-issued GMP and Notice of GMP recorded at the registry of deeds for the Coakley Landfill are presented in Attachment E. Given the nature of the groundwater conditions at the Superfund site and its proximity to the Property, GeoInsight reviewed available investigation and groundwater monitoring reports for the landfill as a part of this Hydrogeologic Study. The

following information was obtained from the Draft 2019 Annual Report (dated July 31, 2020) for the Coakley Landfill on file with the NHDES:

> "*Overburden groundwater flowing westward from the landfill discharges into a large wetland complex that serves as a hydraulic boundary for groundwater and the headwaters for Berrys Brook, which then flows in a northerly direction, and Little River, which flows to the south.*
>
> *Groundwater flow in bedrock is also interpreted to move in a westerly direction from the landfill toward a bedrock trough located beneath the wetland complex. This bedrock trough is oriented north/northeast to south/southwest parallel to regional geologic structure. As groundwater encounters this bedrock trough, it is likely that groundwater in bedrock is migrating in the direction (trend) of regional geologic structure, which is coincident with the Berrys Brook valley to the north and the Little River valley to the south and ultimately discharging to Little River and Berrys Brook.*
>
> *Consistent with historical results, CL* [USEPA Cleanup Level] *and/or AGQS* [Ambient Groundwater Quality Standard] *exceedances were identified for 1,4-dioxane, TBA* [tertiary butyl alcohol], *arsenic, and manganese in one or more wells* [at and near the landfill]. *In general, the parameters and locations that exceeded the regulatory thresholds are similar to historical monitoring events. Tert-butyl alcohol exceedances were limited to two wells in 2019, consistent with historical data."*

Groundwater monitoring at the landfill also includes sampling of per- and poly-fluorinated alkyl substances (PFAS) in overburden and bedrock groundwater as PFAS are a constituent of concern at the landfill site. Groundwater elevation contour plans and constituent distribution maps from the aforementioned 2019 Annual Report are presented in Attachment E and the location of the Property is identified on these plans.

The groundwater contour plans for the overburden and bedrock aquifer for the landfill generally depict a western component to groundwater flow. This finding would generally position the Property hydraulically upgradient from the landfill, which is consistent with a mapped westerly groundwater flow direction for the Property based upon wells installed for this Hydrogeologic Study.

Based upon the mapped extent of constituent/plume iso-contours in groundwater for the landfill (Attachment E), arsenic, manganese, and 1,4-dioxane plumes were inferred to be present in overburden groundwater at the Property, and 1,4-dioxane and PFAS were inferred to be present in bedrock groundwater beneath the Property. It should be noted; however, that the iso-contours were inferred by others in the vicinity of the Property based upon data from distant monitoring wells (see well locations on CES Inc.'s Figure 3 and 4 in Attachment E) and are not based on groundwater testing data obtained from the Property (also, Property-specific overburden groundwater flow direction is westerly). Groundwater sampling data from a pre-existing overburden monitoring well on the Property ("unnamed monitoring well" on Figures 2 and 3; currently dry, and unavailable for this study) collected in January 2020 by others had detected concentration of arsenic, manganese, and PFAS, which were below applicable AGQSs (1,4-dioxane was not tested in the January 2020 sampling event).

Arsenic and manganese are commonly present in groundwater as geologic background consistent with the January 2020 concentrations reported for the unnamed well (9.4 mg/L for arsenic and 260 mg/L for manganese). The detected concentrations of two PFAS', perfluorooctanoic acid (PFOA) of 3.5 parts per trillion or ppt, and perfluorooctane sulfonic acid (PFOS) of 3.94 ppt in the unnamed monitoring well at the Property may possibly be false positives or anthropogenic background, and unrelated to the landfill, but are less than the current AGQSs of 12 ppt for PFOA and 15 ppt for PFOS. This 2020 groundwater testing data furthers the conclusion that the landfill is not adversely affecting overburden groundwater below the Property.

GROUNDWATER MOUNDING ANALYSIS

Depth to groundwater below the Property ranges from 13.5 to 24.5 feet bgs, so mounding of groundwater beneath proposed wastewater leach fields is not anticipated to reduce the unsaturated soil profile such that percolation of groundwater will be hindered. Also, with the proposed porous pavement to manage and reinfiltrate stormwater and with no localized recharge basin planned, mounding due to storm water re-infiltration is not anticipated to be significant. However, following standard practice and to verify that there will be no significant mounding beneath the leach fields, GeoInsight calculated estimated/predicted groundwater mound heights using the proposed design flows and hydraulic conductivity data obtained in conjunction with this study.

The maximum groundwater mound height beneath the wastewater disposal fields was calculated using the method described by Hantush (1967)[1]. A calculation for a single field was conducted to represent each of the ten fields as they all have the same design flows and will be located in similar soil types. Variables in the mounding calculation included:

- Initial saturated thickness: 10 feet. This was based upon soil boring with total depths of approximately 30 feet and a depth to water of approximately 20 feet. Since the borings did not reach refusal on bedrock, the actual saturated thickness is greater than 10 feet, but lower saturated thicknesses result in higher predicted mounds, so this is a conservative assumption.

- Hydraulic conductivity: 23 feet/day. This is the lowest value calculated from the slug tests performed as part of this study. Use of the lower hydraulic conductivity value results in a conservative condition (it will predict higher mound heights).

- Porosity: 0.2 (dimensionless). This is an assumption based upon literature values for the sandy materials described in the boring logs.

- Disposal field dimensions: 42 feet by 16.5 feet. This is the design size of 9 of the 10 fields. The tenth field is designed at 32 feet by 22.5 feet which results in a smaller mound.

- Discharge volume: 960 gallons per day. This is the design volume for each disposal field. The design volume is conservative and typical flows will be lower.

[1] Hantush, M.S. 1967, *Growth and decay of groundwater mounds in response to uniform percolation*: Water Resources Research, v.3, P. 227-234.

- Time of loading: 90, 180 and 365 days. These are all extremely conservative conditions. Typically, 30 days is considered the duration required to reach steady-state conditions even at maximum loading.

Results of the mounding calculations gives predicted mound heights of 0.3 feet, 0.7 feet and 1.3 feet for loading durations of 90 days, 180 days and 365 days, respectively, beneath the leach fields (Attachment F). With depths to water on site of 13 to 24 feet or greater, these mound heights are not significant.

NITRATE LOADING

Leach fields, particularly those that aggregate wastewater flows from multiple dwelling units into shared subsurface disposal systems, can result in a contribution of nitrate into the aquifer that, depending on site hydrogeology, can result in nitrate levels that exceed the New Hampshire AGQS of 10 mg/L. It is important to evaluate the nitrate loading and how that affects groundwater quality, with particular concern to meeting the AGQS of 10 mg/L at the downgradient Property boundary.

The nitrogen/nitrate concentration at the downgradient Property boundary was simulated using a commonly accepted mass-balance approach. In this method, the nitrate concentration is calculated by the total nitrate mass entering the groundwater on the property, divided by the water recharging the area of the wastewater disposal fields that flows to the downgradient boundary plus any known background concentration of nitrate. The total nitrogen/nitrate concentration is given by the volume and concentration of wastewater flows and inputs from loss from fertilized lawn area. There are 10 wastewater disposal fields with a design flow of 960 gallons per day each. A conservative nitrate concentration assumption for residential wastewater is 40 mg/L (Massachusetts DEP *Guidelines for Title 5 Aggregation of flows and Nitrogen Loading* 310 CMR 15.216 cites 35 mg/L). Assuming a post development-maintained lawn area of 1 acre in the wastewater field recharge area (Figure 3), a fertilizer application of 3 pounds per 1,000 square feet per year of which 25% is not consumed and is leached to the groundwater (MADEP *Guidelines*), the total nitrate load to the Property is approximately 545 million milligrams per year.

The area in which groundwater flows to the disposal fields from the upgradient to the downgradient boundary was delineated by interpretation of the May 28, 2021 groundwater contour map (Figure 3). This area was measured at 3.53 acres. As conservative assumption, the pavement, which is proposed to be porous, was assumed for the mass balance calculation to be impermeable. The pavement and building areas totaling 1.72 acres was deducted from the recharge area. This is conservative as permeable/porous pavement and roof run-off recharge via drip edges are planned for the development, so actual recharge to the disposal field recharge area will be higher than simulated. Annual average precipitation for Rye is 50 inches of which it is assumed 50 percent infiltrates to recharge groundwater. Since the water supply is municipal and coming from an off-site source rather than an on-site well, the wastewater fields yield a total net recharge of 17 million liters per year. This results in a calculated concentration of nitrate of 30.4 mg/L plus a known background concentration of an average 1.3 mg/L, which results in 31.7 mg/L of nitrate in groundwater at the downgradient Property boundary. Nitrate loading calculation spreadsheets are presented in Attachment F. The predicted concentration of

31.7 mg/L of nitrate exceeds the NH Ambient Groundwater Quality Standard (NH AGQS) of 10 mg/L and, therefore, denitrification via pretreatment will be necessary.

SeptiTech nitrate pretreatment systems are planned for each disposal field. According to SeptiTech / Bio-Microbics of Maine Inc., their systems will result in 85 to 90 percent reduction in nitrogen/nitrate. Assuming the low-end estimate of 85 percent reduction of nitrogen in effluent from the treatment systems, the nitrogen input to the mass balance calculation was updated substituting 6 mg/L nitrogen in place of the 40 mg/L assumption for untreated residential wastewater effluent. The resulting mass balance calculation (with other inputs remaining the same), yields a concentration of 5.3 mg/L nitrate from the pre-treated wastewater effluent from the SeptiTech systems, plus a known background concentration of an average 1.3 mg/L, for a total predicted nitrate level 6.6 mg/L at the downgradient Property boundary, which is below the NH AGQS of 10 mg/L.

CONCLUSIONS

Based upon the Hydrogeologic Study completed for the Property, recharge of residential septic wastewater into 10 leach fields in the proposed Tuck condo development, assuming pre-treatment with SeptiTech denitrification units, will result in nitrate concentrations that are below the NH AGQS of 10 mg/L at the downgradient (western) Property boundary. This conclusion indicates that the wastewater systems will not cause degradation of the water quality in the Aquifer Protection District or in groundwater migrating off-site.

It should be further noted, notwithstanding, the preceding conclusion, that the Property is located in the GMZ for the Coakley Landfill, which currently restricts use of groundwater on-site, and groundwater from the Property flows towards and onto the Coakley Landfill property, which is also a part of the landfill's GMZ where groundwater use is restricted. Therefore, use of the overburden or bedrock aquifers in the Aquifer Protection District on and in the area of the Property and landfill for a future municipal well location appears unlikely. Nonetheless, the proposed nitrate pretreatment systems for the condo development leach fields are protective of groundwater quality in the Aquifer Protection District.

Please contact us at (603) 314-0820 if you have questions regarding this Hydrogeologic Study.

Sincerely,
GEOINSIGHT, INC.

Darrin L. Santos, P.G.
Associate/Senior Geologist

Andrea W. Kenter, P.G.
Senior Associate/Senior Hydrogeologist

Attachments

cc: Tuck Realty Corporation
P:\9212-007 Tuck Realty Rye NH Hydro Study\Rye Tuck Realty Hydro study.doc

FIGURES

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SUBSURFACE EXPLORATION LOCATION PLAN

1"=100'

0 100 200

APPROX. SCALE IN FEET

- N -

LEGEND

MW-3 APPROXIMATE MONITORING WELL LOCATION AND DESIGNATION

TP19 APPROXIMATE JONES & BEACH ENGINEERS, INC. TEST PIT LOCATION

GEO-1 GEO-2 GEO-3 GEO-4 GEO-5 GEO-6 MW-3 MW-6

APPROXIMATE FOOTPRINT OF FORMER MOTEL

PROPOSED PROPERTY LINE

LOT 1 192,985 S.F. 4.43 AC.

LOT 2 223,942 S.F. 5.14 AC.

100' WETLAND SETBACK & NO DISTURBANCE

PAVED ACCESS ROAD

LAFAYETTE ROAD (US ROUTE 1)

NORTH HAMPTON

RYE

NOTES

1. THIS FIGURE IS BASED UPON A PLAN TITLED "EXISTING CONDITIONS PLAN," PREPARED BY JONES & BEACH ENGINEERS, INC. AND DATED SEPTEMBER 28, 2020.

2. THE APPROXIMATE FOOTPRINT OF THE FORMER MOTEL IS BASED UPON A PLAN TITLED "SKETCH OF LAND," BY JOHN W. DURGIN CIVIL ENGINEERS DATED DECEMBER 1971 AND REVISED JANUARY 1972.

SITE LOCUS

1"=2000'

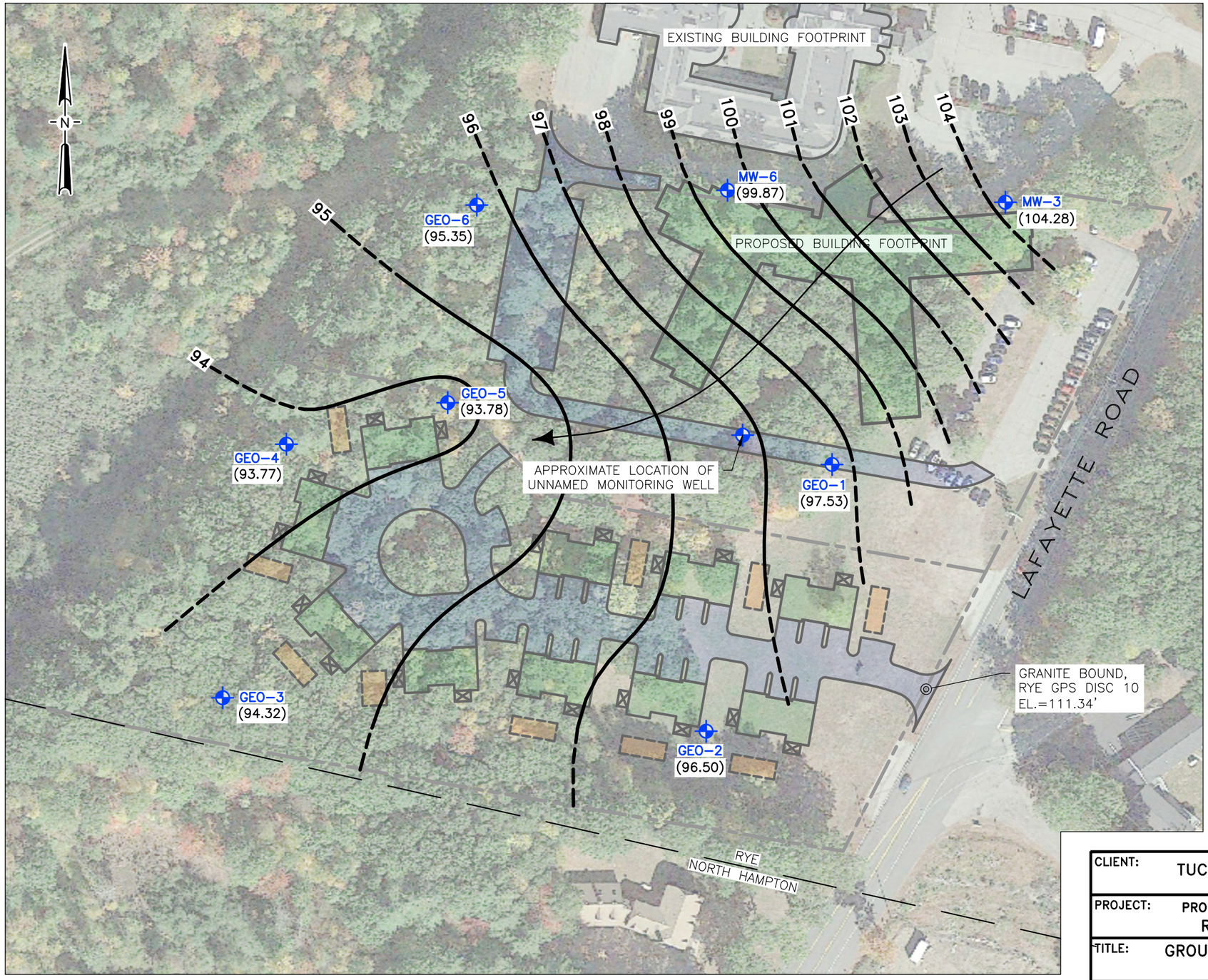
0 2000 4000

APPROX. SCALE IN FEET

CLIENT: TUCK REALTY CORPORATION			
PROJECT: PROPOSED CONDO DEVELOPMENT LAFAYETTE ROAD, RYE, NH			
TITLE: SITE LOCUS AND SITE PLAN			
DESIGNED: DLS	DRAWN: STM	CHECKED: DLS	APPROVED: MCP
SCALE: AS SHOWN	DATE: 06/17/21	FILE NO.: 9212D005	PROJECT NO.: 9212-007
FIGURE NO.: 1			

GeoInsight
Practical in Nature

PLOT DATE: 6-17-21
FILE: I:\9212\9212D005.dwg



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- GEO-1 — MONITORING WELL LOCATION
- 98 — RELATIVE GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- INFERRED DIRECTION OF GROUNDWATER FLOW
- (97.53) — RELATIVE GROUNDWATER ELEVATION

NOTES

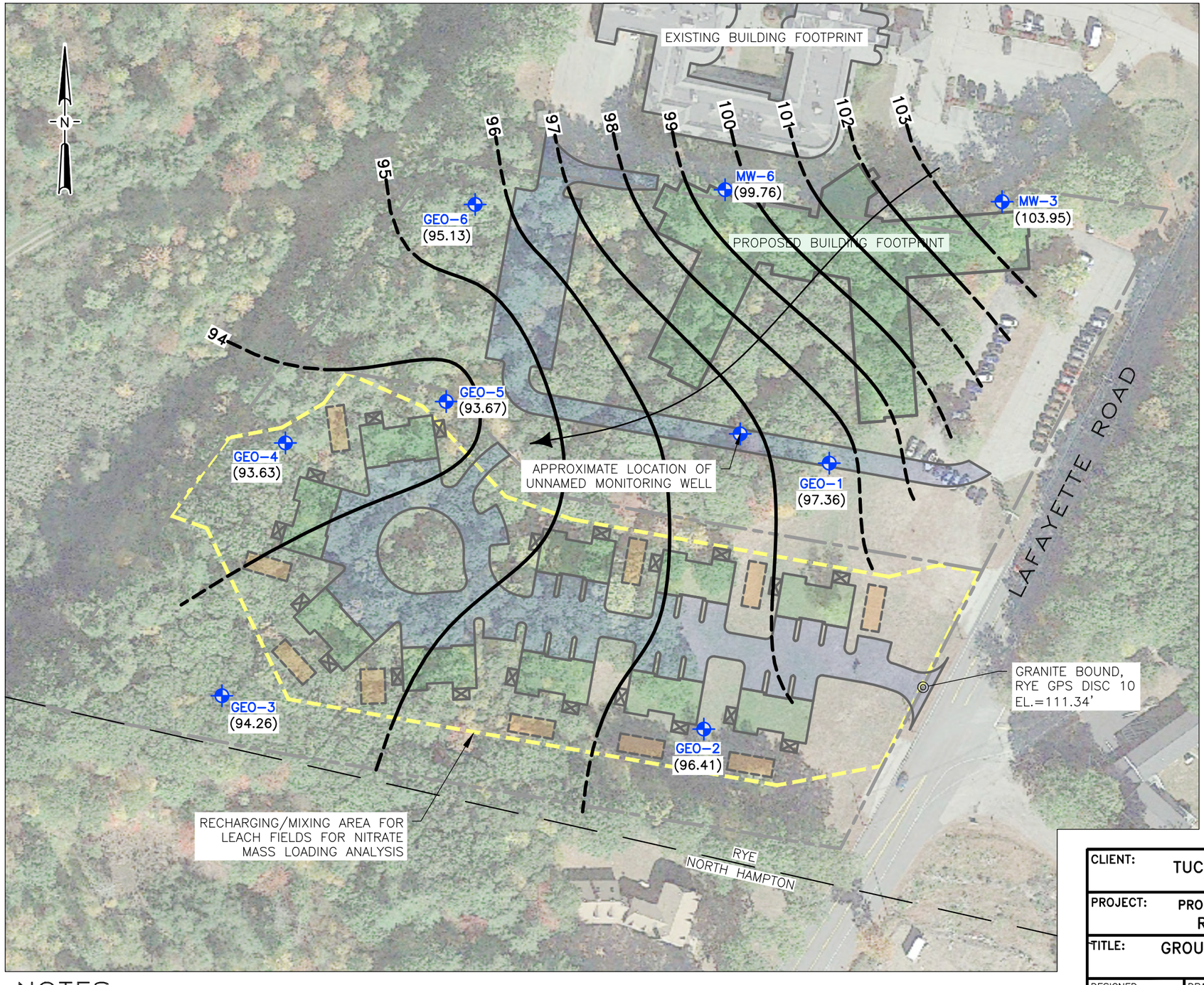
1. THIS PLAN IS BASED UPON AN AERIAL IMAGE OBTAINED FORM GOOGLE EARTH DATED OCTOBER 20, 2020 AND A SITE PLAN PREPARED BY JONES & BEACH ENGINEERS, INC. AND DATED DECEMBER 17, 2019 LAST REVISED SEPTEMBER 28, 2020.

0 100 200

APPROX. SCALE IN FEET

CLIENT: TUCK REALTY CORPORATION				
PROJECT: PROPOSED CONDO DEVELOPMENT RYE, NEW HAMPSHIRE				
TITLE: GROUNDWATER CONTOUR PLAN MAY 23, 2021				
DESIGNED: JRB	DRAWN: STM	CHECKED: DLS	APPROVED: DLS	GeoInsight
SCALE: AS SHOWN	DATE: 06/17/21	FILE NO.: 9212D004	PROJECT NO.: 9212-007	FIGURE NO.: 2

PLOT DATE: 6-17-21
FILE: C:\Users\stmckee\AppData\Local\Temp\AcPublish_39628\9212D004.dwg



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- GEO-1 — MONITORING WELL LOCATION
- 98 — RELATIVE GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- INFERRED DIRECTION OF GROUNDWATER FLOW
- (97.53) — RELATIVE GROUNDWATER ELEVATION

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1. THIS PLAN IS BASED UPON AN AERIAL IMAGE OBTAINED FORM GOOGLE EARTH DATED OCTOBER 20, 2020 AND A SITE PLAN PREPARED BY JONES & BEACH ENGINEERS, INC. AND DATED DECEMBER 17, 2019 LAST REVISED SEPTEMBER 28, 2020.

0 100 200

APPROX. SCALE IN FEET

CLIENT: TUCK REALTY CORPORATION			
PROJECT: PROPOSED CONDO DEVELOPMENT RYE, NEW HAMPSHIRE			
TITLE: GROUNDWATER CONTOUR PLAN MAY 28, 2021			
DESIGNED: JRB	DRAWN: STM	CHECKED: DLS	APPROVED: DLS
SCALE: AS SHOWN	DATE: 06/17/21	FILE NO.: 9212D004	PROJECT NO.: 9212-007

GeoInsight

FIGURE NO.: 3

PLOT DATE: 6-17-21
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TABLES

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TABLE 1
GROUNDWATER ELEVATION DATA
MAP 10, LOT 1
LAFAYETTE ROAD
RYE, NEW HAMPSHIRE

Well ID	Date	TOC Elevation (feet)	Depth To Water (feet)	Groundwater Elevation (feet)
GEO-1	5/23/2021 5/28/2021	116.58	19.05 19.22	97.53 97.36
GEO-2	5/23/2021 5/28/2021	112.97	16.47 16.56	96.50 96.41
GEO-3	5/23/2021 5/28/2021	111.37	17.05 17.11	94.32 94.26
GEO-4	5/23/2021 5/28/2021	113.91	20.14 20.28	93.77 93.63
GEO-5	5/23/2021 5/28/2021	121.03	27.25 27.36	93.78 93.67
GEO-6	5/23/2021 5/28/2021	120.26	24.91 25.13	95.35 95.13
MW-3	5/23/2021 5/28/2021	121.26	16.98 17.31	104.28 103.95
MW-6	5/23/2021 5/28/2021	123.46	23.59 23.70	99.87 99.76

NOTES:

1. TOC = top of casing.
2. TOC elevations were surveyed by GeoInsight, Inc. on May 28, 2021 to an benchmark with an established elevation of 111.34 feet (granite bound with a "Rye GPS" disc note on it) for the survey datum/control.

TABLE 2
GROUNDWATER FIELD AND LABORATORY TESTING DATA
MAP 10, LOT 1
LAFAYETTE ROAD
RYE, NEW HAMPSHIRE

Well ID	Date	FIELD TEST PARAMETERS					LABORATORY ANALYSES		
		Temp (celcius)	**pH** (standard units)	**Specific Conductivity** (milli-Siemens per centimeter)	**Dissolved Oxygen** (mg/L)	**Oxidation-Reduction Potential** (milli-Volts)	**Ammonia-Nitrogen** (mg/L)	**Nitrate-Nitrogen** (mg/L)	**Chloride** (mg/L)
						NH Ambient Groundwater Quality Standard (AQGS)	No Standard	**10** mg/L	No Standard
GEO-1	5/23/2021	13.8	7.8	928	2.2	72	ND(0.5)	ND(0.1)	220.0
	5/28/2021	10.4	6.8	1,166	12.6	227	--	--	--
GEO-2	5/23/2021	10.4	6.6	191	8.3	22	ND(0.5)	2.2	3.9
	5/28/2021	8.5	6.6	255	7.6	206	--	--	--
GEO-3	5/23/2021	10.9	6.8	780	8.5	29	ND(0.5)	1.1	200
	5/28/2021	8.8	6.6	935	7.4	207	--	.	--
GEO-4	5/23/2021	10.5	6.7	382	8.8	30	ND(0.5)	1.4	76
	5/28/2021	8.5	6.6	384	8.3	197	--	--	--
GEO-5	5/23/2021	10.7	6.6	111	8.5	-1	0.9	ND(0.1)	12
	5/28/2021	8.6	6.8	117	7.8	192	--	--	--
GEO-6	5/23/2021	12.1	6.3	890	8.4	-7	ND(0.5)	2.9	240
	5/28/2021	10.4	6.2	1,132	7.6	200	--	--	--
MW-3	5/23/2021	11.5	5.6	1,378	9.4	67	ND(0.5)	1.3	420
	5/28/2021	9.4	5.7	2,008	8.7	200	--	--	--
MW-6	5/23/2021	12.4	6.4	1,437	9.6	73	ND(0.5)	0.9	430
	5/28/2021	10.3	6.4	1,714	8.2	196	--	--	--

Notes:
1. ND(x) denotes analyte not detected above laboratory practical quantitation limit noted in parentheses.
2. mg/L = milligrams per liter.

ATTACHMENT A

ASSESSOR MAP AND AQUIFER PROTECTION DISTRICT MAP

NEW HAMPSHIRE | MASSACHUSETTS | CONNECTICUT | MAINE
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N

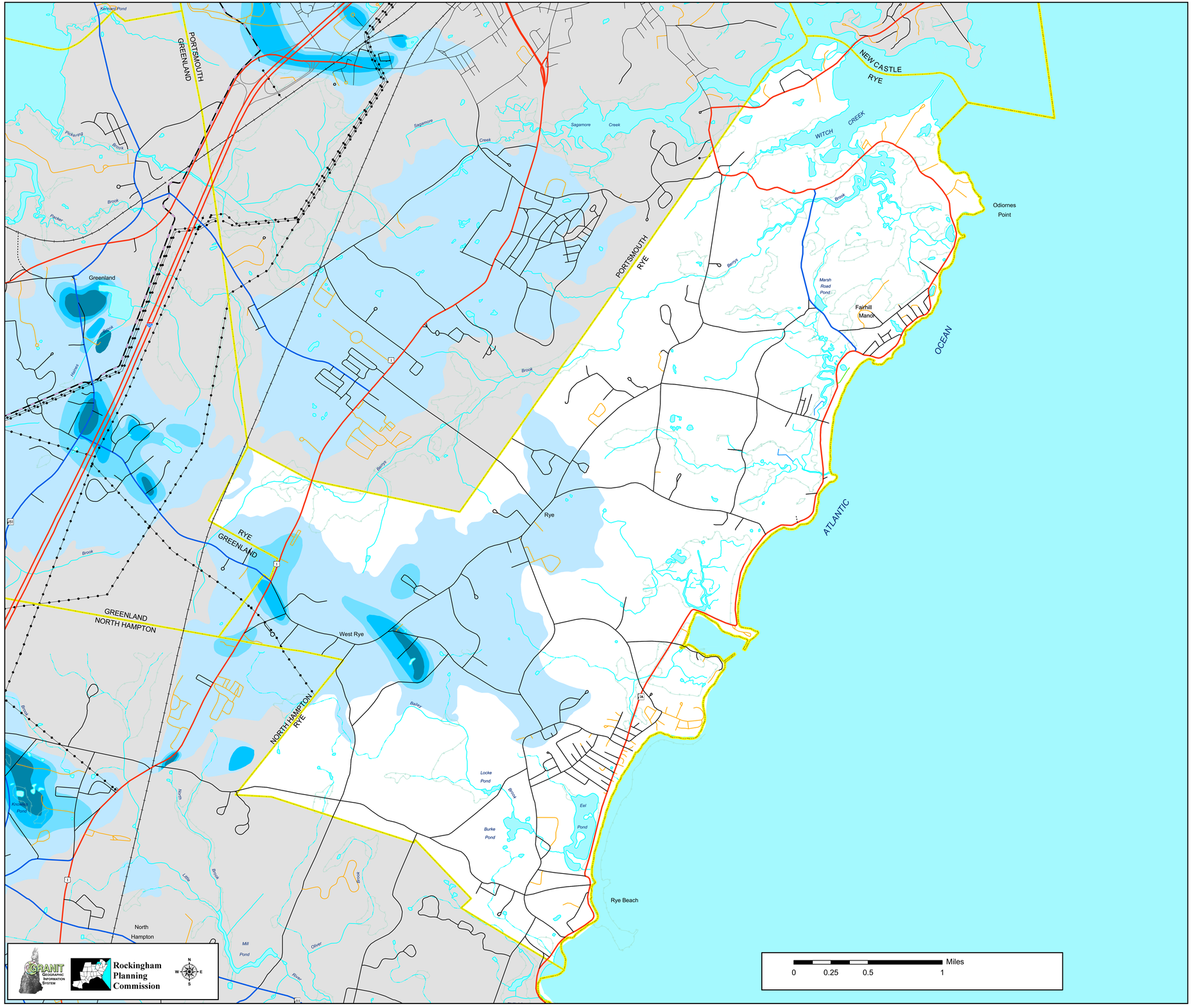
Rye, NH

1 inch = 551 Feet

0 551 1102 1653

January 28, 2021

Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.



Rockingham Planning Commission Standard Map Set

Stratified Drift Aquifers Map
Rye, New Hampshire

June 2003

LEGEND

Transmissivity in Feet Squared per Day of

Stratified-Drift Aquifers in the Lower Merrimack and Coastal River Basins

- Less than 1000
- 1000 to 2000
- 2000 to 4000
- greater than 4000

BASE FEATURES

Roads by Legislative Class
- Class I - Primary System
- Class II - Secondary System
- Class III -State Recreational
- Class IV - within Compacts
- Class V - Municipal
- Class VI - Unmaintained Municipal
- Private

Political Boundaries
- State Boundary
- County Boundary
- Town Boundary
- **Railroads**
- **Major Powerlines**
- **Major Pipelines**

Surface Water Features
- Stream, Shoreline
- Intermittent Stream
- Apparent Wetland Limit
- Other Water Feature
- Bodies of Water

Adjacent Municipalities

This is a static legend for the Rockingham Region. All features may not be present within the extent of this map.

MAP DATA SOURCES

Stratified-Drift Aquifer data was automated by Complex Systems Research Center, UNH and is archived in the GRANIT Database. The aquifer data was automated from maps generated as part of a larger study of groundwater resources in New Hampshire. The Study was conducted under a cooperative agreement between the US Geological Survey and the NH Department of Environmental Services, Water Resources Division. It included an assessment of the aquifers within stratified sand and gravel deposits.

Transmissivity of Stratified Drift Aquifers quantifies the ability of an aquifer to transmit water, measured in feet squared per day. Transmissivity/Aquifer data was automated by Complex Systems Research Center, UNH and is archived in the GRANIT Database. The aquifer data was automated from maps generated as part of a larger study of groundwater resources in New Hampshire. The Study was conducted under a cooperative agreement between the US Geological Survey and the NH Department of Environmental Services, Water Resources Division. It included an assessment of the aquifers within stratified sand and gravel deposits.

The specific reports that cover the Rockingham Planning Region are the following:
US Geological Survey Open-File Report 92-95, "**Geohydrologic and Ground-Water-Quality Data for Stratified-Drift Aquifers in the Exeter, Lamprey, and Oyster River Basins, Southeastern New Hampshire.**" This study was prepared in cooperation with the NH Department of Environmental Services, Water Resources Division and was completed in 1992.

US Geological Survey Water-Resources Investigations Report 91-4025, "**Geohydrology and Water Quality of Stratified-Drift Aquifers in the Lower Merrimack and Coastal River Basins, Southeastern New Hampshire.**" This study was prepared in cooperation with the NH Department of Environmental Services, Water Resources Division and was completed in 1992.

Base Features
Base features (transportation, political and hydrographic) were automated from the USGS Digital Line Graph data, 1:24,000. as archived in the GRANIT database at Complex Systems Research Center, Institute for the study of Earth, Oceans and Space, University of New Hampshire, Durham, NH; 1992-1999. The roads within the Rockingham Planning Region have been updated by Rockingham Planning Commission and by NH Department of Transportation through ongoing efforts.

NOTE: Base features for areas surrounding the Rockingham Region may be shown on this map. These features were automated from USGS 1:100,000 scale digital data sources. This information was provided for reference only. RPC makes no claim to its completeness or accuracy.

THIS MAP WAS FUNDED BY A GRANT FROM THE NH OFFICE OF STATE PLANNING

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ATTACHMENT B

SOIL BORING / WELL COMPLETION LOGS

NEW HAMPSHIRE | MASSACHUSETTS | CONNECTICUT | MAINE
GEOINSIGHT.COM | INFO@GEOINSIGHT.COM | 800.271.1953

SOIL BORING / WELL COMPLETION LOG

GeoInsight
Environmental Strategy & Engineering

Client: Benchmark Senior Living / Tuck Realty Corp.	**Boring Identification:** B-9	**Well ID:** GEO-1
Project: Map 10, Lot 1 (former Hector's Motel)		**Sheet:** 1 of 2
Location: Lafayette Road (Rt. 1), Rye, NH	**Chkd. By:** DLS	**Project Number:** 9212
Drilling Company: GeoSearch, Inc.	**Boring Location:** 43.00243721 N 70.81120395 W	
Foreman: Mike D.	**Top of PVC Riser Elevation:** 116.58'	**Datum:** 111.34'
GeoInsight Engineer/Geologist: Joshua Brown	**Top of Protector Elevation:** NS	**Ground Elevation:** NA
	Date Started: 5/13/2021	**Date Completed:** 5/13/2021

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** 2" SS / Auto
Model: CME-850	**Hammer (lb):** 140
Method: Hollow stem auger	**Fall (in):** 30

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
05/13/2021	19.03	Top of Riser	1 hour
05/23/2021	19.05		10 days

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	WELL COMPLETION DETAIL	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0				--		0-2" Organic topsoil			
1				--					
				--					
2				--					
				--					
3				--		Grinding at 3'			
				--					
4				--					
				--					
5	S-1	24/12	5-7	7		**S-1:** Dense, Brown, fine to coarse SAND, some Gravel, trace organics, damp		<1	1
				17					
6				19					
				16					
7				--		Cuttings: Gravelly from 6-7'	SAND		
				--					
8				--					
				--					
9				--					
				--					
10	S-2	24/12	10-12	8		**S-2:** Medium dense, brownish gray, fine to coarse SAND, little Silt, trace Gravel, damp		<1	1
				11					
11				12					
				13					
12				--					
				--					
13				--					
				--					
14				--					
				--					
15	S-3	24/18	15-17	9		**S-3:** Dense, brown, fine to coarse SAND, some Silt, trace Gravel, moist		<1	1
				17					
16				17					
				11					
17				--			SAND & SILT		
				--					
18				--		Cuttings: Gravelly between 18-19'			
				--					
19				--					
				--					
20									

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	Density	Blows/ft.	Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	5-8	M. STIFF
31-50	DENSE	9-15	STIFF
>50	V. DENSE	16-30	V. STIFF
		>30	HARD

WELL CONSTRUCTION NOTES

32' well constructed with 3' standpipe and 29' bgs.

WELL MATERIALS	INTERVAL (feet bgs)
Concrete	0-0.5
Backfill	0.5-12
Grout	NA
Bentonite: Chips	12-13
Sandpack: # 2 Sand	13-29
Riser	17
Screen	15

LEGEND

NOTES

1. Soil samples screened in the field with a MiniRae 3000 photoionization detector with a 10.6 eV lamp.
2. bgs = below ground surface.

SOIL BORING / WELL COMPLETION LOG

GeoInsight
Environmental Strategy & Engineering

Client: Benchmark Senior Living / Tuck Realty Corp.	**Boring Identification:** B-9	**Well ID:** GEO-1
Project: Map 10, Lot 1 (former Hector's Motel)		**Sheet:** 2 of 2
Location: Lafayette Road (Rt. 1), Rye, NH	**Chkd. By:** DLS	**Project Number:** 9212
Drilling Company: GeoSearch, Inc.	**Boring Location:** 43.00243721 N 70.81120395 W	
Foreman: Mike D.	**Top of PVC Riser Elevation:** 116.58'	**Datum:** 111.34'
GeoInsight Engineer/Geologist: Joshua Brown	**Top of Protector Elevation:** NS	**Ground Elevation:** NA
	Date Started: 5/13/2021	**Date Completed:** 5/13/2021

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** 2" SS / Auto
Model: CME-850	**Hammer (lb):** 140
Method: Hollow stem auger	**Fall (in):** 30

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
05/13/2021	19.03	Top of Riser	1 hour
05/23/2021	19.05		10 days

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	WELL COMPLETION DETAIL	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
20	S-4	24/24	20-22	5		**S-4:** Medium dense, gray, fine SAND and SILT, trace Clay, wet		<1	1
				6					
21				7					
				6					
22				--					
				--					
23				--					
				--					
24				--					
				--			SAND & SILT		
25	S-5	24/24	25-27	WOH		**S-5:** Medium stiff, gray, fine SILT, trace fine Sand, trace Clay, wet		<1	1
				2					
26				3					
				9		Augered to 29' bgs.			
27				--					
				--					
28				--					
				--		*Boring terminated at 29' bgs.*			
29						*Set monitoring well at 29' bgs*			
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

GRANULAR SOILS Blows/ft.	GRANULAR SOILS Density	COHESIVE SOILS Blows/ft.	COHESIVE SOILS Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	5-8	M. STIFF
31-50	DENSE	9-15	STIFF
>50	V. DENSE	16-30	V. STIFF
		>30	HARD

WELL CONSTRUCTION NOTES

32' well constructed with 3' standpipe and 29' bgs.

WELL MATERIALS	INTERVAL (feet bgs)
Concrete	0-0.5
Backfill	0.5-12
Grout	NA
Bentonite: Chips	12-13
Sandpack: # 2 Sand	13-29
Riser	17
Screen	15

LEGEND

NOTES

1. Soil samples screened in the field with a MiniRae 3000 photoionization detector with a 10.6 eV lamp.
2. bgs = below ground surface.

SOIL BORING / WELL COMPLETION LOG

GeoInsight®
Environmental Strategy & Engineering

Client: Benchmark Senior Living / Tuck Realty Corp.	**Boring Identification:** B-10	**Well ID:** GEO-2
Project: Map 10, Lot 1 (former Hector's Motel)		**Sheet:** 1 of 1
Location: Lafayette Road (Rt. 1), Rye, NH	**Chkd. By:** DLS	**Project Number:** 9212
Drilling Company: GeoSearch, Inc.	**Boring Location:** 43.00176000 N 70.81164608 W	
Foreman: Mike D.	**Top of PVC Riser Elevation:** 112.97'	**Datum:** 111.34'
GeoInsight Engineer/Geologist: Joshua Brown	**Top of Protector Elevation:** NS	**Ground Elevation:** NA
	Date Started: 5/13/2021	**Date Completed:** 5/13/2021

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** 2" SS / Auto
Model: CME-850	**Hammer (lb):** 140
Method: Hollow stem auger	**Fall (in):** 30

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
05/13/2021	16.32	Top of Riser	1 hour
05/23/2021	16.47		10 days

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	WELL COMPLETION DETAIL	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0				--		0-2" - Organic topsoil			
1				--					
				--					
2				--					
				--					
3				--					
				--					
4				--					
				--					
5	S-1	24/12	5-7	9		**S-1:** Dense, grayish brown, fine to coarse SAND, some Gravel, trace Silt, damp		<1	1
				12					
6				19					
				13		Cuttings: Gravelly from ~5-6' and grinding at ~8'			
7				--			SAND & GRAVEL		
				--					
8				--					
				--					
9				--					
				--					
10	S-2	24/12	10-12	13		**S-2:** Dense, grayish brown, fine to coarse SAND, soime Gravel, trace Silt, damp		<1	1
				14					
11				18					
				13					
12				--					
				--					
13				--					
				--					
14				--					
				--					
15	S-3	24/18	15-17	12		**S-3:** Medium dense, brown, fine to coarse SAND and GRAVEL, some Silt, wet		<1	1
				13					
16				15					
				9					
17				--					
				--					
18				--			SAND & SILT		
				--					
19				--					
				--					
20	S-4A	12/12	20-21	5		**S-4A:** Medium dense, brown, fine to coarse SAND, trace Silt, wet		<1	1
				6		**S-4B:** Medium dense, grayish brown, fine SAND and SILT, wet			
21	S-4B	12/12	21-22	10				<1	1
				10		*Boring terminated at 22' bgs.*			
22						*Set monitoring well at 22' bgs.*			
23									
24									
25									

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	Density	Blows/ft.	Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	5-8	M. STIFF
31-50	DENSE	9-15	STIFF
>50	V. DENSE	16-30	V. STIFF
		>30	HARD

WELL CONSTRUCTION NOTES

25' well constructed with 3' standpipe and 22' bgs.

WELL MATERIALS	INTERVAL (feet bgs)
Concrete	0-0.5
Backfill	0.5-5
Grout	NA
Bentonite: Chips	5-6
Sandpack: # 2 Sand	6-22
Riser	10
Screen	15

LEGEND

NOTES

1. Soil samples screened in the field with a MiniRae 3000 photoionization detector with a 10.6 eV lamp.
2. bgs = below ground surface.

SOIL BORING / WELL COMPLETION LOG

GeoInsight®
Environmental Strategy & Engineering

Client: Benchmark Senior Living / Tuck Realty Corp.	**Boring Identification:** B-11	**Well ID:** GEO-3
Project: Map 10, Lot 1 (former Hector's Motel)		**Sheet:** 1 of 1
Location: Lafayette Road (Rt. 1), Rye, NH	**Chkd. By:** DLS	**Project Number:** 9212
Drilling Company: GeoSearch, Inc.	**Boring Location:** 43.00185871 N 70.81331703 W	
Foreman: Mike D.	**Top of PVC Riser Elevation:** 111.37'	**Datum:** 111.34'
GeoInsight Engineer/Geologist: Joshua Brown	**Top of Protector Elevation:** NS	**Ground Elevation:** NA
	Date Started: 5/13/2021	**Date Completed:** 5/13/2021

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** 2" SS / Auto
Model: CME-850	**Hammer (lb):** 140
Method: Hollow stem auger	**Fall (in):** 30

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
05/13/2021	16.96	Top of Riser	1 hour
05/23/2021	17.05		10 days

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	WELL COMPLETION DETAIL	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0				--		0-3" - Organic topsoil			
				--					
1				--					
				--					
2				--					
				--					
3				--					
				--					
4				--					
				--					
5	S-1	24/12	5-7	12		**S-1:** Medium dense, brown, fine to coarse SAND,		<1	1
				17		some Gravel, trace Silt, damp			
6				11					
				9		Cuttings: Gravelly and grinding at ~5'			
7				--					
				--					
8				--					
				--					
9				--					
				--					
10	S-2	24/11	10-12	5		**S-2:** Medium dense, brown, fine to coarse SAND,		<1	1
				12		some Gravel, trace Silt, damp	SAND & GRAVEL		
11				11					
				11					
12				--		Cuttings: Gravelly from 10-15.			
				--					
13				--					
				--					
14				--					
				--					
15	S-3	24/8	15-17	6		**S-3:** Medium dense, brown, fine to coarse SAND and		<1	1
				12		GRAVEL, trace Silt, wet			
16				10					
				7					
17				--					
				--					
18				--					
				--					
19				--					
				--					
20	S-4	24/18	20-22	16		**S-4:** Dense, brown, fine to coarse SAND, some		<1	1
				20		Gravel, some Silt, wet			
21				16					
				16		*Boring terminated at 22' bgs.*			
22						*Set monitoring well at 22' bgs.*			
23									
24									
25									

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	Density	Blows/ft.	Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	5-8	M. STIFF
31-50	DENSE	9-15	STIFF
>50	V. DENSE	16-30	V. STIFF
		>30	HARD

WELL CONSTRUCTION NOTES

25' well constructed with 3' standpipe and 22' bgs.

WELL MATERIALS	INTERVAL (feet bgs)
Concrete	0-0.5
Backfill	0.5-5
Grout	NA
Bentonite: Chips	5-6
Sandpack: # 2 Sand	6-22
Riser	10
Screen	15

LEGEND

NOTES

1. Soil samples screened in the field with a MiniRae 3000 photoionization detector with a 10.6 eV lamp.
2. bgs = below ground surface.

SOIL BORING / WELL COMPLETION LOG

GeoInsight
Environmental Strategy & Engineering

Client: Benchmark Senior Living / Tuck Realty Corp.	**Boring Identification:** B-12	**Well ID:** GEO-4
Project: Map 10, Lot 1 (former Hector's Motel)		**Sheet:** 1 of 2
Location: Lafayette Road (Rt. 1), Rye, NH	**Chkd. By:** DLS	**Project Number:** 9212
Drilling Company: GeoSearch, Inc.	**Boring Location:** 43.00250177 N 70.81308876 W	
Foreman: Mike D.	**Top of PVC Riser Elevation:** 113.91'	**Datum:** 111.34'
GeoInsight Engineer/Geologist: Joshua Brown	**Top of Protector Elevation:** NS	**Ground Elevation:** NA
	Date Started: 5/14/2021	**Date Completed:** 5/14/2021

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** 2" SS / Auto
Model: CME-850	**Hammer (lb):** 140
Method: Hollow stem auger	**Fall (in):** 30

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
05/14/2021	20.05	Top of Riser	1 hour
05/23/2021	20.14		9 days

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	WELL COMPLETION DETAIL	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0				--		0-3" - Organic topsoil			
				--					
1				--					
				--					
2				--					
				--					
3				--		Grinding from ~3-5' - Gravelly.			
				--					
4				--					
				--					
5	S-1	24/13	5-7	7		**S-1:** Medium dense, grayish brown, fine to coarse SAND, some Gravel, trace Silt, damp		<1	1
				10					
6				9					
				9					
7				--		Cuttings: Gravelly from ~5-7'			
				--					
8				--					
				--					
9				--					
				--					
10	S-2	24/16	10-12	9		**S-2:** Medium Dense, grayish brown, fine to coarse SAND, trace Silt, trace Gravel, damp	SAND & GRAVEL	<1	1
				8					
11				8					
				8					
12				--		Cuttings: Gravellyl at ~12' bgs.			
				--					
13				--					
				--					
14				--					
				--					
15	S-3	24/2	15-17	8		**S-3:** Medium dense, brown, fine to coarse SAND, trace Silt, damp		<1	1
				9					
16				7					
				11					
17				--					
				--					
18				--					
				--					
19				--					
				--					
20				--					

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	Density	Blows/ft.	Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	5-8	M. STIFF
31-50	DENSE	9-15	STIFF
>50	V. DENSE	16-30	V. STIFF
		>30	HARD

WELL CONSTRUCTION NOTES

30' well constructed with 3' standpipe and 27' bgs.

WELL MATERIALS	INTERVAL (feet bgs)
Concrete	0-0.5
Backfill	0.5-10
Grout	NA
Bentonite: Chips	10-11
Sandpack: # 2 Sand	11-27
Riser	15
Screen	15

LEGEND

NOTES

1. Soil samples screened in the field with a MiniRae 3000 photoionization detector with a 10.6 eV lamp.
2. bgs = below ground surface.

SOIL BORING / WELL COMPLETION LOG

GeoInsight
Environmental Strategy & Engineering

Client: Benchmark Senior Living / Tuck Realty Corp.	**Boring Identification:** B-12	**Well ID:** GEO-4
Project: Map 10, Lot 1 (former Hector's Motel)		**Sheet:** 2 of 2
Location: Lafayette Road (Rt. 1), Rye, NH	**Chkd. By:** DLS	**Project Number:** 9212
Drilling Company: GeoSearch, Inc.	**Boring Location:** 43.00250177 N 70.81308876 W	
Foreman: Mike D.	**Top of PVC Riser Elevation:** 113.91'	**Datum:** 111.34'
GeoInsight Engineer/Geologist: Joshua Brown	**Top of Protector Elevation:** NS	**Ground Elevation:** NA
	Date Started: 5/14/2021	**Date Completed:** 5/14/2021

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** 2" SS / Auto
Model: CME-850	**Hammer (lb):** 140
Method: Hollow stem auger	**Fall (in):** 30

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
05/14/2021	20.05	Top of Riser	1 hour
05/23/2021	20.14		9 days

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	WELL COMPLETION DETAIL	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
20	S-4	24/15	20-22	5		**S-4:** Medium dense, grayish brown, fine to coarse SAND, some Gravel, trace Silt, wet	SAND & GRAVEL	<1	1
				7					
21				11					
				13					
22				--					
				--					
23				--					
				--					
24				--					
				--					
25	S-5	24/6	25-27	10		**S-5:** Medium dense, gray, SILT and fine to coarse SAND, wet	SAND & SILT	<1	1
				10					
26				10					
				11		*Boring terminated at 27' bgs.*			
27				--		*Set monitoring well at 27' bgs*			
				--					
28				--					
				--					
29									
30									
31									
32									
33									
34									
35	S-3	24/	15-17						
36									
37									
38									
39									
40									

GRANULAR SOILS Blows/ft.	GRANULAR SOILS Density	COHESIVE SOILS Blows/ft.	COHESIVE SOILS Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	5-8	M. STIFF
31-50	DENSE	9-15	STIFF
>50	V. DENSE	16-30	V. STIFF
		>30	HARD

WELL CONSTRUCTION NOTES

30' well constructed with 3' standpipe and 27' bgs.

WELL MATERIALS	INTERVAL (feet bgs)
Concrete	0-0.5
Backfill	0.5-10
Grout	NA
Bentonite: Chips	10-11
Sandpack: # 2 Sand	11-27
Riser	15
Screen	15

LEGEND

NOTES

1. Soil samples screened in the field with a MiniRae 3000 photoionization detector with a 10.6 eV lamp.
2. bgs = below ground surface.

SOIL BORING / WELL COMPLETION LOG

GeoInsight
Environmental Strategy & Engineering

Client: Benchmark Senior Living / Tuck Realty Corp.	**Boring Identification:** B-13	**Well ID:** GEO-5
Project: Map 10, Lot 1 (former Hector's Motel)		**Sheet:** 1 of 2
Location: Lafayette Road (Rt. 1), Rye, NH	**Chkd. By:** DLS	**Project Number:** 9212
Drilling Company: GeoSearch, Inc.	**Boring Location:** 43.00260300 N 70.81252969 W	
Foreman: Mike D.	**Top of PVC Riser Elevation:** 121.03'	**Datum:** 111.34'
GeoInsight Engineer/Geologist: Joshua Brown	**Top of Protector Elevation:** NS	**Ground Elevation:** NA
	Date Started: 5/14/2021	**Date Completed:** 5/14/2021

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** 2" SS / Auto
Model: CME-850	**Hammer (lb):** 140
Method: Hollow stem auger	**Fall (in):** 30

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
05/14/2021	27.11	Top of Riser	1 hour
05/23/2021	27.25		9 days

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	WELL COMPLETION DETAIL	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0				--		0-3" - Organic topsoil			
1				--					
				--					
2				--					
				--					
3				--		Cuttings: Grinding at ~2 - Gravelly material			
				--					
4				--					
				--					
5	S-1	24/12	5-7	9		**S-1:** Dense, brown, fine to coarse SAND, trace Silt,		<1	1
				12		trace Gravel, damp - small amount of pulverized rock			
6				20		and roots in sampler.			
				13					
7				--					
				--					
8				--					
				--					
9				--					
				--					
10	S-2	24/13	10-12	5		**S-2:** Medium dense, grayish brown, fine to coarse		<1	1
				9		SAND, trace Silt, trace Gravel, damp			
11				7					
				6					
12				--					
				--			SAND		
13				--					
				--					
14				--					
				--					
15	S-3	24/12	15-17	5		**S-3:** Medium dense, grayish brown, fine to coarse		<1	1
				9		SAND, trace Silt, damp			
16				12					
				12					
17				--					
				--					
18				--					
				--					
19				--					
				--					
20				--					

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	Density	Blows/ft.	Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	5-8	M. STIFF
31-50	DENSE	9-15	STIFF
>50	V. DENSE	16-30	V. STIFF
		>30	HARD

WELL CONSTRUCTION NOTES

35' well constructed with 3' standpipe and 32' bgs.

WELL MATERIALS	INTERVAL (feet bgs)
Concrete	0-0.5
Backfill	0.5-15
Grout	NA
Bentonite: Chips	15-16
Sandpack: # 2 Sand	16-32
Riser	17
Screen	15

LEGEND

NOTES

1. Soil samples screened in the field with a MiniRae 3000 photoionization detector with a 10.6 eV lamp.
2. bgs = below ground surface.

SOIL BORING / WELL COMPLETION LOG

GeoInsight
Environmental Strategy & Engineering

Client: Benchmark Senior Living / Tuck Realty Corp.	**Boring Identification:** B-13	**Well ID:** GEO-5
Project: Map 10, Lot 1 (former Hector's Motel)		**Sheet:** 2 of 2
Location: Lafayette Road (Rt. 1), Rye, NH	**Chkd. By:** DLS	**Project Number:** 9212
Drilling Company: GeoSearch, Inc.	**Boring Location:** 43.00260300 N 70.81252969 W	
Foreman: Mike D.	**Top of PVC Riser Elevation:** 121.03'	**Datum:** 111.34'
GeoInsight Engineer/Geologist: Joshua Brown	**Top of Protector Elevation:** NS	**Ground Elevation:** NA
	Date Started: 5/14/2021	**Date Completed:** 5/14/2021

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** 2" SS / Auto
Model: CME-850	**Hammer (lb):** 140
Method: Hollow stem auger	**Fall (in):** 30

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
05/14/2021	27.11	Top of Riser	1 hour
05/23/2021	27.25		9 days

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	WELL COMPLETION DETAIL	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
20	S-4	24/3	20-22	15		**S-4:** Dense, brown, fine to coarse SAND, trace Silt, trace Gravel, moist		<1	1
				17					
21				17					
				20					
22				--					
				--					
23				--		Cuttings: Grinding at ~23' bgs.			
				--					
24				--					
				--					
25	S-5	24/10	25-27	11		**S-5:** Medium dense, brownish gray, fine to coarse SAND, some Gravel, trace Silt, wet	SAND & GRAVEL	<1	1
				9					
26				10					
				6					
27				--					
				--					
28				--					
				--					
29				--					
				--					
30	S-6	24/	30-32	16		**S-6:** Medium dense, brownish gray, fine to coarse SAND, some Gravel, trace Silt, wet		<1	1
				14					
31				14					
				20		*Boring terminated at 32' bgs.*			
32						*Set monitoring well at 32' bgs*			
33									
34									
35									
36									
37									
38									
39									
40									

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	Density	Blows/ft.	Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	5-8	M. STIFF
31-50	DENSE	9-15	STIFF
>50	V. DENSE	16-30	V. STIFF
		>30	HARD

WELL CONSTRUCTION NOTES

35' well constructed with 3' standpipe and 32' bgs.

WELL MATERIALS	INTERVAL (feet bgs)
Concrete	0-0.5
Backfill	0.5-15
Grout	NA
Bentonite: Chips	15-16
Sandpack: # 2 Sand	16-32
Riser	17
Screen	15

LEGEND

NOTES

1. Soil samples screened in the field with a MiniRae 3000 photoionization detector with a 10.6 eV lamp.
2. bgs = Below ground surface; NS = Not surveyed; WOH = Weight of hammer

SOIL BORING / WELL COMPLETION LOG

GeoInsight
Environmental Strategy & Engineering

Client: Benchmark Senior Living / Tuck Realty Corp.	**Boring Identification:** B-14	**Well ID:** GEO-6
Project: Map 10, Lot 1 (former Hector's Motel)		**Sheet:** 1 of 2
Location: Lafayette Road (Rt. 1), Rye, NH	**Chkd. By:** DLS	**Project Number:** 9212
Drilling Company: GeoSearch, Inc.	**Boring Location:** 43.00310488 N 70.81242190 W	
Foreman: Mike D.	**Top of PVC Riser Elevation:** 120.26	**Datum:** 111.34'
GeoInsight Engineer/Geologist: Joshua Brown	**Top of Protector Elevation:** NS	**Ground Elevation:** NA
	Date Started: 5/14/2021	**Date Completed:** 5/14/2021

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** 2" SS / Auto
Model: CME-850	**Hammer (lb):** 140
Method: Hollow stem auger	**Fall (in):** 30

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
05/14/2021	24.64	Top of Riser	1 hour
05/23/2021	24.91		9 days

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	WELL COMPLETION DETAIL	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0				--		Switched to sampling every 10' due to time constraints.			
1				--					
				--					
2				--					
				--					
3				--					
				--		Cuttings: Material in cuttings from 0-10' consistent with other borings - Brown fine to coarse SAND, some gravel, damp.			
4				--					
				--					
5				--					
				--					
6				--					
				--					
7				--					
				--					
8				--					
				--					
9				--					
				--					
10	S-1	24/12	10-12	17		**S-1:** Medium dense, brown, fine to coarse SAND, some Gravel, trace Silt, damp	SAND & GRAVEL	<1	1
				13					
11				13					
				12					
12				--					
				--					
13				--					
				--					
14				--					
				--					
15				--					
				--					
16				--					
				--					
17				--					
				--					
18				--					
				--					
19				--					
				--					
20									

GRANULAR SOILS Blows/ft.	GRANULAR SOILS Density	COHESIVE SOILS Blows/ft.	COHESIVE SOILS Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	5-8	M. STIFF
31-50	DENSE	9-15	STIFF
>50	V. DENSE	16-30	V. STIFF
		>30	HARD

WELL CONSTRUCTION NOTES

36' well constructed with 3' standpipe and 33' bgs.

WELL MATERIALS	INTERVAL (feet bgs)
Concrete	0-0.5
Backfill	0.5-15
Grout	NA
Bentonite: Chips	15-16
Sandpack: # 2 Sand	16-32
Riser	22
Screen	13

LEGEND

NOTES

1. Soil samples screened in the field with a MiniRae 3000 photoionization detector with a 10.6 eV lamp.
2. bgs = below ground surface.

SOIL BORING / WELL COMPLETION LOG

GeoInsight®
Environmental Strategy & Engineering

Client: Benchmark Senior Living / Tuck Realty Corp.	**Boring Identification:** B-14	**Well ID:** GEO-6
Project: Map 10, Lot 1 (former Hector's Motel)		**Sheet:** 2 of 2
Location: Lafayette Road (Rt. 1), Rye, NH	**Chkd. By:** DLS	**Project Number:** 9212
Drilling Company: GeoSearch, Inc.	**Boring Location:** 43.00310488 N 70.81242190 W	
Foreman: Mike D.	**Top of PVC Riser Elevation:** 120.26	**Datum:** 111.34'
GeoInsight Engineer/Geologist: Joshua Brown	**Top of Protector Elevation:** NS	**Ground Elevation:** NA
	Date Started: 5/14/2021	**Date Completed:** 5/14/2021

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** 2" SS / Auto
Model: CME-850	**Hammer (lb):** 140
Method: Hollow stem auger	**Fall (in):** 30

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
05/14/2021	24.64	Top of Riser	1 hour
05/23/2021	24.91		9 days

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	WELL COMPLETION DETAIL	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
20	S-2A	12/9	20-21	18		**S-2A:** Dense, brown, fine to medium SAND, trace Silt, damp	SAND & GRAVEL	<1	1
21				16					
	S-2B	12/9	21-22	15		**S-2B:** Dense, brown, fine SAND and SILT, damp			
22				13					
				--					
23				--					
				--		Cutting: Water at ~25'			
24				--					
				--					
25				--					
	S-3	24/24	25-27	5		**S-3:** Stiff, gray, fine SAND and SILT, some Clay, wet		<1	1
26				5					
				5					
27				8			SAND & SILT		
				--					
28				--					
				--					
29				--					
				--					
30				--				<1	1
				--					
31				--					
				--					
32				--					
				--					
33						*Boring terminated at 33' bgs.*			
						Set monitoring well at 33' bgs			
34									
35									
36									
37									
38									
39									
40									

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	**Density**	**Blows/ft.**	**Consistency**
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	5-8	M. STIFF
31-50	DENSE	9-15	STIFF
>50	V. DENSE	16-30	V. STIFF
		>30	HARD

WELL CONSTRUCTION NOTES

36' well constructed with 3' standpipe and 33' bgs.

WELL MATERIALS	INTERVAL (feet bgs)
Concrete	0-0.5
Backfill	0.5-18
Grout	NA
Bentonite: Chips	18-19
Sandpack: # 2 Sand	19-33
Riser	23
Screen	13

LEGEND

NOTES

1. Soil samples screened in the field with a MiniRae 3000 photoionization detector with a 10.6 eV lamp.
2. bgs = Below ground surface; NS = Not surveyed; WOH = Weight of hammer

ATTACHMENT C

LABORATORY ANALYTICAL REPORT

NEW HAMPSHIRE | MASSACHUSETTS | CONNECTICUT | MAINE
GEOINSIGHT.COM | INFO@GEOINSIGHT.COM | 800.271.1953

Laboratory Report

Absolute Resource associates
124 Heritage Avenue Portsmouth NH 03801

Darrin Santos
GeoInsight, Inc.
186 Granite Street
3rd Floor, Suite A
Manchester, NH 03103

PO Number: None
Job ID: 57095
Date Received: 5/24/21

Project: Benchmark Rye 9212-006

Attached please find results for the analysis of the samples received on the date referenced above.

Unless otherwise noted in the attached report, the analyses performed met the requirements of Absolute Resource Associates' Quality Assurance Plan. The Standard Operating Procedures are based upon USEPA SW-846, USEPA Methods for Chemical Analysis of Water and Wastewater, Standard Methods for the Examination of Water and Wastewater and other recognized methodologies. The results contained in this report pertain only to the samples as indicated on the chain of custody.

Absolute Resource Associates maintains certification with the agencies listed below. The reported results apply to the sample(s) in the condition as received at the time the laboratory took custody. This report shall not be reproduced except in full, without written approval of the laboratory. The liability of ARA is limited to the cost of the requested analyses, unless otherwise agreed upon in writing.

We appreciate the opportunity to provide laboratory services. If you have any questions regarding the enclosed report, please contact the laboratory and we will be glad to assist you.

Sincerely,
Absolute Resource Associates

Aaron DeWees
Chief Operating Officer

Date of Approval: 6/1/2021
Total number of pages: 5

Absolute Resource Associates Certifications

New Hampshire	1732	Massachusetts	M-NH902
Maine	NH902		

Project ID: Benchmark Rye 9212-006

Job ID: 57095

Sample#: 57095-001
Sample ID: GEO-1
Matrix: Water
Sampled: 5/23/21 13:10

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Analysis Batch	Analysis Date	Analysis Time	Reference
Ammonia as N	< 0.5	0.5	mg/L	1	SFM		2101459	5/25/21	9:40	SM4500NH3-D
Chloride	**220**	2.5	mg/L	5	DBV		2101487	5/26/21	14:31	E300.0A
Nitrate-N	< 0.1	0.1	mg/L	1	DBV		2101441	5/24/21	12:37	E300.0A

Sample#: 57095-002
Sample ID: GEO-2
Matrix: Water
Sampled: 5/23/21 13:20

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Analysis Batch	Analysis Date	Analysis Time	Reference
Ammonia as N	< 0.5	0.5	mg/L	1	SFM		2101459	5/25/21	9:40	SM4500NH3-D
Chloride	**3.9**	0.5	mg/L	1	DBV		2101487	5/26/21	15:20	E300.0A
Nitrate-N	**2.2**	0.1	mg/L	1	DBV		2101441	5/24/21	13:27	E300.0A

Sample#: 57095-003
Sample ID: GEO-3
Matrix: Water
Sampled: 5/23/21 13:30

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Analysis Batch	Analysis Date	Analysis Time	Reference
Ammonia as N	< 0.5	0.5	mg/L	1	SFM		2101459	5/25/21	9:40	SM4500NH3-D
Chloride	**200**	2.5	mg/L	5	DBV		2101487	5/26/21	14:47	E300.0A
Nitrate-N	**1.1**	0.1	mg/L	1	DBV		2101441	5/24/21	13:43	E300.0A

Sample#: 57095-004
Sample ID: GEO-4
Matrix: Water
Sampled: 5/23/21 13:40

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Analysis Batch	Analysis Date	Analysis Time	Reference
Ammonia as N	< 0.5	0.5	mg/L	1	SFM		2101459	5/25/21	9:40	SM4500NH3-D
Chloride	**76**	0.5	mg/L	1	DBV		2101487	5/26/21	15:37	E300.0A
Nitrate-N	**1.4**	0.1	mg/L	1	DBV		2101441	5/24/21	14:00	E300.0A

Sample#: 57095-005
Sample ID: GEO-5
Matrix: Water
Sampled: 5/23/21 13:50

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Analysis Batch	Analysis Date	Analysis Time	Reference
Ammonia as N	**0.9**	0.5	mg/L	1	SFM		2101486	5/27/21	7:25	SM4500NH3-D
Chloride	**12**	0.5	mg/L	1	DBV		2101441	5/24/21	14:16	E300.0A
Nitrate-N	< 0.1	0.1	mg/L	1	DBV		2101441	5/24/21	14:16	E300.0A

Absolute Resource associates

Project ID: Benchmark Rye 9212-006
Job ID: 57095

Sample#: 57095-006
Sample ID: GEO-6
Matrix: Water
Sampled: 5/23/21 14:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
Ammonia as N	< 0.5	0.5	mg/L	1	SFM		2101459	5/25/21	9:40	SM4500NH3-D
Chloride	**240**	2.5	mg/L	5	DBV		2101487	5/26/21	15:04	E300.0A
Nitrate-N	**2.9**	0.1	mg/L	1	DBV		2101441	5/24/21	14:33	E300.0A

Sample#: 57095-007
Sample ID: MW-3
Matrix: Water
Sampled: 5/23/21 14:10

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
Ammonia as N	< 0.5	0.5	mg/L	1	SFM		2101459	5/25/21	9:40	SM4500NH3-D
Chloride	**420**	5.0	mg/L	10	DBV		2101487	5/26/21	13:58	E300.0A
Nitrate-N	**1.3**	0.1	mg/L	1	DBV		2101441	5/24/21	14:49	E300.0A

Sample#: 57095-008
Sample ID: MW-6
Matrix: Water
Sampled: 5/23/21 14:20

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
Ammonia as N	< 0.5	0.5	mg/L	1	SFM		2101486	5/27/21	7:25	SM4500NH3-D
Chloride	**430**	5.0	mg/L	10	DBV		2101487	5/26/21	14:14	E300.0A
Nitrate-N	**0.9**	0.1	mg/L	1	DBV		2101441	5/24/21	15:05	E300.0A

Absolute Resource associates

Absolute Resource associates
124 Heritage Avenue #16
Portsmouth, NH 03801
603-436-2001
absoluteresourceassociates.com

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

57095

Company Name: GeoInsight Inc.
Company Address: 186 Granite St. Manchester, NH
Report To: Dassin Santos
Phone #: (603) 314-0820
Invoice to: Same
Email: DLSANTOS@Geoinc.com
PO #:

Project Name: Benchmark Rye
Project #: 9212-006
Project Location: (NH) MA ME VT
Accreditation Required? N/Y:
Protocol: RCRA SDWA NPDES; MCP NHDES DOD
Reporting Limits: QAPP GW-1 S-1; EPA DW Other
Quote #
☐ NH Reimbursement Pricing

Lab Sample ID (Lab Use Only)	Field ID	# CONTAINERS	Matrix: WATER	SOLID	OTHER	Preservation Method: HCl	HNO_3	H_2SO_4	NaOH	MeOH	Sampling: DATE	TIME	SAMPLER
S10451-01	GEO-1	2	X					X			5/23/21	13:10	JRB
-02	GEO-2	2	X					X				13:20	
-03	GEO-3	2	X					X				13:30	
-04	GEO-4	2	X					X				13:40	
-05	GEO-5	2	X					X				13:50	
-06	GEO-6	2	X					X				14:00	
-07	MW-3	2	X					X				14:10	
-08	MW-6	2	X					X			↓	14:20	↓

ANALYSIS REQUEST

Lab Sample ID	☐ VOC 8260 ☐ VOC 8260 NHDES ☐ VOC 8260 MADEP	☐ VOC 624.1 ☐ VOC BTEX MtBE, only ☐ VOC 8021VT	☐ VPH MADEP ☐ GRO 8015 ☐ 1,4-Dioxane	☐ VOC 524.2 ☐ VOC 524.2 NH List ☐ Gases-List:	☐ TPH 8100 ☐ DRO 8015 ☐ EPH MADEP ☐ TPH Fingerprint	☐ 8270PAH ☐ 8270ABN ☐ 625.1 ☐ EDB	☐ 8082 PCB ☐ 8081 Pesticides ☐ 608.3 Pest/PCB	☐ PFAS 537.1 ☐ PFAS 533 ☐ PFAS isotope dilution	☐ O&G 1664 ☐ Mineral O&G 1664	☐ pH ☐ BOD ☐ Conductivity ☐ Turbidity ☐ Apparent Color	☐ TSS ☐ TDS ☐ TVS ☐ Alkalinity ☐ Acidity	☐ RCRA Metals ☐ Priority Pollutant Metals ☐ TAL Metals ☐ Hardness	☐ Total Metals-list:	☐ Dissolved Metals-list:	☐ Ammonia ☐ COD ☐ TKN ☐ TN ☐ TON ☐ TOC ☐ Ferrous Iron	☐ T-Phosphorus ☐ Bacteria P/A ☐ Bacteria MPN ☐ Enterococci	☐ Cyanide ☐ Sulfide ☐ Nitrate + Nitrite ☐ Ortho P ☐ Phenols	☐ Nitrate ☐ Nitrite ☐ Chloride ☐ Sulfate ☐ Bromide ☐ Fluoride	☐ Corrosivity ☐ Ignitibility/FP	☐ TCLP Metals ☐ TCLP VOC ☐ TCLP SVOC ☐ TCLP Pesticide	Subcontract: ☐ Grain Size ☐ Herbicides ☐ Asbestos	Nitrate-Nitrogen & Ammonia-Nitrogen	Grab (G) or Composite (C)
S10451-01																				X			X	G
-02																				X			X	G
-03																				X			X	G
-04																				X			X	G
-05																				X			X	G
-06																				X			X	G
-07																				X			X	G
-08																				X			X	G

TAT REQUESTED
Priority (24 hr)* ☐
Expedited (48 hr)* ☐
Standard (10 Business Days) ☒
*Date Needed

See absoluteresourceassociates.com for sample acceptance policy and current accreditation lists.

SPECIAL INSTRUCTIONS Short Hold Samples.

REPORTING INSTRUCTIONS ☒ PDF (e-mail address) DLSANTOS@Geoinc.com
☐ HARD COPY REQUIRED ☐ EDD

RECEIVED ON ICE ☒ YES ☐ NO
TEMPERATURE 0 °C

CUSTODY RECORD
QSD-01 Revision 03/09/2020

	Relinquished by Sampler:	Date	Time	Received by:	Date	Time
	JRB	5/24/21				
	Relinquished by:	Date	Time	Received by:	Date	Time
	Relinquished by:	Date	Time	Received by Laboratory:	Date	Time
					5/24/21	7:51

Sample Receipt Condition Report

Absolute Resource Associates **Job Number:** 57095

Samples Received from: ☐-UPS ☐-FedEx ☐-USPS ☐-Lab Courier ☒-Client Drop-off ☐-_____

Custody Seals - present & intact: ☐-Yes ☐-No ☒-N/A CoC signed: ☒-Yes ☐-No

Receipt Temp: 0 °C Samples on ice? ☒-Yes ☐-No ☐-N/A Sampled < 24 hrs ago? ☒-Yes ☐-No

PFAS-only real ice? ☐-Yes ☐-No ☒-N/A Any signs of freezing? ☐-Yes ☑-No

Comments:_____

Preservation / Analysis	Bottle Size/Type & Quantity										Check pH for ALL applicable* samples and document:
HCl	40mL(G)		250mL(P)		500mL(P)		1L(G)				
HNO_3	125mL(P)		250mL(P)		500mL(P)						
H_2SO_4	40mL(G)		60mL(P)		125mL(P)		250mL(P)	8	500mL(P)		pH<2 SM
NaOH	125mL(P)		250mL(P)								
$(NH_4)_2SO_4$	60mL(P)		125mL(P)		250mL(P)						
ZnAc-NaOH	125mL(P)		250mL(P)								
Trizma	125mL(P)		250mL (P)								*pH ✓by analyst:VOC, PFAS, TOC,O&G
NH_4Ac	125mL(P)		250mL (P)								Residual Cl not present:
NaS_2O_3	40mL(G)		120mL(P)								ABN625____Pest608____
MeOH	20mL(G)		40mL(G)								Bacteria ResCl ✓by analyst
None (solid)	2oz(G)		4oz(G)		8oz(G)		Syringe				PC Dry applicable? Y N
None (water)	40ml (G)		60mL(P)	8	125mL(P)		250mL(P)		500mL(P)		1L(G) 1L (P)
~~Mold~~	Cassette		Bulk		Plate		Tape Lift				
Asbestos	Cassette		Bulk								
Lead	Cassette		~~Bulk~~		Wipe						

Login Review	Yes	No	N/A	Comments
Proper lab sample containers/enough volume/correct preservative?	X			
Analyses marked on COC match bottles received?	X			
VOC &TOC Water-no headspace? VOC Solid-MeOH covers solid, no leaks, Prep Expiration OK?			X	
PFAS: Lab specific bottles? QC received, if required?			X	
Bacteria bottles provided by ARA?			X	
Samples within holding time?	X			
Immediate tests communicated in writing: (NO3) NO_2,o-PO_4, pH, BOD, Coliform/*E. coli* (P/A or MPN), Enterococci, Color Surfactants, Turbidity, Odor, CrVI, Ferrous Iron, Dissolved Oxygen, Unpres 624	X	DBV		
Date, time & ID on samples match CoC?	X			
Rushes communicated to analyst in writing?			X	
Subcontract note on login board?			|	
Pesticides EPA 608 pH5-9?			|	
Compliance samples have no discrepancies/require no flags?			|	(Or must be rejected)
Log-in Supervisor notified immediately of following items:			↓	Discrepancies, compliance samples (NHDES, MADEP, DoD etc.) or uncommon requests.

Inspected and Received By: _____ Date/Time: 5/24/21 8:35

Peer Review Checklist

☐ Client ID/Project Manager	☐ On Ice, Temperature OK?	☐ Sample IDs	☐ Analyses in Correctly
☐ Project Name	☐ PO# (if provided)	☐ Matrix	-references
☐ TAT/rushes communicated	☐ Sub samples sent? Shipping Charge?	☐ Date/Time collected	-wastewater methods
☐ Received Date/Time	☐ Issues noted above communicated?	☐ Short HTs communicated	☐ Notes from CoC in LIMS

Reviewed By: _____ Date: _____

Notes: (continue on back as needed)

	Initials	Date	What was sent?
Uploaded / PDF	_____	_____	Report / Data / EDD / Invoice
Uploaded / PDF	_____	_____	Report / Data / EDD / Invoice
Uploaded / PDF	_____	_____	Report / Data / EDD / Invoice

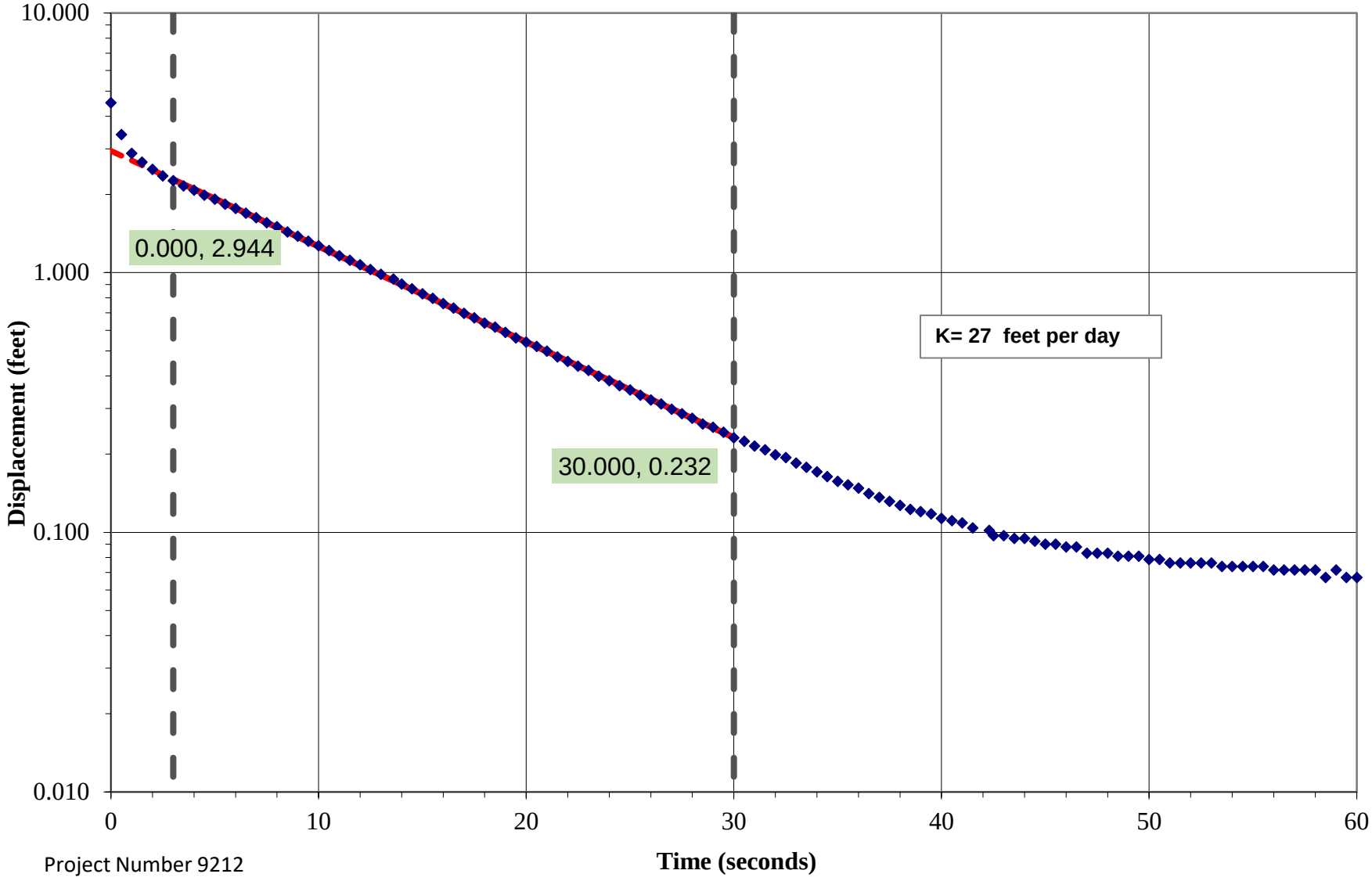
ATTACHMENT D

SLUG TEST DATA AND HYDRAULIC CONDUCTIVITY CALCULATIONS

NEW HAMPSHIRE | MASSACHUSETTS | CONNECTICUT | MAINE
GEOINSIGHT.COM | INFO@GEOINSIGHT.COM | 800.271.1953

GEO-1 SLUG TEST ANALYSIS (Trial 1)

Benchmark Senior Living Lafayette Road, Rye NH



Project Number 9212

Bouwer and Rice Slug Test for Partially-Penetrating Wells

Note L_w<H

Project Name:	Benchmark Senior Living
Project Address:	Lafayette Road, Rye NH
Project Number:	9212
Test Well:	GEO-1
Trial:	1

Instructions: enter values in shaded cells.

Well and Aquifer Parameters

Well casing diameter ($2r_c$)	0.16667	feet	
Boring diameter ($2r_w$)	0.54167	feet	
Height of water column in well (L_w)	13.07	feet	
Length of saturated well screen (L_e)	13.07	feet	Note: L_e will equal L_w for wells screened across the water table (shallow wells).
Aquifer Thickness (H)	20	feet	Assumption
Gravel pack porosity (n)	0.3	dimensionless	Note: 30% porosity (0.3) is typical for gravel packs.
Anisotropy ratio (K_r/K_z)	10	dimensionless	Note: a value of 1 is equal to no anisotropy ($K_z = K_h$). Most sites will have an anisotropy ratio greater than 1 ($K_r > K_z$).

Notes:

1. For a 2-inch diameter well, the well casing diameter ($2r_c$) is 0.16667 feet and the boring diameter ($2r_w$) is typically 0.54167 feet (6.5-inch diameter augers).
2. For a 4-inch diameter well, the well casing diameter ($2r_c$) is 0.33333 feet and the boring diameter ($2r_w$) is typically 0.6875 feet (8.25-inch diameter augers).
3. For a 6-inch diameter well, the well casing diameter ($2r_c$) is 0.5 feet and the boring diameter ($2r_w$) is typically 0.83333 feet (10-inch diameter augers).

Well casing radius (r_c)	0.083335	feet	
Equivalent casing radius (r_{ce})	0.163911	feet	Note: corrected for porosity of gravel pack (shallow wells only).
Boring radius (r_w)	0.270835	feet	
Corrected boring radius (r_w*)	0.085646	feet	Note: corrected for anisotropy.
L_e/r_w (for Bouwer and Rice graph)	152.61	dimensionless	

Parameters from recovery graph

Displacement at t=0 (y_0)	2.944	feet
Arbitrary time on straight line slope (t)	30.000	seconds
Displacement at that arbitrary time (y_t)	0.232	feet

Dimensionless Parameters (calculated from Bouwer and Rice Graph by linear interpolation)

A	5.39	dimensionless
B	0.96	dimensionless

Ln R_e/r_w	3.55014				
Hydraulic Conductivity (K)	**3.09E-04**	ft/sec	**9.42E-03**	cm/sec	**2.67E+01** ft/day

References:

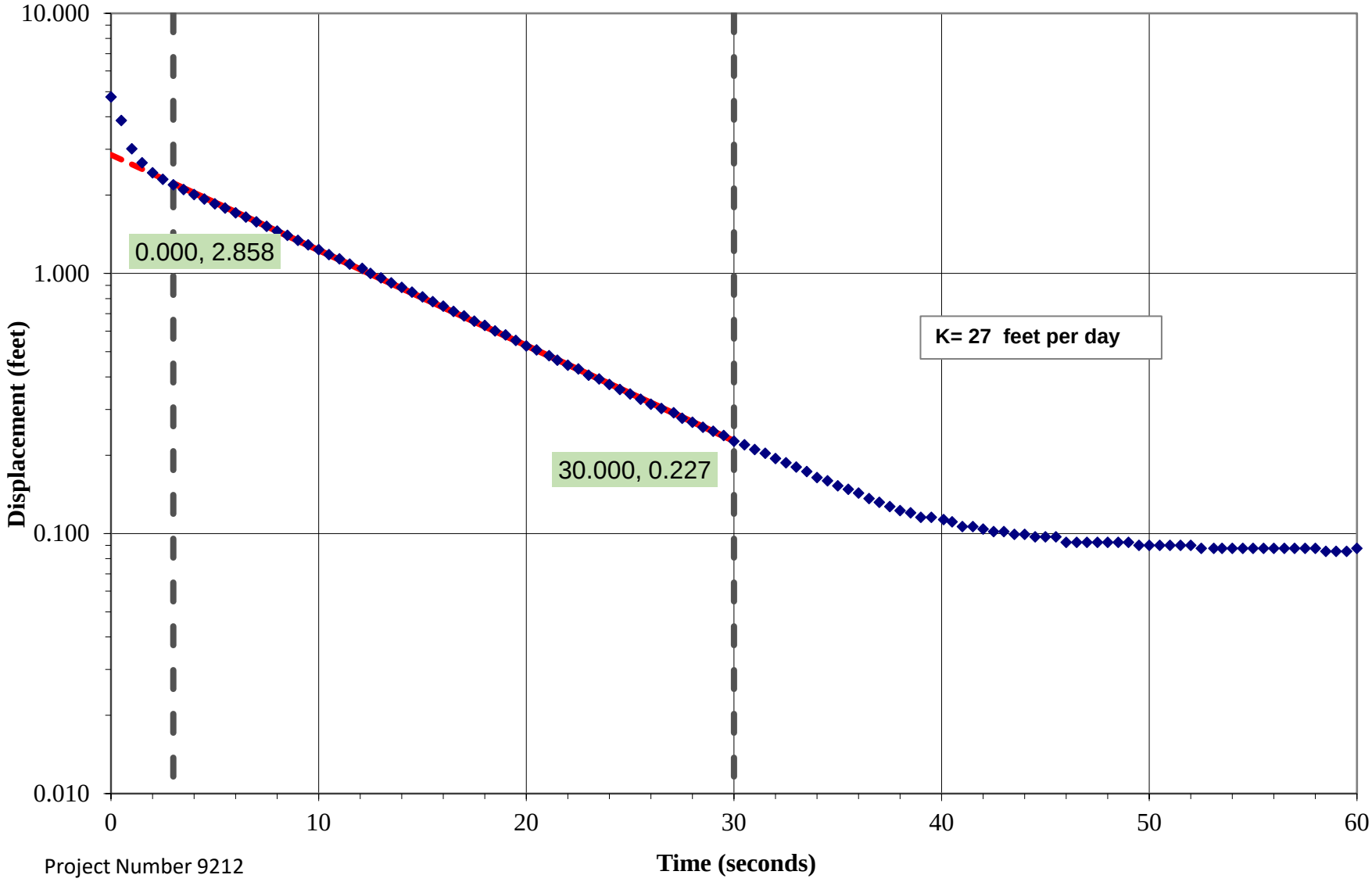
Bouwer, H. and Rice, R.C., 1976, A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells. Water Resources Research, Vol. 12 No. 3, pp. 423-428.

Bouwer, H. 1989, The Bouwer and Rice Slug Test - An Update. Ground Water, Vol. 27, No. 3, pp. 304-309.

Zlotnik, V. 1994, Interpretation of Slug and Packer Tests in Anisotropic Aquifers. Ground Water, Vol. 32, No. 5, pp. 761-766.

GEO-1 SLUG TEST ANALYSIS (Trial 2)

Benchmark Senior Living Lafayette Road, Rye NH



Project Number 9212

Bouwer and Rice Slug Test for Partially-Penetrating Wells

Note L_w<H

Project Name:	Benchmark Senior Living
Project Address:	Lafayette Road, Rye NH
Project Number:	9212
Test Well:	GEO-1
Trial:	2

Instructions: enter values in shaded cells.

Well and Aquifer Parameters

Well casing diameter ($2r_c$)	0.16667	feet	
Boring diameter ($2r_w$)	0.54167	feet	
Height of water column in well (L_w)	13.07	feet	
Length of saturated well screen (L_e)	13.07	feet	Note: L_e will equal L_w for wells screened across the water table (shallow wells).
Aquifer Thickness (H)	20	feet	Assumption
Gravel pack porosity (n)	0.3	dimensionless	Note: 30% porosity (0.3) is typical for gravel packs.
Anisotropy ratio (K_r/K_z)	10	dimensionless	Note: a value of 1 is equal to no anisotropy ($K_z = K_h$). Most sites will have an anisotropy ratio greater than 1 ($K_r > K_z$).

Notes:

1. For a 2-inch diameter well, the well casing diameter ($2r_c$) is 0.16667 feet and the boring diameter ($2r_w$) is typically 0.54167 feet (6.5-inch diameter augers).
2. For a 4-inch diameter well, the well casing diameter ($2r_c$) is 0.33333 feet and the boring diameter ($2r_w$) is typically 0.6875 feet (8.25-inch diameter augers).
3. For a 6-inch diameter well, the well casing diameter ($2r_c$) is 0.5 feet and the boring diameter ($2r_w$) is typically 0.83333 feet (10-inch diameter augers).

Well casing radius (r_c)	0.083335	feet	
Equivalent casing radius (r_{ce})	0.163911	feet	Note: corrected for porosity of gravel pack (shallow wells only).
Boring radius (r_w)	0.270835	feet	
Corrected boring radius (r_w*)	0.085646	feet	Note: corrected for anisotropy.
L_e/r_w (for Bouwer and Rice graph)	152.61	dimensionless	

Parameters from recovery graph

Displacement at t=0 (y_0)	2.858	feet
Arbitrary time on straight line slope (t)	30.000	seconds
Displacement at that arbitrary time (y_t)	0.227	feet

Dimensionless Parameters (calculated from Bouwer and Rice Graph by linear interpolation)

A	5.39	dimensionless
B	0.96	dimensionless

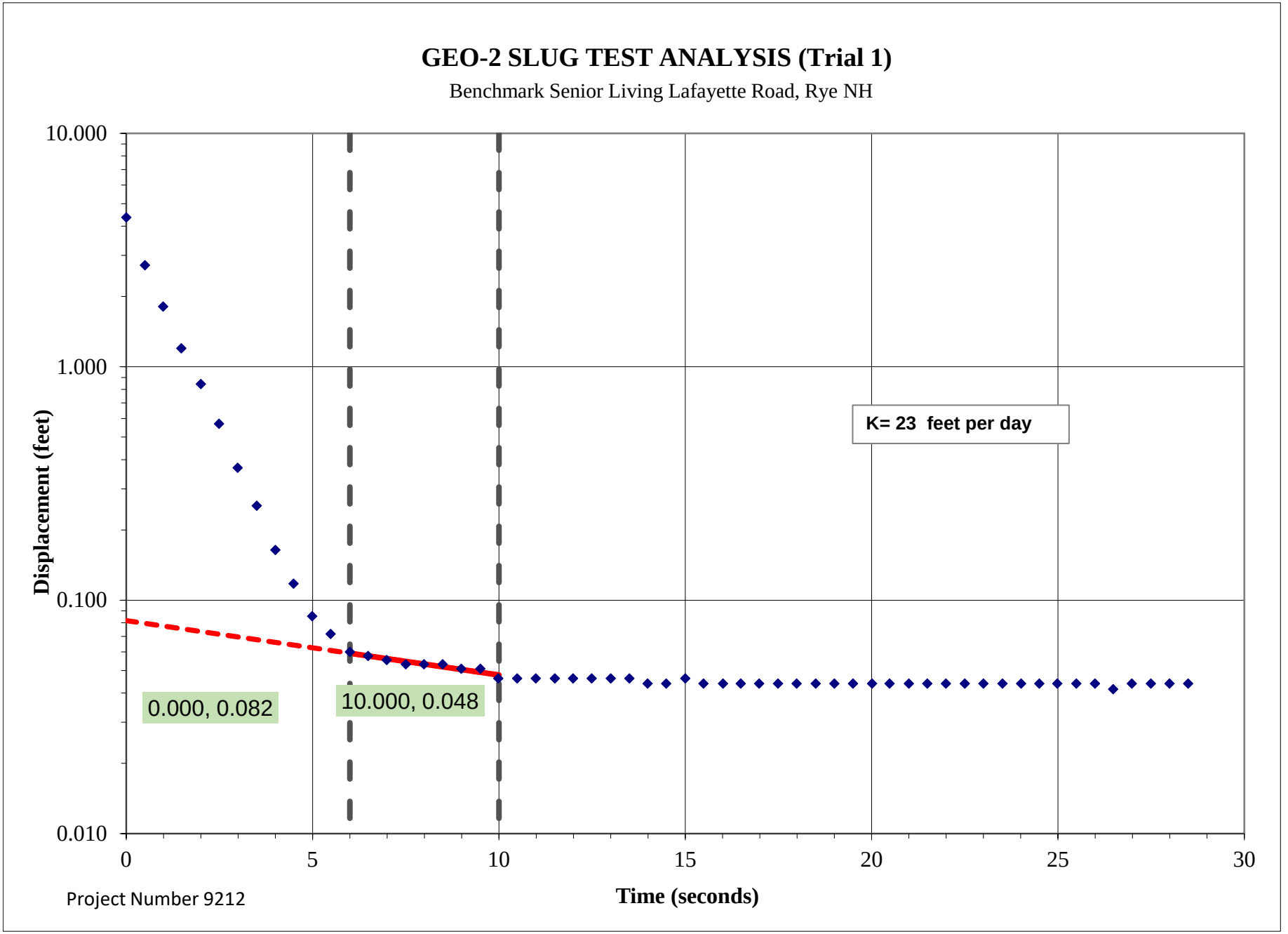
Ln R_e/r_w	3.55014				
Hydraulic Conductivity (K)	**3.08E-04**	ft/sec	**9.39E-03**	cm/sec	**2.66E+01** ft/day

References:

Bouwer, H. and Rice, R.C., 1976, A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells. Water Resources Research, Vol. 12 No. 3, pp. 423-428.

Bouwer, H. 1989, The Bouwer and Rice Slug Test - An Update. Ground Water, Vol. 27, No. 3, pp. 304-309.

Zlotnik, V. 1994, Interpretation of Slug and Packer Tests in Anisotropic Aquifers. Ground Water, Vol. 32, No. 5, pp. 761-766.


GEO-2 SLUG TEST ANALYSIS (Trial 1)
Benchmark Senior Living Lafayette Road, Rye NH
10.000
1.000
0.100
0.010
Displacement (feet)
K= 23 feet per day
0.000, 0.082
10.000, 0.048
0
5
10
15
20
25
30
Time (seconds)
Project Number 9212

Bouwer and Rice Slug Test for Partially-Penetrating Wells

Note L_w<H

Project Name:	Benchmark Senior Living
Project Address:	Lafayette Road, Rye NH
Project Number:	9212
Test Well:	GEO-2
Trial:	1

Instructions: enter values in shaded cells.

Well and Aquifer Parameters

Well casing diameter ($2r_c$)	0.16667	feet	
Boring diameter ($2r_w$)	0.54167	feet	
Height of water column in well (L_w)	8.39	feet	
Length of saturated well screen (L_e)	8.39	feet	Note: L_e will equal L_w for wells screened across the water table (shallow wells).
Aquifer Thickness (H)	20	feet	Assumption
Gravel pack porosity (n)	0.3	dimensionless	Note: 30% porosity (0.3) is typical for gravel packs.
Anisotropy ratio (K_r/K_z)	10	dimensionless	Note: a value of 1 is equal to no anisotropy ($K_z = K_h$). Most sites will have an anisotropy ratio greater than 1 ($K_r > K_z$).

Notes:

1. For a 2-inch diameter well, the well casing diameter ($2r_c$) is 0.16667 feet and the boring diameter ($2r_w$) is typically 0.54167 feet (6.5-inch diameter augers).
2. For a 4-inch diameter well, the well casing diameter ($2r_c$) is 0.33333 feet and the boring diameter ($2r_w$) is typically 0.6875 feet (8.25-inch diameter augers).
3. For a 6-inch diameter well, the well casing diameter ($2r_c$) is 0.5 feet and the boring diameter ($2r_w$) is typically 0.83333 feet (10-inch diameter augers).

Well casing radius (r_c)	0.083335	feet	
Equivalent casing radius (r_{ce})	0.163911	feet	Note: corrected for porosity of gravel pack (shallow wells only).
Boring radius (r_w)	0.270835	feet	
Corrected boring radius (r_w*)	0.085646	feet	Note: corrected for anisotropy.
L_e/r_w (for Bouwer and Rice graph)	97.96	dimensionless	

Parameters from recovery graph

Displacement at t=0 (y_0)	0.082	feet
Arbitrary time on straight line slope (t)	10.000	seconds
Displacement at that arbitrary time (y_t)	0.048	feet

Dimensionless Parameters (calculated from Bouwer and Rice Graph by linear interpolation)

A	4.31	dimensionless
B	0.73	dimensionless

Ln R_e/r_w	3.11975				
Hydraulic Conductivity (K)	**2.68E-04**	ft/sec	**8.17E-03**	cm/sec	**2.32E+01** ft/day

References:

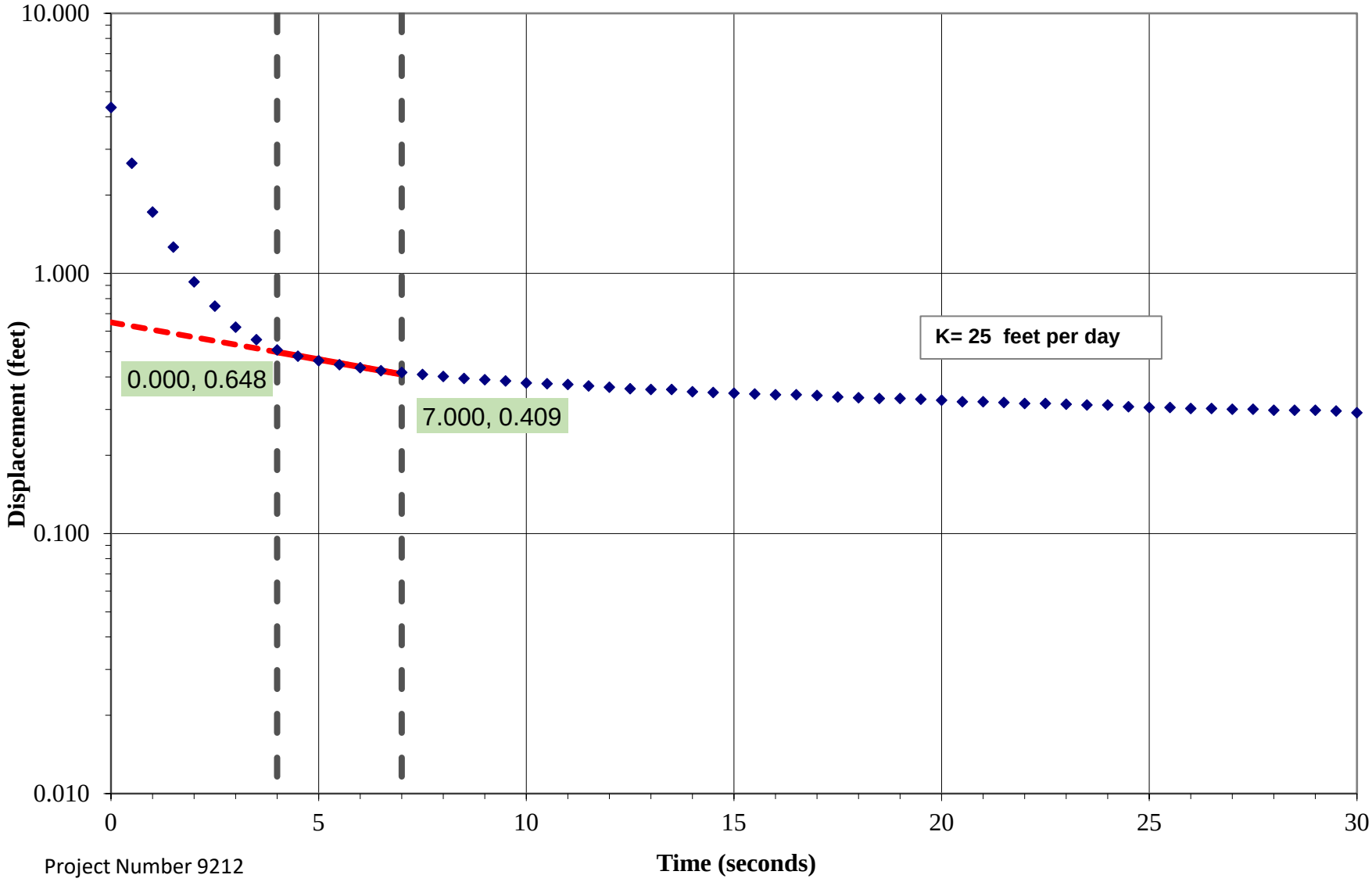
Bouwer, H. and Rice, R.C., 1976, A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells. Water Resources Research, Vol. 12 No. 3, pp. 423-428.

Bouwer, H. 1989, The Bouwer and Rice Slug Test - An Update. Ground Water, Vol. 27, No. 3, pp. 304-309.

Zlotnik, V. 1994, Interpretation of Slug and Packer Tests in Anisotropic Aquifers. Ground Water, Vol. 32, No. 5, pp. 761-766.

GEO-6 SLUG TEST ANALYSIS (Trial 1)

Benchmark Senior Living Lafayette Road, Rye NH



Project Number 9212

Bouwer and Rice Slug Test for Partially-Penetrating Wells

Note L_w<H

Project Name:	Benchmark Senior Living
Project Address:	Lafayette Road, Rye NH
Project Number:	9212
Test Well:	GEO-6
Trial:	1

Instructions: enter values in shaded cells.

Well and Aquifer Parameters

Well casing diameter ($2r_c$)	0.16667	feet	
Boring diameter ($2r_w$)	0.54167	feet	
Height of water column in well (L_w)	10.19	feet	
Length of saturated well screen (L_e)	10.19	feet	Note: L_e will equal L_w for wells screened across the water table (shallow wells).
Aquifer Thickness (H)	20	feet	Assumption
Gravel pack porosity (n)	0.3	dimensionless	Note: 30% porosity (0.3) is typical for gravel packs.
Anisotropy ratio (K_r/K_z)	10	dimensionless	Note: a value of 1 is equal to no anisotropy ($K_z = K_h$). Most sites will have an anisotropy ratio greater than 1 ($K_r > K_z$).

Notes:

1. For a 2-inch diameter well, the well casing diameter ($2r_c$) is 0.16667 feet and the boring diameter ($2r_w$) is typically 0.54167 feet (6.5-inch diameter augers).
2. For a 4-inch diameter well, the well casing diameter ($2r_c$) is 0.33333 feet and the boring diameter ($2r_w$) is typically 0.6875 feet (8.25-inch diameter augers).
3. For a 6-inch diameter well, the well casing diameter ($2r_c$) is 0.5 feet and the boring diameter ($2r_w$) is typically 0.83333 feet (10-inch diameter augers).

Well casing radius (r_c)	0.083335	feet	
Equivalent casing radius (r_{ce})	0.163911	feet	Note: corrected for porosity of gravel pack (shallow wells only).
Boring radius (r_w)	0.270835	feet	
Corrected boring radius (r_w*)	0.085646	feet	Note: corrected for anisotropy.
L_e/r_w (for Bouwer and Rice graph)	118.98	dimensionless	

Parameters from recovery graph

Displacement at t=0 (y_0)	0.648	feet
Arbitrary time on straight line slope (t)	7.000	seconds
Displacement at that arbitrary time (y_t)	0.409	feet

Dimensionless Parameters (calculated from Bouwer and Rice Graph by linear interpolation)

A	4.74	dimensionless
B	0.82	dimensionless

Ln R_e/r_w	3.30422				
Hydraulic Conductivity (K)	**2.86E-04**	ft/sec	**8.72E-03**	cm/sec	**2.47E+01** ft/day

References:

Bouwer, H. and Rice, R.C., 1976, A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells. Water Resources Research, Vol. 12 No. 3, pp. 423-428.

Bouwer, H. 1989, The Bouwer and Rice Slug Test - An Update. Ground Water, Vol. 27, No. 3, pp. 304-309.

Zlotnik, V. 1994, Interpretation of Slug and Packer Tests in Anisotropic Aquifers. Ground Water, Vol. 32, No. 5, pp. 761-766.

ATTACHMENT E

COAKLEY LANDFILL INFORMATION

NEW HAMPSHIRE | MASSACHUSETTS | CONNECTICUT | MAINE
GEOINSIGHT.COM | INFO@GEOINSIGHT.COM | 800.271.1953

NOTICE OF GROUNDWATER MANAGEMENT PERMIT
GWP-198712001-N-002
TO BE RECORDED AGAINST:

Coakley Landfill Inc. Bk1340 P254 and Bk1347 P172

NOTICE IS HEREBY GIVEN THAT: The New Hampshire Department of Environmental Services (Department) has issued Groundwater Management Permit #GWP-198712001-N-002 ("Permit") to the Coakley Landfill Group. Pursuant to Env-Or 607.09(a) this notice is recorded for each property located within the groundwater management zone identified in the Permit at the Registry of Deeds in Rockingham County.

The Permit establishes a Groundwater Management Zone ("GMZ"), an area within which groundwater use must be controlled and monitored due to the presence of groundwater contaminants that exceed the State's Ambient Groundwater Quality Standards ("AGQS"). The Permit may include conditions to and restrictions upon the use of the properties within the GMZ, including restrictions on the use of groundwater.

The Permit was originally issued on June 19, 2008 and renewed January 7, 2014 expires on January 6, 2019, unless renewed for subsequent five-year period(s). This Notice will remain in effect until such time as the AGQS are restored within the GMZ and the Department issues a Release of Recordation to the Permittee. The Permit is available for review at the New Hampshire Department of Environmental Services, 29 Hazen Drive, Concord, NH 03301 or can be viewed by searching under our OneStop Data Retrieval Site at http://www2.des.nh.gov/OneStop/ORCB_Query.aspx?Project+CCST .

The following properties are located within the GMZ:

Tax Map / Lot No.	Property Address	Owner	Deed Ref. (Book / Page)
6/37	365 Lafayette Road, Rye	SNS LLC	5238/2463
10/11	355 Lafayette Road, Rye	Malcolm E. Smith III	5079/0262
17/72	67 North Road, North Hampton	Joan M Nordstrom	2416/583
17/73	65 North Road, North Hampton	Joseph F and Yolanda Fitzgerald	3007/2807
17/82	160 Lafayette Road, North Hampton	Luck Enterprises, Inc.	2473/1659
17/86	180 Lafayette Road, North Hampton	Christopher C and Louis J Fucci	3319/952
17/87	186 Lafayette Road, North Hampton	Lori A Lessard Trustee	2760/2099
21/8	188 Lafayette Road, North Hampton	Joseph J and Helen M McKittrick	2641/2656
21/10	8A Lafayette Terrace, North Hampton	John J Sr and Dorleena Wylie	4030/2567
21/11	12A Lafayette Terrace, North Hampton	Seth McAlister	5044/102
21/12	16A Lafayette Terrace, North Hampton	William and Christine Adinolfo	2963/1721
21/14	20 Lafayette Terrace, North Hampton	Joseph Hanley	4682/1265
21/14-1	40-42 Lafayette Terrace, North Hampton	James A C Jones	4451/1104
21/15	44 Lafayette Terrace, North Hampton	Joseph B and Bridget S Conner	4183/1638
21/16	46 Lafayette Terrace, North Hampton	Rodney K Booker Trustee	5196/2724
21/17	1 Lafayette Terrace, North Hampton	Judith I and Bernard P Tracey	2450/687

21/18	3 Lafayette Terrace, North Hampton	Erin and Joshua Miller	5029/1768
21/19	5 Lafayette Terrace, North Hampton	Richard P and Kimberly M Bartlett	3824/2799
21/20	9 Lafayette Terrace, North Hampton	Alexis J Perron III	3088/1774
21/21	11 Lafayette Terrace, North Hampton	Kenneth and Tracey Margeson	3121/1606
21/22	15 Lafayette Terrace, North Hampton	Edward and Anita Gabree	3013/2221
21/23	Part of 11 Lafayette Terrace	Kenneth and Tracey Margeson	3121/1606
21/24	43 Lafayette Terrace, North Hampton	William Warman	4374/1365
21/25	45 Lafayette Terrace, North Hampton	ZCCMMXIIVOOOOOIIIII5INH LTD Partnership	2530/1863
21/26	198 Lafayette Road, North Hampton	Gozinta LLC	4275/904
21/27	206 Lafayette Road, North Hampton	206 Lafayette Road LLC	4785/379
21/27-1	200 Lafayette Road, North Hampton	Derek R Burt Trustee	5147/325
21/28	216 Lafayette Road, North Hampton	Stella A Ciborowski Trust	2414/729
21/28-1	216 Lafayette Road, North Hampton	Leo J Crotty Jr	2475/1278
21/29	212 Lafayette Road, North Hampton	S&L Realty Trust	3666/1199
21/31	224 Lafayette Road, North Hampton	SNS LLC	5238/2463
21/32	Coakley Landfill, North Hampton	Coakley Landfill LLC	3117/2934
21/33	Coakley Landfill, North Hampton	Coakley Landfill LLC	3117/2934
21/34	Lafayette Road Rear, North Hampton	James A C Jones	4451/1102

21/35	Lafayette Terrace Rear, North Hampton	James A C Jones	4451/1102
21/36	Lafayette Terrace Rear, North Hampton	James A C Jones	4451/1102
21/37	Lafayette Terrace Rear, North Hampton	Town of North Hampton	3415/1661
21/39	North Road Rear, North Hampton	Joan, Breen and Denise Grenier- Winther, Susan Sherr, and Caryn Blake	5142/2979
21/41	North Road Rear, North Hampton	Elmer M Sewall	1340/524
21/46	10 Lafayette Terrace / Part of 8A, North Hampton	John J Sr and Dorleena L Wylie	3219/2588
*R1/13	340 Breakfast Hill Road (Portion Only)	Elmer M Sewall Rev Trust 96	3159/928
R1/9B	560 Breakfast Hill Road	Town of Greenland	3454/1131

Shaded rows indicate newly added lots.

*An expanded portion of the Sewall parcel (Tax Map R1 Lot #13) is included within the GMZ, as shown on the updated plot plan entitled "*Groundwater Monitoring Zone Plan*" prepared by Richard D. Bartlett & Associates, LLC., certified on December 11, 2013, and described as follows:

Commencing at a point on the easterly line of land now or formerly of the Boston and Maine Corporation, said point being a distance of 600.93 feet as measured along a curve to the left, having a central angle of 01°54'46" and a radius of 18,000.00 feet, from a steel pin set on the southerly sideline of Breakfast Hill Road marking the northeasterly most corner of said Boston and Maine land identified on tax map R1 as lot 11, thence by a curve to the left, having a central angle of 00°33'15" and a radius of 18,000.00 feet, a distance of 174.06 feet to a point, thence by a curve to the left, having a central angle of 00°24'32" and a radius of 11,425.51 feet, a distance of 81.56 feet to a point; thence S13°08'30"W a distance of 1,419.54 feet to a point; thence, N76°51'30"W a distance of 99.00 feet to a point at land now or formerly of Elmer M. Sewall Revocable Trust 96, thence, along said Sewall land, N35°09'35"E a distance of 88.02 feet to a point; thence, continuing by said Sewall land, N13°08'30"E a distance of 163.21 feet to a point; thence N76°51'30"W a distance of 434.00 feet, through said Sewall land to a point; thence S17°29'30"W a distance of 1,097.80 feet to a point on the Greenland-North Hampton town line, said point being N79°55'00"W a distance of 18.99 feet from a concrete bound, on said town line, engraved "G" and "N-H", thence, along said town line, N79°55'00"W a distance of 345.00 feet to a point; thence N23°21'55"E a distance of 2,504.63 feet to a point; thence N25°28'15"E a distance of 551.47 feet to a point; thence S72°51'15"E a distance of 221.87 feet to a point; thence S15°37'10"W a distance of 441.43 feet to a point; thence S75°34'35"E a distance of 166.70 feet continuing through said Sewall land and said

Boston and Maine land to the point of beginning.

Containing 1,306,532 square feet or 29.99 acres, of which 27.42 acres is the land of the Elmer M. Sewall Revocable Trust 96 and 2.57 acres is the land of the Boston and Maine Corporation.

/s/Robert Sullivan, Permittee
Coakley Landfill Group

February 26, 2014

Approved pursuant to authorization of Coakley
Executive Committee via electronic communication

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

The

NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES

hereby issues

GROUNDWATER MANAGEMENT PERMIT NO. GWP-198712001-N-002

to the permittee

COAKLEY LANDFILL GROUP

to monitor the past discharge of

Contaminants Of Concern
(as identified in Table 12 of the 1994 Record of Decision and subsequent decision documents)

at

COAKLEY LANDFILL
(480 Breakfast Hill Road)

in NORTH HAMPTON, N.H.

via the groundwater, surface water and sediment monitoring system comprised of

32 monitoring wells, 3 surface water, 2 sediment, and 1 leachate sampling locations and 5 residential drinking water supply wells

as depicted on the Site Plan and tables entitled

Environmental Monitoring Network (site plan);
OU-1 Groundwater Monitoring Wells and Water Supply Wells; and
OU-2 Groundwater Monitoring Wells

dated September 2013 (site plan) and July 2013 Revision 2.0 (tables), prepared by Summit Environmental Consultants

TO: COAKLEY LANDFILL GROUP
1 JUNKINS AVENUE
PORTSMOUTH, NEW HAMPSHIRE 03801

Date of Issuance: January 7, 2014
Date of Expiration: January 6, 2019

(continued)

Pursuant to authority in N.H. RSA 485-C:6-a, the New Hampshire Department of Environmental Services (Department), hereby grants this permit to monitor past discharges to the groundwater at the above described location for five years subject to the following conditions:

STANDARD MANAGEMENT PERMIT CONDITIONS

1. The permittee shall not violate Ambient Groundwater Quality Standards adopted by the Department (N.H. Admin. Rules Env-Or 600) in groundwater outside the boundaries of the Groundwater Management Zone, as shown on the referenced site plan and updated on the plot plan entitled "*Groundwater Monitoring Zone Plan"* prepared by Richard D. Bartlett & Associates, LLC., certified on December 11, 2013.

2. The permittee shall not cause groundwater degradation that results in a violation of surface water quality standards (N.H. Admin. Rules Env-Ws 1700) in any surface water body.

3. The permittee shall allow any authorized staff of the Department, 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.

4. The permittee shall apply for the renewal of this permit at least 90 days prior to its expiration date.

5. This permit is transferable only upon written request to, and approval of, the Department. Compliance with the existing Permit shall be established prior to permit transfer. Transfer requests shall include the name and address of the person to whom the permit transfer is requested, signature of the current and future permittee, and a summary of all monitoring results to date.

6. The Department reserves the right, under N.H. Admin. Rules Env-Or 600, to require additional hydrogeologic studies and/or remedial measures if the Department receives information indicating the need for such work.

7. The permittee shall maintain a water quality monitoring program and submit monitoring results to the Department's Waste Management Division no later than 45 days after sampling. Samples shall be taken from site monitoring wells, surface water and sediment sampling points as shown and labeled on the referenced site plan in accordance with the schedule outlined herein:

Monitoring Locations	**Sampling Frequency**	**Parameters**
FPC-4B, AE-4B	August each year	Bedrock well - field parameters, TAL metals (**total, unless highly turbid**), NHDES Waste Management Division full list of analytes for volatile organics (full list VOCs).
FPC-5A, MW-4, MW-9, OP-2	August each year	Overburden wells – field parameters, TAL metals (**dissolved**), 1,4-dioxane.
FPC-6B, FPC-8B, GZ-105, AE-2B, AE-3B, MW-5S, MW-5D, MW-6, MW-8, MW-11	August each year	Bedrock wells – field parameters, TAL metals (t**otal, unless highly turbid**), full list VOCs, 1,4-dioxane.
FPC-7A, FPC-9A, FPC-11A, AE-1A, MW-10, OP-5	August each year	Overburden wells – field parameters, TAL metals (**dissolved**)

- 3 -**Monitoring Locations**	**Sampling Frequency**	**Parameters**
FPC-5B, BP-4	August each year	Bedrock well – field parameters, TAL metals (**total, unless highly turbid**), 1,4-dioxane.
FPC-6A, FPC-8A, AE-2A, AE-3A	August each year	Overburden wells – field parameters, TAL metals (**dissolved**), full list VOCs, 1,4-dioxane.
AE-4A	August each year	Overburden well – field parameters, TAL metals (**dissolved**), full list VOCs.
FPC-7B, FPC-11B, AE-1B	August each year	Bedrock wells – field parameters, TAL metals (**total, unless highly turbid**).
Residential, Surface Water, Sediment & Leachate		
368BHR (R-3), 339BHR	August & February each year	Bedrock drinking water well – Field parameters, arsenic & manganese (**total**), VOCs full list (EPA Method 524), 1,4-dioxane.
399BHR (R-5), 346BHR, 415BHR	August each year	Field parameters, arsenic & manganese (**total**), NHDES full list (EPA Method 524), 1,4-dioxane.
SW-4, SW-5, SW-103	August each year	Field parameters, ammonia, TAL metals (**dissolved**), full list VOCs.
SED-4, SED-5	August each year	Metals (total).
L-1	August each year	Field parameters, COD, ammonia, TAL metals (**dissolved**).

Sampling shall be performed in accordance with the documents listed in Env-Or 610.02 (e) and the approved Environmental Monitoring Plan. Samples shall be analyzed by a laboratory certified by the U.S. Environmental Protection Agency or the New Hampshire Department of Environmental Services pursuant to Env-C 300. All overburden groundwater samples collected for metal 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. Surface water samples and samples collected from bedrock or water supply wells shall be analyzed for total metals, and shall not be filtered. As referred to herein, the term "TAL Metals" refers to aluminum, arsenic, barium, cadmium, calcium, chromium, copper, iron, lead, magnesium, mercury, nickel, potassium, selenium, silver, sodium, thallium, zinc, cobalt, beryllium, manganese, antimony, and vanadium.

Summaries of water quality shall be submitted annually to the Department's Waste Management Division, in the month of February, using a format acceptable to the Department. The Summary Report shall include the information listed in Env-Or 607.04 (a), as applicable.

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

8. Issuance of this permit is based on the Groundwater Management Permit Application dated October 3, 2013 and the historical documents found in the Department file DES #198712001. The Department may require additional hydrogeologic studies and/or remedial measures if invalid or inaccurate data are submitted.

9. Within 15 days of the date of Department approval of this Groundwater Management Permit, the permittee shall provide notice of the permit by certified mail, return receipt requested, to all owners of **newly added lots** of record (i.e., not noticed under original permit) within the Groundwater Management Zone (see shaded lots in Special Condition #12). The permittee shall submit documentation of this notification to the Department within 45 days of permit issuance.

10. Within 60 days of the date of Department approval of this Groundwater Management Permit, the permit holder shall record notice of the permit in the registry of deeds in the chain of title for each **newly added lot** within the Groundwater Management Zone (see shaded lots in Special Condition #12). The original notice on Lot 13 Map R1 shall be amended to reflect the expanded GMZ within this lot. **Recordation requires that the registry be provided with the name of current property owner and associated book and page numbers for the deed of each lot encumbered by this permit. Portions of State/Town/City roadways and associated right-of-way properties within the Groundwater Management Zone do not require recordation.** A copy of each recorded notice shall be submitted to the Department and to the governing body of each municipality in which the site or any lot within the GMZ is located within 30 days of recordation.

11. Within 30 days of discovery of a violation of an ambient groundwater quality standard at or beyond the Groundwater Management Zone boundary, the permittee shall notify the Department in writing. Within 60 days of discovery, the permittee shall submit recommendations to correct the violation. The Department shall approve the recommendations if the Department determines that they will correct the violation.

SPECIAL CONDITIONS FOR THIS PERMIT

12. Recorded property within the Groundwater Management Zone shall include the lots, or portions thereof, as listed and described in the following table:

Tax Map / Lot No.	Property Address	Owner	Deed Ref. (Book / Page)
6/37	365 Lafayette Road, Rye	SNS LLC	5238/2463
10/11	355 Lafayette Road, Rye	Malcolm E. Smith III	5079/0262
17/72	67 North Road, North Hampton	Joan M Nordstrom	2416/583
17/73	65 North Road, North Hampton	Joseph F and Yolanda Fitzgerald	3007/2807
17/82	160 Lafayette Road, North Hampton	Luck Enterprises, Inc.	2473/1659
17/86	180 Lafayette Road, North Hampton	Christopher C and Louis J Fucci	3319/952
17/87	186 Lafayette Road, North Hampton	Lori A Lessard Trustee	2760/2099
21/8	188 Lafayette Road, North Hampton	Joseph J and Helen M McKittrick	2641/2656
21/10	8A Lafayette Terrace, North Hampton	John J Sr and Dorleena Wylie	4030/2567
21/11	12A Lafayette Terrace, North Hampton	Seth McAlister	5044/102
21/12	16A Lafayette Terrace, North Hampton	William and Christine Adinolfo	2963/1721
21/14	20 Lafayette Terrace, North Hampton	Joseph Hanley	4682/1265
21/14-1	40-42 Lafayette Terrace, North Hampton	James A C Jones	4451/1104
21/15	44 Lafayette Terrace, North Hampton	Joseph B and Bridget S Conner	4183/1638
21/16	46 Lafayette Terrace, North Hampton	Rodney K Booker Trustee	5196/2724

Tax Map / Lot No.	Property Address	Owner	Deed Ref. (Book / Page)
21/17	1 Lafayette Terrace, North Hampton	Judith I and Bernard P Tracey	2450/687
21/18	3 Lafayette Terrace, North Hampton	Erin and Joshua Miller	5029/1768
21/19	5 Lafayette Terrace, North Hampton	Richard P and Kimberly M Bartlett	3824/2799
21/20	9 Lafayette Terrace, North Hampton	Alexis J Perron III	3088/1774
21/21	11 Lafayette Terrace, North Hampton	Kenneth and Tracey Margeson	3121/1606
21/22	15 Lafayette Terrace, North Hampton	Edward and Anita Gabree	3013/2221
21/23	Part of 11 Lafayette Terrace	Kenneth and Tracey Margeson	3121/1606
21/24	43 Lafayette Terrace, North Hampton	William Warman	4374/1365
21/25	45 Lafayette Terrace, North Hampton	ZCCMMXIIVOOOOOIIIII5INH LTD Partnership	2530/1863
21/26	198 Lafayette Road, North Hampton	Gozinta LLC	4275/904
21/27	206 Lafayette Road, North Hampton	206 Lafayette Road LLC	4785/379
21/27-1	200 Lafayette Road, North Hampton	Derek R Burt Trustee	5147/325
21/28	216 Lafayette Road, North Hampton	Stella A Ciborowski Trust	2414/729
21/28-1	216 Lafayette Road, North Hampton	Leo J Crotty Jr	2475/1278
21/29	212 Lafayette Road, North Hampton	S&L Realty Trust	3666/1199
21/31	224 Lafayette Road, North Hampton	SNS LLC	5238/2463
21/32	Coakley Landfill, North Hampton	Coakley Landfill LLC	3117/2934
21/33	Coakley Landfill, North Hampton	Coakley Landfill LLC	3117/2934
21/34	Lafayette Road Rear, North Hampton	James A C Jones	4451/1102
21/35	Lafayette Terrace Rear, North Hampton	James A C Jones	4451/1102
21/36	Lafayette Terrace Rear, North Hampton	James A C Jones	4451/1102
21/37	Lafayette Terrace Rear, North Hampton	Town of North Hampton	3415/1661
21/39	North Road Rear, North Hampton	Joan, Breen and Denise Grenier- Winther, Susan Sherr, and Caryn Blake	5142/2979
21/41	North Road Rear, North Hampton	Elmer M Sewall	1340/524
21/46	10 Lafayette Terrace / Part of 8A, North Hampton	John J Sr and Dorleena L Wylie	3219/2588

Tax Map / Lot No.	Property Address	Owner	Deed Ref. (Book / Page)
*R1/13	340 Breakfast Hill Road (Portion Only)	Elmer M Sewall Rev Trust 96	3159/928
R1/9B	560 Breakfast Hill Road	Town of Greenland	3454/1131

Shaded rows indicate newly added lots that require notice per Standard Permit Conditions #9 and #10. The original notice on Lot 13 Map R1 should be amended and recorded to reflect the expanded GMZ within this lot.

*An expanded portion of the Sewall parcel (Tax Map R1 Lot #13) is included within the GMZ, as shown on the updated plot plan entitled "*Groundwater Monitoring Zone Plan"* prepared by Richard D. Bartlett & Associates, LLC., certified on December 11, 2013, and described as follows:

Commencing at a point on the easterly line of land now or formerly of the Boston and Maine Corporation, said point being a distance of 600.93 feet as measured along a curve to the left, having a central angle of 01º54'46" and a radius of 18,000.00 feet, from a steel pin set on the southerly sideline of Breakfast Hill Road marking the northeasterly most corner of said Boston and Maine land identified on tax map R1 as lot 11, thence by a curve to the left, having a central angle of 00º33'15" and a radius of 18,000.00 feet, a distance of 174.06 feet to a point, thence by a curve to the left, having a central angle of 00º24'32" and a radius of 11,425.51 feet, a distance of 81.56 feet to a point; thence S13º08'30"W a distance of 1,419.54 feet to a point; thence, N76º51'30"W a distance of 99.00 feet to a point at land now or formerly of Elmer M. Sewall Revocable Trust 96, thence, along said Sewall land, N35º09'35"E a distance of 88.02 feet to a point; thence, continuing by said Sewall land, N13º08'30"E a distance of 163.21 feet to a point; thence N76º51'30"W a distance of 434.00 feet, through said Sewall land to a point; thence S17º29'30"W a distance of 1,097.80 feet to a point on the Greenland-North Hampton town line, said point being N79º55'00"W a distance of 18.99 feet from a concrete bound, on said town line, engraved "G" and "N-H", thence, along said town line, N79º55'00"W a distance of 345.00 feet to a point; thence N23º21'55"E a distance of 2,504.63 feet to a point; thence N25º28'15"E a distance of 551.47 feet to a point; thence S72º51'15"E a distance of 221.87 feet to a point; thence S15º37'10"W a distance of 441.43 feet to a point; thence S75º34'35"E a distance of 166.70 feet continuing through said Sewall land and said Boston and Maine land to the point of beginning.

Containing 1,306,532 square feet or 29.99 acres, of which 27.42 acres is the land of the Elmer M. Sewall Revocable Trust 96 and 2.57 acres is the land of the Boston and Maine Corporation.

13. INSTALLATION OF NEW GMZ COMPLIANCE WELLS

Two well couplets (overburden and bedrock) shall be installed near the revised GMZ boundary. Locations to be confirmed with EPA & DES prior to construction. Wells shall be installed and sampled as part of the regular scheduled 2014 sampling program.

14. UNDEVELOPED LOTS WITHIN THE GROUNDWATER MANAGEMENT ZONE:
Consistent with Env-Or 607.06(d), for each undeveloped lot, or portion thereof, which is within the Groundwater Management Zone and lacks access to a public water supply, the permittee shall contact the property owner annually to determine if a water supply well has been installed. The permittee shall include a report on this inquiry in the Annual Summary Report required in Standard Permit Condition #7. The results of these inquiries shall be documented in each Annual Summary Report.

Upon discovery of a new drinking water supply well within the Groundwater Management Zone, the permittee shall provide written notification to the Department and, to ensure compliance with Env-Or 607.06(a), submit a contingency plan to provide potable drinking water in the event the well is or becomes contaminated above the ambient groundwater quality standards. The potable water supply shall meet applicable federal and state water quality criteria. This plan shall be submitted to the Department for approval within 15 days of the date of discovery.

The permittee shall sample the new supply well within 30 days of discovery. The well shall be sampled for all the analytical parameters included in Standard Condition # 7, unless otherwise specified in writing by the Department. The permittee shall forward all analytical results to the Department's Waste Management Division, the Department's Environmental Health Program, and the owner of the drinking water supply well within 7 days of receipt of the results.

If the results for the new well meet the ambient groundwater quality standards, the permittee shall continue to sample the new wells annually as part of the permit. If the results for the new well indicate a violation of the ambient groundwater quality standards, the permittee shall notify the owner immediately and conduct confirmatory sampling within 14 days of receiving the original results.

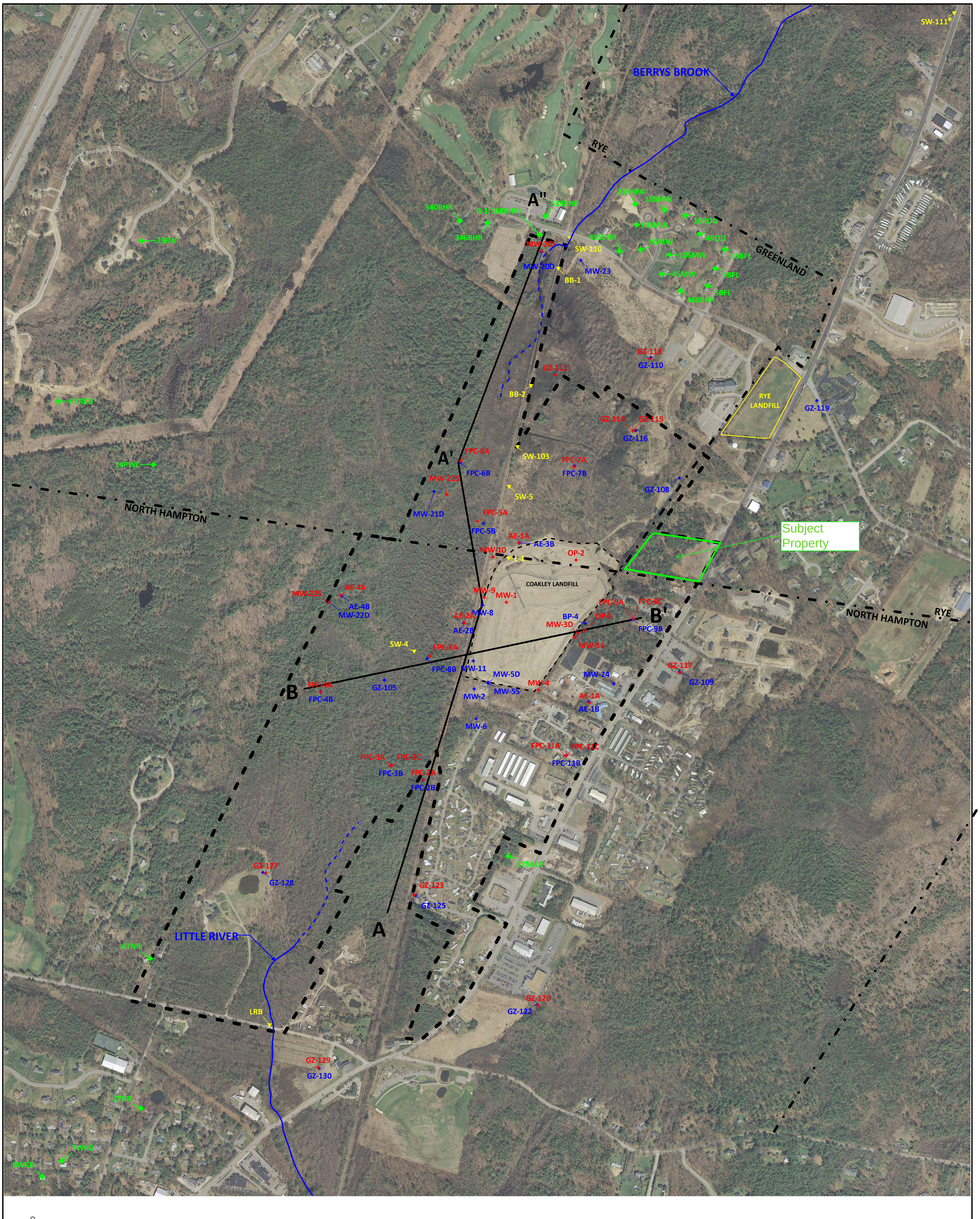
Upon confirmation of a violation of the ambient groundwater quality standards in a new drinking water well, the permittee shall immediately implement the contingency plan to provide a potable drinking water supply that meets applicable federal and state water quality criteria.

15. All monitoring wells at the site shall be properly maintained and secured from unauthorized access or surface water infiltration.

16. The permittee shall update ownership information required by Env-Or 607.03(a)(20) for all properties within the Groundwater Management Zone prior to renewal of the permit or upon a recommendation for site closure.

Carl W. Baxter, P.E., Administrator
Hazardous Waste Remediation Bureau
Waste Management Division

Under RSA 21-0:14 and 21-0:9-V, any person aggrieved by any terms or conditions of this permit may appeal to the Waste Management Council in accordance with RSA 541-A and N.H. Admin. Rules, Env-WMC 200. Such appeal must be made to the Council within 30 days and must be addressed to the Chairman of the Waste Management Council, c/o Appeals Clerk, Department of Environmental Services Legal Unit, 29 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095.



LEGEND

- 67RCD — RESIDENTIAL WATER SUPPLY WELL LOCATION
- GZ-117 — OVERBURDEN GROUNDWATER MONITORING WELL
- GZ-108 — BEDROCK GROUNDWATER MONITORING WELL
- SW-103 — SURFACE WATER SAMPLING LOCATION
  *LOCATION 500 FT NORTH AT INTERSECTION OF LAFAYETTE RD AND BERRY'S BROOK.
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- TOWN LINE

NOTES

1. THIS SITE PLAN IS BASED ON EXISTING SAMPLING LOCATIONS AS PER THE COAKLEY LANDFILL SUPERFUND SITE REVISED SAMPLING AND ANALYSIS PLAN DATED JULY 18, 2018.
2. GMZ BOUNDARY IS BASED UPON "GMZ BOUNDARY PLAN" DATED MAY 9, 2008 INCLUDED IN THE 2008 GMP APPLICATION PREPARED BY HANCOCK ASSOCIATES AND 2013 GMZ EXPANSION AREA ESTABLISHED BY THE 2013 GMP DATED JANUARY 7, 2014.
3. GIS DATA CURTESY OF NEW HAPSHIRE ONLINE GRANIT DATABASE.
4. MAP IS PROJECTED USING THE NEW HAMPSHIRE STATE PLANE PROJECTION, US FEET AND REFERENCES THE NORTH AMERICAN VERTICAL DATUM OF 1983.
5. SURFACE WATER SAMPLE LOCATION SW-111 IS LOCATED APPROXIMATELY 220 FEET NORTH OF MAPPED AREA ADJACENT TO THE SOUTH OF 3660 LAFAYETTE ROAD.

COAKLEY LANDFILL SUPERFUND SITE
NEW HAMPSHIRE

GRAPHIC SCALE: 0 FT, 400 FT, 800 FT, 1200 FT, 1600 FT

SCALE	DATE	DRAWN BY	CHECKED BY	DESIGNED BY	APPROVED BY	JOB NUMBER	DRAWING NUMBER
1:4,800	2019-11-06	CFB	MAD	CFB		10424.016	FIGURE 2

ISSUE STATUS: FOR DISCUSSION PURPOSES ONLY

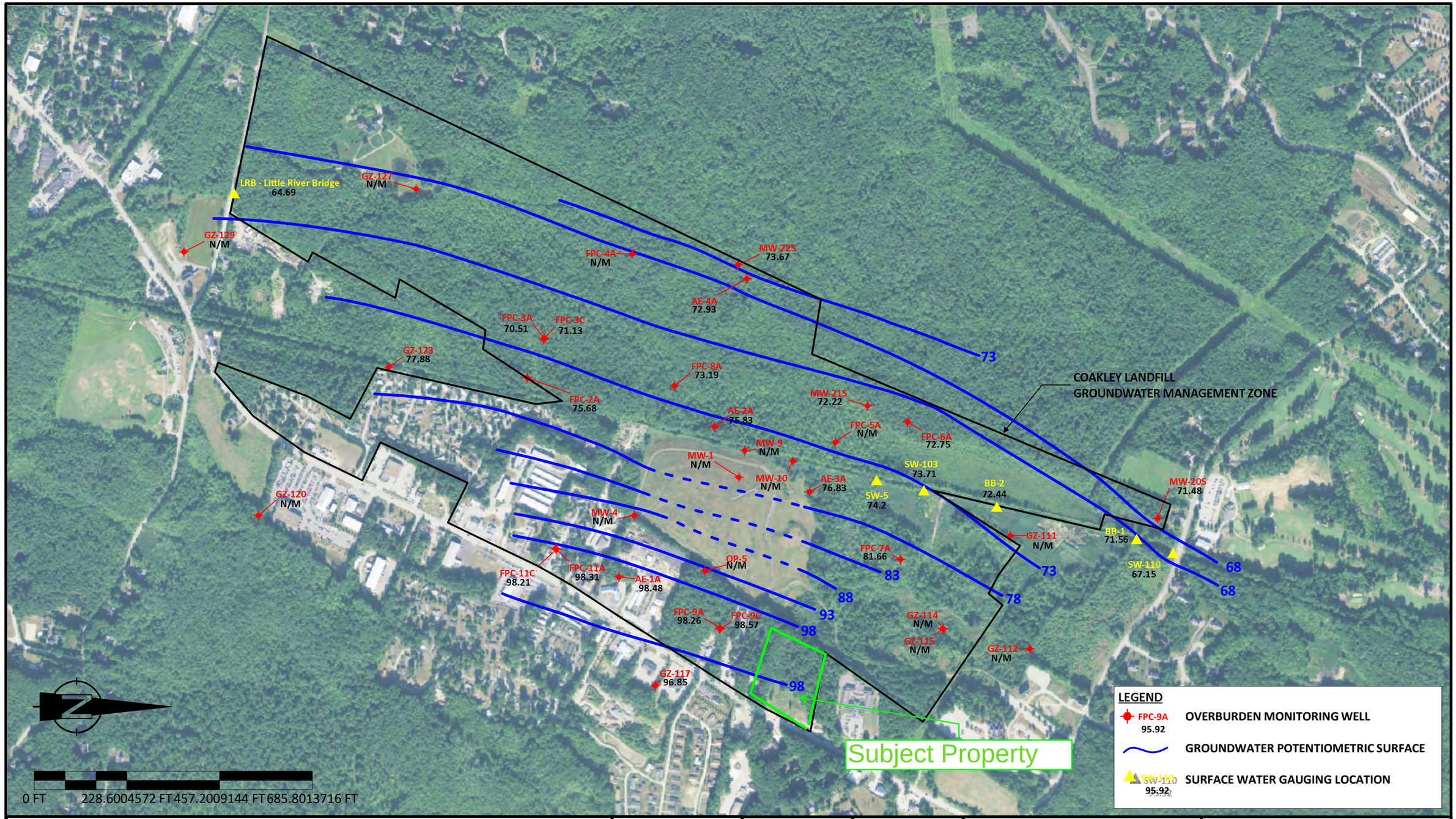
REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R7				
R6				
R5				
R4				
R3				
R2				
R1				

PROJECT TITLE
COAKLEY LANDFILL SUPERFUND SITE
NORTH HAMPTON AND GREENLAND, NEW HAMPSHIRE

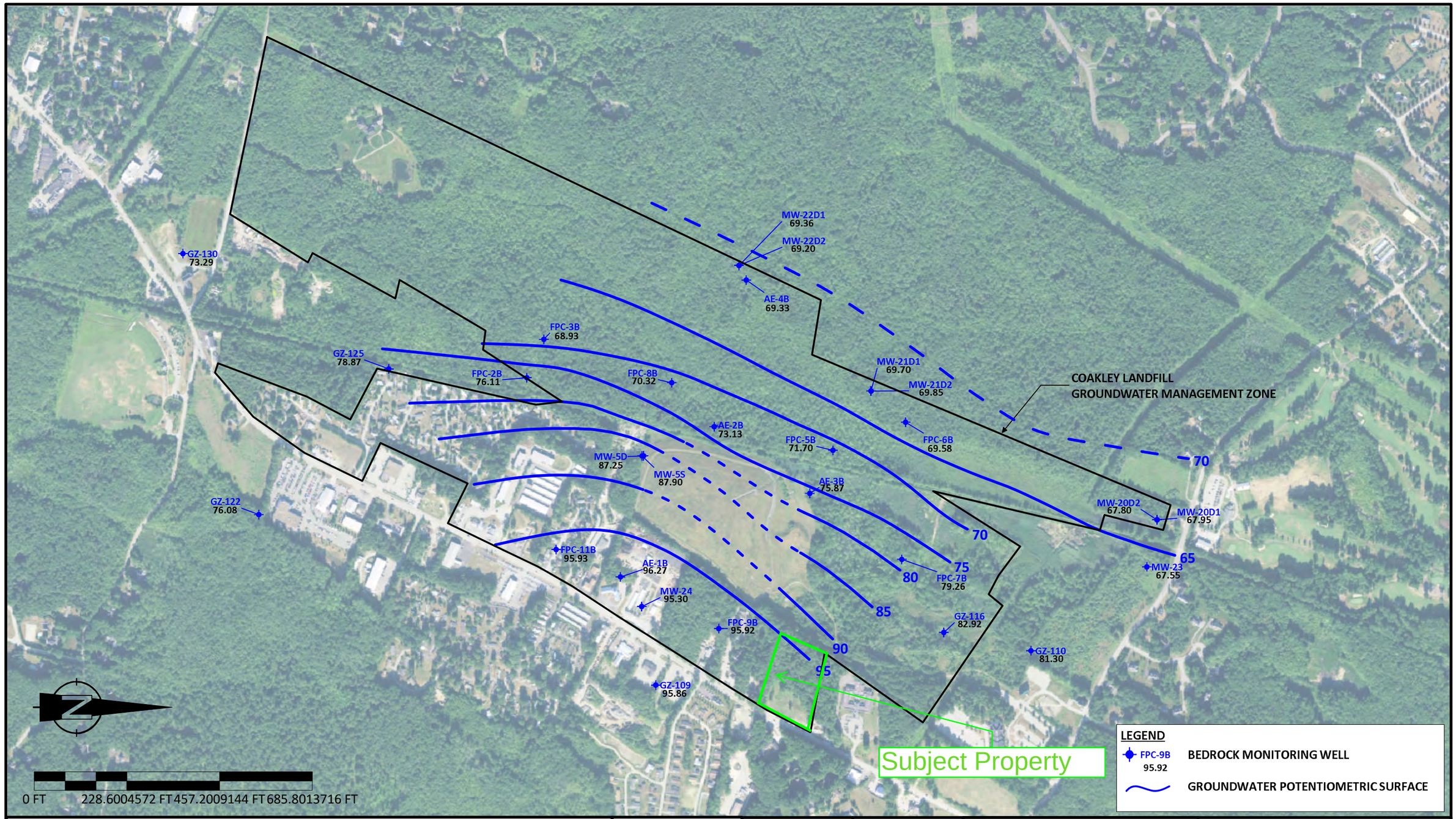
SHEET TITLE
GROUNDWATER MONITORING WELL NETWORK
OVERBURDEN AND BEDROCK MONITORING WELLS

CES INC
Engineers • Environmental Scientists • Surveyors

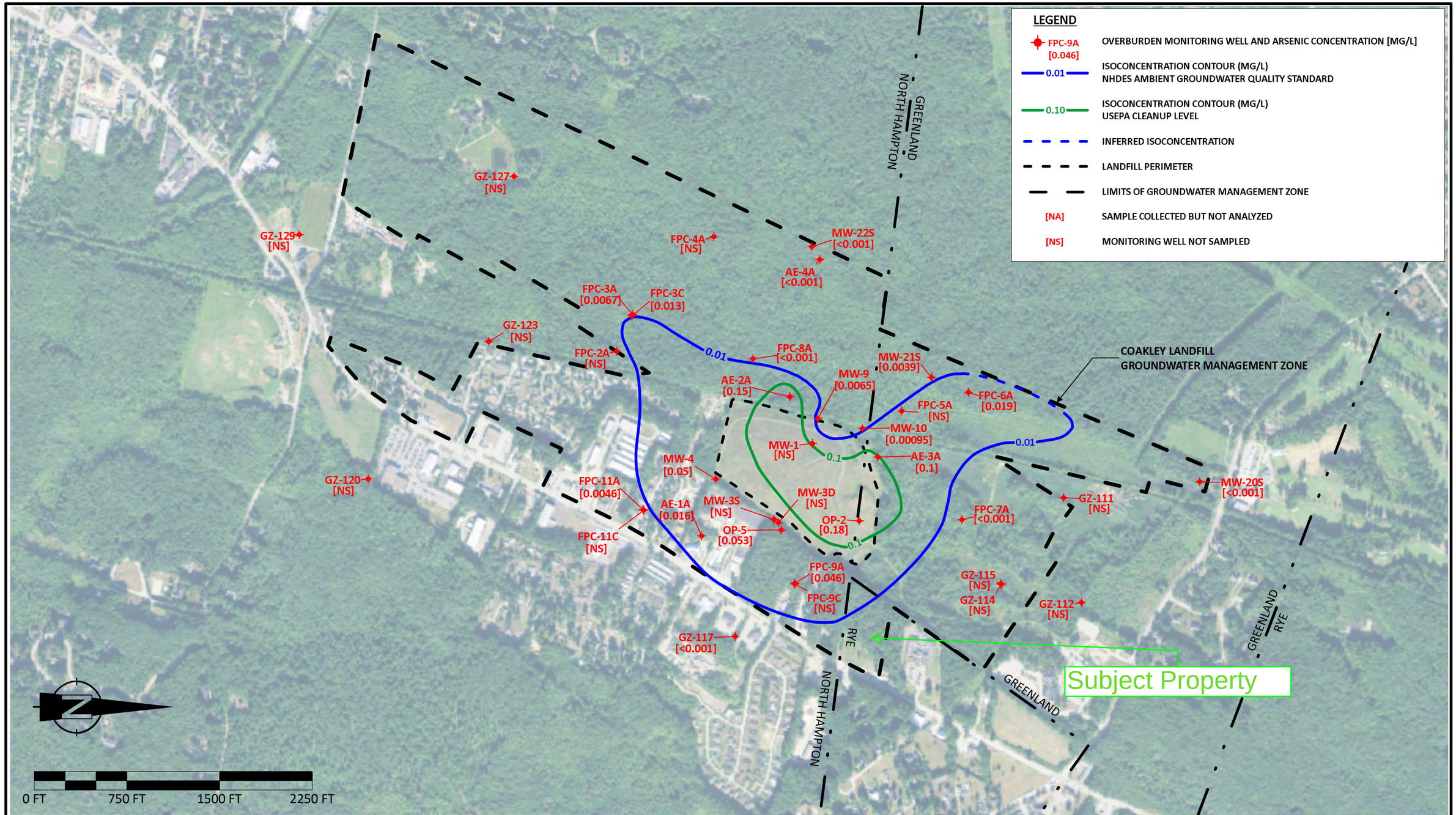
Brewer, 465 South Main Street, PO Box 639, Brewer, ME, T.207-989-4824, F.207-989-4881
Bar Harbor, 1366 State Hwy 102, Bar Harbor, ME, T.207-288-0587, F.207-288-0588
Lewiston, 640 Main Street, Lewiston, ME, T.207-795-6009, F.207-795-6128
Machias, 61 Dublin Street, PO Box 567, Machias, ME, T.207-255-3270, F.207-255-6367
Presque Isle, 549 Main Street, PO Box 827, Presque Isle, ME, T.207-764-8412, F.207-764-8414
Waterville, 44 Main Street, Suite 204, Waterville, ME, T.207-680-2202, F.207-680-2204
Saco, 146 Main Street, Suite 300, Saco, ME, T.207-283-9151, F.207-283-9136
BWLK, a division of CES, Inc., 13041 McGregor Blvd, Fort Myers, FL 33919, T.239-481-1331, F.239-481-1073



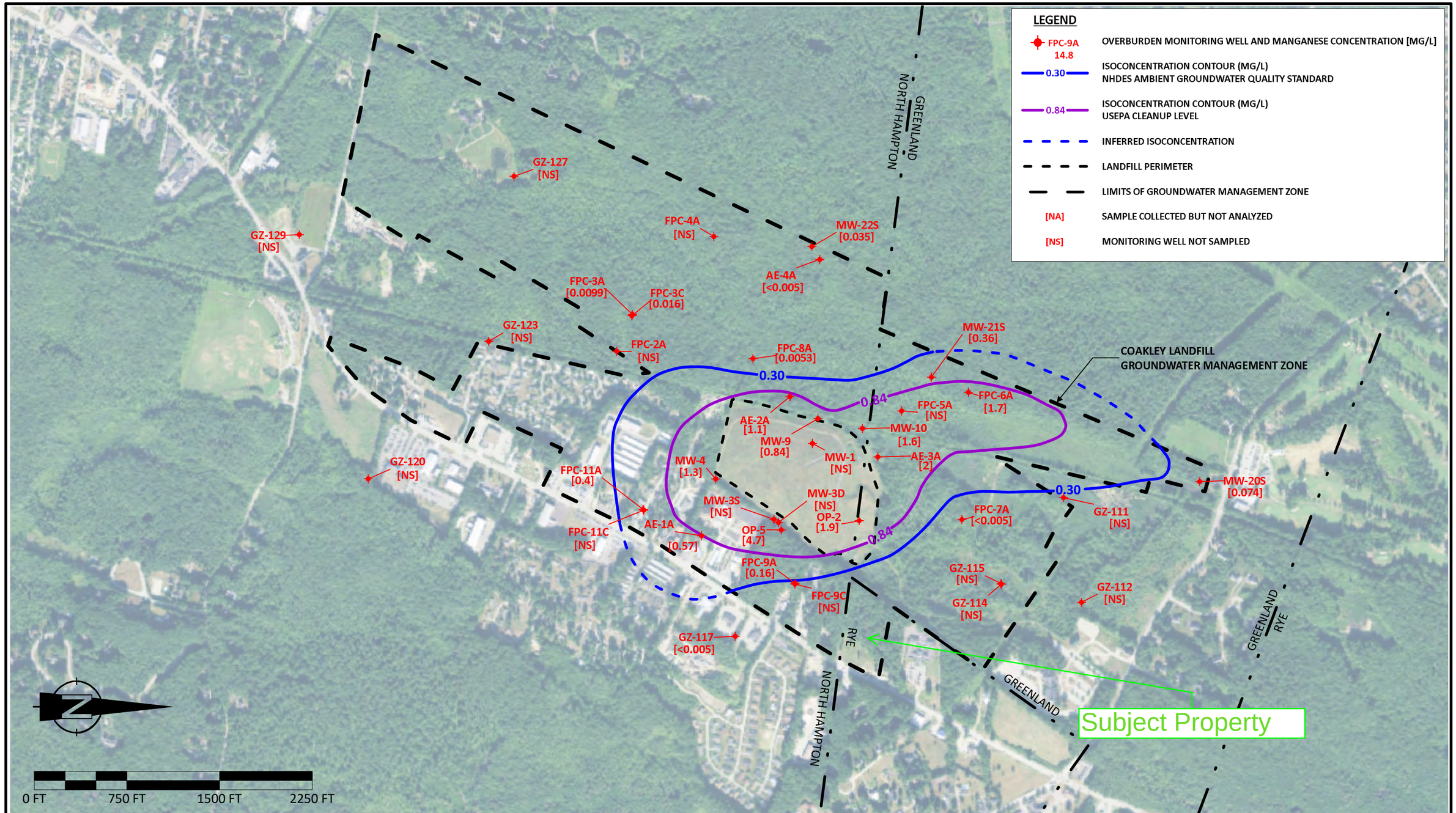
PROJECT TITLE: COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE	DWG: FIGURE 3	BY: CFB	REV:	NOTE: N/M - NOT MEASURED N/A - NOT INSTALLED AT TIME OF GAUGING OR HAD BLOCKAGE	CES INC Engineers • Environmental Scientists • Surveyors
SHEET TITLE: SPRING 2019 OVERBURDEN GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR MAP	JN: 10424.024	DATE: 2020-05-28	REV DATE:		
	SCALE: AS SHOWN	APPROVED BY: MAD	ISSUE:		
		CHECKED BY: CFB	ISSUE DATE:		



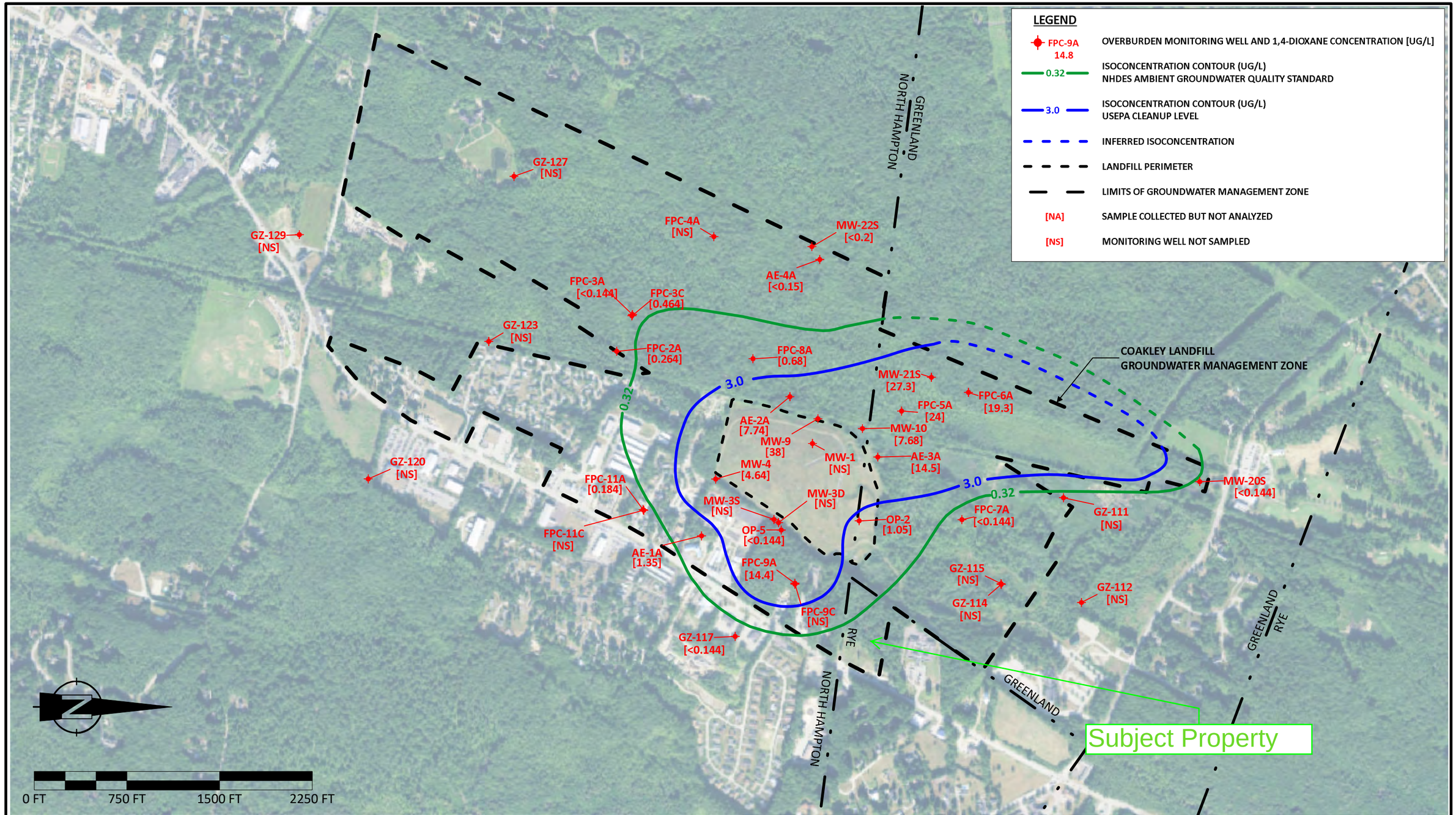
PROJECT TITLE: COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE	DWG: FIGURE 4	BY: CFB	REV:	NOTE: N/M - NOT MEASURED FROZ - FROZEN N/A - NOT INSTALLED AT TIME OF GAUGING OR HAD BLOCKAGE	CES INC Engineers • Environmental Scientists • Surveyors
SHEET TITLE: FALL 2019 BEDROCK GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR MAP	JN: 10424.016	DATE: 2020-06-22	REV DATE:		
	SCALE: AS SHOWN	APPROVED BY: SLY	ISSUE:		
		CHECKED BY: CFB	ISSUE DATE:		



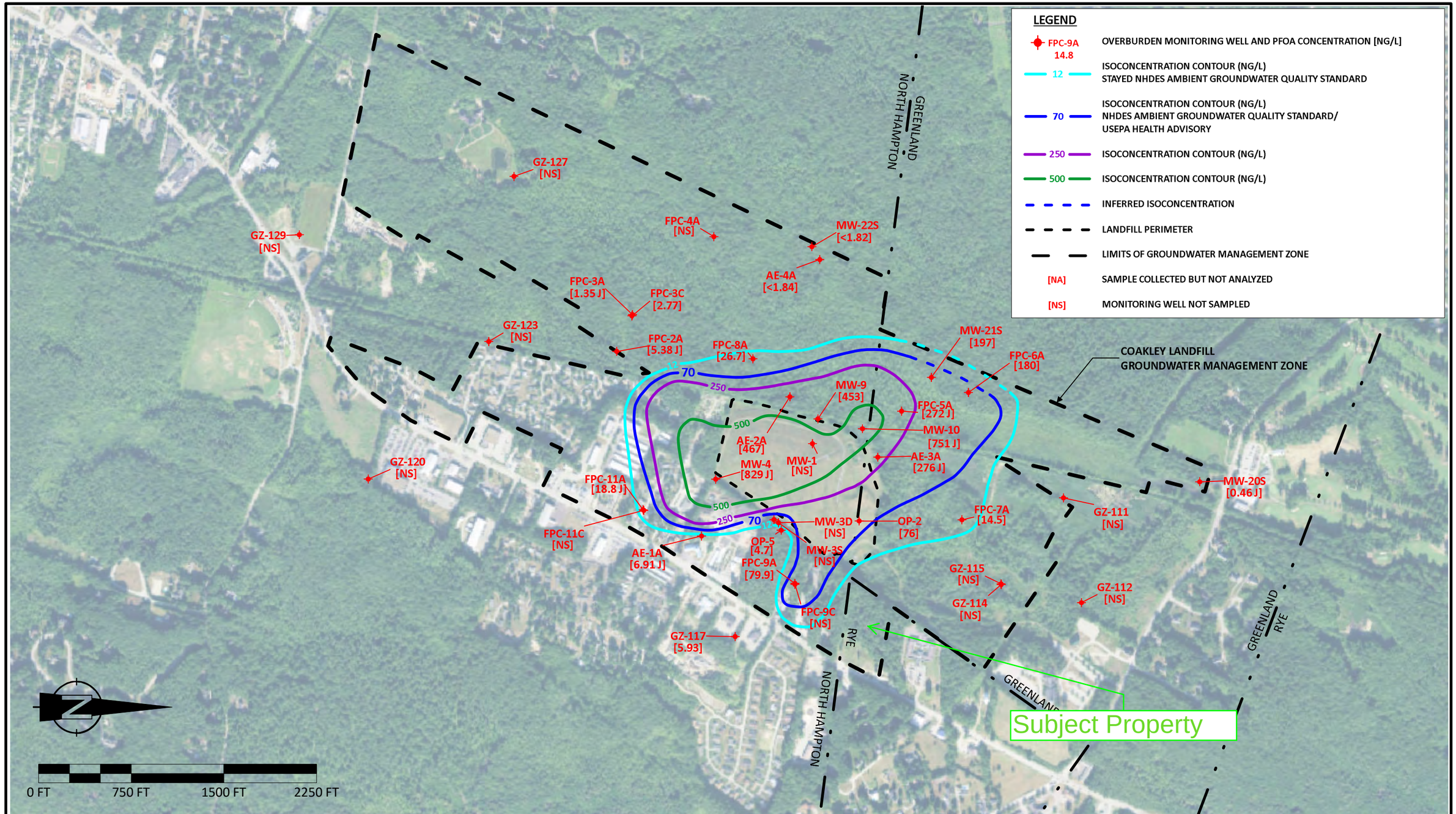
PROJECT TITLE: COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE	DWG: FIGURE 5	BY: KWD	REV:	NOTE:	CES INC Engineers • Environmental Scientists • Surveyors
SHEET TITLE: SPRING 2019 LATERAL DISTRIBUTION OF DISSOLVED ARSENIC IN OVERBURDEN GROUNDWATER	JN: 10424.024	DATE: 2020-05-12	REV DATE:		
	SCALE: AS SHOWN	APPROVED BY: CFB	ISSUE:		
		CHECKED BY: SLY	ISSUE DATE:		



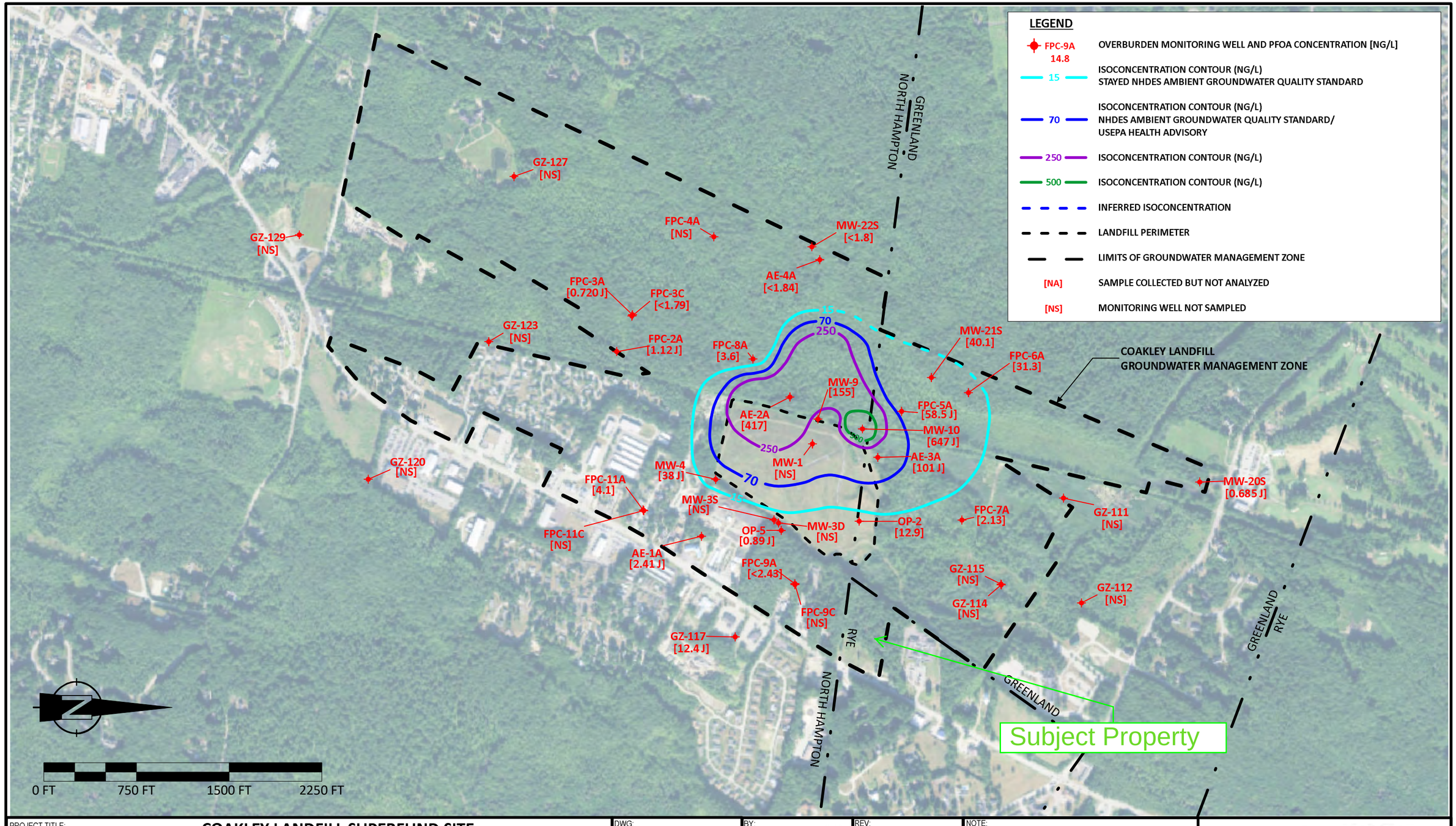
PROJECT TITLE: **COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE**	DWG: **FIGURE 6**	BY: KWD	REV:	NOTE:	CES INC Engineers • Environmental Scientists • Surveyors
SHEET TITLE: **SPRING 2019 LATERAL DISTRIBUTION OF DISSOLVED MANGANESE IN OVERBURDEN GROUNDWATER**	JN: 10424.024	DATE: 2020-05-12	REV DATE:		
	SCALE: AS SHOWN	APPROVED BY: CFB	ISSUE:		
		CHECKED BY: SLY	ISSUE DATE:		



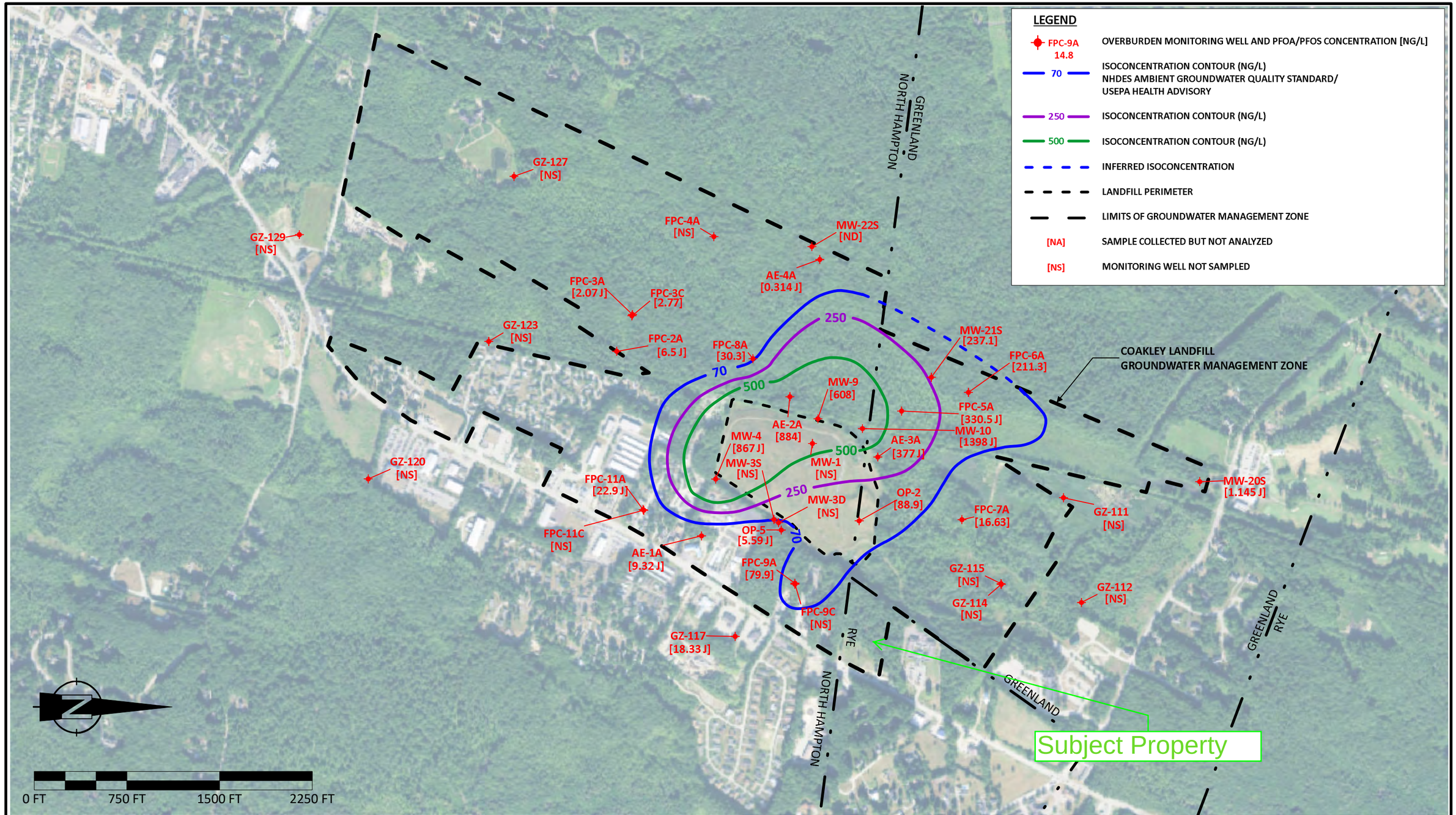
PROJECT TITLE: COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE	DWG: FIGURE 7	BY: KWD	REV:	NOTE:	CES INC Engineers • Environmental Scientists • Surveyors
SHEET TITLE: FALL 2019 LATERAL DISTRIBUTION OF 1,4-DIOXANE IN OVERBURDEN GROUNDWATER	JN: 10424.024	DATE: 2020-05-12	REV DATE:		
	SCALE: AS SHOWN	APPROVED BY: CFB	ISSUE:		
		CHECKED BY: SLY	ISSUE DATE:		



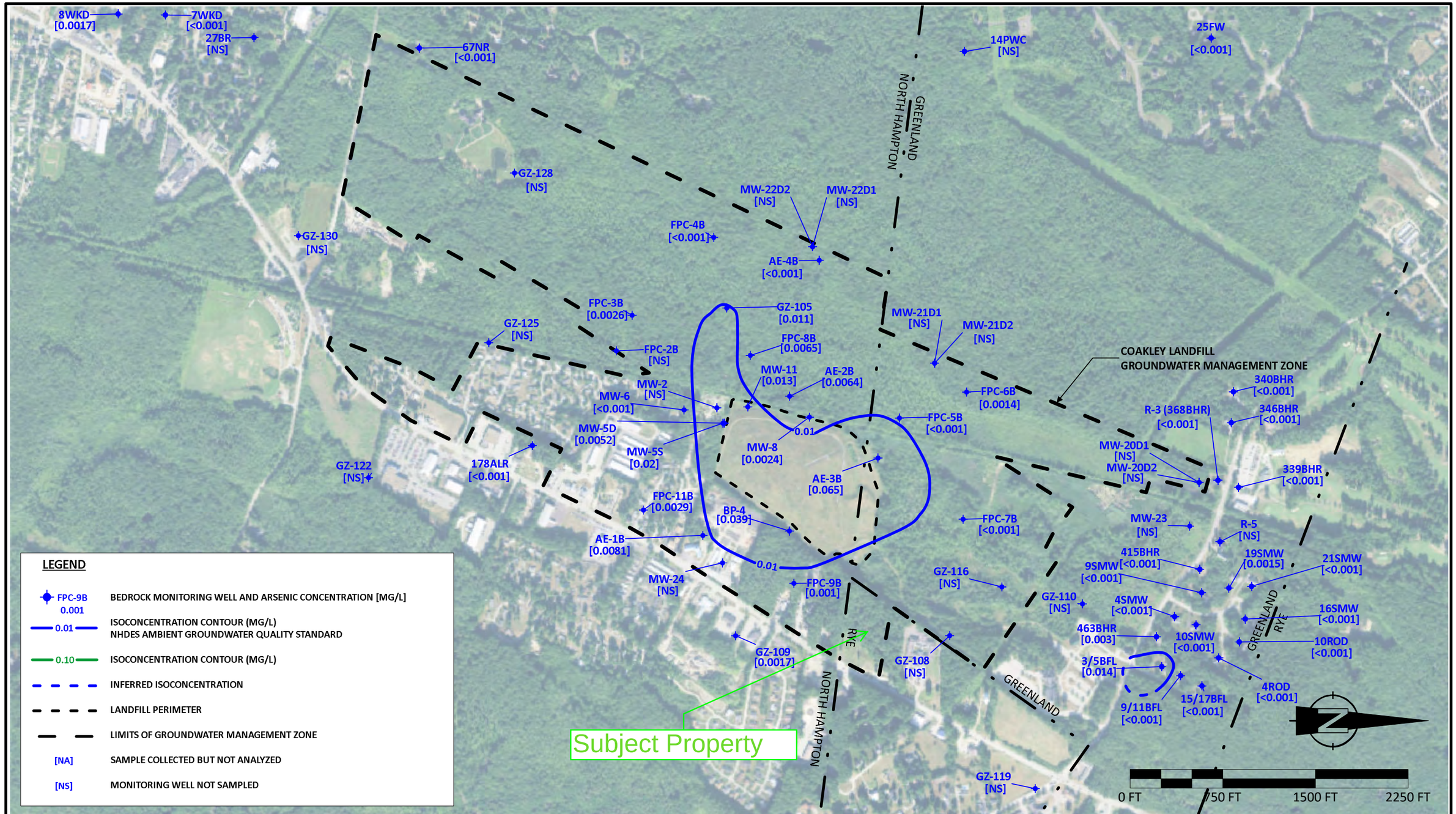
PROJECT TITLE: COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE	DWG: **FIGURE 8**	BY: CFB	REV:	NOTE: On September 30, 2019, the AGQS for PFAS compounds perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were lowered from their previous AGQS of 70 nanograms per liter (ng/L) each to 12 ng/L and 15 ng/L, respectively. These standards were stayed by a court ruling on December 31, 2019.	CES INC Engineers • Environmental Scientists • Surveyors
SHEET TITLE: FALL 2019 LATERAL DISTRIBUTION OF PFOA IN OVERBURDEN GROUNDWATER	JN: 10424.024	DATE: 2020-06-25	REV DATE:		
	SCALE: AS SHOWN	APPROVED BY: CFB	ISSUE:		
		CHECKED BY: SLY	ISSUE DATE:		



PROJECT TITLE: COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE	DWG: FIGURE 9	BY: KWD	REV:	NOTE: On September 30, 2019, the AGQS for PFAS compounds perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were lowered from their previous AGQS of 70 nanograms per liter (ng/L) each to 12 ng/L and 15 ng/L, respectively. These standards were stayed by a court ruling on December 31, 2019.	CES INC Engineers • Environmental Scientists • Surveyors
SHEET TITLE: FALL 2019 LATERAL DISTRIBUTION OF PFOS IN OVERBURDEN GROUNDWATER	JN: 10424.024	DATE: 2020-06-25	REV DATE:		
	SCALE: AS SHOWN	APPROVED BY: CFB	ISSUE:		
		CHECKED BY: SLY	ISSUE DATE:		



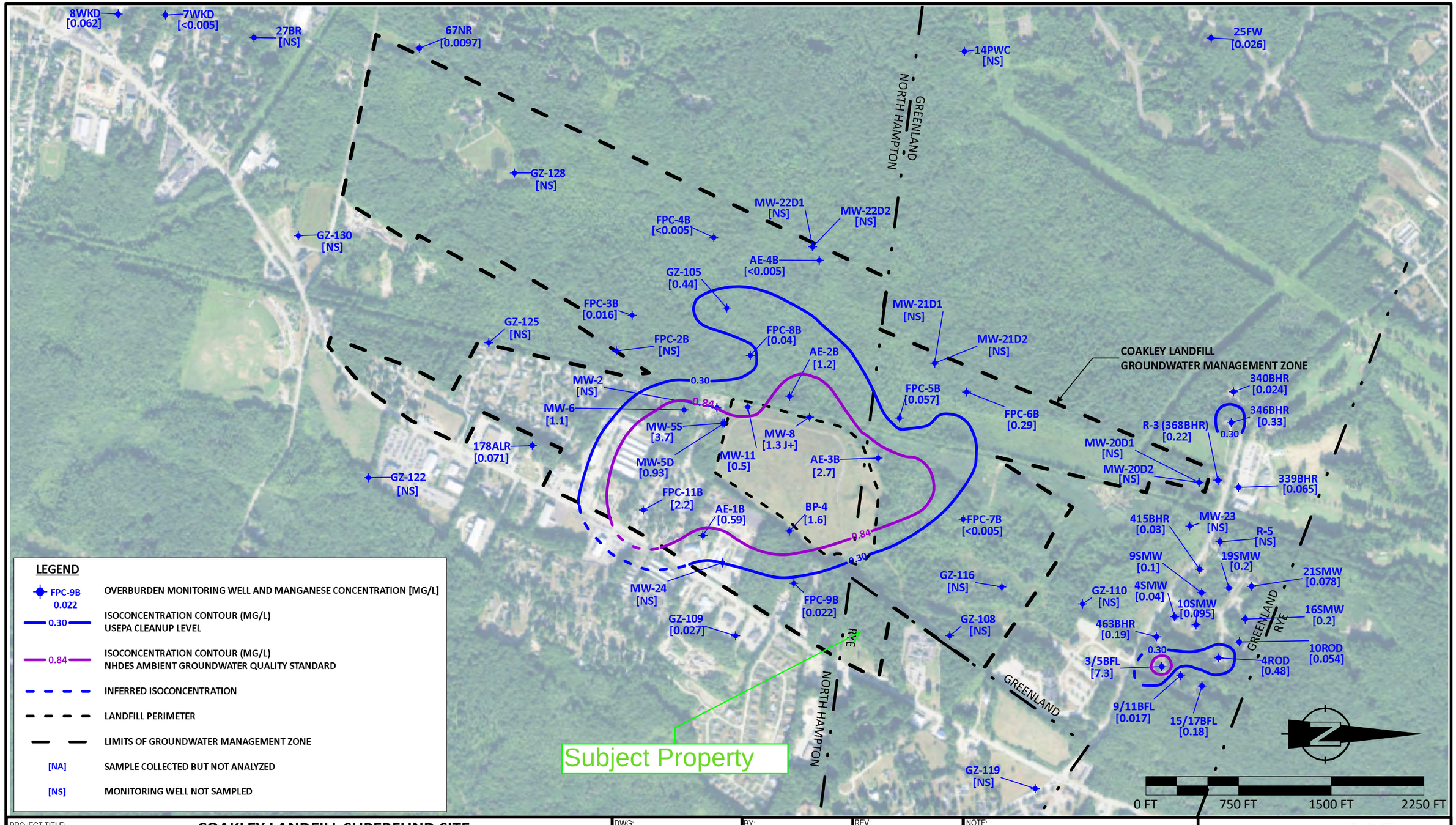
PROJECT TITLE: COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE	DWG: FIGURE 10	BY: KWD	REV:	NOTE:	CES INC Engineers • Environmental Scientists • Surveyors
SHEET TITLE: FALL 2019 LATERAL DISTRIBUTION OF PFOA + PFOS IN OVERBURDEN GROUNDWATER	JN: 10424.024	DATE: 2020-05-12	REV DATE:		
	SCALE: AS SHOWN	APPROVED BY: CFB	ISSUE:		
		CHECKED BY: SLY	ISSUE DATE:		



LEGEND

FPC-9B 0.001	BEDROCK MONITORING WELL AND ARSENIC CONCENTRATION [MG/L]
0.01	ISOCONCENTRATION CONTOUR (MG/L) NHDES AMBIENT GROUNDWATER QUALITY STANDARD
0.10	ISOCONCENTRATION CONTOUR (MG/L)
	INFERRED ISOCONCENTRATION
	LANDFILL PERIMETER
	LIMITS OF GROUNDWATER MANAGEMENT ZONE
[NA]	SAMPLE COLLECTED BUT NOT ANALYZED
[NS]	MONITORING WELL NOT SAMPLED

PROJECT TITLE: COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE	DWG: FIGURE 11	BY: KWD	REV:	NOTE:	CES INC Engineers • Environmental Scientists • Surveyors
		DATE: 2020-05-12	REV DATE:		
SHEET TITLE: SPRING 2019 LATERAL DISTRIBUTION OF TOTAL ARSENIC IN BEDROCK GROUNDWATER	JN: 10424.024	APPROVED BY: CFB	ISSUE:		
	SCALE: AS SHOWN	CHECKED BY: SLY	ISSUE DATE:		



LEGEND

FPC-9B 0.022	OVERBURDEN MONITORING WELL AND MANGANESE CONCENTRATION [MG/L]
0.30	ISOCONCENTRATION CONTOUR (MG/L) USEPA CLEANUP LEVEL
0.84	ISOCONCENTRATION CONTOUR (MG/L) NHDES AMBIENT GROUNDWATER QUALITY STANDARD
	INFERRED ISOCONCENTRATION
	LANDFILL PERIMETER
	LIMITS OF GROUNDWATER MANAGEMENT ZONE
[NA]	SAMPLE COLLECTED BUT NOT ANALYZED
[NS]	MONITORING WELL NOT SAMPLED

PROJECT TITLE: **COAKLEY LANDFILL SUPERFUND SITE**
NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE

SHEET TITLE: **SPRING 2019 LATERAL DISTRIBUTION OF TOTAL MANGANESE IN BEDROCK GROUNDWATER**

DWG: **FIGURE 12**

JN: 10424.024

SCALE: AS SHOWN

BY:	KWD	REV:	
DATE:	2020-05-12	REV DATE:	
APPROVED BY:	CFB	ISSUE:	
CHECKED BY:	SLY	ISSUE DATE:	

NOTE:

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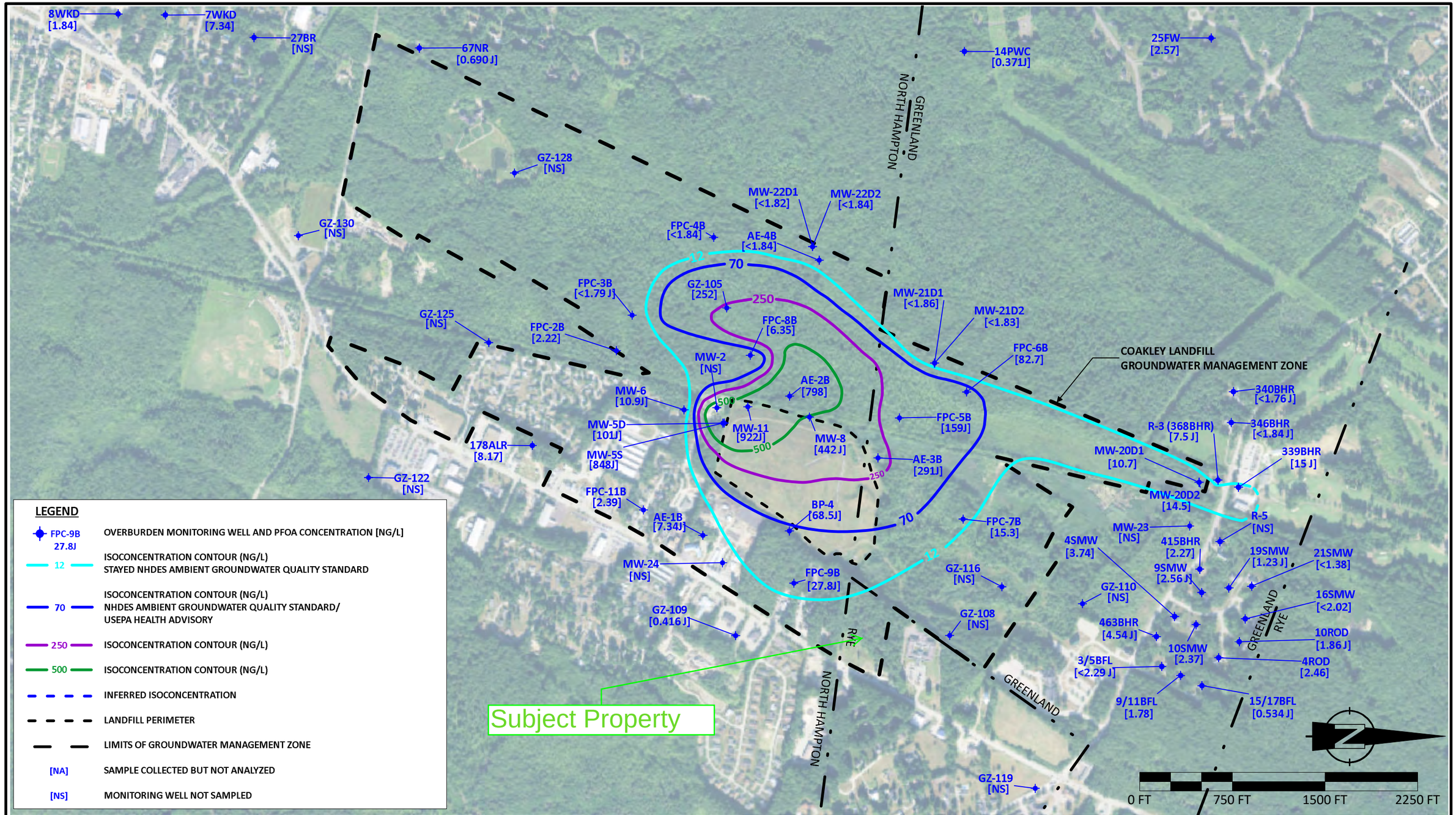
8WKD [<0.132R]
7WKD [<0.147R]
27BR [NS]
67NR [<0.153R]
14PWC [0.136R]
25FW [<0.144R]
GREENLAND
NORTH HAMPTON
GZ-128 [NS]
GZ-130 [NS]
MW-22D1 [<0.15]
MW-22D2 [<0.139]
FPC-4B [<0.15]
0.32
AE-4B [<0.139]
FPC-3B [<0.15]
GZ-105 [49.9]
MW-21D1 [<0.15]
GZ-125 [NS]
FPC-2B [<0.15]
3.0
FPC-8B [0.51]
MW-21D2 [<0.15]
MW-2 [NS]
AE-2B [56.9]
COAKLEY LANDFILL
GROUNDWATER MANAGEMENT ZONE
MW-6 [<0.139]
FPC-6B [9]
340BHR [<0.129R]
MW-8 [146]
346BHR [<0.144R]
MW-5S [32.9]
FPC-5B [42.3]
178ALR [0.182J-]
MW-11 [35.1]
MW-5D [132]
MW-20D1 [0.412]
AE-3B [16.4]
MW-20D2 [0.613]
R-3 (368BHR) [0.377J-]
GZ-122 [NS]
3.0
339BHR [0.385J-]
FPC-11B [<0.15]
FPC-7B [0.178]
MW-23 [NS]
BP-4 [7.14]
415BHR [<0.142R]
R-5 [NS]
AE-1B [1.22]
19SMW [<0.136R]
21SMW [<0.136R]
GZ-116 [NS]
9SMW [<0.147R]
MW-24 [NS]
FPC-9B [5.53]
4SMW [<0.144R]
GZ-110 [NS]
16SMW [<0.139R]
GZ-109 [<0.144]
0.32
GZ-108 [NS]
GREENLAND
RYE
463BHR [<0.136R]
10SMW [<0.139R]
10ROD [<0.136R]
3/5BFL [<0.147R]
4ROD [<0.132R]
RYE
NORTH HAMPTON
GREENLAND
9/11BFL [<0.132R]
15/17BFL [<0.139R]
Subject Property
GZ-119 [NS]
N
0 FT
750 FT
1500 FT
2250 FT

LEGEND

- FPC-9B 5.53 — OVERBURDEN MONITORING WELL AND 1,4-DIOXANE CONCENTRATION [UG/L]
- 0.32 — ISOCONCENTRATION CONTOUR (UG/L) NHDES AMBIENT GROUNDWATER QUALITY STANDARD
- 3.0 — ISOCONCENTRATION CONTOUR (UG/L) USEPA CLEANUP LEVEL
- INFERRED ISOCONCENTRATION
- LANDFILL PERIMETER
- LIMITS OF GROUNDWATER MANAGEMENT ZONE
- [NA] — SAMPLE COLLECTED BUT NOT ANALYZED
- [NS] — MONITORING WELL NOT SAMPLED

PROJECT TITLE: COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE	DWG: FIGURE 13	BY: KWD	REV:	NOTE:	CES INC Engineers • Environmental Scientists • Surveyors
SHEET TITLE: FALL 2019 LATERAL DISTRIBUTION OF 1,4-DIOXANE IN BEDROCK GROUNDWATER	JN: 10424.024	DATE: 2020-05-12	REV DATE:		
	SCALE: AS SHOWN	APPROVED BY: CFB	ISSUE:		
		CHECKED BY: SLY	ISSUE DATE:		



LEGEND

FPC-9B 27.8J	OVERBURDEN MONITORING WELL AND PFOA CONCENTRATION [NG/L]
12	ISOCONCENTRATION CONTOUR (NG/L) STAYED NHDES AMBIENT GROUNDWATER QUALITY STANDARD
70	ISOCONCENTRATION CONTOUR (NG/L) NHDES AMBIENT GROUNDWATER QUALITY STANDARD/ USEPA HEALTH ADVISORY
250	ISOCONCENTRATION CONTOUR (NG/L)
500	ISOCONCENTRATION CONTOUR (NG/L)
	INFERRED ISOCONCENTRATION
	LANDFILL PERIMETER
	LIMITS OF GROUNDWATER MANAGEMENT ZONE
[NA]	SAMPLE COLLECTED BUT NOT ANALYZED
[NS]	MONITORING WELL NOT SAMPLED

PROJECT TITLE: **COAKLEY LANDFILL SUPERFUND SITE**
NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE

SHEET TITLE: **FALL 2019 LATERAL DISTRIBUTION OF PFOA IN BEDROCK GROUNDWATER**

DWG: **FIGURE 14**

JN: 10424.024

SCALE: AS SHOWN

BY:	CFB	REV:	
DATE:	2020-06-24	REV DATE:	
APPROVED BY:	CFB	ISSUE:	
CHECKED BY:	SLY	ISSUE DATE:	

NOTE:
On September 30, 2019, the AGQS for PFAS compounds perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were lowered from their previous AGQS of 70 nanograms per liter (ng/L) each to 12 ng/L and 15 ng/L, respectively. These standards were stayed by a court ruling on December 31, 2019.

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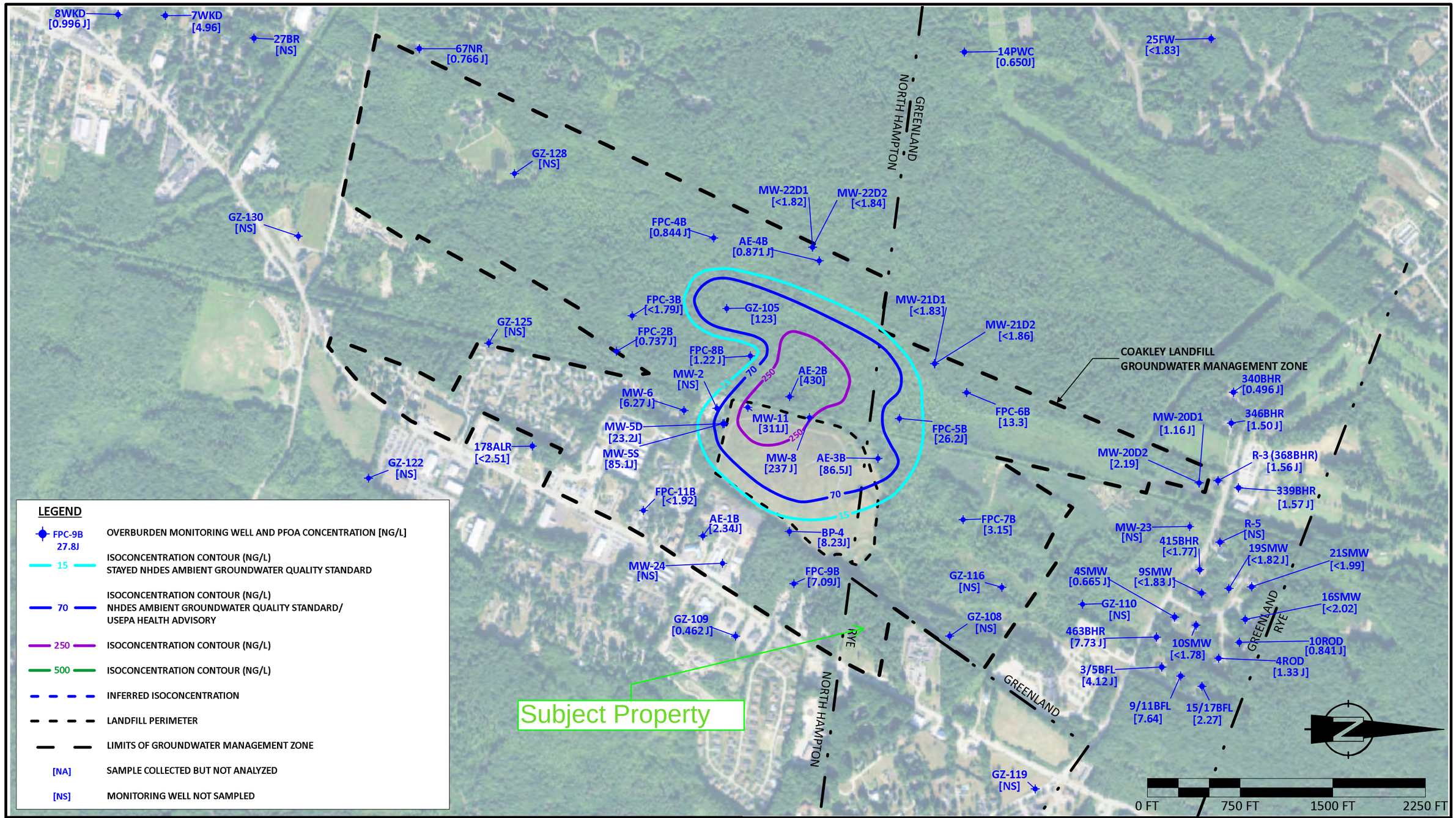

LEGEND

FPC-9B 27.8J	OVERBURDEN MONITORING WELL AND PFOA CONCENTRATION [NG/L]
15	ISOCONCENTRATION CONTOUR (NG/L) STAYED NHDES AMBIENT GROUNDWATER QUALITY STANDARD
70	ISOCONCENTRATION CONTOUR (NG/L) NHDES AMBIENT GROUNDWATER QUALITY STANDARD/ USEPA HEALTH ADVISORY
250	ISOCONCENTRATION CONTOUR (NG/L)
500	ISOCONCENTRATION CONTOUR (NG/L)
	INFERRED ISOCONCENTRATION
	LANDFILL PERIMETER
	LIMITS OF GROUNDWATER MANAGEMENT ZONE
[NA]	SAMPLE COLLECTED BUT NOT ANALYZED
[NS]	MONITORING WELL NOT SAMPLED

PROJECT TITLE: **COAKLEY LANDFILL SUPERFUND SITE**
NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE

SHEET TITLE: **FALL 2019 LATERAL DISTRIBUTION OF PFOS IN BEDROCK GROUNDWATER**

DWG: **FIGURE 15**

JN: 10424.024

SCALE: AS SHOWN

BY:	KWD	REV:	
DATE:	2020-06-25	REV DATE:	
APPROVED BY:	CFB	ISSUE:	
CHECKED BY:	SLY	ISSUE DATE:	

NOTE:
On September 30, 2019, the AGQS for PFAS compounds perfluor-ooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were lowered from their previous AGQS of 70 nanograms per liter (ng/L) each to 12 ng/L and 15 ng/L, respectively. These standards were stayed by a court ruling on December 31, 2019.

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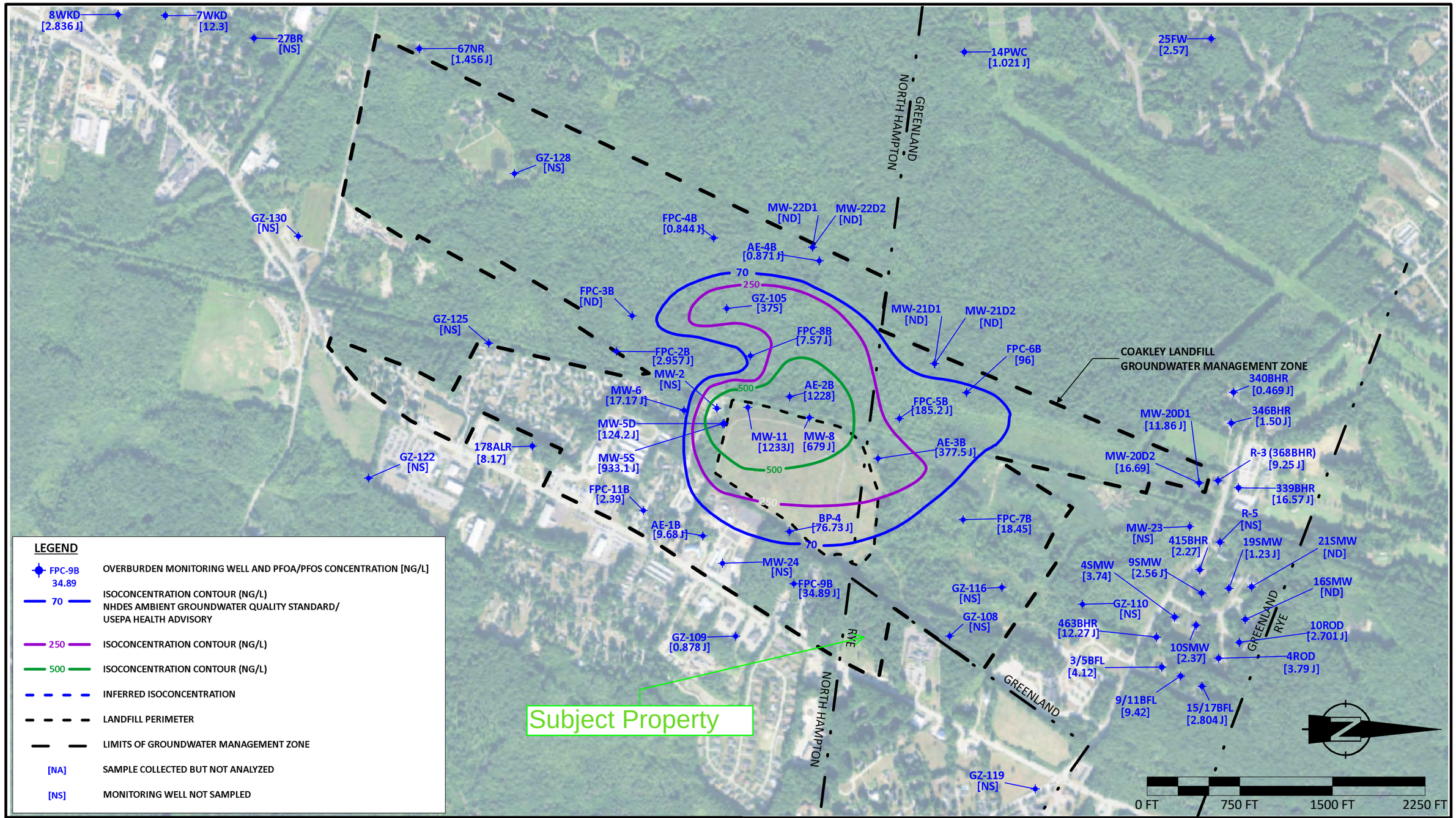

LEGEND

FPC-9B 34.89	OVERBURDEN MONITORING WELL AND PFOA/PFOS CONCENTRATION [NG/L]
70	ISOCONCENTRATION CONTOUR (NG/L) NHDES AMBIENT GROUNDWATER QUALITY STANDARD/ USEPA HEALTH ADVISORY
250	ISOCONCENTRATION CONTOUR (NG/L)
500	ISOCONCENTRATION CONTOUR (NG/L)
	INFERRED ISOCONCENTRATION
	LANDFILL PERIMETER
	LIMITS OF GROUNDWATER MANAGEMENT ZONE
[NA]	SAMPLE COLLECTED BUT NOT ANALYZED
[NS]	MONITORING WELL NOT SAMPLED

PROJECT TITLE: **COAKLEY LANDFILL SUPERFUND SITE**
NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE

SHEET TITLE: **FALL 2019 LATERAL DISTRIBUTION OF PFOA + PFOS IN BEDROCK GROUNDWATER**

DWG: **FIGURE 16**

JN:	10424.024		
SCALE:	AS SHOWN		
BY:	KWD	REV:	
DATE:	2020-05-12	REV DATE:	
APPROVED BY:	CFB	ISSUE:	
CHECKED BY:	SLY	ISSUE DATE:	

NOTE:

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ATTACHMENT F

GROUNDWATER MOUNDING AND NITRATE LOADING/MASS BALANCE SPREADSHEETS

NEW HAMPSHIRE | MASSACHUSETTS | CONNECTICUT | MAINE
GEOINSIGHT.COM | INFO@GEOINSIGHT.COM | 800.271.1953

Maximum groundwater mound height in response to uniform percolation given by Hantush (1967) is:

$h_m^2-h_i^2=(2\omega/K)\nu t S^*(\alpha,\beta)$

Where:

h_m = maximum saturated thickness as a result of loading (ft)

h_i = initial saturated thickness (ft)

ω = loading rate (cubic feet per day)
or $(Q/7.4805)/(2l^* 2\alpha)$
Q= loading rate (GPD)
l= half length of loading area (ft)
α= half width of loading area (ft)

K = hydraulic conductivity (ft/day)

ν = Kb/ε
b= $\frac{1}{2}(h_i+h_m) \approx h_i$ since $(h_i-h_m) \ll h_i$
ε= porosity (dimensionless)

t = duration of loading (days)

$S^*(\alpha,\beta)$= an integral error function determined from tables
$\alpha = l/(4\nu t)^{1/2}$
$\beta = \alpha/(4\nu t)^{1/2}$

Given:

h_i	=	10	ft
K	=	23	ft/day
ε	=	0.2	
$2l$	=	42	ft
2α	=	16.5	ft
Q	=	960	GPD
t	=	30.0	days

Solution:

ω = (960 / 7.4805) / (42 * 16.5) = 0.19

ν = (23 * 10) / 0.2 = 1150.00

α = (21 / (4 * 1150 * 30.0)$^{1/2}$ = 0.057

β = (8.25 / (4 * 1150 * 30.0)$^{1/2}$ = 0.022

$S^*(\alpha,\beta)$ = 0.0101 (from table)

$h_m^2-h_i^2$ = (2 * 0.19 / 23) * 1150.0 * 30.00 * 0.0101 = 5.61

h_m = (5.61 + 10 ^{2})$^{1/2}$ = 10.28

Mound Height = 10.28 - h_i = 0.3 feet

Maximum groundwater mound height in response to uniform percolation given by Hantush (1967) is:

$h_m^2-h_i^2=(2\omega/K)\nu t S^*(\alpha,\beta)$

Where:

h_m = maximum saturated thickness as a result of loading (ft)

h_i = initial saturated thickness (ft)

ω = loading rate (cubic feet per day)
or $(Q/7.4805)/(2l^* 2\alpha)$
Q= loading rate (GPD)
l= half length of loading area (ft)
α= half width of loading area (ft)

K = hydraulic conductivity (ft/day)

ν = Kb/ε
b= $\frac{1}{2}(h_i+h_m) \approx h_i$ since $(h_i-h_m) \ll h_i$
ε= porosity (dimensionless)

t = duration of loading (days)

$S^*(\alpha,\beta)$= an integral error function determined from tables
$\alpha = l/(4\nu t)^{1/2}$
$\beta = \alpha/(4\nu t)^{1/2}$

Given:

h_i	=	10	ft
K	=	23	ft/day
ε	=	0.2	
$2l$	=	42	ft
2α	=	16.5	ft
Q	=	960	GPD
t	=	180.0	days

Solution:

ω = (960 / 7.4805) / (42 * 16.5) = 0.19

ν = (23 * 10) / 0.2 = 1150.00

α = (21 / (4 * 1150 * 180.0)$^{1/2}$ = 0.023

β = (8.25 / (4 * 1150 * 180.0)$^{1/2}$ = 0.009

$S^*(\alpha,\beta)$ = 0.0041 (from table)

$h_m^2-h_i^2$= (2 * 0.19 / 23) * 1150.0 * 180.00 * 0.0041 = 13.67

h_m= (13.67 + 10 ^{2})$^{1/2}$ = 10.66

Mound Height = 10.66 - h_i = 0.7 feet

Maximum groundwater mound height in response to uniform percolation given by Hantush (1967) is:

$h_m^2-h_i^2=(2\omega/K)\nu t S^*(\alpha,\beta)$

Where:

h_m = maximum saturated thickness as a result of loading (ft)

h_i = initial saturated thickness (ft)

ω = loading rate (cubic feet per day)
or $(Q/7.4805)/(2l^* 2\alpha)$
Q= loading rate (GPD)
l= half length of loading area (ft)
α= half width of loading area (ft)

K = hydraulic conductivity (ft/day)

ν = Kb/ε
b= $\frac{1}{2}(h_i+h_m) \approx h_i$ since $(h_i-h_m) \ll h_i$
ε= porosity (dimensionless)

t = duration of loading (days)

$S^*(\alpha,\beta)$= an integral error function determined from tables
$\alpha = l/(4\nu t)^{1/2}$
$\beta = \alpha/(4\nu t)^{1/2}$

Given:

h_i =	10	ft
K =	23	ft/day
ε =	0.2	
$2l$ =	42	ft
2α =	16.5	ft
Q =	960	GPD
t =	365.0	days

Solution:

ω = (960 / 7.4805) / (42 * 16.5) = 0.19

ν = (23 * 10) / 0.2 = 1150.00

α = (21 / (4 * 1150 * 365.0)$^{1/2}$ = 0.016

β = (8.25 / (4 * 1150 * 365.0)$^{1/2}$ = 0.006

$S^*(\alpha,\beta)$ = 0.0041 (from table)

$h_m^2-h_i^2$= (2 * 0.19 / 23) * 1150.0 * 365.00 * 0.0041 = 27.71

h_m= (27.71 + 10 ^{2})$^{1/2}$ = 11.30

Mound Height = 11.30 - h_i = 1.3 feet

NITROGEN LOADING CALCULATION

I Nitrogen Load

A. Septic

wastewater volume (gallons/day)				septic nitrogen (mg/yr)
9600	x	40 mg/L (given -- 85% reduction)	=	79,470,720

B. Fertilizer

lawn area (sq ft)				fertilizer nitrogen (lbs/yr)		fertilizer nitrogen (mg/yr)
43,560 ESTIMATE	x	3 lbs/ 1000 sq ft / yr (given -- 25% leached)	=	33	or	14,818,851

Total Nitrogen = 94,289,571 mg/yr

II Recharge Volume

A. Precipitation

recharge area (ac)		imperv. area (ac)		recharge area (sq ft)
3.53	-	1.72	=	78,869

average precip (in/yr)		% infiltrate		recharge rate (ft/day)
50	x	50	=	0.0057

recharge area (sq ft)		recharge rate (ft/day)		precipitation recharge (gal/day)
78,869	x	0.0057	=	3,363

B. Septic (not included if water supply is from a well on the site)

septic recharge (gal/day)
9,600

Total Recharge = 4,731,495 gal/yr or 17,908,709 L/yr

III Concentration

Nitrogen Load (mg/yr) / Recharge Volume (L/yr) = 5.3 mg/L

NITROGEN LOADING CALCULATION

I Nitrogen Load

A. Septic

wastewater volume (gallons/day)				septic nitrogen (mg/yr)
9600	x	40 mg/L (no reduction)	=	529,804,800

B. Fertilizer

lawn area (sq ft)				fertilizer nitrogen (lbs/yr)		fertilizer nitrogen (mg/yr)
43,560 ESTIMATE	x	3 lbs/ 1000 sq ft / yr (given -- 25% leached)	=	33	or	14,818,851

Total Nitrogen = 544,623,651 mg/yr

II Recharge Volume

A. Precipitation

recharge area (ac)		imperv. area (ac)		recharge area (sq ft)
3.53	-	1.72	=	78,869

average precip (in/yr)		% infiltrate		recharge rate (ft/day)
50	x	50	=	0.0057

recharge area (sq ft)		recharge rate (ft/day)		precipitation recharge (gal/day)
78,869	x	0.0057	=	3,363

B. Septic (not included if water supply is from a well on the site)

septic recharge (gal/day)
9,600

Total Recharge = 4,731,495 gal/yr or 17,908,709 L/yr

III Concentration

Nitrogen Load (mg/yr) / Recharge Volume (L/yr) = 30.4 mg/L