

HYDROGEOLOGIC EVALUATION

Tanglewood Development
Candia & Chester, New Hampshire

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1.0 INTRODUCTION

1.1 PURPOSE

Verdantas LLC (Verdantas) prepared this assessment to summarize our review of hydrogeologic conditions for the proposed development on 191.13 acres of land located off Crowley Road in Candia and Chester, New Hampshire (the Property). The Town of Candia and the Town of Chester, New Hampshire will herein be referred to as “The Towns.” The Towns’ Planning Boards (the Boards) are currently reviewing an application for the development of 28 lot residential subdivision named Tanglewood by DAR, LLC (DAR). Verdantas was provided with a copy of the proposed development plans dated April 30, 2024 included in Appendix A. DAR plans to supply water to the development using individual private bedrock wells and hired Verdantas to assess the ability of the bedrock aquifer to meet the needs of the development, and to provide an opinion on the likelihood that this can be done without adverse impacts to surrounding water users. The purpose of this report is to report on the results of that assessment.

1.2 SITE SETTING

Figure 1 depicts the Property location and Figure 2 depicts an approximate one-mile buffer surrounding the proposed house lots and the associated open space. According to the Towns’ assessor’s databases, the proposed development area of the Property currently consists of four parcels, two in the Town of Candia (Tax Map 414, Lots 152 and 152-10), and two in the Town of Chester (Tax Map 11, Lots 30 and 30-7). The Property is currently undeveloped and owned by DAR Builders LLC. Proposed lot locations in relation to adjacent and nearby lots are depicted in Figure 3 and proposed well locations are depicted on the Grading, Drainage, & Utilities Overview Plan included in Appendix A.

The closest surface water is Fordway Brook located approximately 500 feet to the east at the closest point approach. The water table beneath the Property is inferred to slope generally to the southeast consistent with site topography.



2.0 HYDROGEOLOGIC EVALUATION

2.1 DOMESTIC WELL MINIMUM ACCEPTABLE YIELD

The New Hampshire Department of Environmental Services (NHDES) produced a fact sheet explaining how much water a satisfactory domestic well should be able to produce which has been included as Appendix B. The document offers two alternate approaches to figuring adequate well yield. The first approach requires that the well be capable of supplying at least 600 gallons within a two-hour period once each day. The second approach requires production of 960 gallons within a four-hour period once each day.

Associated with each approach is a table that matches a given sustainable yield with a corresponding recommended well depth. The lower the sustainable yield, the deeper the minimum required depth. The idea is that if a well can sustain only a relatively low pumping rate, the greater depth allows for storage of a proportionately larger volume of water in the wellbore. For example, Table 2 in Appendix B shows the relationship between sustained yield and minimum well depth for the second approach (960 gallons in four hours) indicates that a well capable of a sustained yield of 3 gallons per minute (gpm) should be at least 200 feet deep. However, a well capable of yielding only 0.5 gpm would need to be at least 600 feet deep (Appendix B).

Adopting the second approach as our model, this implies that a domestic well should be capable of producing a total of 960 gallons each day. This amounts to 0.67 gpm when averaged over the course of an entire day, which is generally consistent with a rule of thumb sometimes adopted by drillers that an adequate domestic well should be able to produce at least 1 gpm or better.

2.2 GEOLOGY AND SOILS

Figure 4 is a map of bedrock contacts and formations on LiDAR imagery and Figure 5 includes bedrock geology and topography together with lineaments mapped by the United States Geological Survey as part of its bedrock aquifer assessment project. The Property and all of the area within the one-mile buffer are underlain by metasedimentary and metavolcanic and lower Devonian metasedimentary rock as part of the Proterozoic Z and Lower Devonian periods, respectively.

Lineaments are linear or curvilinear features that can be recognized on topographic maps, aerial photos, satellite images, and other map-like products. They are of interest in bedrock aquifer studies because lineaments can sometimes represent the surface expression of bedrock structures that may correspond with zones of concentrated fracturing, jointing, and faulting characteristic of productive fractured-bedrock aquifers. In some cases, wells drilled along mapped lineaments may tend to have higher-than-average yields. Figure 5 shows lineaments with a range of orientations scattered across the region that includes the project Property. There are approximately three to four prominent lineaments present within the proposed development area of the sort that might be expected to be associated with productive bedrock aquifers. Moreover, the well data obtained from the OneStop database reveals regions of unusually high-water yields



corresponding with individual lineaments, which appear dispersed across the area. For example, the well located along the northwest one-mile buffer is located among multiple lineaments and yields approximately 25 gpm or the lineament located in the southwest area of the one-mile buffer along Raymond and Smith Road displays wells with yields as high as 40 gpm. The well yields for surrounding bedrock supply wells are discussed in section 2.3. Based on geology and lineament patterns, there is no reason to expect that the productivity of bedrock wells drilled to support house lots in the open space subdivision would differ significantly from that of the typical bedrock wells in the surrounding area.

Figure 6 is a soils map, obtained from the U.S. Department of Agriculture (USDA) Web Soil Survey site. The map shows that soil in the project area is dominantly a fine sandy loam. All of the soil deposits are of the type that develop over various categories of glacial sediments, mostly till, but also better-sorted and more permeable deposits (glaciofluvial sand and gravel; basal melt-out till). The soils mapped in the project area can show a wide range of water-transmitting capacities.

2.3 WELL INFORMATION

The NHDES OneStop Database was queried for water well records in the Towns of Candia, Chester, and Raymond. A total of 188 of the wells were identified within one mile of the edge of the area to be occupied by house lots. In considering the information from the database, a few limitations should be kept in mind. The database is not comprehensive and includes only wells that have been recorded by well drillers and uploaded to the NHDES database. Older wells are commonly not included in the database. Some wells are not accompanied by precise location information. The database contains fields for yield, total well depth, depth to bedrock, casing length, and static water level, but data for one or more of these categories may be missing for some wells. Finally, some inaccuracies may exist in the data. In particular, there can be considerable variation in the reliability of driller yield estimates. Despite the limitations, overall, the well data is quite valuable, and the large quantity of well data surrounding the subdivision allows the opportunity for statistical analysis.

Table 1 is a summary of statistics for the 188 wells within one mile of the property to be occupied by house lots. Figures 7, 8, and 9 are maps showing the well locations from the NHDES database, respectively showing yield, total depth, and depth to bedrock of the wells. The fine green line on these figures marks the portion of the Property to be devoted to house lots, the bold red line depicts the boundary of the parcel and open space. All of the wells listed in the database were bedrock wells, with the exception of four wells, two of which were drilling in gravel and two are unknown. Yields were reported for 185 of the 188 wells (Table 1). The average yield was 10.1 gpm, and the median was 6.0 gpm. One hundred and fourteen wells had a yield of less than 10 gpm, refer to Table 2. The average depth of these wells was 442 feet. Drillers typically stop drilling when a well is both deep enough to have adequate storage for household use, and adequate yield has been obtained. The data indicates that drillers generally did not need to drill to great depths to develop a water supply adequate for a household. Additionally, one well was found to be located within the Property but outside of the proposed development area. This well



was drilled to 346 feet and yielded 7 gpm, which is considered a strong and reliable flow rate for residential use.

The average well depth was 378 feet, and the median depth was 360 feet (Table 1); these depths are typical for New Hampshire bedrock wells. The maximum depth was 1,180 feet, and 54 wells were equal to or deeper than 500 feet. The average yield of those wells was 3.6 gpm. This again indicates that it was not necessary to drill excessively deep to get enough water to satisfy a single-family home. The depth to bedrock showed considerable variation, but unconsolidated overburden was less than 20 feet thick at most well sites. Casing lengths are necessarily greater than the depth to bedrock because the casing must be firmly seated in solid bedrock to create a good sanitary seal, but taking that into account, casing lengths closely correlated with bedrock depth.

The final column of Table 1 shows yield per foot of uncased well depth. This variable is a measure of bedrock aquifer productivity. It indicates how deep, on average, a well must be drilled to obtain a given flow rate. For example, the expected well depth to reach a well yield target of 2 gpm using the lowest value for this variable from Table 1 (0.01 gpm/ft, excluding individual wells reporting zero yield) would be:

$$2 \text{ gpm} / 0.01 \text{ gpm/ft} = 200 \text{ feet}$$

This is not an extraordinarily great depth for a New Hampshire bedrock well, and it should be remembered that this depth prediction uses the least-productive well among the 185 wells from the OneStop database (excluding wells showing zero gpm) to develop this depth estimate. It is another indication that the fractured bedrock aquifer in the vicinity of the Property is generally capable of supporting wells capable of producing enough water for an individual household.

The buffer distance of one mile was chosen as a well search radius to ensure that a large enough sampling of wells was included, and it is our opinion that geological conditions within the one-mile buffer are reasonably representative of conditions that can be expected at the project site. However, as a check on that opinion, we also considered the wells within a half mile of the project site. There are 70 wells within a half mile of the edge of the property. Their average yield is 8.5 gpm, and their average depth is 378 feet. These values closely resemble those of the one-mile buffer, as shown on Table 1. We conclude that it is reasonable to expect that wells drilled to serve the homes in the Tanglewood subdivision will have characteristics similar to those summarized in Table 1.

2.4 LOW YIELDING WELLS

Of the 188 wells included in the one-mile search radius only a small proportion, 5% (nine wells) were documented with yields of less than 1 gpm considered adequate for domestic use by NHDES. Wells yielding less than 1 gpm based on well records are plotted in yellow on Figure 7. Several low yield wells are located to the southwest and northwest within a half-mile from the subdivision. The vast majority of wells surrounding the subdivision yield above 1 gpm. Two low



yielding wells were documented near the proposed Tanglewood subdivision (667 Candia Road, Chester, NH [Tax Map 20, Lot 701] and 101 Crowley Road, Chester, NH [Tax Map 29, Lot 3]). These wells located were both drilled to a total depth of 505 feet below grade surface and yield approximately 0.5 gpm each. The well located at 667 Candia Road is surrounded by higher yielding and shallower wells including wells located closer to the subdivision, including adjacent wells drilled to depths of 240 feet and 305 feet below grade surface, yielding approximately 15 and 7 gpm, respectively. The well located at 101 Crowley Road does not have any immediate neighboring wells, however the closest well yields 6 gpm and was drilled to a depth of 1,000 feet.

According to NHDES, the median depth of bedrock wells in New Hampshire is 400 feet and the median yield is 15 gpm, as described in NHDES Environmental Fact Sheet attached as Appendix C. Of the 188 wells included in the one-mile search radius, the average total well depth was 379 feet below grade surface. Seven of these wells were drilled to depths equal to or greater than 800 feet. Two of the seven wells drilled to depths equal to or greater than 800 feet yielded lower than one gpm and one did not report a yield. Only one of these seven wells was located relatively near (within a half mile) the project Property off Crowley Road in Candia (Tax Map 414, Lot 5). The well was drilled to 1,000 feet and yielded approximately 1.5 gpm and is not considered a concern to the proposed development area.



3.0 SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

3.1 FINDINGS AND CONCLUSIONS

Well information from the OneStop database documents that average well yields within one mile of proposed subdivision (10.1 gpm) are well above minimum yields needed for residential drinking water supplies. Of the 188 residential wells within one mile of the subdivision, only nine of these wells (5%) were reported to have a yield less than one gpm, and seven wells had to be drilled equal to or deeper than 800 feet. Six of the nine low yield wells are located over a half mile in various directions around the proposed subdivision. The entire area is underlain by the same rock types including granites of the Proterozoic Z and Lower Devonian Formation, and there is no reason to expect that individual wells drilled in the proposed subdivision would show markedly different yield characteristics than those in the database. Lineament frequencies on the property are similar or denser compared to the surrounding one-mile area suggesting that the bedrock aquifer may be similarly fractured in the project area. The density of wells planned for the proposed subdivision is consistent with that of the wells in several areas within a one-mile buffer. Existing wells in the region immediately surrounding the Tanglewood development have relatively average yields, and data from the OneStop database also show that homeowners typically did not need to drill to extraordinary depths to achieve the yields necessary to supply water to a single-family home.

In our opinion, the aggregate impact of withdrawals from bedrock wells serving the subdivision is not likely to produce undesirable impacts at offsite wells causing a decline in the water table that would interfere with residential use. Considering the large number of well records in the area documenting adequate yields and moderate well depths, the confidence in this assessment of low risk is interpreted to be strong. However, this is an analysis of data trends using existing, available well data. Accordingly, guarantees that there will be no adverse impacts cannot be provided. This analysis assumes that proposed residential wells will be limited to providing water for domestic use. The impact of extensive withdrawals for landscaping, extensive irrigation, farming, or other excessive water uses such as filling swimming pools is not considered.




4.0 LIMITATIONS


Verdantas completed this hydrogeologic study in a manner consistent with similar consultants completing similar studies. Verdantas did not conduct field work in association with this project and our study was limited to review and evaluation of data compiled by others. Conclusions and recommendations are based on limited data over a limited time frame. Verdantas makes no warrantee or guarantee regarding the impact of nearby wells. Additional studies could reveal information that contradicts findings provided in this report.

If you have questions regarding this report, please feel free to call us at the numbers below.

Sincerely,
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Attachments



TABLES

TABLE 1 WELL STATISTICS SUMMARY

TABLE 2 RAW ONESTOP WELL DATA WITHIN 1-MILE BUFFER BY YIELD



**TABLE 1
WELL STATISTICS SUMMARY
HYDROGEOLOGIC STUDY
TANGLEWOOD, CANDIA CHESTER, NH**

	Total Depth	Depth to Bedrock	Casing Length	Yield	Static Water Level	Uncased Depth	Yield Per Foot Uncased Depth
Units	ft	ft	ft	gpm	ft	ft	gpm/ft
1-Mile Buffer							
# of Wells	188	185	186	185	130	185	185
Maximum	1180	90	100	60	594	1080	0.06
Minimum	82.0	0.0	0.0	0.5	0.0	82	0.01
Average	378.4	18.2	37.6	10.1	31.2	341	0.03
Median	360	12	40	6.0	16	320	0.02
0.5-Mile Buffer							
# of Wells	70	68	69	69	47	69	69
Maximum	1000	81	97	40	594	903	0.04
Minimum	125	0.0	0.0	0.5	0.0	125	0.00
Average	377.9	17.0	37.3	8.5	43.2	341	0.03
Median	393	12	40	6.0	20	353	0.02

NOTES:

1. ft = feet; gpm = gallons per minute.
2. The number of wells included in each column refers to the quantity of data points available in the OneStop database at the time of review. Not every piece of information is always included, thus reflecting the variation in number of wells.
3. The minimum calculated yield per foot of uncased well depth for the one-mile search radius, excluding wells reporting zero yield, is 0.01 gpm/ft.

TABLE 2
RAW ONESTOP WELL DATA WITHIN 1-MILE BUFFER BY YIELD
HYDROGEOLOGIC STUDY
TANGLEWOOD, CANDIA CHESTER, NH

WELL	WRB	FNAME	NAME	ST	ROAD	TOWN	MAP	PARCEL	DCOMP	USE	REASON	TYPE	TOTD	BKDK	YTQ	CASING	YTM	YTD	SWL	DMEAS	WQ	OB	LONGITUDE	LATITUDE	
4/11/18 DD	200.1413	NA	NA	13	KENDALL LN	RAYMOND	20	14-1-21	3/23/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	640	49	0.5	60	COMPRESSED AIR	0.5	266	3/26/2018	NO	SANDGRAVEL	-71.247317	43.023617	
7/30/18 DD	200.1423	NA	NA	15	KENDALL LN.	RAYMOND	20	14-1-20	7/24/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	640	40	0.5	50	COMPRESSED AIR	0.5	12	7/27/2018	NO	SANDGRAVEL	-71.247367	43.02325	
10/31/23 DD	200.1566			181	LANE RD	RAYMOND	14-1	5	10/19/2023	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	400	54	0.5	65	COMPRESSED AIR	0.5	15	10/30/2023	NO	SANDGRAVELTILL	-71.254667	43.02045	
27513190	200.1468	ALYSSA & OWEN	MURRAY	3	SADDLEPATH RD	RAYMOND	14	003-018	9/18/2014	DOMESTIC DRINKING WATER	REPLACE EXISTING	BEDROCK (DRILLED)	705	4	0.5	31	COMPRESSED AIR	2	22	9/22/2014	NO	GRAVEL	-71.2503	43.0147	
STATE	44.0978	JIG-SAW BUILDERS		667	CANDIA RD	CHESTER	20-Nov	701	6/17/2014	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	505	10	0.5	40	COMPRESSED AIR	1.5	25	6/17/2014	NO	SAND	-71.2808	43.008717	
0	44.1158			101	CROWLEY ROAD	CHESTER	11	29-3	1/25/2024	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	505	23	0.5	40	COMPRESSED AIR	1			NO	TILL	-71.27665	43.018583	
4/11/18 DD	200.1414	NA	NA	8	KENDALL LN	RAYMOND	20	14-1-3	4/5/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	800	27	0.5	60	COMPRESSED AIR	0.5	400	4/6/2018	NO	GRAVEL	-71.24705	43.024667	
0	37.0886			64	LANE ROAD	CANDIA	414	147-1	10/21/2023	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	1005	15	0.5	40	COMPRESSED AIR	1	13		NO	TILL	-71.259117	43.02645	
55	37.0238	M.	CURRIE	20	LANE RD	CANDIA	414	144-000	5/3/1991	DOMESTIC	REPLACE EXISTING	DRILLED IN BEDROCK	600	50	0.5	65	3	0.58			NO	GRAVELCLAY	-71.257809	43.029622	
6/13/18 DD	200.1417	NA	NA	4	KENDALL LN.	RAYMOND	20	14-1-1	5/23/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	640	30	1	40	COMPRESSED AIR	0.5	13	6/5/2018	NO	GRAVEL	-71.247333	43.025283	
6/13/18 DD	200.1418	NA	NA	7	KENDALL LN.	RAYMOND	20	14-1-24	5/22/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	640	40	1	60	COMPRESSED AIR	0.5	17	6/11/2018	NO	GRAVEL	-71.247583	43.0246	
23472	44.0972	SARA	BIBEAU	2	SMITH RD	CHESTER	0	0	8/31/2015	DOMESTIC DRINKING WATER	REPLACE EXISTING	BEDROCK (DRILLED)	500	8	1	70	COMPRESSED AIR	0.5	16.7	9/3/2015	YES	GRAVEL	-71.275667	43.004033	
0	37.0883			54	LANE ROAD	CANDIA	414	147-2	11/22/2023	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	505	10	1	40	COMPRESSED AIR	1	10		NO	TILL	-71.258967	43.026983	
0	37.0865			388	CHESTER RD	CANDIA	414	081-000	1/4/2019	DOMESTIC DRINKING WATER	REPLACE EXISTING	BEDROCK (DRILLED)	505	20	1	32	COMPRESSED AIR	1	15	1/7/2019		SAND	-71.284167	43.022767	
200.0806	G	ASSAD		134	GREEN RD	RAYMOND	20	23	3/10/1999	DOMESTIC	REPLACE EXISTING	DRILLED IN BEDROCK	600	34	1	45	3	1	40	3/12/1999		SANDCLAY	-71.253789	43.029161	
2329	200.1061	S	FINNERAN	15	SADDLEPATH RD	RAYMOND	45	034-000	11/25/2002	DOMESTIC	REPLACE EXISTING	DRILLED IN BEDROCK	605	10	1.25	63	3	1	58	11/25/2002		TILL	-71.247786	43.017464	
19-072	37.0846	SAUL	LEVESQUE	29	CROWLEY ROAD	CANDIA	414	5	9/15/2020	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	1000	13	1.5	40	COMPRESSED AIR	0.5	593.7	9/22/2020	NO	TILL	-71.2824	43.021067	
012-07	37.0685		DREAMSCAPE DEVELOPING		CROWLEY RD	CANDIA		9	3/21/2007	DOMESTIC	NEW	DRILLED IN BEDROCK	500	16	1.5	40	3	0.5				NO	GRAVEL	-71.269067	43.017983
0	37.0885				LANE ROAD	CANDIA	414	147	10/22/2023	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	505	15	1.5	40	COMPRESSED AIR	1	3		NO	TILL	-71.25915	43.025917	
1	44.0187	G.	MYERS	122	SHATTIGEE RD	CHESTER	11	38-3	9/24/1990	DOMESTIC	NEW	DRILLED IN BEDROCK	385	16	1.5	26	3	0.5	35	9/25/1990		GRAVEL CLAY	-71.266292	43.006264	
	44.0288	C.	SAMSON	12	CEDAR HILL RD	CHESTER	11	31-9	4/6/1994	DOMESTIC	NEW	DRILLED IN GRAVEL	406	9	1.5	20	3	0.5	5	4/6/1994		SANDGRAVEL	-71.282257	43.011863	
1/15/21 DD	200.1489	NA	NA	26	KENDALL LN.	RAYMOND	20	1/14/2012	12/1/2020	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	500	7	2	40	COMPRESSED AIR	0.5	30	1/14/2021	NO	SANDGRAVEL	-71.246317	43.021317	
0	44.1154	KYLE & JOHANNA	EARNSHAW	5	SHATTIGEE ROAD	CHESTER	11	33-1	1/3/2023	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	505	26	2	40	COMPRESSED AIR	1	400		NO	TILL	-71.277483	43.007	
6/29/18 DD	200.1422	NA	NA	10	KENDALL LN.	RAYMOND	20	14-1-4	6/13/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	640	28	2	40	COMPRESSED AIR	0.5	19	6/28/2018	NO	GRAVEL	-71.2469	43.02435	
2/7/20 DD	200.1439	NA	NA	22	KENDALL LN.	RAYMOND	20	14-1-10	11/12/2019	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	500	17	2	40	COMPRESSED AIR	0.5	10	11/16/2019	NO	SANDGRAVEL	-71.245867	43.021983	
47-2021	37.086	JAMES	REID	497	PATTEN HILL RD	CANDIA	166	54-4	6/28/2021	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	1005	4	2	20	COMPRESSED AIR	1			NO	TILL	-71.259217	43.031217	
	37.0729		JP VENTURES		CRAWLEY RD	CANDIA	414	2	3/26/2010	DOMESTIC	NEW	DRILLED IN BEDROCK	440	7	2	21	3	1				TILL	-71.26655	43.0202	
	44.0773	N.	CHAMBERLIN	491	LANE RD	CHESTER	11	53	10/3/2002	DOMESTIC	NEW	DRILLED IN BEDROCK	500	81	2	100	2	2.5	16	10/15/2002		SAND	-71.260172	42.997071	
79	200.0399	J	SURPRENANT	119	GREEN RD	RAYMOND	20	41	5/20/1989	DOMESTIC	NEW	DRILLED IN BEDROCK	400	60	2	70	3	0.17				SANDGRAVEL CLAY	-71.249811	43.027056	
1267759	200.0937	A	THOMPSON	1	LANE RD	RAYMOND	1	011-000	9/26/2001	DOMESTIC	REPLACE EXISTING	DRILLED IN BEDROCK	520	22	2	41	3	0.5				CLAY	-71.247023	43.010199	
	44.0293	C.	SAMSON	37	CEDAR RD	CHESTER	11	31-6	7/26/1994	DOMESTIC	REPLACE EXISTING	DRILLED IN BEDROCK	406		2		3	0.5	15	7/26/1994		TILL	-71.280674	43.013085	
3	13.0211	G.	COPPOLA	12	OLD TOWNE RD	AUBURN	11	37-20	11/11/1987	DOMESTIC	NEW	DRILLED IN BEDROCK	406	9	2	20	3	0.5	15	11/11/1987		GRAVEL	-71.297255	43.009806	
10109	44.0899	B. & J.	GITSCHER	858	CANDIA RD	CHESTER	121	10	8/12/2010	DOMESTIC	NEW	DRILLED IN BEDROCK	500	19	2.5	40	3	1				GRAVELTILL	-71.283917	43.018483	
22	200.0187	E	JOHNSON	128	GREEN RD	RAYMOND	4	012-003	11/17/1986	DOMESTIC	NEW	DRILLED IN BEDROCK	359	58	2.75	72	1	1				CLAY	-71.252372	43.028123	
4/11/18 DD	200.1412	NA	NA	11	KENDALL LN	RAYMOND	20	14-1-22	3/26/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	760	38	3	50	COMPRESSED AIR	0.5	19	11/17/1986	NO	GRAVEL	-71.24735	43.023883	
1-10126	44.0881	M. & B.	DUFOUR & ROBERGE	74	MULBERRY LN	CHESTER	11	41	7/10/2009	OTHER	NEW	DRILLED IN BEDROCK	1180	12	3	42	3	1	20	7/30/2009		GRAVEL	-71.270183	43.020933	
6/13/18 DD	200.1419	NA	NA	6	KENDALL LN.	RAYMOND	20	14-1-2	5/24/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	640	30	3	40	COMPRESSED AIR	0.5	15	6/5/2018	NO	SANDGRAVEL	-71.24725	43.024933	
9/21/18 DD	200.1429	NA	NA	19	KENDALL LN.	RAYMOND	20	14-1-18	7/30/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	640	22	3	40	COMPRESSED AIR	0.5	31	7/31/2018	NO	TILL	-71.247433	43.02255	
	44.0834	M.	MCCODLE	545	LANE RD	CHESTER		3/9/2005		DOMESTIC	NEW	DRILLED IN BEDROCK	407	9	3	20	3	2	5	3/13/2005		GRAVEL	-71.265733	42.997733	
140	200.002	D	LARIVIERE	13	SADDLEPATH RD	RAYMOND	14	18-Jan	12/18/1984	DOMESTIC	NEW	DRILLED IN BEDROCK	162	28	3	40	3	1				CLAY	-71.248293	43.017	
	13.0246	S.	MAHONEY	8	OLD TOWNE RD	AUBURN	11	37-22	9/23/1988	DOMESTIC	NEW	DRILLED IN BEDROCK	406	2	3	13.5	3	0.5	7	9/23/1988		GRAVEL	-71.29629	43.00933	
147	200.0021	J	DANIELS JR	15	SADDLEPATH RD	RAYMOND	14	17-Jan	12/31/1984	DOMESTIC	NEW	DRILLED IN BEDROCK	150	12	3	20	3	1				GRAVEL	-71.247874	43.017508	
406	200.1185		JEMCO BUILDERS	44	SHERMAN DR	RAYMOND	14-1	36 LOT 31	11/10/2004	DOMESTIC	NEW	DRILLED IN BEDROCK	220	11	3	40	3	1.5	9	12/9/2004		TILL	-71.244846	43.01869	
364-010511TW10	44.0706		BOJACK CONST	23	MULBERRY LN	CHESTER	11	41-7	5/4/2001	DOMESTIC	NEW	DRILLED IN BEDROCK	420	22	3	40	1		35	5/4/2001	Y	GRAVELCLAY	-71.273804	43.005801	
	44.0762		ABDALLAH CONST	650	LANE RD	CHESTER	11	44-2	9/21/2002	DOMESTIC	NEW	DRILLED IN BEDROCK	505	5	3	40	3	1.5	30	9/26/2002		GRAVEL	-71.272005	43.002478	
316	37.019	A.	IZBICKI	144	CROWLEY RD	CANDIA	414	086-000	12/1/1988	DOMESTIC	NEW	DRILLED IN BEDROCK	355	11	3	21	3	0.5	10	12/3/1988		CLAY	-71.271149	43.019724	
406	200.1193		JEMCO BUILDERS	36	SHERMAN DR	RAYMOND	14-1	32 LOT 35	11/15/2004	DOMESTIC	NEW	DRILLED IN BEDROCK	320	5	3	20	3	1.25	17	11/21/2004		TILL	-71.246065	43.017496	
116	37.0303		NETWORK BLDRS	28	LANE RD	CANDIA		11/29/1994		DOMESTIC	REPLACE EXISTING	DRILLED IN BEDROCK	420	25	3.5	40	3	1				CLAY	-71.25775	43.029033	
364-010116RT9	44.0699		BOJACK CONST	59	MULBERRY LN	CHESTER	11	41-10	1/10/2001	DOMESTIC	NEW	DRILLED IN BEDROCK	380	6.5	3.5	20	1		40	1/10/2001	Y	GRAVELCLAY	-71.27		

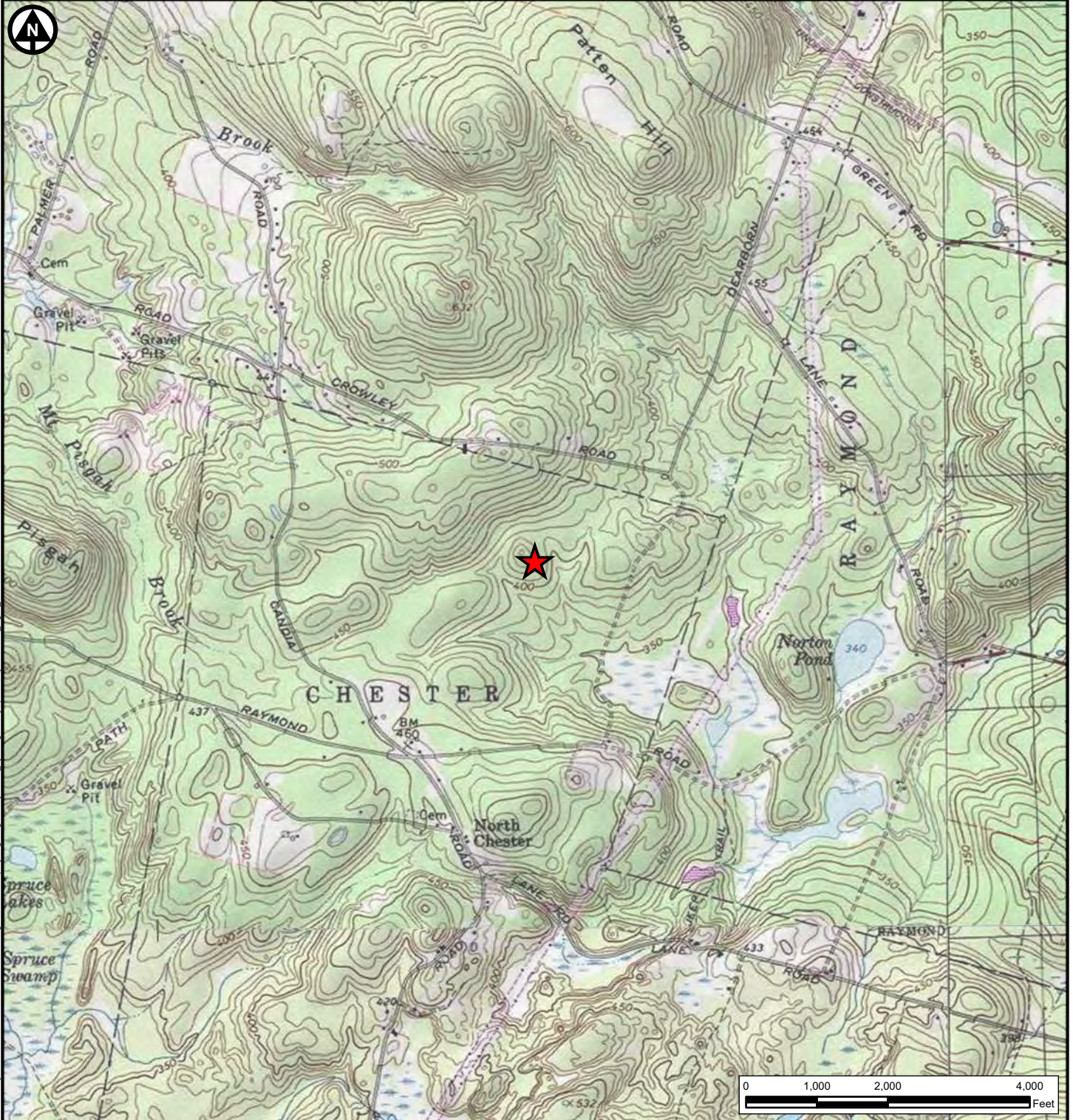
TABLE 2
RAW ONESTOP WELL DATA WITHIN 1-MILE BUFFER BY YIELD
HYDROGEOLOGIC STUDY
TANGLEWOOD, CANDIA CHESTER, NH

WELL	WRB	R	FNAME	NAME	ST	ROAD	TOWN	MAP	PARCEL	DCOMP	USE	REASON	TYPE	TOTD	BKDK	YTD	CASING	YTM	YTD	SWL	DMEAS	WQ	OB	LONGITUDE	LATITUDE		
1858	44.0274	R	GARRETT	GARRETT	640	CANDIA RD	CHESTER	11	33	4/12/1994	DOMESTIC	NEW	DRILLED IN BEDROCK	346	15	7	41	3		1	10	4/13/1994	TILL	-71.264937	43.013899		
1837	37.0264	M	DEMERRIT JR	DEMERRIT JR	370	CHESTER RD	CANDIA	414	080-000	12/4/1993	DOMESTIC	NEW	DRILLED IN BEDROCK	519	50	7	66	3		1			TILL	-71.284038	43.0244		
1251688	44.059		MARK CALLEDARE BUILDERS	MARK CALLEDARE BUILDERS	17	SHATTIGEE RD	CHESTER	11	33-2	8/16/2001	DOMESTIC	NEW	DRILLED IN BEDROCK	200	36	7	61	3		0.5			CLAY	-71.275814	43.007502		
364-010116RT8	44.0698		BOJACK CONST	BOJACK CONST	52	MULBERRY LN	CHESTER	11	41-13	1/7/2001	DOMESTIC	NEW	DRILLED IN BEDROCK	240	7	7	20	3		0.5	12	1/7/2001	Y	GRAVELCLAY	-71.272207	43.004265	
09899W	200.0832		JEMCO BUILDERS	JEMCO BUILDERS		WATSON HILL ESTATES	RAYMOND	14	001-026	6/14/1999	DOMESTIC	NEW	DRILLED IN BEDROCK	220	5	7	20	3		0.75	21	6/14/1999		TILL	-71.244675	43.019912	
121	200.1311	D	ANDERSON	ANDERSON	129	LANE RD	RAYMOND	14	26-Mar	12/19/2007	DOMESTIC	NEW	DRILLED IN BEDROCK	385	18	7	40	3		1				GRAVELTILL	-71.247159	43.011197	
	44.0156		SORKIN	SORKIN	535	LANE RD	CHESTER	11	50	11/11/1989	DOMESTIC	NEW	DRILLED IN BEDROCK	205	6	7	20	3		0.5				CLAY	-71.263398	42.98596	
23	200.0015	M	HARVEY	HARVEY	45	SADDLEPATH RD	RAYMOND	45	9	8/2/1984	DOMESTIC	NEW	DRILLED IN BEDROCK	325	21	8	30	3			20	8/20/1984		SANDGRAVEL	-71.250855	43.015987	
364-010116RT7	44.0696		BOJACK CONST	BOJACK CONST	45	MULBERRY LN	CHESTER	11	41-9	11/5/2001	DOMESTIC	NEW	DRILLED IN BEDROCK	400	14	8	30	1			25	11/5/2001	Y	GRAVELCLAY	-71.271668	43.005583	
14246	44.0552		LAMPHERE CONSTRUCTION	LAMPHERE CONSTRUCTION	44	MCINTOSH LN	CHESTER	11	13-Jul	8/17/2000	DOMESTIC	NEW	DRILLED IN BEDROCK	500	3	8	20	2		6.5	10	8/21/2000	Y	GRAVEL	-71.272554	42.99992	
14408	44.0587		LAMPHERE CONSTRUCTION	LAMPHERE CONSTRUCTION	30	MCINTOSH LN	CHESTER	11	12-Jul	10/24/2000	DOMESTIC	NEW	DRILLED IN BEDROCK	500	4	8	20	2		8	8	10/26/2000	Y	CLAY	-71.274453	42.997041	
	200.1036		JEMCO BUILDERS	JEMCO BUILDERS	18	SHERMAN DR	RAYMOND	14-4	76 LOT 9	6/5/2003	DOMESTIC	NEW	DRILLED IN BEDROCK	140	5	8	40	3		0.5	0	6/5/2003		TILL	-71.243743	43.01477	
4599	200.083		PREMIUM BUILDERS	PREMIUM BUILDERS	127A	GREEN RD	RAYMOND	20	38	3/27/1999	DOMESTIC	NEW	DRILLED IN BEDROCK	280	23	8	42	3		0.75	22	3/27/1999		CLAY	-71.250799	43.028685	
155	44.0872		MIKE DELANEY	MIKE DELANEY	10	NORTON POND RD	CHESTER	7	21-7	6/10/2008	DOMESTIC	NEW	DRILLED IN BEDROCK	205	5	8	20	3						OTHER_TILL	-71.258533	43.010108	
13832	44.0382		LAMPHERE CONSTRUCTION	LAMPHERE CONSTRUCTION	20	MCINTOSH LN	CHESTER	11	11-Jul	3/27/2000	DOMESTIC	NEW	DRILLED IN BEDROCK	500	3	9	20	2			7	30	3/31/2000	Y	GRAVEL	-71.27553	42.997436
12/18/20 DD	200.1484	NA	NA	NA	24	KENDALL LN.	RAYMOND	20	14-1-11	11/30/2020	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	240	6	10	20			0.5			NO	GRAVEL	-71.245683	43.022417	
6/15/18 DD	200.142	NA	NA	NA	3	KENDALL LN.	RAYMOND	20	14-1-25	6/14/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	400	32	10	50			0.5			NO	SANDGRAVEL	-71.247683	43.025817	
1-10204	200.1338		BLUE FIN DEVELOPMENT	BLUE FIN DEVELOPMENT		NORTON POND RD	RAYMOND	7	21-4	12/22/2009	DOMESTIC	REPLACE EXISTING	DRILLED IN BEDROCK	460	6	10	41	3			1	25	12/23/2009		TILL	-71.256967	43.010367
9091	200.1309		ENGLEWOOD CONST	ENGLEWOOD CONST	9	NORTON POND RD	RAYMOND	7	21-9	7/8/2008	DOMESTIC	NEW	DRILLED IN BEDROCK	205	11	10	40	3		0.5	35	7/9/2008		SAND	-71.258083	43.0105	
7/24/20 DD	37.0839	NA	NA	NA	325	CROWLEY RD.	CANDIA	414	150-1	7/15/2020	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	260	12	10	40			0.5			NO	SANDTILL	-71.260067	43.024583	
377	200.0112	T	CASTLE	CASTLE	180	LANE RD	RAYMOND	13	1	2/3/1986	DOMESTIC	NEW	DRILLED IN BEDROCK	225	32	10	42	3			1			GRAVEL	-71.255184	43.019242	
97227	44.0526	R	KENNETT	KENNETT	107	SHATTIGEE RD	CHESTER	11	37-1	10/28/1987	DOMESTIC	REPLACE EXISTING	DRILLED IN BEDROCK	500	18	10	37	3			1			GRAVEL	-71.267351	43.007428	
13	200.0361	R	DEMERS	DEMERS	35	SHATAGEE RD	RAYMOND	7	15	8/17/1988	DOMESTIC	NEW	DRILLED IN BEDROCK	200	7	10	20	3			0.17				TILL	-71.259761	43.006579
364-010511TW9	44.0692		BOJACK CONST	BOJACK CONST	35	MULBERRY LN	CHESTER	11	41-8	5/5/2001	DOMESTIC	NEW	DRILLED IN BEDROCK	420	7.5	10	20	1		0.5	35	5/5/2001	Y	GRAVELCLAY	-71.272629	43.005742	
1998	44.0535	D	DALLAIRE	DALLAIRE	829	CANDIA RD	CHESTER	11	24	11/14/1997	DOMESTIC	REPLACE EXISTING	DRILLED IN BEDROCK	450	22	10	34	3			1	30	11/14/1997		GRAVELTILL	-71.28465	43.017974
406	200.1186		JEMCO BUILDERS	JEMCO BUILDERS	42	SHERMAN DR	RAYMOND	14-1	35 LOT 32	11/11/2004	DOMESTIC	NEW	DRILLED IN BEDROCK	180	5	10	20	3		0.5	9	11/11/2004		TILL	-71.24547	43.018756	
140	200.0066	J	STEPHENSON	STEPHENSON		TAMARACK LN	RAYMOND	45	23	12/6/1984	DOMESTIC	NEW	DRILLED IN BEDROCK	140	8	10	24	3						SAND	-71.248859	43.013617	
157	44.0555	F	CAREO	CAREO	48	SHATTIGEE RD	CHESTER	11	41-4	6/23/2000	DOMESTIC	NEW	DRILLED IN BEDROCK	300	40	10	56	3			1			TILL	-71.272937	43.006631	
406	200.1194		JEMCO BUILDERS	JEMCO BUILDERS	31	SHERMAN DR	RAYMOND	14-1	41 LOT 24	11/14/2004	DOMESTIC	NEW	DRILLED IN BEDROCK	140	5	10	20	3		0.5	7	11/19/2004		TILL	-71.244974	43.016786	
364-001017RT3	44.0684		BOJACK CONST	BOJACK CONST	82	MULBERRY LN	CHESTER	11	41-11	10/11/2000	DOMESTIC	NEW	DRILLED IN BEDROCK	420	4	11	20	1			40	10/11/2000	Y	GRAVEL	-71.26965	43.004613	
10/19/18 DD	200.143	NA	NA	NA	20	KENDALL LN.	RAYMOND	20	14-1-9	10/15/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	420	42	12	60			0.5			NO	GRAVELTILL	-71.24665	43.0225	
9350	200.1339	G. & M.	BELAND	BELAND	15	NORTON POND RD	RAYMOND	7	21-8	3/12/2010	OTHER	NEW	DRILLED IN BEDROCK	360	22	12	42	2		4.5	49	3/17/2010	Y	CLAY	-71.257833	43.010833	
3/18/21 DD	200.1493	NA	NA	NA	27	KENDALL LN.	RAYMOND	20	14-1-14	3/16/2021	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	240	47	12	60			0.5			NO	SANDGRAVELTILL	-71.24745	43.020983	
1-10795	37.0754	JP VENTURES LLC	CROWLEY ROAD	CROWLEY ROAD	414	CROWLEY ROAD	CANDIA	414	90-9	1/9/2013	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	220	81	12	97			0.5	25	1/10/2013		TILL	-71.264433	43.023967	
	44.0515	F	COOK	COOK		SMITH RD	CHESTER	11	13	12/9/1997	DOMESTIC	NEW	DRILLED IN BEDROCK	406	50	12	60	3			2	30	12/9/1997		SANDGRAVEL	-71.286258	43.006054
	200.1039		JEMCO BUILDERS	JEMCO BUILDERS	5	SHERMAN DR	RAYMOND	14-3	34 LOT 2	6/3/2003	DOMESTIC	NEW	DRILLED IN BEDROCK	220	6	12	40	3		0.5	0	6/3/2003		TILL	-71.245114	43.012152	
406	200.1195		JEMCO BUILDERS	JEMCO BUILDERS	30	SHERMAN DR	RAYMOND	14-1	29 LOT 38	11/14/2004	DOMESTIC	NEW	DRILLED IN BEDROCK	140	5	12	20	3		0.5	6	11/20/2004		TILL	-71.245354	43.016083	
106901	200.0512	T	HATEM	HATEM	144	LANE RD	RAYMOND	11	027-001	1/5/1990	DOMESTIC	NEW	DRILLED IN BEDROCK	140	6	12	20	3			12	1/6/1990		TILL	-71.25134	43.011301	
98290	44.0321		ERIC HOWARD BUILDERS	ERIC HOWARD BUILDERS		SHATTIGEE RD	CHESTER	11	41-3	11/6/1998	DOMESTIC	NEW	DRILLED IN BEDROCK	500	5	14	20	3			1			SAND	-71.274111	43.006536	
18043	44.1038	RYAN	RIDLEY	RIDLEY	669	CANDIA ROAD	CHESTER	20	11	4/4/2018	DOMESTIC DRINKING WATER	REPLACE EXISTING	BEDROCK (DRILLED)	240	19	15	40			0.5			NO	GRAVEL	-71.28205	43.0098	
1/18/19 DD	200.1432	NA	NA	NA	18	KENDALL LN.	RAYMOND	20	14-1-8	11/15/2018	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	280	28	15	40			0.5			NO	GRAVEL	-71.2465	43.02255	
STATE	44.1083		OLYMPIA BUILDERS	OLYMPIA BUILDERS	102	SHATTIGEE	CHESTER	011-038	1	7/12/2016	DOMESTIC DRINKING WATER	NEW	BEDROCK (DRILLED)	425	15	15	40			1.5	25	7/12/2016	NO	CLAY/SILT	-71.267633	43.006433	
	44.0769		CANDIA RD	CANDIA RD	471	CANDIA RD	CHESTER			8/5/2002	DOMESTIC	NEW	DRILLED IN BEDROCK	385	7	15	40	3			1	50	8/5/2002		TILL	-71.279333	42.99795
10199W	200.0831		JEMCO BUILDERS	JEMCO BUILDERS	25	WATSON HILL RD	RAYMOND	14	001-027	6/9/1999	DOMESTIC	NEW	DRILLED IN BEDROCK	360	5	15	20	3		0.5	13	6/9/1999		TILL	-71.244903	43.020991	
591	44.0068	D	ROSALBO	ROSALBO	540	CANDIA RD	CHESTER	11	4-Jul	10/10/1986	DOMESTIC	NEW	DRILLED IN BEDROCK	181	3	15	20	3			1			TILL	-71.27381	43.001267	
	44.0287	C	SAMSOM	SAMSOM	29	CEDAR HILL RD	CHESTER	11	31-5	2/24/1994	DOMESTIC	NEW	DRILLED IN BEDROCK	326	11	15	20	3		0.5	12	2/24/1994		SANDGRAVEL	-71.281849	43.012482	
697	200.0257	R	HETHERINGTON	HETHERINGTON	15	TAMARACK LN	RAYMOND	14	12-Mar	9/9/1987	DOMESTIC	NEW	DRILLED IN BEDROCK	160	3	15	21	3						CLAY	-71.249824	43.01198	
4																											

FIGURES

- FIGURE 1 SITE LOCUS MAP
- FIGURE 2 SITE PLAN WITH ONE MILE BUFFER
- FIGURE 3 PROJECT PLAN
- FIGURE 4 BEDROCK CONTACTS/FORMATIONS ON LIDAR IMAGERY
- FIGURE 5 BEDROCK GEOLOGIC MAP WITH LINEAMENTS
- FIGURE 6 SOILS MAP
- FIGURE 7 NHDES WELLS DATABASE – YIELD
- FIGURE 8 NHDES WELLS DATABASE – TOTAL DEPTH
- FIGURE 9 NHDES WELLS DATABASE – DEPTH TO BEDROCK





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Subject Property Location



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New Hampshire

Sources:
Aerial Imagery: Esri Imagery Web Service dated 2019.

Topographic Map: National Geographic Society Web Service.

Quadrangle: Candia, New Hampshire



Tanglewood Development
Candia & Chester, New Hampshire

Site Locus Map

Hydrogeologic Study

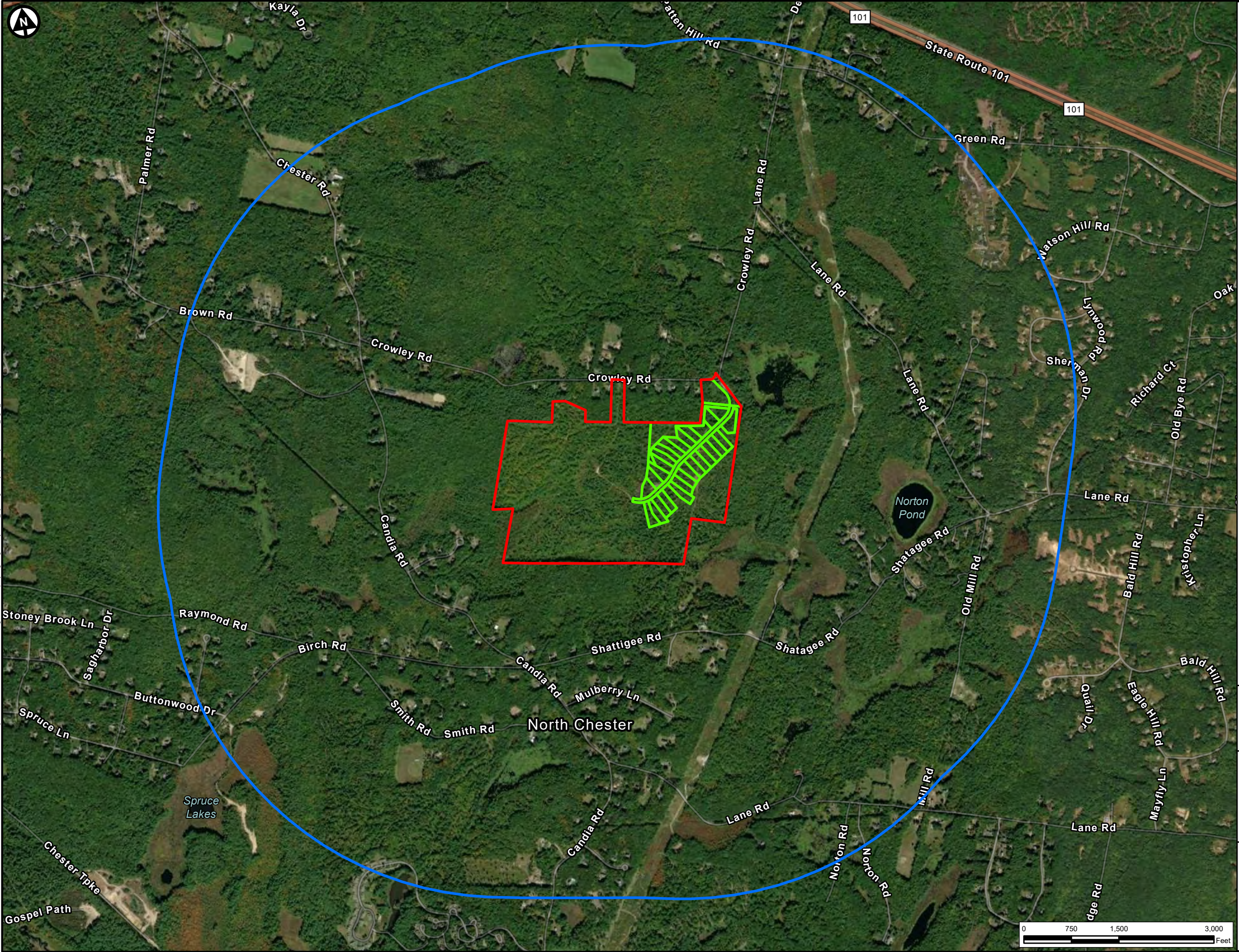
Project Number
36542

Date
06/2025

Author
bsanchez

Scale
1 in = 2,000 ft

Figure
1



- Subject Property Boundary
- One-Mile Buffer
- Proposed Shannon Drive

Notes:
 1. The aerial photo was acquired through the Esri Imagery Web Service. Aerial photography dated 2019.
 2. Proposed Shannon Drive locations are approximate.

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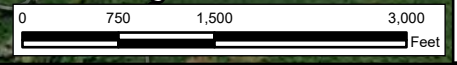


Tanglewood Development
 Candia & Chester, New Hampshire

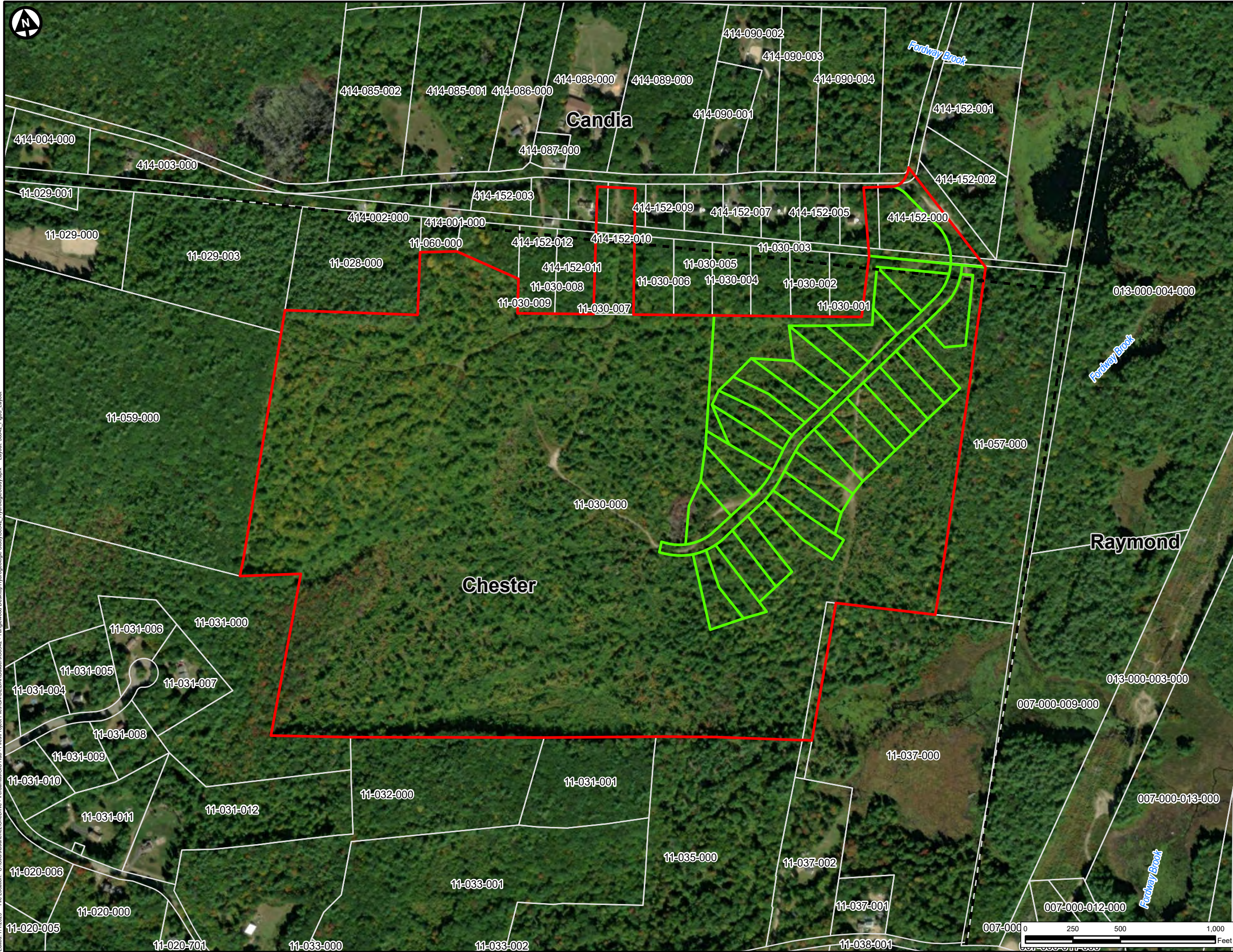
**Site Map
 With One Mile Buffer**

Hydrogeologic Study

Project Number	36542
Date	06/2025
Author	bsanchez
Scale	1 in = 1,500 ft
Figure	2



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 Produced Using Esri's ArcGIS Software



Subject Property Boundary
 New Hampshire Tax Parcels
 Town Boundary
 Proposed Shannon Drive
 11-030 Map - Lot ID

Note:

1. The aerial photo was acquired through the Esri Imagery Web Service. Aerial photography dated 2019.
2. Proposed Shannon Drive locations are approximate.
3. Parcel data was acquired from NHGIS.

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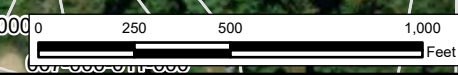


Tanglewood Development
Candia & Chester, New Hampshire

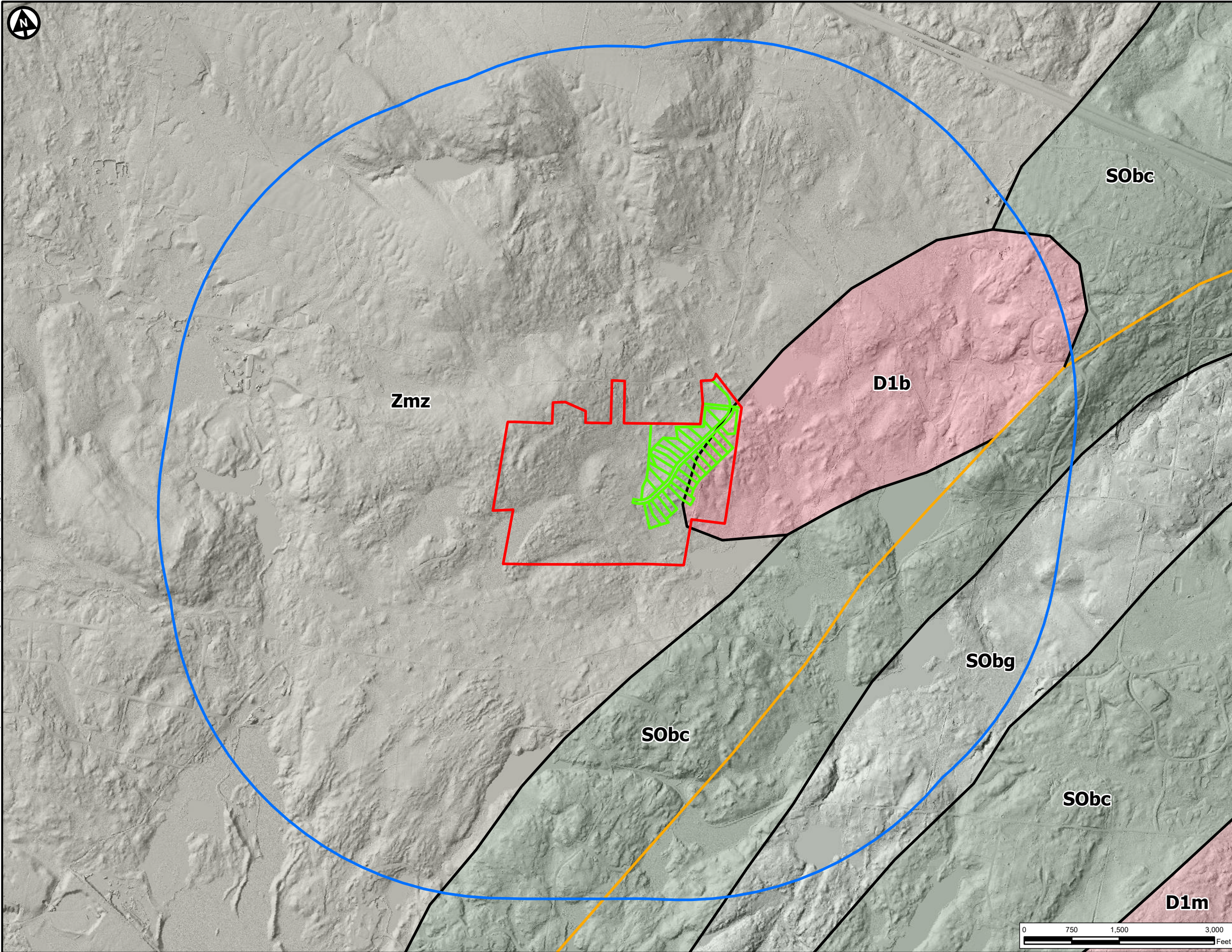
Project Plan

Hydrogeologic Study

Project Number	36542
Date	07/2025
Author	bsanchez
Scale	1 in = 500 ft
Figure	3



Edited: 7/1/2025 File Location: C:\Users\bsanchez\OneDrive - Verdantas\GIS Hub - Files\Project Files\CD\22\BAR\Bulens\36542 - Tanglewood Desktop Hydrogeologic Study\36542_Hydrogeologic_Study.aprx Layout: 36542_Fig03_Layout



- ▭ Subject Property Boundary
- ▭ One-Mile Buffer
- ▭ Proposed Shannon Drive
- Geologic Contact
- Normal or Strike-slip Fault
- ▭ D1b
- ▭ D1m
- ▭ SObc
- ▭ SObg
- ▭ Zmz

Bedrock ID	Bedrock Description
D1b	Found in Woodsville and Whitefield quadrangles and in small intrusive units in northern and southeastern New Hampshire
D1m	Similar to Concord Granite
SObc	Contains more calc-silicate (15 percent) than does the remainder of the formation (5 percent)
SObg	White muscovite schist. Equivalent to the Gonic Formation of Hussey (1962)
Zmz	Migmatite consisting of pink, foliated biotite granite intruding gneissic and granulose metasedimentary and metavolcanic rocks in southeastern New Hampshire

Notes:
 1. LiDAR imagery was taken from the NH Bare Earth Imagery Server, dated 2022.
 2. Bedrock formations and contacts data was acquired from NHGIS.
 3. Proposed Shannon Drive locations are approximate.

DISCLAIMER: Verdantas LLC has furnished this map to the Client for its sole and exclusive use as a preliminary planning and screening tool. This map is reproduced from geospatial information compiled from third-party sources which may change over time and are not accurate as to mapping, surveying or engineering standards. Verdantas LLC makes no representation or warranty as to the content, accuracy, timeliness or completeness of any information. In no event will Verdantas LLC, its owners, officers, employees or agents, be liable for damages of any kind arising out of the use of this map by Client or any other party.

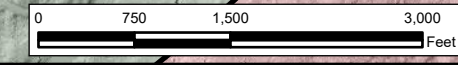


Tanglewood Development
 Candia & Chester, New Hampshire

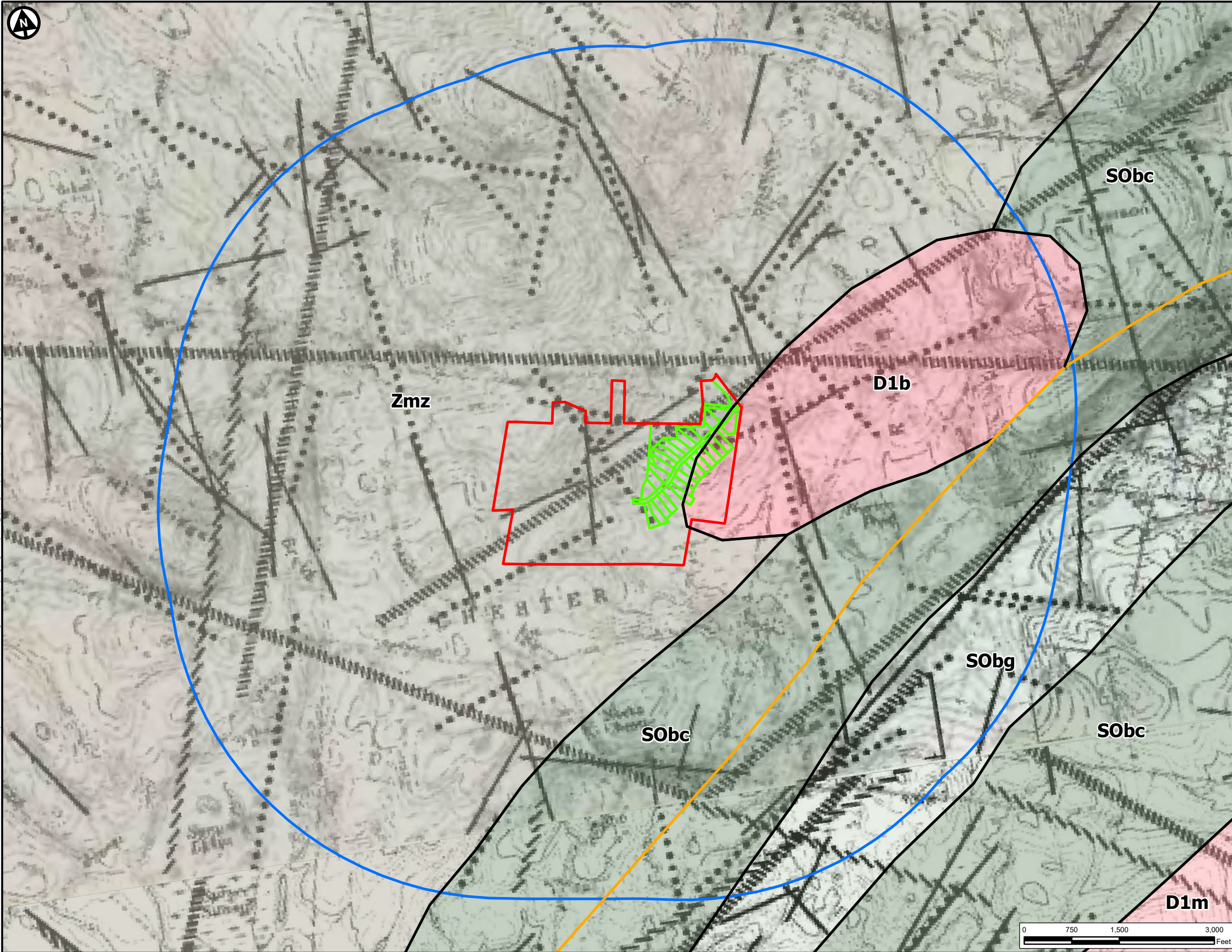
Project Number	36542
Date	07/2025
Author	bsanchez
Scale	1 in = 1,500 ft
Figure	4

Bedrock Contacts/Formations on LiDAR Imagery

Hydrogeologic Study



Edited: 7/1/2025 File Location: C:\Users\bsanchez\OneDrive - Verdantas\GIS Hub - Files\Project Files\CA-D2024\Bulens\36542 - Tanglewood Development Hydrogeologic Study\36542_Hydrogeologic_Study.aprx Layout: 36542_Fig04_Bedrock.DAR
 Produced Using Esri's ArcGIS Software



- Subject Property Boundary
- One-Mile Buffer
- Proposed Shannon Drive
- Geologic Contact
- Normal or Strike-Slip Fault
- Lineament Observed at Low-Altitude (1:20000)
- Lineament Observed at High-Altitude (1:80,000)
- Lineament Observed by Side-Looking Airborne Radar Imagery (1:250,000)
- Lineament observed by Landsat Imagery (1:1,000,000)
- D1b
- D1m
- SObc
- SObg
- Zmz

Bedrock ID	Bedrock Description
D1b	Found in Woodsville and Whitefield quadrangles and in small intrusive units in northern and southeastern New Hampshire
D1m	Similar to Concord Granite
SObc	Contains more calc-silicate (15 percent) than does the remainder of the formation (5 percent)
SObg	White muscovite schist. Equivalent to the Gonic Formation of Hussey (1962)
Zmz	Migmatite consisting of pink, foliated biotite granite intruding gneissic and granulose metasedimentary and metavolcanic rocks in southeastern New Hampshire

Notes:
 1. Lineament locations and accompanying topographic map was acquired from the "Lineament Map of Area 1 of The New Hampshire Bedrock Aquifer Assessment, Central New Hampshire" and "Lineament Map of Area 4 of The New Hampshire Bedrock Aquifer Assessment, Central New Hampshire" dated 1997.
 2. Bedrock formations and contacts data was acquired from NHGIS.
 3. Proposed Shannon Drive locations are approximate.

DISCLAIMER: Verdantas LLC has furnished this map to the Client for its sole and exclusive use as a preliminary planning and screening tool. This map is reproduced from geospatial information compiled from third-party sources which may change over time and are not accurate as to mapping, surveying or engineering standards. Verdantas LLC makes no representation or warranty as to the content, accuracy, timeliness or completeness of any information. In no event will Verdantas LLC, its owners, officers, employees or agents, be liable for damages of any kind arising out of the use of this map by Client or any other party.



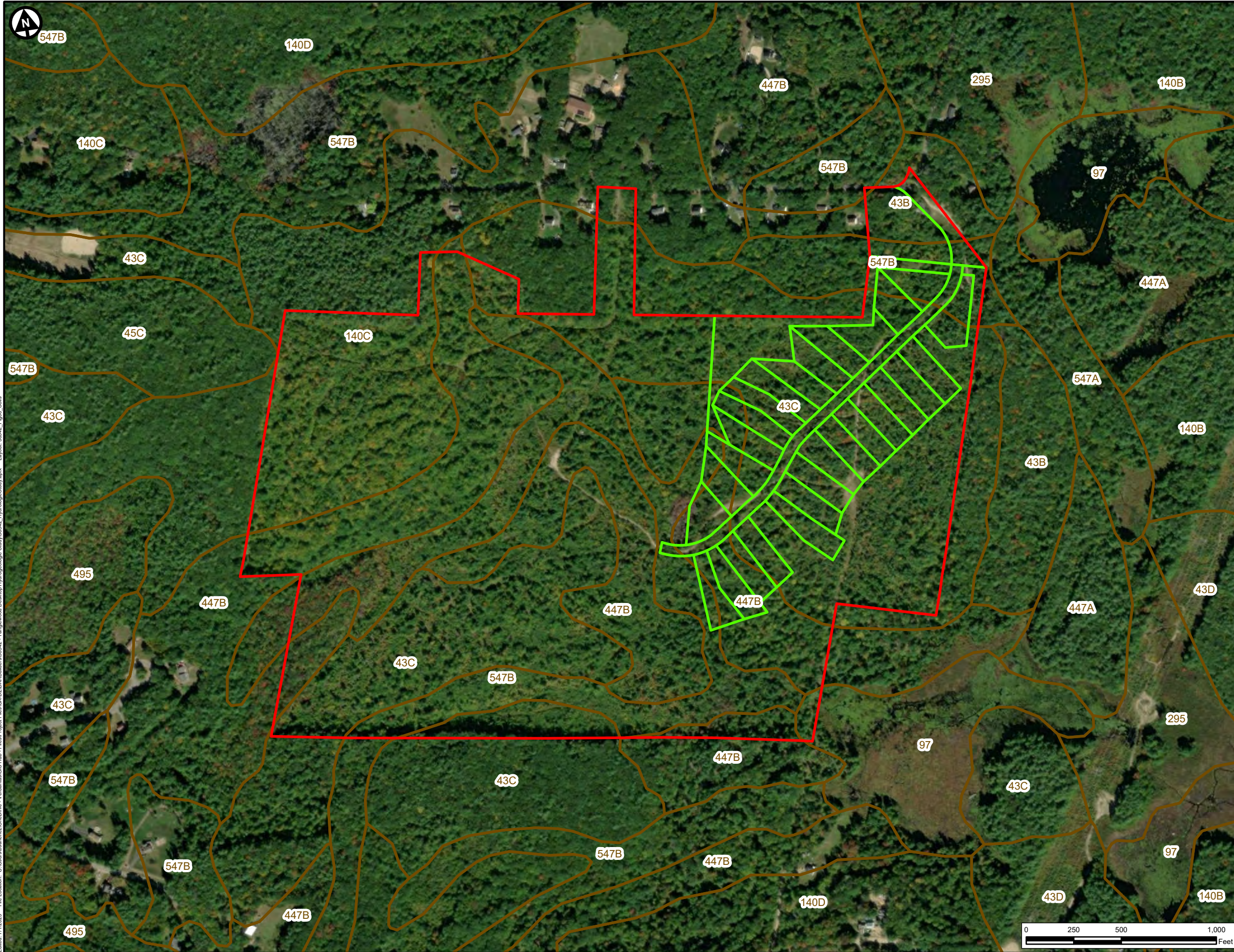
Tanglewood Development
 Candia & Chester, New Hampshire

**Bedrock Geologic Map
 with Lineaments**

Hydrogeologic Study

Project Number	36542
Date	07/2025
Author	bsanchez
Scale	1 in = 1,500 ft
Figure	5

Edited: 7/1/2025 File Location: C:\Users\bsanchez\OneDrive - Verdantas\GIS Hub - Files\Project Files\CA-D2\BAR\Bulden\36542 - Tanglewood Desktop Hydrogeologic Study\36542_HydrogeologicStudy.aprx Layout: 36542_Fig05_Lineaments



- Subject Property Boundary
- One-Mile Buffer
- Proposed Shannon Drive
- Soil Series

Soil ID	Soil Description
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky
140D	Chatfield-Hollis-Canton complex, 15 to 35 percent slopes, rocky
295	Greenwood mucky peat
43B	Canton fine sandy loam, 0 to 8 percent slopes, very stony
43C	Canton fine sandy loam, 8 to 15 percent slopes, very stony
43D	Canton fine sandy loam, 15 to 25 percent slopes, very stony
447A	Scituate-Newfields complex, 0 to 3 percent slopes, very stony
447B	Scituate-Newfields complex, 3 to 8 percent slopes, very stony
45C	Montauk fine sandy loam, 8 to 15 percent slopes, very stony
495	Natchaug mucky peat, 0 to 2 percent slopes
547A	Walpole very fine sandy loam, 0 to 3 percent slopes, very stony
547B	Walpole very fine sandy loam, 3 to 8 percent slopes, very stony
97	Freetown and Natchaug mucky peats, ponded, 0 to 2 percent slopes

Notes:
 1. The aerial photo was acquired through the Esri Imagery Web Service. Aerial photography dated 2019.
 2. Proposed Shannon Drive locations are approximate.
 3. Soil data was acquired from NHGIS.

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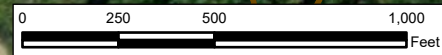


Tanglewood Development
 Candia & Chester, New Hampshire

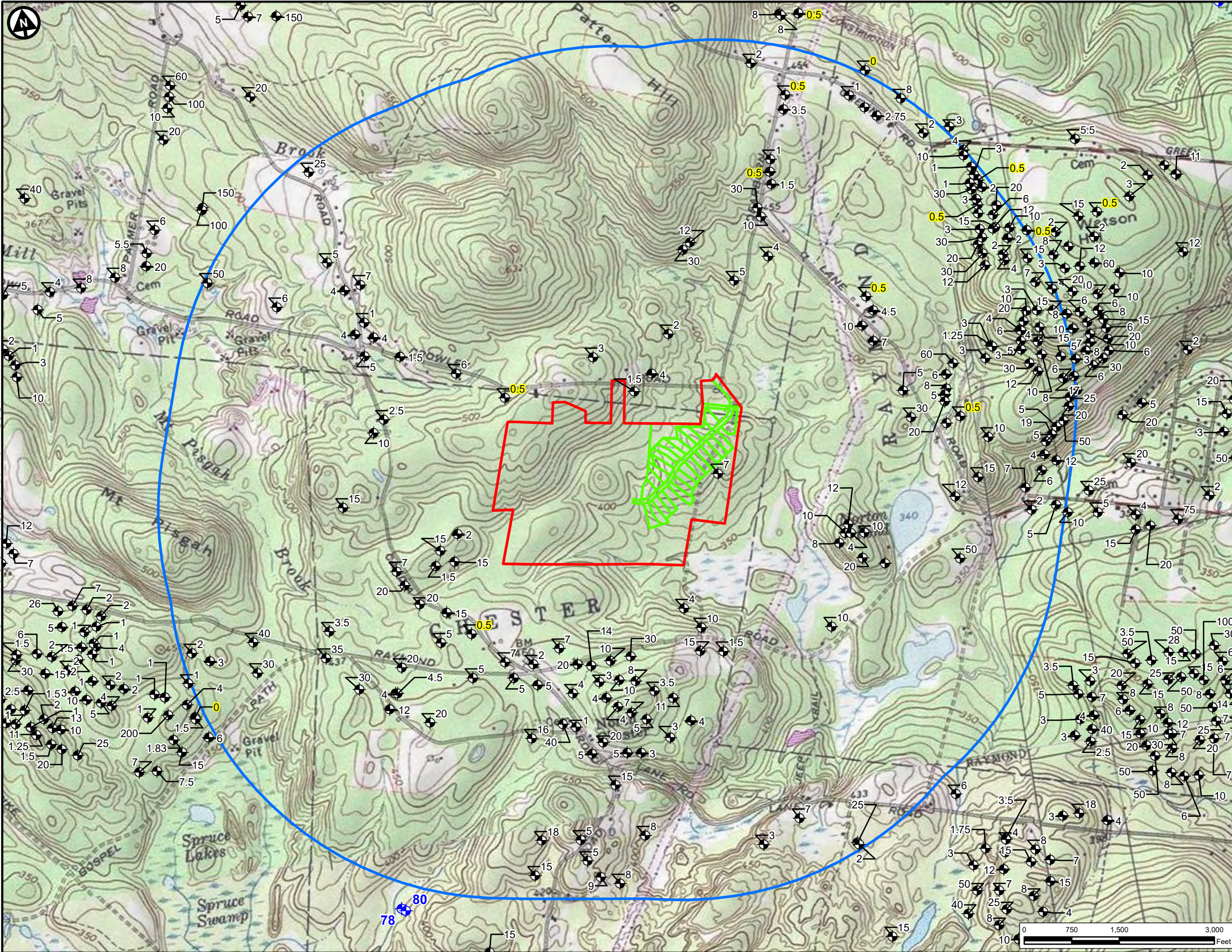
Soils Map

Hydrogeologic Study

Project Number	36542
Date	07/2025
Author	bsanchez
Scale	1 in = 500 ft
Figure	6



Edited: 7/1/2025 File Location: C:\Users\bsanchez\OneDrive - Verdantas\GIS Hub - Files\Project Files\CD\2025\Tanglewood Development\Hydrogeologic Study\36542 - Tanglewood Development\Hydrogeologic Study\36542 - Hydrogeologic Study.aprx Layout: 36542_Fig06_Soils



- Subject Property Boundary
- One-Mile Buffer
- Proposed Shannon Drive
- Houses Assumed To Have a Well
- OneStop Database Well
- 20 Yield (Gallons per Minute)
- .25 Yield Below 1 (Gallons per Minute)

- Notes:**
1. The topographic map was taken from the National Geographic Society Web Service.
 2. Proposed Shannon Drive locations are approximate.
 3. Well data was acquired from NHGIS.

DISCLAIMER: Verdantas LLC has furnished this map to the Client for its sole and exclusive use as a preliminary planning and screening tool. This map is reproduced from geospatial information compiled from third-party sources which may change over time and are not accurate as to mapping, surveying or engineering standards. Verdantas LLC makes no representation or warranty as to the content, accuracy, timeliness or completeness of any information. In no event will Verdantas LLC, its owners, officers, employees or agents, be liable for damages of any kind arising out of the use of this map by Client or any other party.

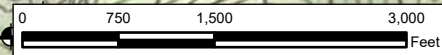


Tanglewood Development
Candia & Chester, New Hampshire

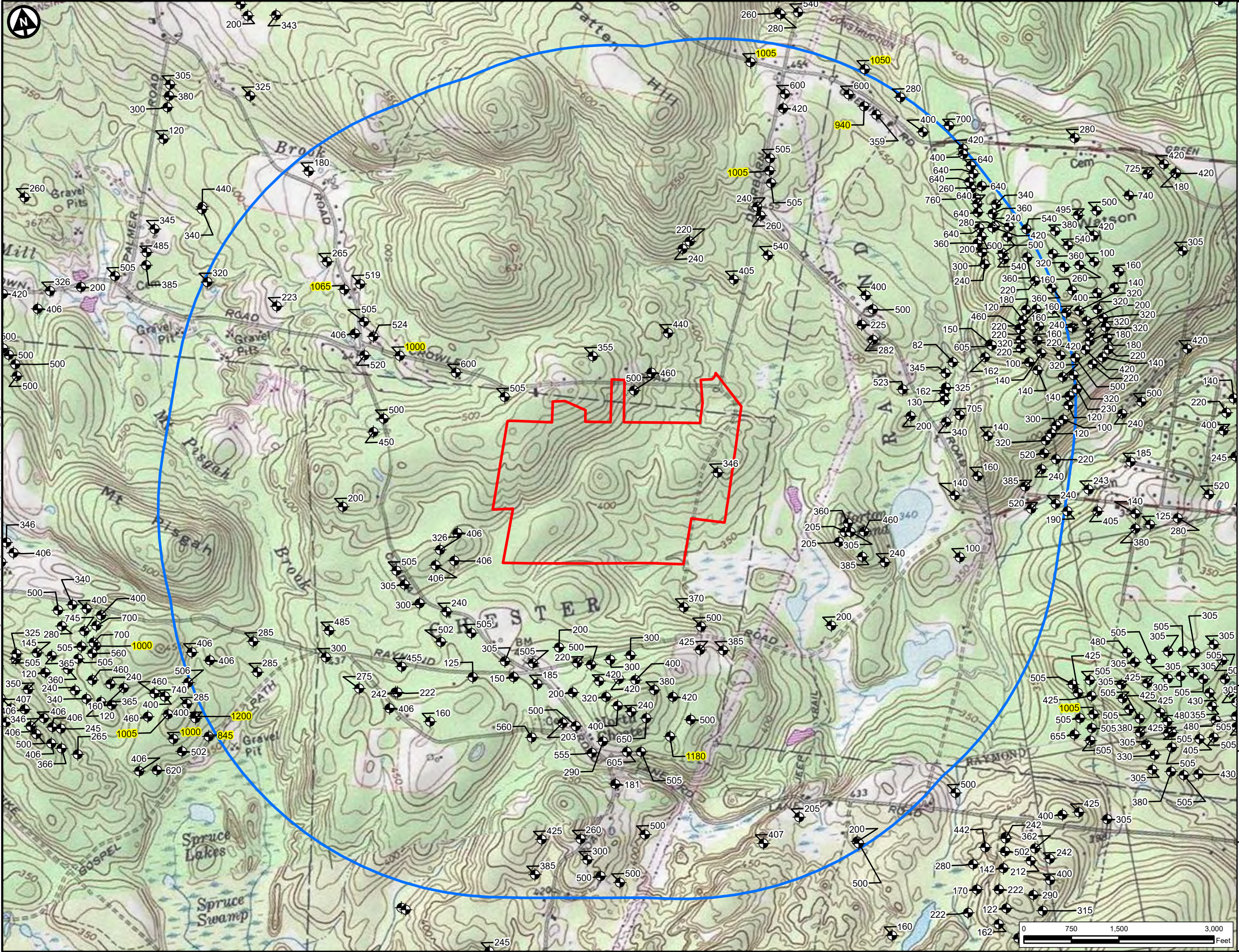
**NHDES Wells
Yield**

Hydrogeologic Study

Project Number	36542
Date	07/2025
Author	bsanchez
Scale	1 in = 1,500 ft
Figure	7



Edited: 7/1/2025 File Location: C:\Users\bsanchez\OneDrive - Verdantas\GIS Hub - Files\Project Files\CD2\DRAB\Bulmers36542 - Tanglewood Development Hydrogeologic Study\36542_Hydrogeologic_Study.aprx Layout: 36542_Fig07_Yields
 Produced Using Esri's ArcGIS Software



- ▭ Subject Property Boundary
- ▭ One-Mile Buffer
- ▬ Proposed Shannon Drive
- Houses Assumed To Have a Well
- OneStop Database Well
- 700 Total Well Depth (ft)
- 825 Total Depth Greater Than 800 feet

- Notes:**
1. The topographic map was taken from the National Geographic Society Web Service.
 2. Proposed Shannon Drive locations are approximate.
 3. Well data was acquired from NHGIS.

DISCLAIMER: Verdantas LLC has furnished this map to the Client for its sole and exclusive use as a preliminary planning and screening tool. This map is reproduced from geospatial information compiled from third-party sources which may change over time and are not accurate as to mapping, surveying or engineering standards. Verdantas LLC makes no representation or warranty as to the content, accuracy, timeliness or completeness of any information. In no event will Verdantas LLC, its owners, officers, employees or agents, be liable for damages of any kind arising out of the use of this map by Client or any other party.

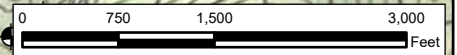


Tanglewood Development
Candia & Chester, New Hampshire

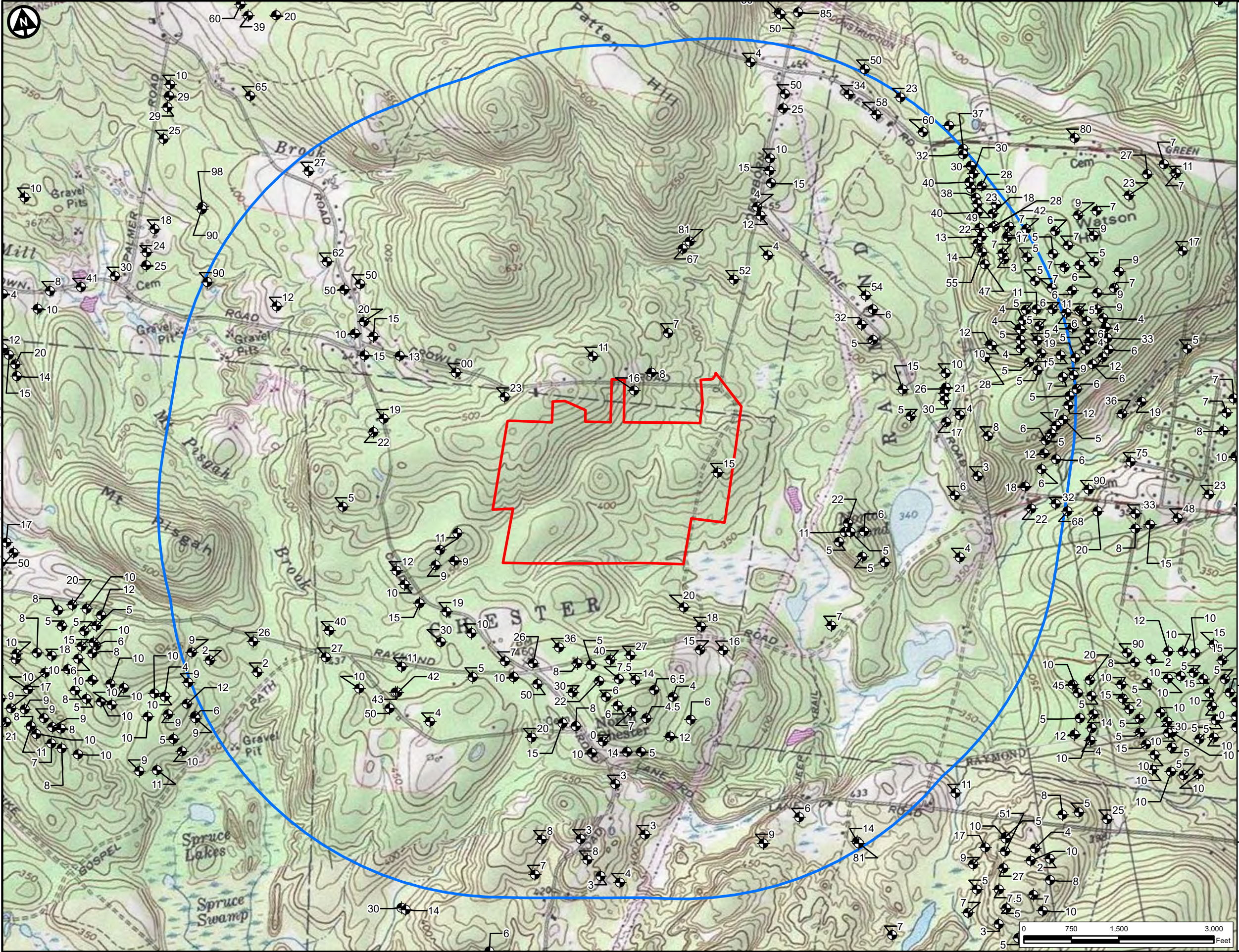
**NHDES Wells
Total Depth**

Hydrogeologic Study

Project Number	36542
Date	07/2025
Author	bsanchez
Scale	1 in = 1,500 ft
Figure	8



Edited: 7/1/2025 File Location: C:\Users\bsanchez\OneDrive - Verdantas\GIS Hub - Files\Projects\Elm_C2\2D\BAR\Bulmers36542 - Tanglewood Desktop\Hydrogeologic_Study\36542_Hydrogeologic_Study.aprx Layout: 36542_Fig8.aprx
 Produced Using Esri's ArcGIS Software



- ▭ Subject Property Boundary
- ▭ One-Mile Buffer
- ▭ Proposed Shannon Drive
- ◆ Houses Assumed To Have a Well
- 20 Total Well Depth (ft)

Notes:
 1. The topographic map was taken from the National Geographic Society Web Service.
 2. Proposed Shannon Drive locations are approximate.
 3. Well data was acquired from NHGIS.

DISCLAIMER: Verdantas LLC has furnished this map to the Client for its sole and exclusive use as a preliminary planning and screening tool. This map is reproduced from geospatial information compiled from third-party sources which may change over time and are not accurate as to mapping, surveying or engineering standards. Verdantas LLC makes no representation or warranty as to the content, accuracy, timeliness or completeness of any information. In no event will Verdantas LLC, its owners, officers, employees or agents, be liable for damages of any kind arising out of the use of this map by Client or any other party.

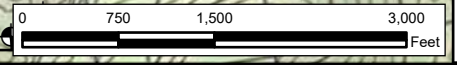


Tanglewood Development
 Candia & Chester, New Hampshire

**NHDES Wells
 Depth To Bedrock**

Hydrogeologic Study

Project Number	36542
Date	07/2025
Author	bsanchez
Scale	1 in = 1,500 ft
Figure	9



Edited: 7/1/2025 File Location: C:\Users\bsanchez\OneDrive - Verdantas\GIS Hub - Files\Projects\Tanglewood Development\Hydrogeologic Study\36542 - Hydrogeologic Study.aprx Layout: 36542_Fig9B_Bandrock
 Produced Using Esri's ArcGIS Software

APPENDICES

- APPENDIX A DAR BUILDERS, LLC PROJECT DEVELOPMENT PLANS
- APPENDIX B NHDES ENVIRONMENTAL FACT SHEET – RECOMMENDED MINIMUM WATER SUPPLY CAPACITY OF PRIVATE WELLS
- APPENDIX C NHDES ENVIRONMENTAL FACT SHEET – OVERVIEW OF WATER SUPPLY SOURCES



APPENDIX A

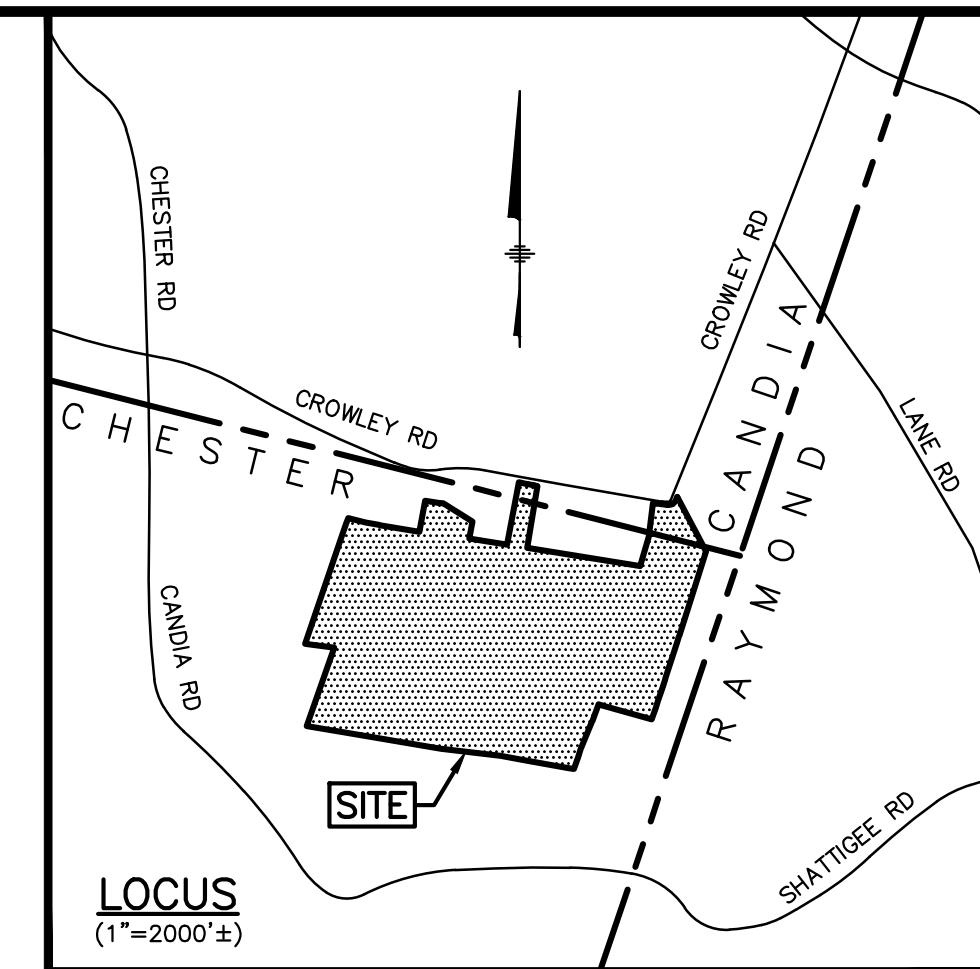
DAR BUILDINGS, LLC PROJECT DEVELOPMENT PLANS



RESIDENTIAL SUBDIVISION

TANGLEWOOD

CANDIA & CHESTER, NH



The Dubay Group, Inc.

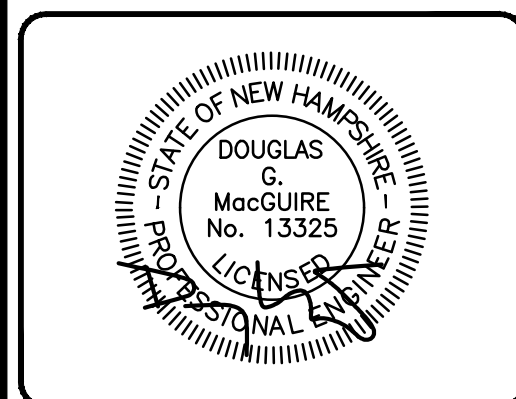
136 Harvey Rd. Bldg B101
Londonderry, NH 03053
603-458-6462

Engineers

Planners

Surveyors

TheDubayGroup.com



SHEET INDEX

1	TITLE SHEET
2	EXISTING CONDITIONS PLAN
3	SITE SPECIFIC SOILS PLAN
4	BOUNDARY PLAN
5-8	SUBDIVISION PLANS
9-12	TOPOGRAPHIC SUBDIVISION PLANS
13	GRADING & DRAINAGE OVERVIEW PLAN
14-16	GRADING, DRAINAGE, & UTILITY PLANS
17-19	ROADWAY LAYOUT PLANS
20-22	PROFILE PLANS
23-25	EROSION CONTROL PLANS
26-32	SITE DETAILS

REVISIONS:

REV#	DATE	COMMENT	BY

DRAWN BY: SJK
CHECKED BY: DGM
DATE: APRIL 30, 2024
SCALE:
FILE: 738-COVER
DEED REF: 5800-2566

PROJECT:

TANGLEWOOD

CANDIA TAX MAP 414
LOTS 152 & 152-10
CHESTER TAX MAP 11
LOTS 30 & 30-7
CROWLEY ROAD
CANDIA & CHESTER NH

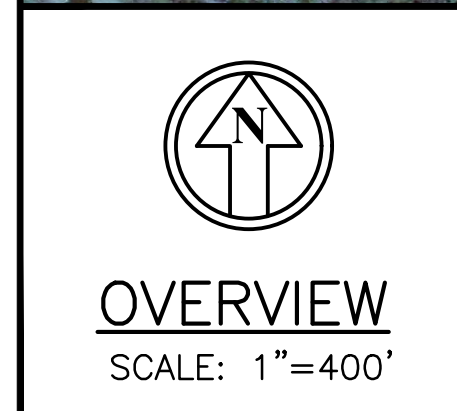
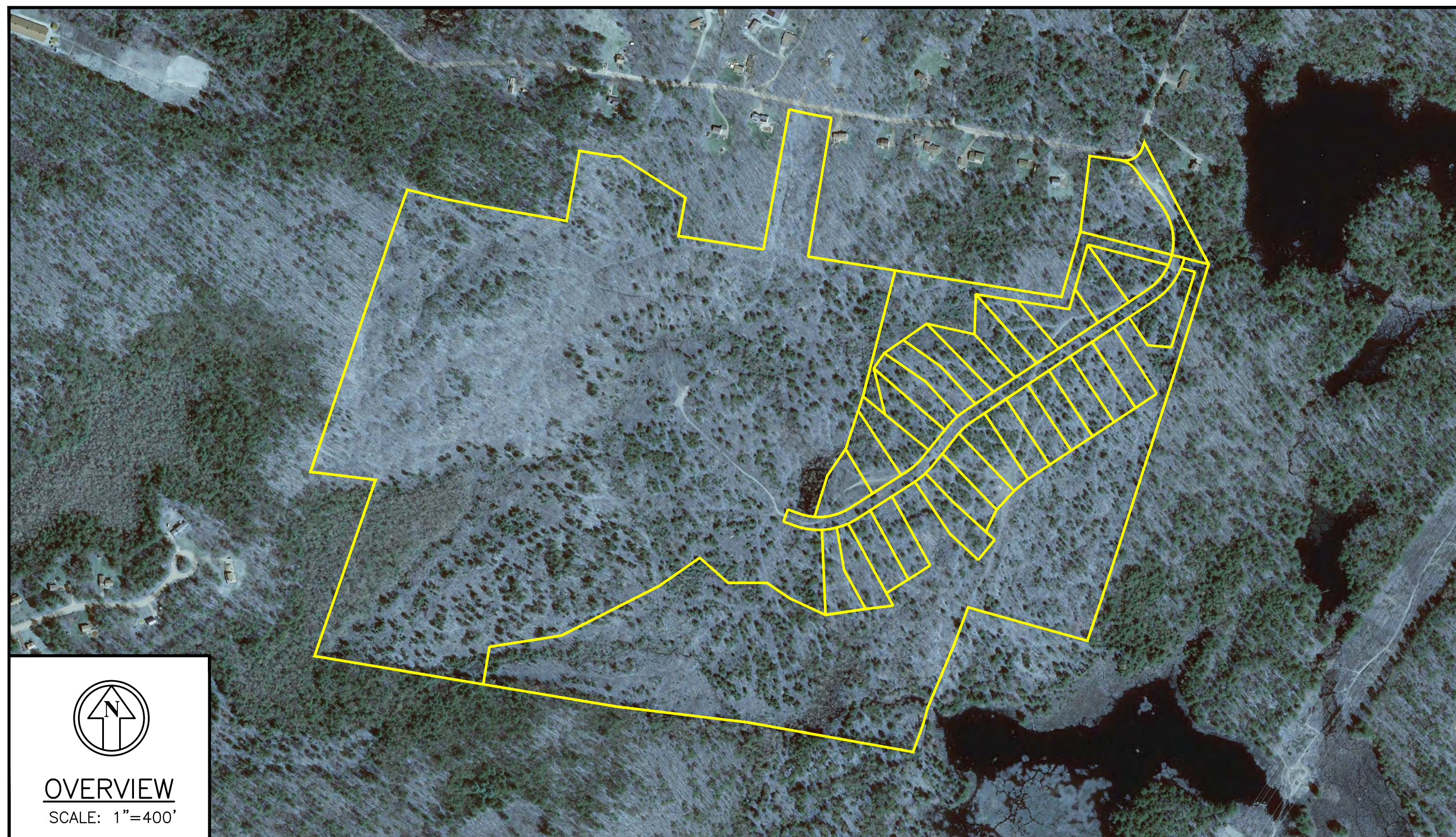
FOR/OWNER

DAR BUILDERS, LLC

722 E. INDUSTRIAL
PARK DRIVE
UNIT 17
MANCHESTER, NH 03109

SHEET TITLE:

TITLE SHEET



REQUIRED PERMITS	PERMIT #	DATE
1) NHDES SUBDIVISION PERMIT	_____	_____
2) NHDES ALTERATION OF TERRAIN PERMIT	_____	_____
3) NHDES WETLAND PERMIT	_____	_____

OWNER'S SIGNATURE

DAR BUILDERS, LLC
722 EAST INDUSTRIAL PARK DRIVE UNIT 17
MANCHESTER, NH 03109

DATE RECORDED _____ RCRD# _____

APPROVED BY THE CANDIA PLANNING BOARD ON

DATE

CHAIRMAN

APPROVED BY THE CHESTER PLANNING BOARD ON

DATE

CHAIRMAN

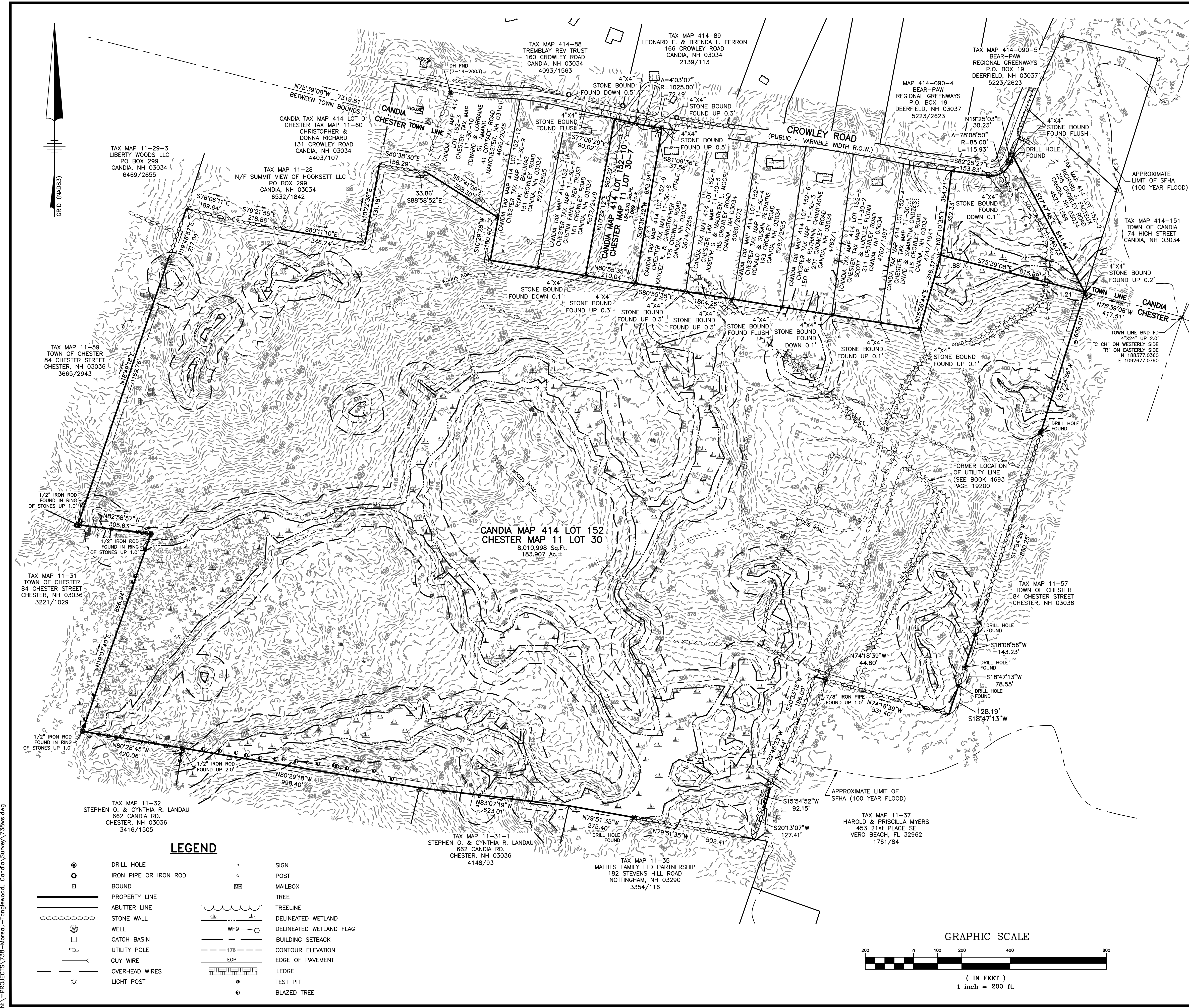


The Dubay Group, Inc.

136 Harvey Rd. Bldg B101
Londonderry, NH 03053
603-458-6462

Engineers
Planners
Surveyors

TheDubayGroup.com



NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING SITE CONDITIONS OF CANDIA MAP 414 LOTS 152 & 152-10 AND CHESTER MAP 11 LOTS 30 & 30-7.
2. EXISTING FEATURES SHOWN HEREON ARE BASES ON A COMBINATION OF INFORMATION TAKEN FROM PLAN REFERENCE #1, LIDAR DATA DOWNLOADED FROM NOAA, OTHER RECORD PLANS, AND A PARTIAL FIELD SURVEY BY THIS OFFICE IN FEBRUARY AND MARCH, 2025.
3. THE BOUNDARY INFORMATION SHOWN HEREON IS BASED ON PLAN REFERENCE #1 AND A PARTIAL FIELD SURVEY PERFORMED BY THIS OFFICE IN FEBRUARY AND MARCH, 2025.
4. THE HORIZONTAL DATUM IS BASED ON NAD83 PER GPS OBSERVATIONS PERFORMED BY THIS OFFICE ON MARCH 05, 2025.
5. THE VERTICAL DATUM IS BASED ON NAVD83 PER GPS OBSERVATIONS PERFORMED BY THIS OFFICE ON MARCH 05, 2025.
6. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON RECORD DESIGN PLANS, DIG SAFE FLAGGING, AND/OR INFORMATION PROVIDED BY THE TOWN OF CANDIA & CHESTER, NH, AND ABOVE GROUND FEATURES LOCATED BY THIS OFFICE. SAID UNDERGROUND UTILITIES ARE NOT WARRANTED TO BE EXACT OR INCLUSIVE OF ALL EXISTING UTILITIES.
7. CANDIA MAP 414 LOTS 152 & 152-10 AND CHESTER MAP 11 LOT 30-7 ARE NOT LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA (100 YEAR FLOOD) PER FLOOD INSURANCE RATE MAP 33015C0170E, WITH AN EFFECTIVE DATE OF MAY 17, 2005 AND A SMALL PORTION OF CHESTER MAP 11 LOTS 30 IS LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA (100 YEAR FLOOD) PER FLOOD INSURANCE RATE MAP 33015C0170E, WITH AN EFFECTIVE DATE OF MAY 17, 2005.
8. REFER TO "NHEC ABANDONMENT OF RIGHT OF WAY" RECORDED IN BOOK 4693 PAGE 1920 THAT RELEASES EASEMENT RIGHTS ASSOCIATED WITH THE FORMER UTILITY LINE THAT ONCE CROSSED CHESTER MAP 11 LOT 30.
9. CANDIA MAP 414 LOT 152 IS ZONED RESIDENTIAL (R) PER THE TOWN OF CANDIA ZONING MAP:

MIN LOT SIZE: 3 AC.
MIN LOT FRONTAGE: 200 FT
MIN FRONT YARD: 50 FT
MIN SIDE YARD: 25 FT
MIN REAR YARD: 25 FT

CHESTER MAP 11 LOT 30 IS ZONED RESIDENTIAL (R-1) PER THE TOWN OF CHESTER ZONING MAP:

MIN LOT SIZE: 2 AC.
MIN LOT FRONTAGE: 290 FT
MIN FRONT YARD: 40 FT
MIN SIDE YARD: 25 FT
MIN REAR YARD: 25 FT

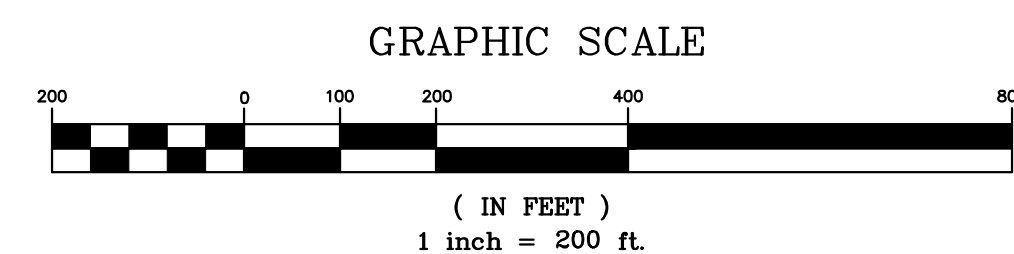
REFER TO THE TOWNS OF CANDIA & CHESTER ZONING ORDINANCE FOR ADDITIONAL INFORMATION AND RESTRICTIONS.

REFERENCE PLANS:

1. "SUBDIVISION PLAN TANGLEWOOD CANDIA TAX MAP 414 LOTS 152 & 152-10 CHESTER TAX MAP 11 LOTS 30 & 30-7, CROWLEY ROAD, CANDIA & CHESTER, NH OWNER OF RECORD: DAR BUILDERS LLC, DATED 9/19/24, BY ERIC C. MITCHELL & ASSOC., INC.
2. ROCKINGHAM COUNTY REGISTRY OF DEEDS (R.C.R.D.) PLAN D 27318
3. R.C.R.D. PLAN D-33026

CERTIFICATION:

I CERTIFY THAT THIS SURVEY AND PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND THAT THIS PLAN IS THE RESULT OF A PARTIAL FIELD SURVEY MADE ON THE GROUND DURING FEBRUARY 2025 AND PLAN REFERENCE NO. 3 WITH AN ERROR OF CLOSURE OF NOT MORE THAN ONE PART IN TEN THOUSAND.



REVISIONS:

REV.	DATE:	COMMENT:	BY:

DRAWN BY: DSJ
CHECKED BY: JAC
DATE: APRIL 30, 2024
SCALE: 1"=200'
FILE: 738ws
DEED REF: 5800-2566

PROJECT:

TANGLEWOOD
CANDIA TAX MAP 414
LOTS 152 & 152-10
CHESTER TAX MAP 11
LOTS 30 & 30-7
CROWLEY ROAD
CANDIA & CHESTER NH
FOROWNER

DAR BUILDERS, LLC

722 E. INDUSTRIAL
PARK DRIVE
UNIT 17
MANCHESTER, NH 03109

SHEET TITLE:

**EXISTING
CONDITIONS
PLAN**

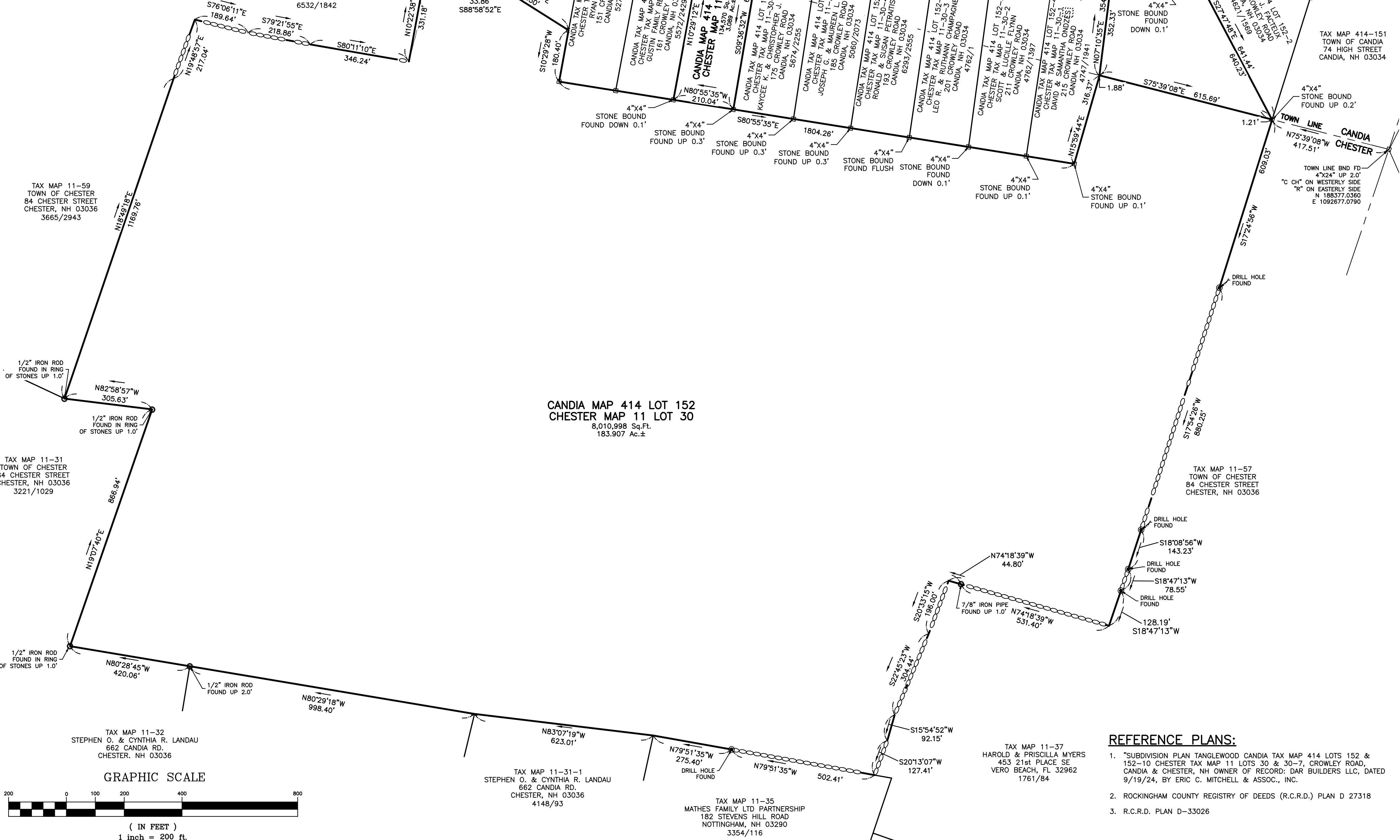
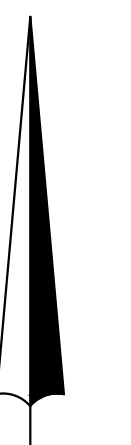
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LEGEND

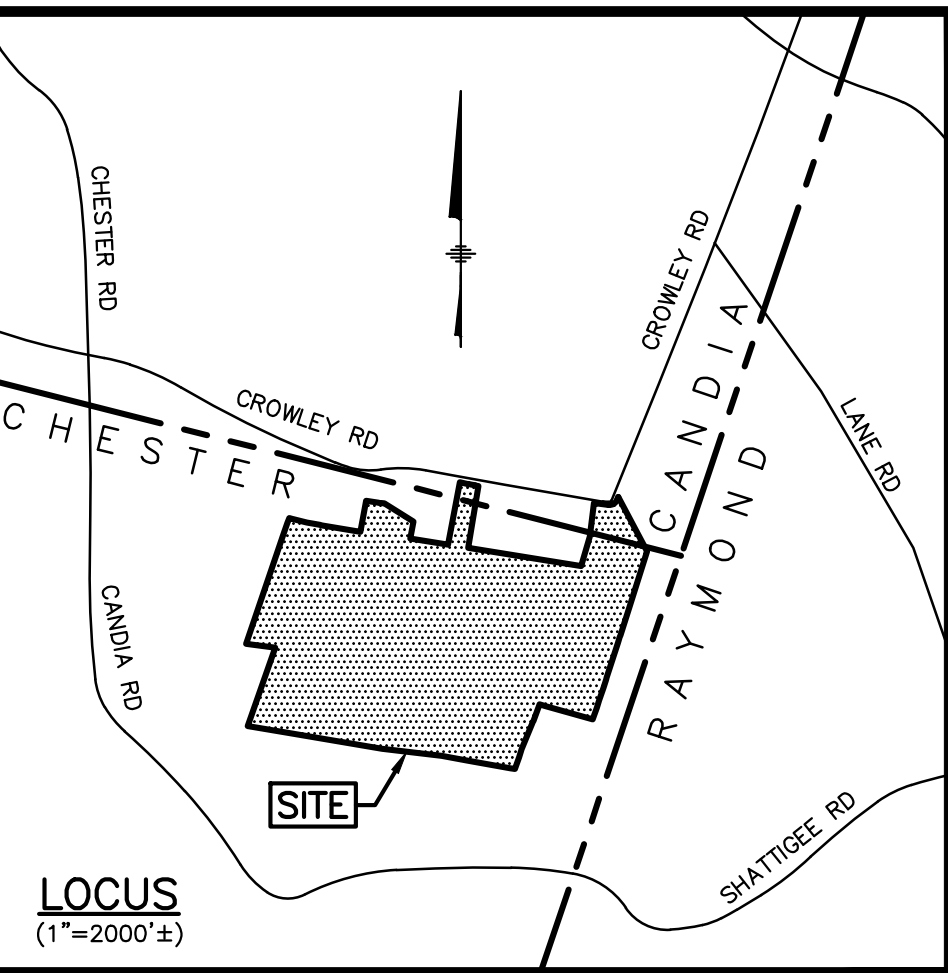
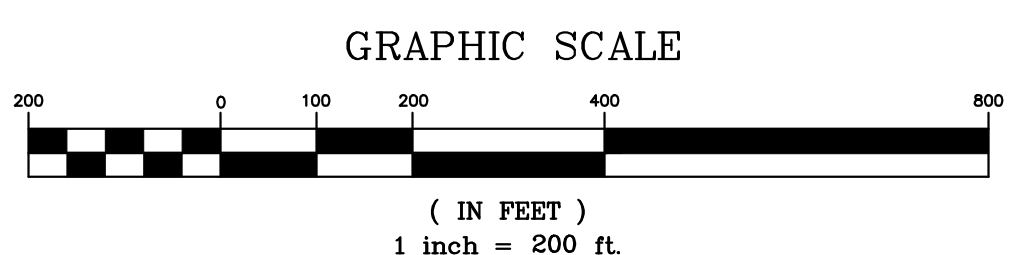
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- IRON PIPE OR IRON ROD
- BOUND
- PROPERTY LINE
- ABUTTER LINE
- STONE WALL
- WELL
- CATCH BASIN
- UTILITY POLE
- GUY WIRE
- OVERHEAD WIRES
- ☆ LIGHT POST
- ▽ SIGN
- POST
- MAILBOX
- TREE
- TREELINE
- DELINEATED WETLAND
- DELINEATED WETLAND FLAG
- BUILDING SETBACK
- CONTOUR ELEVATION
- EOP
- EDGE OF PAVEMENT
- LEDGE
- TEST PIT
- BLAZED TREE

LEGEND

- DRILL HOLE
- IRON PIPE OR IRON ROD
- BOUND
- PROPERTY LINE
- ABUTTER LINE
- STONE WALL
- ⊙ WELL
- ⊕ CATCH BASIN
- ⊙ UTILITY POLE
- GUY WIRE
- OVERHEAD WIRES
- ⊙ LIGHT POST
- ⊙ SIGN
- ⊙ POST
- ⊙ MAILBOX
- ⊙ TREE
- TREELINE
- DELINEATED WETLAND
- DELINEATED WETLAND FLAG
- BUILDING SETBACK
- CONTOUR ELEVATION
- EDGE OF PAVEMENT
- LEDGE
- ⊙ TEST PIT
- ⊙ BLAZED TREE



**CANDIA MAP 414 LOT 152
CHESTER MAP 11 LOT 30**
8,010,998 Sq.Ft.
183,907 Ac.±



LOCUS
(1"=2000'±)

- NOTES:**
1. THE INTENT OF THIS PLAN IS TO SHOW THE BOUNDARY OF CANDIA MAP 414 LOTS 152 & 152-10 AND CHESTER MAP 11 LOTS 30 & 30-7.
 2. EXISTING FEATURES SHOWN HEREON ARE BASES ON A COMBINATION OF INFORMATION TAKEN FROM PLAN REFERENCE #1, LIDAR DATA DOWNLOADED FROM NOAA, OTHER RECORD PLANS, AND A PARTIAL FIELD SURVEY BY THIS OFFICE IN FEBRUARY AND MARCH, 2025.
 3. THE BOUNDARY INFORMATION SHOWN HEREON IS BASED ON PLAN REFERENCE #1 AND A PARTIAL FIELD SURVEY PERFORMED BY THIS OFFICE IN FEBRUARY AND MARCH 2025.
 4. THE HORIZONTAL DATUM IS BASED ON NAD83 PER GPS OBSERVATIONS PERFORMED BY THIS OFFICE ON MARCH 05, 2025.
 5. CANDIA MAP 414 LOTS 152 & 152-10 AND CHESTER MAP 11 LOT 30-7 ARE NOT LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA (100 YEAR FLOOD) PER FLOOD INSURANCE RATE MAP 33015C0170E, WITH AN EFFECTIVE DATE OF MAY 17, 2005 AND A SMALL PORTION OF CHESTER MAP 11 LOTS 30 IS LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA (100 YEAR FLOOD) PER FLOOD INSURANCE RATE MAP 33015C0170E, WITH AN EFFECTIVE DATE OF MAY 17, 2005.
 6. REFER TO "NHEC ABANDONMENT OF RIGHT OF WAY" RECORDED IN BOOK 4693 PAGE 1920 THAT RELEASES EASEMENT RIGHTS ASSOCIATED WITH THE FORMER UTILITY LINE THAT ONCE CROSSED CHESTER MAP 11 LOT 30.

CERTIFICATION:

I CERTIFY THAT THIS SURVEY AND PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND THAT THIS PLAN IS THE RESULT OF A PARTIAL FIELD SURVEY MADE ON THE GROUND DURING FEBRUARY 2025 AND PLAN REFERENCE NO. 3 WITH AN ERROR OF CLOSURE OF NOT MORE THAN ONE PART IN TEN THOUSAND.

JOEL A. CONNOLLY, LLS 997 DATE

OWNER'S SIGNATURE

DAR BUILDERS, LLC
722 EAST INDUSTRIAL PARK DRIVE, UNIT 17
MANCHESTER, NH 03109
BOOK 5800 PAGE 2566 (CORRECTIVE DEED)
BOOK 5747 PAGE 1970

APPROVED BY THE CANDIA, NH
PLANNING BOARD ON: _____
CERTIFIED BY: _____
CHAIRMAN: _____
SECRETARY: _____
OTHER MEMBER: _____
OTHER MEMBER: _____
OTHER MEMBER: _____
OTHER MEMBER: _____

APPROVED BY THE CHESTER, NH
PLANNING BOARD ON: _____
CERTIFIED BY: _____
CHAIRMAN: _____
TOWN PLANNER: _____



The Dubai Group, Inc.
136 Harvey Rd. Bldg B101
Londonderry, NH 03053
603-458-6462

Engineers
Planners
Surveyors
TheDubayGroup.com

REVISIONS:

REV.	DATE	COMMENT	BY

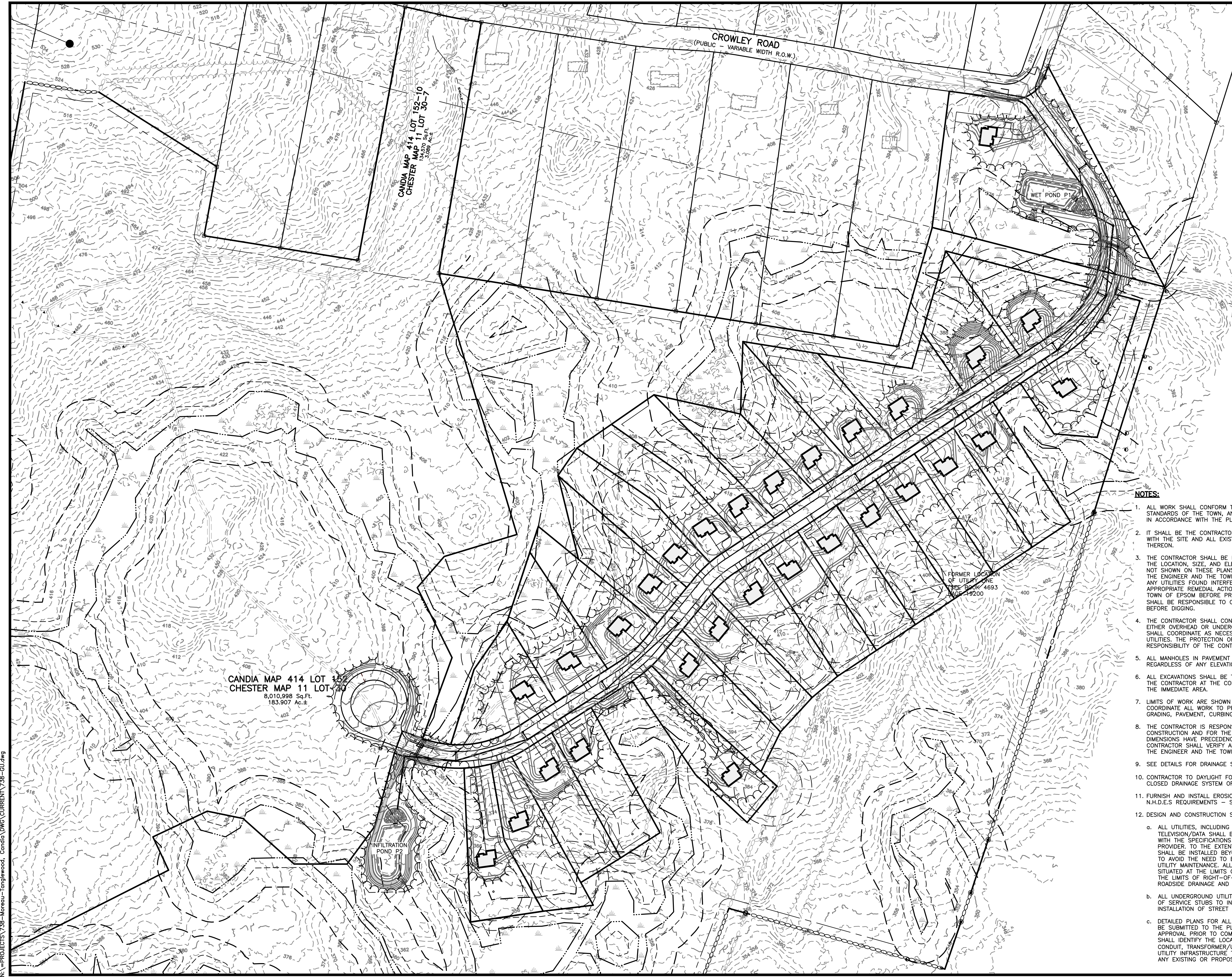
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CHECKED BY: JAC
DATE: APRIL 30, 2024
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DEED REF: 5800-2566

PROJECT:
TANGLEWOOD
CANDIA TAX MAP 414
LOTS 152 & 152-10
CHESTER TAX MAP 11
LOTS 30 & 30-7
CROWLEY ROAD
CANDIA & CHESTER NH
FOROWNER

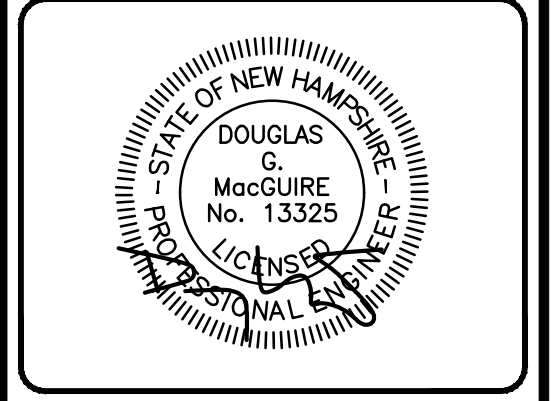
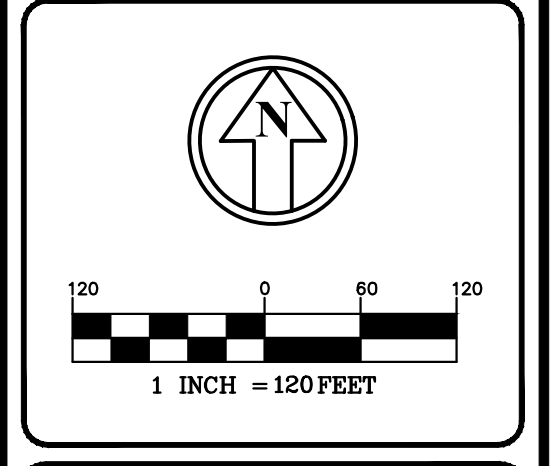
DAR BUILDERS, LLC
722 E. INDUSTRIAL
PARK DRIVE
UNIT 17
MANCHESTER, NH 03109

SHEET TITLE:
BOUNDARY PLAN

N:\PROJECTS\738-Maneu-Tanglewood_Candia\Survey\738-SUB.dwg



Engineers
Planners
Surveyors
TheDubayGroup.com



REVISIONS:

REV.	DATE	COMMENT	BY

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CHECKED BY: DGM
DATE: APRIL 30, 2024
SCALE: 1"=120'
FILE: 738-GU
DEED REF: 5800-2566

PROJECT:
TANGLEWOOD
CANDIA TAX MAP 414
LOTS 152 & 152-10
CHESTER TAX MAP 11
LOTS 30 & 30-7
CROWLEY ROAD
CANDIA & CHESTER NH
FOR/OWNER
DAR BUILDERS, LLC
722 E. INDUSTRIAL
PARK DRIVE
UNIT 17
MANCHESTER, NH 03109

SHEET TITLE:
**GRADING,
DRAINAGE, &
UTILITIES
OVERVIEW PLAN**

- NOTES:**
- ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE TOWN, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
 - IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEIRSELF WITH THE SITE AND ALL EXISTING CONDITIONS SURROUNDING IT AND THEREON.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE, AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER AND THE TOWN OF EPSOM SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION BE AGREED TO BY THE ENGINEER AND THE TOWN OF EPSOM BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT "DIGSAFE" (811) AT LEAST 72 HOURS BEFORE DIGGING.
 - THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA AND SHALL COORDINATE AS NECESSARY WITH THE UTILITY COMPANIES OF SAID UTILITIES. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.
 - ALL MANHOLES IN PAVEMENT SHALL HAVE RIMS SET TO FINISH GRADE REGARDLESS OF ANY ELEVATIONS OTHERWISE SHOWN.
 - ALL EXCAVATIONS SHALL BE THOROUGHLY SECURED ON A DAILY BASIS BY THE CONTRACTOR AT THE COMPLETION OF CONSTRUCTION OPERATIONS IN THE IMMEDIATE AREA.
 - LIMITS OF WORK ARE SHOWN AS APPROXIMATE. THE CONTRACTOR SHALL COORDINATE ALL WORK TO PROVIDE SMOOTH TRANSITIONS. THIS INCLUDES GRADING, PAVEMENT, CURBING, AND ALIGNMENTS.
 - THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR THE CONDITIONS AT THE SITE. WRITTEN DIMENSIONS HAVE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND REPORT DISCREPANCIES TO THE ENGINEER AND THE TOWN.
 - SEE DETAILS FOR DRAINAGE SPECIFICATIONS
 - CONTRACTOR TO DAYLIGHT FOUNDATION/ROOF DRAINS TO THE PROPOSED CLOSED DRAINAGE SYSTEM OR TOE OF SLOPE WHERE POSSIBLE.
 - FURNISH AND INSTALL EROSION AND SEDIMENTATION CONTROL SYSTEMS PER N.H.D.E.S REQUIREMENTS - SEE DETAILS.
 - DESIGN AND CONSTRUCTION STANDARDS FOR UTILITIES
 - ALL UTILITIES, INCLUDING ELECTRIC, TELEPHONE AND CABLE TELEVISION/DATA SHALL BE INSTALLED UNDERGROUND IN ACCORDANCE WITH THE SPECIFICATIONS OF EACH APPLICABLE LICENSED PUBLIC UTILITY PROVIDER. TO THE EXTENT POSSIBLE, UNDERGROUND UTILITY CONDUIT SHALL BE INSTALLED BEYOND THE LIMITS OF ROADWAY PAVEMENT SO AS TO AVOID THE NEED TO EXCAVATE PAVEMENT WHEN PERFORMING ROUTINE UTILITY MAINTENANCE. ALL TRANSFORMERS AND RISERS SHALL BE SITUATED AT THE LIMITS OF RIGHT-OF-WAY, OR IN EASEMENTS BEYOND THE LIMITS OF RIGHT-OF-WAY IF NECESSARY, TO AVOID CONFLICT WITH ROADSIDE DRAINAGE AND MAINTENANCE ACTIVITIES.
 - ALL UNDERGROUND UTILITY INSTALLATION, INCLUDING THE INSTALLATION OF SERVICE STUBS TO INDIVIDUAL LOTS, SHALL BE COMPLETED PRIOR TO INSTALLATION OF STREET PAVEMENT.
 - DETAILED PLANS FOR ALL UNDERGROUND UTILITY SERVICE LINES SHALL BE SUBMITTED TO THE PLANNING DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO COMMENCEMENT OF CONSTRUCTION. SUCH PLANS SHALL IDENTIFY THE LOCATION OF ALL PROPOSED UNDERGROUND UTILITY CONDUIT, TRANSFORMER/UTILITY RISERS, SERVICE STUBS AND OTHER UTILITY INFRASTRUCTURE TO BE SITUATED WITHIN THE RIGHT-OF-WAY OF ANY EXISTING OR PROPOSED STREET.

APPENDIX B

NHDES ENVIRONMENTAL FACT SHEET – RECOMMENDED MINIMUM WATER SUPPLY CAPACITY FOR PRIVATE WELLS



ENVIRONMENTAL Fact Sheet



29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

DWGB-1-8

2021

Recommended Minimum Water Supply Capacity for Private Wells

One of the most important factors to consider when planning to purchase or build a home is the adequacy of the water supply. The amount of water available to the home can be as important as the quality of the water. How much water is adequate for a private domestic supply is a commonly asked question of NHDES and the Water Well Board. Please note that the State of New Hampshire does not regulate how much water a private well shall yield. Some towns have adopted ordinances requiring private wells produce a specific amount of water prior to issuing occupancy or building permits; check with your local authority to find out more.

Available water supply is a function of both the recovery rate and the storage volume of the well. These two factors contribute to the actual capacity of the supply particularly if the well recovery rate is low. A standard 6-inch diameter drilled well can store 1½ gallons of water per foot of well depth. The actual volume of water in storage will depend on the water level in the well and the pump setting depth.

The Water Well Board suggests that a minimum water supply capacity for domestic internal household use should be at least 600 gallons of water within a two-hour period once each day. This is equivalent to a flow rate of 5 gallons per minute (gpm) for two hours. Alternatively, the New Hampshire Water Well Association recommends a flow rate of 4 gpm for a period of four hours as an optimum water supply capacity for a private domestic supply. This volume is equivalent to 960 gallons of water within a four-hour period. Some homeowners may find these amounts to be less than desirable depending on the size of the family and/or if outdoor use is a requirement.

The following tables were developed to assist readers to interpret the recommendations above. In both tables, the overall yield is the sum of the aquifer yield to the well and the available well storage. The tables presume a pump setting of 20 feet above the bottom of the well and a static water level of 20 feet below the ground surface. However, a pump can be set anywhere in the well and the static water level changes over time.

Contact a licensed water well contractor or licensed pump installer for information about pumping tests and available options for increasing the capacity of inadequate supplies. Also see fact sheet [DWGB-1-13, "Determining the Reliable Capacity of a Private Water Supply Well and Pumping System"](#) for more information.

Recommended Minimum Capacity

The values in Table 1 provide a yield of 600 gallons of water to the home during a period of two hours of pumping.

Table 1. Supply 600 gallons in Two Hours

Sustained Well Yield (gpm)	Required Well Depth (ft)
0.5	400
1	360
1.5	320
2	280
2.5	240
3	200
3.5	160
4	120
4.5	80
5	---

Recommended Optimum Capacity

The values in Table 2 provide a yield of 960 gallons of water to the home during a period of four hours of pumping.

Table 2. Supply 960 gallons in Four Hours

Sustained Well Yield (gpm)	Required Well Depth (ft)
0.5	600
1	520
1.5	440
2	360
2.5	280
3	200
3.5	120
4	---

For Additional Information

Please contact the Drinking Water and Groundwater Bureau and the New Hampshire Water Well Board at (603) 271-1974 or waterwellprogram@des.nh.gov or visit our website at www.des.nh.gov.

Note: This fact sheet is accurate as of September 2019. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.

APPENDIX C

NHDES ENVIRONMENTAL FACT SHEET – OVERVIEW OF WATER SUPPLY SOURCES



ENVIRONMENTAL Fact Sheet



29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

DWGB-1-1

2020

Overview of Water Supply Sources

This is the first in a series of fact sheets regarding sources of drinking water supply commonly used in New Hampshire. The two types of water supply sources, surface water and groundwater sources, are described within. Refer to additional fact sheets from the New Hampshire Department of Environmental Services (NHDES) for more details on these sources of water supply.

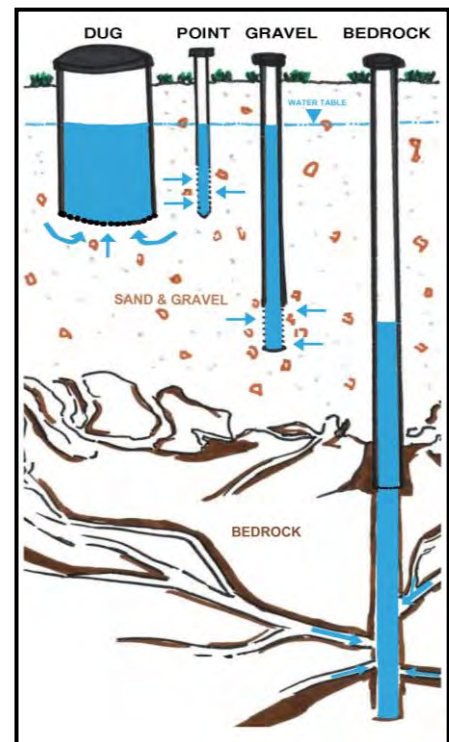
Surface Water Sources

Approximately 40 surface water supplies are used as sources of public water in New Hampshire. NHDES strongly recommends that surface waters *not* be used as the source of drinking water for private homes due to their risk of contamination by bacteria and other disease-causing organisms. Refer to the fact sheet WD-DWGB-1-11 "Use of Lakes or Streams for Domestic Water Supply" for more information.

Groundwater Sources

New Hampshire is relatively water rich. Wells that take water from unconsolidated soil and rock deposits (sand and gravel above the bedrock) are called gravel wells, wash wells, point wells or dug wells. These wells are only feasible where the soils are sufficiently porous to transmit water and where the saturated zone (the area below the water table and above the bedrock) is sufficiently thick to resist drought effects. Bedrock wells (also referred to as drilled or artesian) are easily developed throughout the state, with a few exceptions.

Well drillers and pump installers in New Hampshire are licensed by the Water Well Board under [NH RSA 482](#). The rules of the board are numbered We 100-1000. There are no state requirements relative to water quality or quantity for private home wells. Some towns have local requirements for private water wells. For guidance and recommendations on adequate water quantity, please see fact sheet WD-DWGB-1-13 "Determining the Reliable Capacity for a Private Water Supply Well and Pumping System." For recommendations on water quality testing, refer to a brochure developed by NHDES and the New Hampshire Department of Human Health Services titled "What's in Your Water."



Types of wells (NHDES, 2018)

Bedrock (Artesian or Drilled) Wells

Most wells in New Hampshire are drilled into bedrock. The median depth of bedrock wells drilled in New Hampshire is 400 feet and the median yield is 15 gallons per minute (gpm). Every bedrock well is different. The depth and yield of your neighbors well does not mean you will find a similar yield at the same depth on your property. If a bedrock well yield is low, the well's yield can often be improved by either surging or hydro-fracturing. For more information on bedrock well construction, refer to the NHDES fact sheet WD-DWGB-1-2 "Bedrock (Artesian, Drilled) Well Design."

Bedrock wells generally have few incidents of bacteria contamination, but tend to have high levels of naturally occurring contaminants, often at levels that pose a risk to human health. Specifically, concentrations of arsenic and radiological compounds (radon, radium and uranium) are, on average, much higher in bedrock wells than sand and gravel wells. Hardness minerals are typically higher in bedrock wells as opposed to sand and gravel wells. The occurrence of iron, manganese, taste and odor in bedrock wells is approximately the same as in wells in sand and gravel deposits.

Wells in Sand and Gravel

Dug Wells. These wells capture water in the upper unconsolidated soil and rock deposits. Historically, dug wells made from fieldstone were very common. More modern dug wells are made from precast concrete components and installed with an excavator. In a properly installed and maintained dug well the water enters the well from the gravel-lined bottom. Poorly constructed or aging wells can have water entering from the top or along the side walls, which contributes to their common bacterial problems. Refer to the fact sheet WD-WDWGB-1-4 "Dug Well Design" for more information.

Gravel Wells and Point Wells. These wells also capture water in the upper unconsolidated soil and rock deposits. Gravel wells are typically installed to depths greater than 30 feet and are installed using specialized drilling equipment (often cable tool or drive and wash rigs). Gravel wells are constructed with plastic (Schedule 40 PVC or thicker) casing and incorporate a screen (typically made of stainless steel) that is installed at the bottom of the well after the borehole is created. Point wells are essentially the same as gravel wells, however, the construction method is different. Point wells are installed with the screen at the front of the pipe being driven into the ground. Some point wells are less than 3-inches in diameter and installed by hand with hammers; these are typically installed to depths less than 30 feet. For more information, refer to the fact sheet WD-DWGB-1-6 "Point Well Design." In gravel and point wells water flows into the screened area at the bottom of the well.

All sand and gravel wells are susceptible to manmade chemicals contamination from many "backyard" activities. Gravel and point wells are less susceptible to bacteria contamination as groundwater is filtered through soil materials prior to entering the well through the screen. All sand and gravel wells are susceptible to manmade chemicals contamination from many "backyard" activities. Gravel and point wells are less sensitive the drought then dug wells as they are often installed deeper into saturated materials.

For More Information

Please contact the Drinking Water and Groundwater Bureau at (603) 271-2513 or dwgbinfo@des.nh.gov or visit our website at des.nh.gov.

Note: This fact sheet is accurate as of June 2019. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.