Hydrogeological Desktop Study

Proposed Conservation Subdivision
Young Road (Tax Map 240, Lot 8)
Barrington, New Hampshire

December 2023
Revised from October 2023

Submitted to:

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825

Submitted by:

Groundwater Withdrawal Permitting – Public Water System Management
Shoreline Permitting – Public Outreach
abby@edgewaternh.com
(603) 630-1971
Gilford, NH

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December 19, 2023
Revised from October 5, 2023

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825

RE: Hydrogeologic Desktop Study near the Young Road Property
Young Road, Barrington, New Hampshire

Mr. Berry,

A residential subdivision development has been proposed for a currently undeveloped parcel of land on Young Road identified as Map 240, Lot 8 in the Town of Barrington. The lot is proposed to be subdivided to incorporate twenty-three (23) single family lots each on their well and septic system. As part of subdivision approval, this hydrogeological study was performed to evaluate the potential impact of the water supply wells needed to support the subdivision on local groundwater resources.

This study is intended to meet the requirements of a Hydrogeologic Study as described in Article 7, Item 7.7, of the Town of Barrington Subdivision Regulations (2022 Version 1). Per Article 16, specifically 16.2, a Hydrogeologic Study shall be required for any well with withdrawal over 20,000 gallons per day. The total proposed number of bedrooms for this 23, 4-bedroom home subdivision is 92-bedrooms at 13,800 gpd (23 homes x 4 bedrooms x 150 gpd per bedroom). NH septic design regulations require designing for 150 gallons per day (gpd) of water per bedroom. The intent is each lot will be fed by its own water supply well. The total withdrawals are not over 20,000 gpd. Per Article 15, specifically 15.3, a Hydrogeologic Study is required for a development where a septic system is being designed to accommodate 2,500 gpd or more. In total, the septic design of all 23 lots is greater than 2,500 gpd. However, each proposed individual lots will be designed for a septic system with maximum design of 600 gpd. Included within is a description of hydrogeology, a groundwater budget, and groundwater quality considerations.

Edgewater Strategies, LLC (Edgewater) has conducted this hydrogeological study for the proposed subdivision and presents the findings below. This study was limited in scope to a desktop study only, utilizing published topographic and geologic data and maps along with water well construction data from the New Hampshire Water Well Board and New Hampshire Geological Survey database. Statements and opinions made regarding the data presented are those of Edgewater's NH Licensed Professional Geologist, Abigail Fopiano (NH P.G. #817) based on the available data.

1. Project Background

The project site is a 65.55-acre parcel located off Young Road between Beauty Hill Road and Route 9 in Barrington, New Hampshire (**Figure 1**). The site is identified as Lot 8 on the Town of Barrington Tax Map 240. New lot divisions are proposed. The lot is currently undeveloped woodland and wetlands. The subdivision proposes to break the parcel into twenty-three (23) lots (see Figures). Each lot is capable to including a 4-bedroom single family home and septic system. NH septic design regulations require designing for 150 gallons per day (gpd) of water per bedroom. Four bedrooms per home has been utilized for water demand/use estimations (4 x 150 gpd = 600 gpd); which is conservative as 3–4-bedroom homes typically use near 200 gpd. The total proposed number of bedrooms for this subdivision is 92-bedrooms at 13,800 gpd (23 homes x 4 bedrooms x 150 gpd per bedroom).

2. Local Hydrogeology

The site is located near the northwest headwaters of the Great Bay Watershed and locally drains eastward into the adjacent Mallego Brook via an on-site wetland complex. The site is not located in any special flood designation according to the Federal Insurance Rate Map, Strafford County Panel 285, Town of Barrington, New Hampshire, Community no. 330178.

According to the Surficial Geologic Map of the Barrington Quadrangle (**Figure 3**) on-site test pit data and well construction data, the site is noted to be covered by up to 26 feet of loose materials above the bedrock surface. The surficial materials are noted to be composed primarily of a mix of sand, gravel, silt, and till. These materials, specifically the silts and till, while can be porous have low hydraulic conductivities and do not make for a viable water supply aquifer. The surficial geologic map and well data indicates there is a pocket of transmissive material to depths of 65 feet to the east of the project site. The topography of the site slopes gradually from the west (Young Road) to the east towards abutting wetlands that drain to Richardson Pond, with the highest elevation at approximately 300 ft above the North American Vertical Datum of 1988 (NAVD88) and the lowest at 240 ft NAVD88. Local groundwater flow in the overburden is expected to flow to the west towards the wetlands.

The surficial deposits are mapped to overlay the Concord Granite, which is characterized as a peraluminous granite unit from the Late Devonian period (**Figure 4**). There is a unit contact between the Concord Granite and the Berwick Formation approximately 4000 ft from the project site. According to the USGS Open-File Report 97-763 *Lineament Map of Area 4 of the New Hampshire Bedrock Aquifer Assessment, Northeast-Central New Hampshire*, there are eight lineaments within 500 feet of the project site which are shown on **Figure 4.** Lineaments are inferred fractures in the bedrock that may help store and transmit water.

3. Bedrock Groundwater Flow

Water supply wells near the proposed subdivision are predominantly bedrock wells. Bedrock groundwater flow is through fractures (sometimes termed veins, fissures, cracks). The depth, direction, angle, and extent of fractures in the bedrock is unknown. When a well is installed, the goal is to intercept saturated fractures that transmit groundwater resulting in a good well yield. Well yield is the amount of water a well can produce and is measured in gallons per minute (gpm). In some cases, little to no fractures are encountered, and the well yield is minimal (less than 1 gpm). In other cases, one or many fractures are encountered, and the yield can be very high. Each well is unique, two wells can be in near proximity and have very different yields. The

water quality can be different as well, it is dependent on the geology at depth and spatial changes in that geology.

Fractures in the rock may extent and intercept multiple wells creating interconnections between wells. The interconnection of bedrock wells through the underlying fractures is unknown until wells are drilled and continual use occurs. And, while there may be observable interconnections between wells (through water level fluctuations), this interference does not necessarily signify wells adversely impact each other.

Determining a bedrock wells yield is done in multiple ways. When a well is drilled the water well contractor performs a short (less than 30 minutes) airlift test and notes the yield. This test typically does not take water levels into account. A more accurate yield test is through pumping the well and monitoring the water level and flow rate. When the water level stabilizes at a certain rate, that is an indication that the water enters the well as the same rate it is pumped. When the pump turns off, if the water level recovers back near to the pre-pumping level in the same amount of time that it was pumped. The rate (gpm) at which the water level stabilized is considered a sustainable well yield. Very few wells undergo this more thorough yield testing. Therefore, the drillers airlift yield is sufficient to get a general understanding of the yield potential of the bedrock aquifer.

The State of New Hampshire does not have regulations as to what a private well needs to yield or what the water quality must be. Instead, we have guidance from state septic design standards, federal and state public drinking water system regulations, water well associations and the New Hampshire Water Well Board. A residential well user shall be able to extract water from the well at a rate that meets their peak demands, then have the water level recover so water is available for extraction the next day and each day thereafter. Peak demand is the highest water use in the day (for example, morning routines with showers, laundry etc. and evening routines with meal preparation, cleaning, etc.).

The New Hampshire Water Well Board suggests that for indoor domestic uses, a private well should be able to produce 600 gallons in 4-hours or 900 gallons in 5-hours, this equates to a well yield of 2.5-3 gpm. However, a well with a yield of 1 gpm or less may work for indoor domestic uses if the well is deep enough to hold peak demand in storage, or an auxiliary storage tank is used in the home. Refer to **Attachment A**, the New Hampshire Department of Environmental Services (NH DES) Fact Sheet, DWGB-1-8 2021: Recommended Minimum Water Supply Capacity for Private Wells.

4. Local Well Data

Since 1984, water well drillers in New Hampshire are required to be licensed and submit well construction reports for all wells installed. This well construction data (Well Reports) is submitted to NH DES and stored with the New Hampshire Geological Survey. Data on wells is available to the public via NH DES OneStop online data library. Local well data was reviewed and compiled to make general statements regarding the local bedrock aquifer. **Table 1** presents reported data for wells within 3,600 feet of the project site. Not all wells are reported to NH DES and only some wells have accurate enough data to geo-locate them. A circle with a 3,600-foot radius was utilized as this is the maximum area utilized as the well head protection area in the permitting of small community water systems. This project does not fall under public water system regulations, yet we can utilize those rules as guidance. The wellhead protection area is defined as the area that may contribute water to the well; within this area well owners shall be aware of and try to reduce the risk from potential contamination sources.

Figure 5 depicts the location of some existing wells near the project site. Not all wells in the NH DES database are georeferenced and show in the figure. Many wells only have road names and not house numbers, GPS coordinates or tax map and Lot to be able to pinpoint a parcel to which they are located. **Table 1** presents reported wells that are presumed to be located near the site based on the data publicly available through NH DES. The wells are shown as type bedrock or sand and gravel.

Given the hydrology at the project site, the proposed new wells will be bedrock wells. Thirty-five bedrock wells were found in the NH DES database to be located on roads or parcels within 3,600 feet of the proposed project site. A summary of the bedrock well data in this area is shown in **Table A** below.

Table A – Summary of Bedrock Well Construction Data

Well Data Statistic	Total Well Depth (Feet)	Depth to bedrock (Feet, Surficial deposit thickness)	Well Yield (gpm)
Minimum	100	0	0.33
Maximum	765	50	50
Median	400	7	4
Average	**362.6**	**12.5**	**10.9**

Notes:
Data based on 35 bedrock wells within 3,600 feet from project site.
Only 34 wells had data on depth to bedrock.
gpm = gallons per minute, air-lift test.

The data indicates eleven of the thirty-five bedrock wells reported well yields of 2.0 gpm or less. Sixteen of the thirty-five bedrock wells reported well yields greater than 5 gpm. The median well yield is 4 gpm. The average well yield is 10.9 gpm. The median well depth is 400 feet. The average well depth is 362.6 feet. Three wells are over 500 feet deep. Only one well is 700 feet or greater in depth. There is variability in both well depth and yield, which is common to bedrock aquifers. The bedrock well construction data suggests a productive bedrock aquifer capable to provide water that meets domestic water needs at depths under 700 feet. While it is possible that one or more of the 23 proposed wells may results in yields less than 2 gpm. Like the other wells already in the area, initial yield of 2pm may be suitable or a well can be hydrofractured or have a pump set deep enough to be able to meet peak domestic water demands.

5. Water Budget

In attempt to understand how the additional groundwater withdrawals from the proposed twenty-three single family homes may impact the local bedrock aquifer, a water budget has been performed for the area within a 3,600-foot radius of the project site. A circle with a 3,600-foot radius was utilized as this is the default maximum area utilized as the well head protection area in the permitting of small community water systems in New Hampshire. The water budget identifies and provides estimates of the inflows and outflows from the aquifer system, specifically accounting for inferred groundwater recharge, withdrawal, and storage within the set area, and is presented in the subsections below. ***This water budget analysis is not intended to provide actual volumes of water in the area as that data cannot be precisely quantified. Specific numbers are used in the analysis to help to assess general uses and availability of water in the area.*** Calculations on the water budget are presented in an Appendix of this report.

5.1 Recharge to Bedrock

Recharge estimates to the underlying bedrock are based on precipitation and published rates of movement of precipitation water to the overburden into the bedrock. According to the long-term precipitation record at the nearby National Oceanic and Atmospheric Administration (NOAA) DURHAM 2 N Monitoring Station, located approximately 6 miles from the site, average precipitation in the region is 47.83 inches. The regional average annual recharge rate of precipitation to shallow overburden (sand and gravel) to groundwater value is based on two well documented United States Geological Survey (USGS) hydrogeologic studies, Flynn and Tasker (USGS 2004) at 21 inches per year and Bent (USGS 1998) with a range of 17.5 to 22.4 inches. The water budget utilizes the average of these reported recharge rates of precipitation to bedrock at 20.5 inches per year or 1.71 feet per year.

Recharge of overburden to bedrock is dependent on the hydraulic conductivity of the overburden and the density of fractures at the bedrock surface. A published study by Lyford, et al, (USGS 2003) that focused on modeling fractured bedrock aquifer systems, cited recharge rates from overburden to bedrock were 8.45 in/yr, 9 in/yr, 10.2-11 in/yr, and 10-20 in/yr, calculating to an average of 13.0 in/yr. The water budget utilized the lowest, most conservative, recharge estimate of 8.45 inches per year or 0.7 feet per year. The project site is bounded to the west by extensive wetlands, which can indicate a either bedrock recharge or discharge area.

Based on the study area of a 3,600-foot radius circle, the estimated annual recharge of groundwater to bedrock is 213.2 million gallons of water.

5.2 Storage in Bedrock

Storage of groundwater within the bedrock aquifer is based on well construction data noting thickness of the bedrock and documented porosity of bedrock. This water budget did not incorporate the volume of water stored in the overburden or any surface waters, as the proposed withdrawals are to be from the bedrock aquifer. This water budget utilizes the average static water level below ground surface of 17.6 feet to average depth of well (362.6 feet), resulting in an inferred thickness of 345.0 feet.

Bedrock groundwater flow and storage is through fractures (sometimes termed veins, fissures, cracks). The value of porosity (void space) of the fractures is based on published porosity of plutonic rocks as defined in Applied Hydrology (Fetter, 1988) as 2% and Groundwater and Wells (Driscoll, 1986) as 0-10%. The water budget utilized the 2% porosity based on geology and published values. Based on this, the estimated volume of water in storage in the bedrock for a study area of a 3,600-foot radius circle 9.75 million gallons.

5.3 Withdrawals from Bedrock

Withdrawals from the bedrock aquifer are presented in the water budget. The current combined estimate for bedrock groundwater withdrawals includes residential homes, the Middle School, Library and Recreation center. There are approximately 111 homes with a combined 306 bedrooms in the study area, equating to 45,900 gpd (306 bedrooms x 150 gpd per bedroom). This is based on the Town of Barrington online assessors GIS database. The school, library and recreation center are estimated to use a combined 2,500 gallons per day. The current bedrock withdrawals are estimated at 48,400 gpd or an annual withdrawal of 17.66 million gallons of water. The estimated proposed subdivision withdrawals, at 13,800 gpd or an annual withdrawal of 5.03 million gallons of water.

Currently, 2.4% of annual recharge is estimated to be withdrawn for human consumption. The addition of water usage for the proposed subdivision creates only a 0.89 % increase in recharge consumption. Relative to

total recharge, this is minimal. It is not anticipated that the additional withdrawals will have a negative impact on the availability of water in the local bedrock aquifer.

Table B – Summary of Water Budget

Study Area (3,600-foot radius circle)	**Cubic Feet**	**Gallons**
Estimated Annual Volume of Groundwater Recharge to Bedrock	**28.50 x 10^6 ft^3**	**213 million**
Estimated Current Annual Withdrawals from Bedrock:	**2.36 x 10^6 ft^3**	**17.6 million**
Estimated Proposed Annual Withdrawals from Bedrock:	**0.67 x 10^6 ft^3**	**5.03 million**
Water Budget Analysis / Net Recharge		
Annual Bedrock Recharge minus Current Withdrawals:	**26.14 x 10^6 ft^3**	**195.4 million**
Annual Bedrock Recharge minus Current and Proposed Withdrawals:	**25.47 x 10^6 ft^3**	**190.3 million**
Percent of Annual Recharge taken by Current Use and Proposed Project:	*2.4%*	
Percent of Annual Recharge taken by proposed Project:	*0.89%*	

Note: Water budget is assumptive based on estimates of recharge, storage and withdrawals of groundwater in the area.

6. Existing Background Water Quality

Per the Town of Barrington Subdivision Regulations (2022 Version 1) existing background water quality is to be include in the Hydrogeologic Study. There are no state requirements for what a private well must yield or what the water quality must be. In fact, water quality information on private wells is considered confidential information from accredited drinking water laboratories. Water quality on residential homes was not gathered for this study. However, there are public water systems near the proposed subdivision. Public water systems are regulated by the State of NH as to conform to the US Environmental Protection Agency laws on public drinking water systems. As such, water quality data for public water systems is available to the public and can be accessed through NH DESs OneStop Online Database.

The following statements are made regarding water quality in nearby public water systems. Laboratory reports for these systems can be found through NH DESs OneStop Online Database.

- The Early Childhood Learning Center, NH DES PWS ID 0155020 is located just over 3,300 feet north from the center of the subject parcel. Recent testing of treated water indicates non-detectable concentrations of arsenic, volatile organic compounds (VOCs), synthetic organic compounds (SOCs) and per-and polyfluoroalkyl substances (PFAS). Iron and manganese were detected at low levels. Nitrate was detected at low levels; nitrite was not detected.
- The Barrington Hills Apartments, NH DES PWS IDs 0152030 and 0152050 are located 5,000 feet north northeast of the center of the subject property. These are two systems fed by different wells.
    - Recent testing for PWS 0152030 (Lower Apartments) indicates non-detectable concentrations of nitrite, VOCs, SOCs and PFAS. Arsenic, uranium, iron, and manganese were detected at low levels (below any drinking water standards).
    - Recent testing for PWS 0152050 (Upper Apartments) indicates non-detectable concentrations of nitrite, VOCs and SOCs. Arsenic, uranium, iron, and manganese were detected at low levels (below any drinking water standards).

Bedrock water quality varies between wells. Common water quality issues in local bedrock aquifers are elevated arsenic or uranium, which can be harmful to human health. Elevated iron, manganese or hardness is common, these compounds are traditionally bothersome to taste, smell and staining and are not harmful. However, recent studies indicate manganese can be harmful at low levels. Acute contaminants, such as bacteria or pathogens and nitrites can be very harmful and are typically due to well construction or land use issues and not natural occurring. It is recommended that any new private well intended to be used for drinking water sources be tested and treated for any compounds that exceed drinking water quality standards. Any installed water treatment shall be maintained per manufacturers specifications and backwash not routed to surface waters.

7. On-site and Abutting Septic Systems

According to the Town assessor's database, aerial photographs and visual assessment, there are thirteen (13) developed lots east of the property across Young Road. These homes incorporate their own water wells and septic systems. By state law, septic systems are designed so there is enough natural filtration (linear footage) around the leach field for nitrates to be reduced to below 10 ppm before it crosses a property boundary. When this cannot be met (for large loading only), groundwater monitoring plans are required by NH DES. For individual system loading of less than 1,000 gpd, nitrate above 10 ppm at the leach field is not expected.

Twelve (12) of these lots homes were built after 2011 and should have been built per state well and wastewater regulations. Therefore, septic plans for these lots were not reviewed. One property (Map 240, Lot 16, 40 Young Road) was reportedly built in 1980 and last sold in 1975. A review of publicly available information on NH DES Subsurface OneStop database was made for this lot. A septic system plan for this lot was not identified.

All proposed lots in the subdivided lot will be privately owned, there is no common space. The proposed individual lots will incorporate individual wells. Each proposed lot will incorporate individual septic systems (tank and leach field) designed for 600 gpd of loading (4 bedrooms at 150 gpd per bedroom). Septic system design plans for each proposed lot have not been completed, as layout of each lot is at the discretion of the future property owner and builder. All lots are sized to be able to accommodate an on-site well with 75-foot radius that does not overlap with the on-site septic system and property setbacks. The risk of transport of nitrates above drinking water standards at any proposed property boundary is low. Given all proposed septic systems will be built per state regulations, there shall be no threat of nitrate contamination to on-site wells or abutters wells.

8. Impact Assessment and Conclusions

Based on the analyses described above, the following conclusions have been compiled regarding the potential for groundwater supply at the Young Road project site:

A. Due to the lack of viable sand and gravel under the project site, water supply for the proposed homes will be derived from the underlying bedrock aquifer.

B. Local water well construction data indicates the bedrock aquifer is capable to provide an adequate amount of water for a well to meet domestic indoor peak water demands.

C. Based on the water budget that assessed general recharge, storage, and withdrawals of groundwater in the area, the annual estimated recharge to the bedrock aquifer is 213.2 million gallons per year. The estimated storage in the bedrock aquifer underlying and within 3,600 feet of the project site is 2,101 million gallons.

D. The project proposes twenty-three, 4-bedroom single family homes each on their own well and septic system. Conservative annual water use from the subdivision are estimated at 5.03 million gallons. This water is expected to be withdrawn from the bedrock, used for domestic purposed, and recharged back to the overburden as treated wastewater. Aside from some contributions to nearby wetlands, this water eventually recharges the bedrock aquifer.

E. Based on the water budget that assessed general recharge, storage, and withdrawals of groundwater in the area, the current annual bedrock groundwater withdrawals for residential homes and public buildings are estimated at 17.6 million gallons. The proposed withdrawals account to a 28.5% increase from the current groundwater withdrawals which is only 0.89% of the annual recharge to bedrock.

F. Bedrock water quality varies between wells. It is recommended that any new private well intended to be used for drinking water be tested and treated when compounds exceed drinking water quality standards.

G. Abutters and the proposed lots do and will incorporate individual wells and septic systems to fall wholly on each lot and will be approved through NH DES. As such, the risk of transport of nitrates above drinking water standards at any proposed property boundary or to any well is low.

H. There are undeveloped lots within 3,600-feet of the project site that when developed would increase bedrock aquifer withdrawals and septic system loading in the future.

I. Based on the data gathered and presented within, the bedrock aquifer underlying the site is expected to be capable of supplying water needed for the proposed homes. The groundwater withdrawals from the proposed subdivision are not anticipated to have an adverse impact on the local bedrock aquifer.

9. Limitations and Hydrogeologic Assessment Considerations

This study was limited in scope to a desktop analysis of groundwater potential and did not incorporate any field data collection. The data as presented and interpreted does not guarantee wells will produce a certain amount of water or that wells will not be interconnected of have the potential to impact, even adversely impact, other wells. In conjunction with the opinions provided above, Edgewater presents the following considerations in relation to the project.

- This report does not include a water quality assessment. New Hampshire does not regulate water quality in private drinking water wells. Typically, private well water quality laboratory data is confidential and not readily available. It is recommended that the proposed wells are tested prior to occupancy.

- The use of groundwater for seasonal irrigation at existing or proposed lots was not specifically addressed in this report nor included in the water budget. Irrigation withdrawals greatly increase

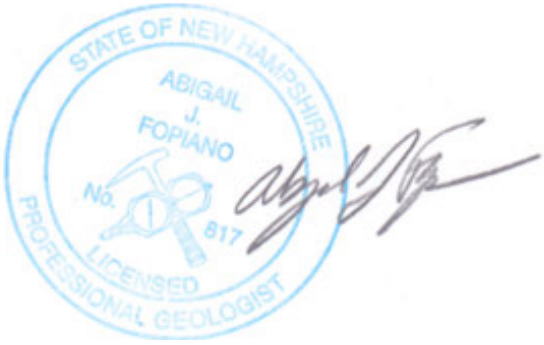
daily water use, sometimes greater than 10 times more water used per day. Irrigation use is seasonal and not necessary to occur every day. It is advised that the Town of Barrington explore municipal authorities on irrigation use for all landowners (limit irrigation during drought, installer certification requirements, etc.).

- The NH Water Well Board does not regulate or require drillers to plug an overflowing well (true artesian), rather stipulates proper drainage control. Although rare, it is advised that for any overflowing well a licensed well driller extend the casing to stop flow or install a plug in the well to prevent unnecessary continual withdrawals from the bedrock aquifer.

Thank you for this opportunity. If you have any questions, please do not hesitate to reach out to me at (603) 630-1971 or abby@edgewaternh.com.

Sincerely,

Abby Thompson Fopiano, P.G.
Hydrogeologist and Owner, Edgewater Strategies, LLC



FIGURES

Young Road Subdivision Project, Barrington, New Hampshire

FIGURE 1
Aerial Photo and Location Map

Legend

- Proposed Young Road Subdivision
- Proposed Subdivision Parcels
- NH DOT Roads

Map Scale is 1:9000, 1 inch = 750 ft

0 600 1,200 1,800 2,400 ft

Notes:

1. Aerial photo background is from the NH Granit 2015 NAIP dataset.

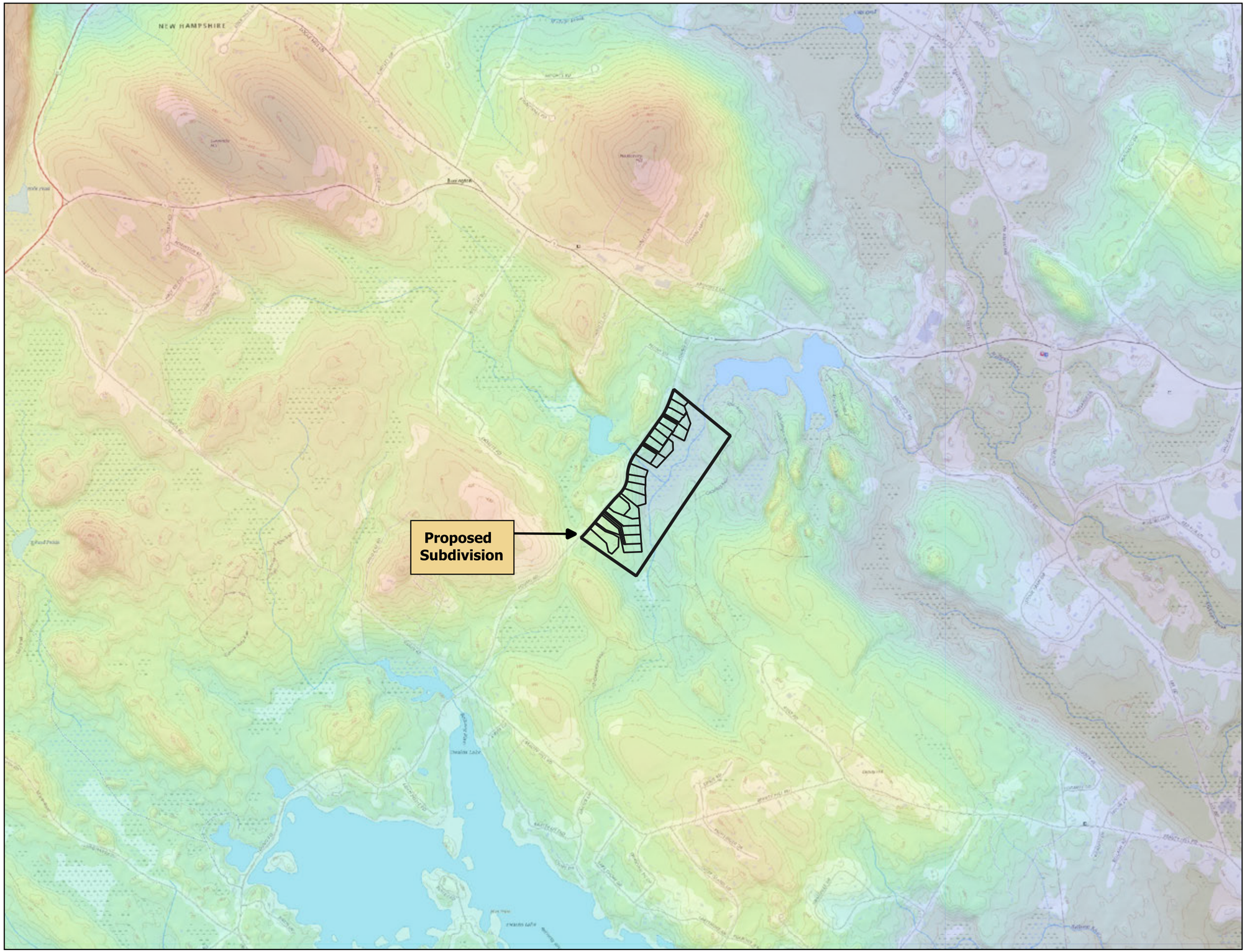
2. Inset basemap is from the World Street Map dataset.

EDGEWATER STRATEGIES
CLEAR SOLUTIONS

Map generated: 7/18/2023

Young Road Subdivision Project, Barrington, New Hampshire

FIGURE 2
Local Topography



Legend

- Proposed Young Road Subdivision
- Proposed Subdivision Parcels

LiDAR Elevation (feet)

505.4
174.6

Map Scale is 1:18000, 1 inch = 1500 ft

0 1,200 2,400 3,600 4,800 ft

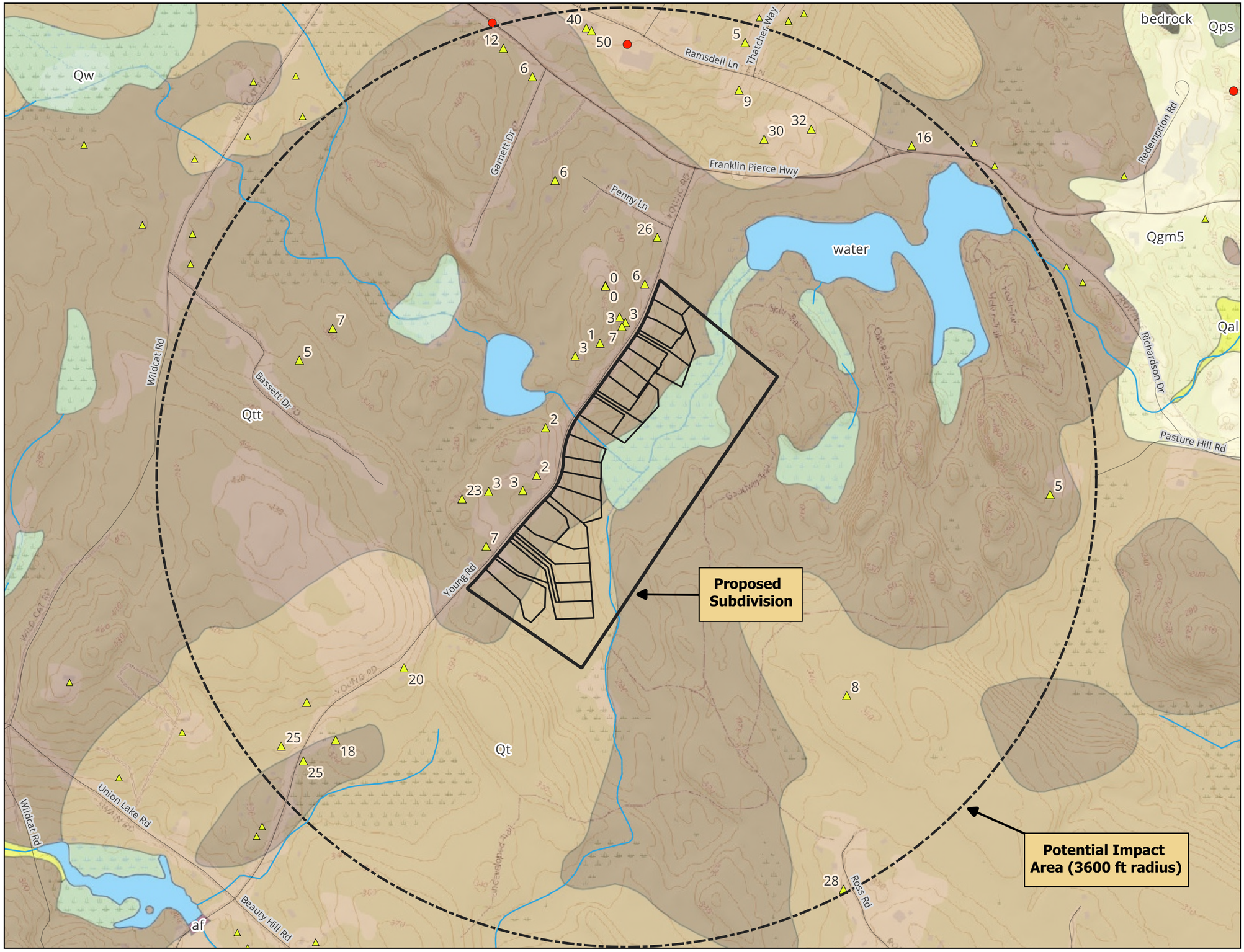
Notes:

1.Basemap is from the USGS US Topo Map dataset.

Map generated: 7/18/2023

Young Road Subdivision Project, Barrington, New Hampshire

FIGURE 3
Surficial Geology



Legend

- Proposed Young Road Subdivision
- Proposed Subdivision Parcels
- NH DOT Roads
- Public Water Supply Well

Well Inside PIA - TYPE

- BEDROCK
  - 16 - depth to bedrock

Surficial Geology

- af - Artificial Fill
- Qal - Alluvium (stream deposits)
- Qgm5 - Glacial Sand and Gravel
- Qps - Sandy Clay and Silt
- Qt - Glacial Till
- Qtt - Thin Till (shallow bedrock)
- Qw - Wetlands
- bedrock
- water
- Stream or Brook (NH Hydrography)

Map Scale is 1:8640, 1 inch = 720 ft

0 500 1,000 1,500 2,000 ft

Notes:

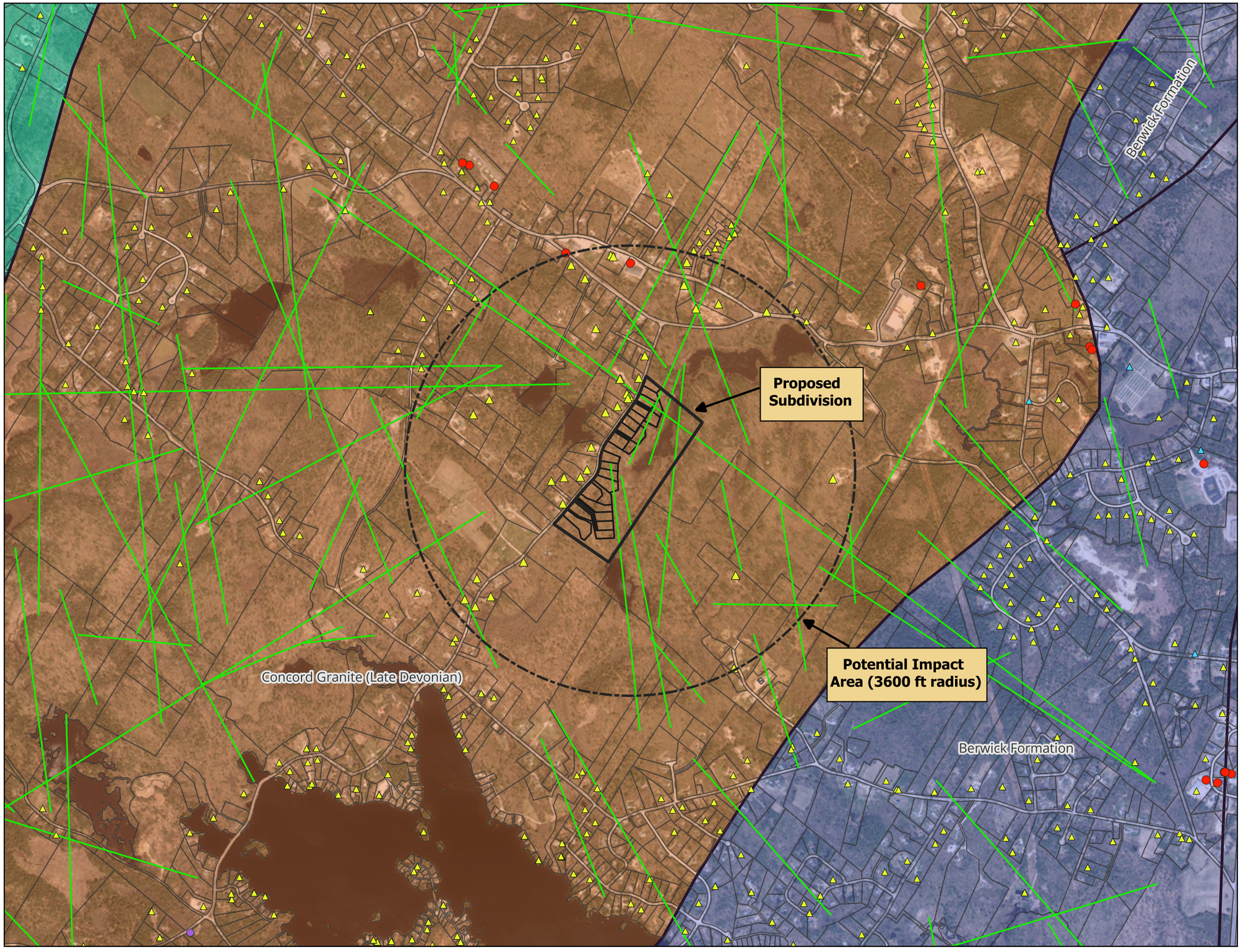
1.Basemap is from the USGS US Topo Map dataset.

2. Surficial geology is from the NHGS compiled surficial geology GeoDatabase for the Barrington Quad.

Map generated: 7/18/2023

Young Road Subdivision Project, Barrington, New Hampshire

FIGURE 4
Bedrock Geology



Legend

- Proposed Young Road Subdivision
- Proposed Subdivision Parcels
- Existing Tax Parcel Boundary
- Public Water Supply Well

Private Well - TYPE

- BEDROCK
- SAND and GRAVEL
- USGS Reported Lineament
- Bedrock Contacts

BEDROCK FORMATIONS

- Berwick Formation
- Concord Granite
- Perry Mountain Formation

Map Scale is 1:18000, 1 inch = 1500 ft

0 1,200 2,400 3,600 4,800 ft

Notes:
1. Private and public well layers are derived from NHDES Water Well Inventory. Locations are approximate and some wells may not be depicted.

2. Lineaments layer is derived from USGS Bedrock Aquifer Assessment Map, Area 4.

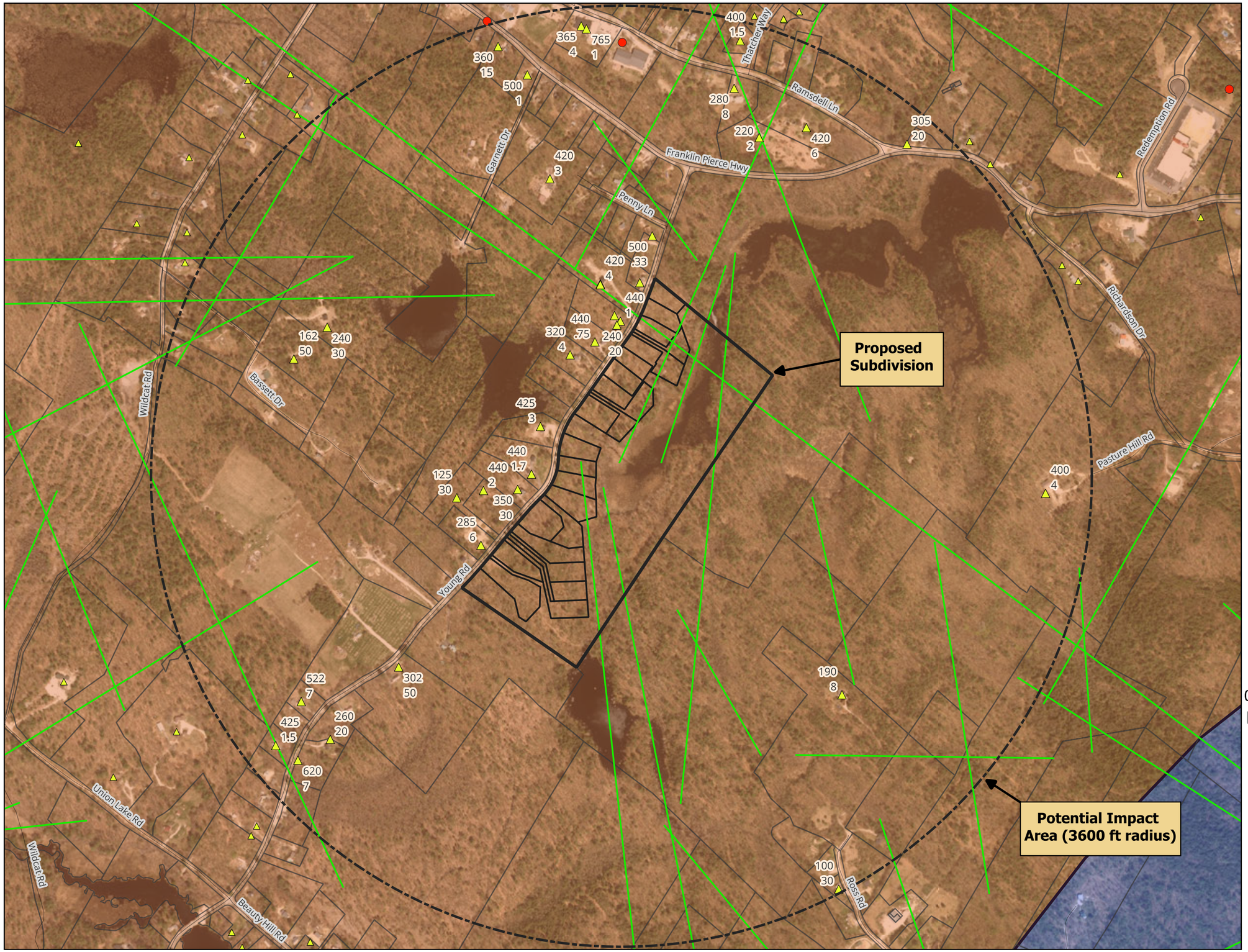
3. Basemap is from the NH Granit 2015 NAIP dataset.

Map generated: 7/18/2023

EDGEWATER STRATEGIES

Young Road Subdivision Project, Barrington, New Hampshire

FIGURE 5
Local Well Inventory



Legend

- Proposed Young Road Subdivision
- Proposed Subdivision Parcels
- Existing Tax Parcel Boundary
- NH DOT Roads
- Public Water Supply Well

Private Well - TYPE

- BEDROCK
  - 400 - Depth
  - 4 - Yield
- USGS Reported Lineament
- Bedrock Contacts

BEDROCK FORMATIONS

- Berwick Formation
- Concord Granite

Map Scale is 1:8640, 1 inch = 720 ft

0 400 800 1,200 1,600 2,000 2,400 ft

Notes:
1. Private and public well layers are derived from NHDES Water Well Inventory. Locations are approximate and some wells may not be depicted.

2. Lineaments layer is derived from USGS Bedrock Aquifer Assessment Map, Area 4.

3. Basemap is from the NH Granit 2015 NAIP dataset.

Map generated: 7/18/2023

NOTES:

1.) OWNER: NORMA BEARDEN
802 NORTH UNION STREET
NATCHEZ, MS 39120

1A.) APPLICANT: PAUL THIBODEAU
76 YOUNG ROAD
BARRINGTON, NH 03825

2.) TAX MAP 240, LOT 8

3.) LOT AREA: 2,855,458 Sq.Ft., 65.55 Ac.

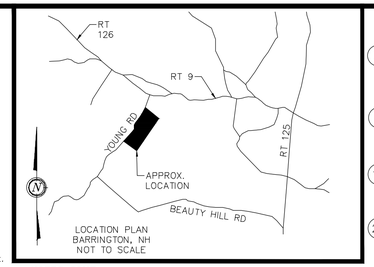
4.) S.C.R.D. BOOK 3085, PAGE 558

5.) ZONING: NR – NEIGHBORHOOD RESIDENTIAL
FRONTAGE ~ 200.0'
MINIMUM LOT SIZE ~ 80,000 Sq. Ft.
FRONT SETBACK ~ 40.0'
REAR SETBACK ~ 30.0'
SIDE SETBACK ~ 30.0'
WETLAND SETBACK ~ 50.0' IF OVER 3,000 Sq. Ft.
PRIME WETLAND BUFFER ~ 100.0'
MAX. BUILDING HEIGHT ~ 35.0'
MAX. LOT COVERAGE ~ 40%

OPEN SPACE CONSERVATION SUBDIVISION
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.
LOT WIDTH AT FRONT SETBACK ~ 75.0'
PERIMETER BUFFER ~ 100.0'
SIDE SETBACK ~ 20.0'
REAR SETBACK ~ 20.0'

6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS PARCEL DOES NOT FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD REF.: FEMA COMMUNITY# –330178, MAP# – 33017C0285D, DATED: MAY 17, 2005.

7.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING CARLSON BRX7 SURVEY GRADE GPS RECEIVERS



LOCATION PLAN
BARRINGTON, NH
NOT TO SCALE

NOTES CONT.:

8.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN OCTOBER OF 2022, WITH AN ERROR OF CLOSURE OF BETTER THAN 1 PART IN 10,000.

9.) SEE THE NOTES PAGE FOR ADDITIONAL INFORMATION TO BE RECORDED HEREWITH.

10.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED SUBDIVISION OF TAX MAP 240, LOT 8, AS SHOWN, INTO 23 INDIVIDUAL LOTS. THIS IS A MULTI SHEET PLAN SET. SHEETS 13–16 IS THE SUBDIVISION SHEET, SHEETS 17–19 IS THE EASEMENT SHEET, BOTH ARE TO BE RECORDED. SHEETS 20–23 SHOWS TOPOGRAPHY WITH THE REMAINING SHEETS PROVIDING ENGINEERING DETAIL FOR CONSTRUCTION PURPOSES. THE ENTIRE PLAN SET CAN BE FOUND AT THE OFFICE OF BERRY SURVEYING & ENGINEERING AND AT THE TOWN OF BARRINGTON PLANNING OFFICE.

11.) THERE WERE NO OBSERVED CEMETERIES OBSERVED ON THE PARCEL AS OF THE DATE OF THE FIELD WORK.

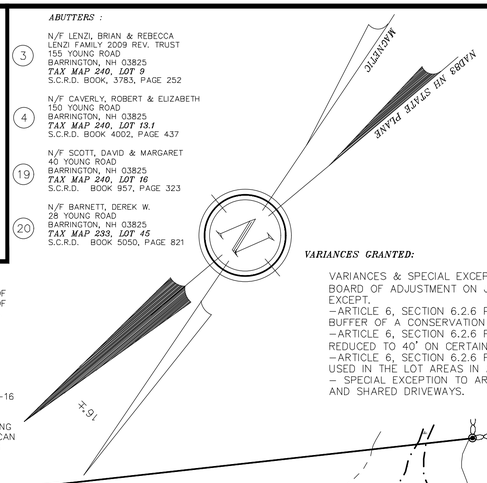
ABUTTERS :

3 N/F LENZI, BRIAN & REBECCA
LENZI FAMILY 2009 REV. TRUST
155 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 9
S.C.R.D. BOOK, 3783, PAGE 252

4 N/F CAVERLY, ROBERT & ELIZABETH
150 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 13.1
S.C.R.D. BOOK 4002, PAGE 437

19 N/F SCOTT, DAVID & MARGARET
40 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 16
S.C.R.D. BOOK 957, PAGE 323

20 N/F BARNETT, DEREK W.
28 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 233, LOT 45
S.C.R.D. BOOK 5050, PAGE 821



PLAN REFERENCES:

1.) "PLAN OF LAND "JOHN A. BUZZELL FARM" WALDRON B. HALEY, BARRINGTON N.H." BY: FREDERICK E. DREW ASSOCIATES DATED: JULY, 1982 S.C.R.D. PLAN #22–168

2.) "BOUNDARY PLAT BARRINGTON, STRAFFORD COUNTY NEW HAMPSHIRE PREPARED FOR CAROLYN L. GOODWILL LIVING REVOCABLE TRUST OF 1999" BY: ORVIS / DREW, LLC DATED: NOVEMBER 16, 2006 S.C.R.D. PLAN #91–11

3.) "SUBDIVISION PLAN PREPARED FOR FISHEYE PROPERTIES LLC" BY: DAVID W. VINCENT, LLS DATED: NOVEMBER 15, 2010 S.C.R.D. PLAN #102–029

PLAN REFERENCES (CONT'D):

4.) "LOT LINE ADJUSTMENT PLAN PREPARED FOR FISHEYE PROPERTIES LLC" BY: DAVID W. VINCENT, LLS DATED: AUGUST 15, 2012 S.C.R.D. PLAN #104–050

5.) "LOT LINE ADJUSTMENT PLAN PREPARED FOR FISHEYE PROPERTIES LLC AND JAMES M. & ELAINE O'DONNELL" BY: DAVID W. VINCENT, LLS DATED: MAY 15, 2013 S.C.R.D. PLAN #105–095

6.) "PERMANENT EASEMENT PLAN, NORMA BEARDEN" BY: HOYLE, TANNER & ASSOCIATES, INC. DATED: FEBRUARY, 2017 S.C.R.D. PLAN #113–27

7.) "BOUNDARY LINE ADJUSTMENT BETWIXT LENZI FAMILY 2009 REVOCABLE TRUST AND THE CARL J. BODGE REVOCABLE TRUST" BY: LAND TECH DATED: MARCH 2, 2022 S.C.R.D. PLAN #12699

VARIANCES GRANTED:

VARIANCES & SPECIAL EXCEPTION WERE GRANTED BY THE TOWN OF BARRINGTON ZONING BOARD OF ADJUSTMENT ON JANUARY 18, 2023, CASE #240–8–GR–22–3VAR/SPEC EXCEPT.
–ARTICLE 6, SECTION 6.2.6 PERIMETER BUFFER TO PERMIT DRIVEWAYS WITHIN THE FRONT BUFFER OF A CONSERVATION SUBDIVISION.
–ARTICLE 6, SECTION 6.2.6 PERIMETER BUFFER TO PERMIT THE FRONT BUFFER TO BE REDUCED TO 40' ON CERTAIN LOTS IN THE CONSERVATION SUBDIVISION.
–ARTICLE 6, SECTION 6.2.6 PERIMETER BUFFER TO PERMIT THE FRONT BUFFER TO BE USED IN THE LOT AREAS IN A CONSERVATION SUBDIVISION
– SPECIAL EXCEPTION TO ARTICLE 4, SECTION 1.3 TO ALLOW SHARED ACCESS POINT AND SHARED DRIVEWAYS.

WETLAND NOTE:

WETLANDS WERE DELINEATED BY JOHN P. HAYES, CWS, IN THE SUMMER OF 2022 USING THE FOLLOWING CRITERIA:

1. USACE. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. VERSION 2.0. U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER. 2012. VICKSBURG, MS.

2. USACE. CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. ENVIRONMENTAL LABORATORY. 1987. VICKSBURG, MS.

3. UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE. 2018. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8.2. L.M. VASILAS, G.W. HURT, AND J.F. BERKOWITZ (EDS.). USDA, NRCS, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.

4. NEW ENGLAND HYDRIC SOIL TECHNICAL COMMITTEE. FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 4. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION. 2019. LOWELL, MA.

5. U.S. ARMY CORPS OF ENGINEERS 2019. NATIONAL WETLAND PLANT LIST, VERSION 3.3. HTTP://WETLAND–PLANTS.USACE.ARMY.MIL/

STATE OF NEW HAMPSHIRE JOHN P. HAYES, III CERTIFIED WETLAND SCIENTIST MAR 18

JOHN P. HAYES, CWS

N/F TOWN OF BARRINGTON
PO BOX 660
BARRINGTON, NH 03825
TAX MAP 240, LOT 18
BOOK 4735, PAGE 866

N/F TOWN OF BARRINGTON
PO BOX 660
BARRINGTON, NH 03825
TAX MAP 240, LOT 38
BOOK 4735, PAGE 874

UPLAND AREA

EDGE OF POORLY DRAINED WETLANDS. DELINEATED BY JOHN P. HAYES, CWS, SUMMER OF 2022

LIMITS OF PRIME WETLAND #4

RANGEWAY PER PLAN REF #2

PRIME WETLAND #4

OPEN WATER

50' WETLANDS BUFFER
100' PRIME WETLAND BUFFER

VERY POORLY DRAINED SOILS

ADDITIONAL 25' WETLANDS BUFFER SEE ZBA APPROVAL

N/F BEARDEN, NORMA
TAX MAP 240
LOT 8
EXISTING LOT AREA
2,855,458 Sq.Ft.,
65.55 Ac.

OPEN SPACE
REQUIRED:
1,713,275 Sq.Ft.
39.33 Ac.
PROVIDED:
1,713,402 Sq.Ft.
39.33 Ac.

UPLAND AREA
RQUIRED:
16.39 Ac.
PROVIDED:
922,927 Sq.Ft.
21.19 Ac.

TAX MAP 240 LOT 8–1
PROPOSED LOT AREA:
38,519 Sq.Ft.
0.88 Ac.

TAX MAP 240 LOT 8–2
PROPOSED LOT AREA:
37,617 Sq.Ft.
0.86 Ac.

TAX MAP 240 LOT 8–3
PROPOSED LOT AREA:
34,487 Sq.Ft.
0.79 Ac.

TAX MAP 240 LOT 8–4
PROPOSED LOT AREA:
44,832 Sq.Ft.
1.03 Ac.

TAX MAP 240 LOT 8–5
PROPOSED LOT AREA:
33,879 Sq.Ft.
0.78 Ac.

TAX MAP 240 LOT 8–6
PROPOSED LOT AREA:
33,879 Sq.Ft.
0.78 Ac.

TAX MAP 240 LOT 8–7
PROPOSED LOT AREA:
39,880 Sq.Ft.
0.92 Ac.

TAX MAP 240 LOT 8–8
PROPOSED LOT AREA:
38,777 Sq.Ft.
0.89 Ac.

TAX MAP 240 LOT 8–9
PROPOSED LOT AREA:
46,408 Sq.Ft.
1.07 Ac.

TAX MAP 240 LOT 8–10
PROPOSED LOT AREA:
34,628 Sq.Ft.
0.79 Ac.

TAX MAP 240 LOT 8–11
PROPOSED LOT AREA:
50,605 Sq.Ft.
1.16 Ac.

TAX MAP 240 LOT 8–12
PROPOSED LOT AREA:
45,396 Sq.Ft.
1.04 Ac.

TAX MAP 240 LOT 8–13
PROPOSED LOT AREA:
36,583 Sq.Ft.
0.84 Ac.

TAX MAP 240 LOT 8–14
PROPOSED LOT AREA:
46,629 Sq.Ft.
1.07 Ac.

TAX MAP 240 LOT 8–15
PROPOSED LOT AREA:
61,975 Sq.Ft.
1.42 Ac.

TAX MAP 240 LOT 8–16
PROPOSED LOT AREA:
51,339 Sq.Ft.
1.18 Ac.

TAX MAP 240 LOT 8–17
PROPOSED LOT AREA:
64,315 Sq.Ft.
1.48 Ac.

TAX MAP 240 LOT 8–18
PROPOSED LOT AREA:
66,483 Sq.Ft.
1.53 Ac.

TAX MAP 240 LOT 8–19
PROPOSED LOT AREA:
50,933 Sq.Ft.
1.17 Ac.

TAX MAP 240 LOT 8–20
PROPOSED LOT AREA:
56,751 Sq.Ft.
1.30 Ac.

TAX MAP 240 LOT 8–21
PROPOSED LOT AREA:
56,606 Sq.Ft.
1.30 Ac.

TAX MAP 240 LOT 8–22
PROPOSED LOT AREA:
53,245 Sq.Ft.
1.22 Ac.

TAX MAP 240 LOT 8–23
PROPOSED LOT AREA:
87,419 Sq.Ft.
2.01 Ac.

EXISTING FIRE CISTERN EASEMENT

EXISTING DRAINAGE EASEMENT

SEE EASEMENT PLANS

50' WETLANDS BUFFER

EX. TRAIL

EDGE OF POORLY DRAINED WETLANDS

100.0'

YOUNG ROAD (CLASS V. PAVED, 50' WIDE ROW)

LLS 652
IRON BND.
~FND~
N260833.25
E1153042.46

LAND TECH
IRON BND.
~FND~
N258426.26
E1151559.67

N/F SCOTT, DAVID & MARGARET
40 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 16
S.C.R.D. BOOK 957, PAGE 323

N/F CHABOT, TODD M. & LYNN M.
48 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.01
S.C.R.D. BOOK, 4648, PAGE 480

N/F NOSEWORTHY, LAURA & KEITH
50 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.02
S.C.R.D. BOOK 4878, PAGE 847

N/F CARSON, KEVIN M. & JESSICA A.
64 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.03
S.C.R.D. BOOK 4163, PAGE 694

N/F LENZI, MARC A. & LAURIE E. TRUSTEES
MARC & LAURIE LENZI REV LIV TRUST
70 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.04
S.C.R.D. BOOK, 4624, PAGE 862

N/F THIBODEAU, PAUL F. & LINDA A.
THIBODEAU FAMILY REV TRUST
76 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.05
S.C.R.D. BOOK 4744, PAGE 376

N/F FISHEYE PROPERTIES, LLC
C/O PAUL THIBODEAU
76 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15
S.C.R.D. BOOK 3855, PAGE 63

N/F GOWER, JIMMY W. & TRACEY D
94 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.06
S.C.R.D. BOOK 4278, PAGE 137

N/F BEAN, JONATHAN & KATIE
112 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.07
S.C.R.D. BOOK 4321, PAGE 225

N/F BRAUCH, MARC & WOODMANSEE, KRIS
114 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.08
S.C.R.D. BOOK, 4958, PAGE 146

N/F PELLEGRINO, MICHELLE C.
120 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.09
S.C.R.D. BOOK, 467, PAGE 51

N/F HARRIS, WALTER W. & JULIE M.
130 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.10
S.C.R.D. BOOK, 4358, PAGE 224

N/F FILION, DALE R. & CAROL J.
134 YOUNG ROAD
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.11
S.C.R.D. BOOK 4319, PAGE 216

N/F AUX, CHRISTOPHER & ANNE
PO BOX 142
BARRINGTON, NH 03825
TAX MAP 240, LOT 15.12
S.C.R.D. BOOK 3954, PAGE 378

EX. HOUSE (TYP.)

LEGEND:

- 3/4" REBAR W/ID CAP ~TBS~
- GRANITE BOUND ~TBS~
- 1/2" REBAR W/EASEMENT CAP ~TBS~
- DRILL HOLE ~FND~
- IRON PIPE ~FND~
- IRON BOUND ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE
- GUY WIRE
- SINGLE POST SIGN
- POORLY DRAINED WETLAND LINE
- PRIME WETLAND LINE
- BUILDING SETBACK LINE
- FRONT BUFFER LINE
- EASEMENT LINE
- 50' POORLY DRAINED WETLAND BUFFER & 100' PRIME WETLAND BUFFER LINE
- STONE WALL
- PROPOSED BOUNDARY LINE
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP TYPICAL
- FND FOUND
- TBS TO BE SET

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

FOR TOWN APPROVAL PURPOSES :

THE SUBDIVISION REGULATIONS OF THE TOWN OF BARRINGTON ARE A PART OF THIS PLAT, AND APPROVAL OF THIS PLAN IS CONTINGENT UPON COMPLETION OF ALL REQUIREMENTS OF SAID SUBDIVISION REGULATIONS, EXCEPTING ONLY MODIFICATIONS MADE IN WRITING BY THE BOARD AND ATTACHED HERETO.

I CERTIFY THAT THIS PLAT EXCEEDS THE MINIMUM REQUIREMENT FOR ACCURACY AND COMPLETENESS OF THE STATE OF N.H. AND OF THE TOWN OF BARRINGTON, N.H. – 1:10,000–

KENNETH A. BERRY L.L.S. 805 DATE 3-27-23

REVISION	DATE	DESCRIPTION
#1	3–20–23	MINOR REVISIONS TO LAYOUT

OVERVIEW SUBDIVISION PLAN
FOR
PAUL THIBODEAU
LAND OF
NORMA BEARDEN
YOUNG ROAD
BARRINGTON, NH
TAX MAP 240, LOT 8

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE: 1 IN. EQUALS 100 FT.
DATE : FEBRUARY 15, 2023
FILE NO. : DB 2022 – 109

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 805 KENNETH A. BERRY SIGNATURE

SHEET 13 OF 49

TABLES

Table 1
Water Wells near proposed Young Road Subdivision
Young Road, Barrington

WRB NUMBER	TYPE OF WELL	DATE INSTALLED	ADDRESS OF WELL	TAX MAP	TAX LOT	TOTAL WELL DEPTH (FT)	DEPTH TO BEDROCK (FT)	STATIC WATER LEVEL (FT)	CASING DEPTH	WELL YIELD (GPM)	WELL USE
015.1993	BEDROCK	11/17/22	FRANKLIN PIERCE HIGHWAY	233	31-0	305	16		60	20	DOMESTIC DRINKING WATER
015.1885	BEDROCK	9/16/19	THATCHER WAY	233	30-1A	400	5	2	20	1.5	DOMESTIC DRINKING WATER
015.1872	BEDROCK	11/12/18	FRANKLIN PIERCE HIWAY/RT 9	223	67	360	12	15	81	15	DOMESTIC DRINKING WATER
015.1827	BEDROCK	8/15/16	RAMSDELL LANE	233	39	420	32		47	6	DOMESTIC DRINKING WATER
015.1842	BEDROCK	6/1/16	YOUNG ROAD	240	15-10	125	23	20	40	30	DOMESTIC DRINKING WATER
015.1755	BEDROCK	8/19/16	FRANKLIN PIERCE HIGHWAY	233	66	500	6	48.6	40	1	DOMESTIC DRINKING WATER
015.1704	BEDROCK	7/28/15	YOUND RD	240	11	285	7	34	20	6	DOMESTIC DRINKING WATER
015.1711	BEDROCK	6/12/15	YOUNG RD.	240	15-9	440	3		20	2	DOMESTIC DRINKING WATER
015.1720	BEDROCK	11/11/14	YOUNG ROAD	240	15-6	425	2	20	20	3	DOMESTIC DRINKING WATER
015.1722	BEDROCK	10/27/14	BASSETT RD.	240	17	240	7		30	30	OPEN LOOP GEOTHERMAL
015.1667	BEDROCK	8/1/14	YOUNG RD	240	14-1	420	0		20	4	DOMESTIC DRINKING WATER
015.1678	BEDROCK	2/18/14	YOUNG RD	240	15-2	440	3		20	1	DOMESTIC DRINKING WATER
015.1611	BEDROCK	8/12/13	YOUNG ROAD	240	16-3	440	1		20	.75	DOMESTIC DRINKING WATER
015.1602	BEDROCK	4/2/13	PENNY LANE	233	46	500	26		60	.33	DOMESTIC DRINKING WATER
015.1646	BEDROCK	2/18/14	YOUNG ROAD	240	15-2	440	3		20	1	DOMESTIC DRINKING WATER
015.1618	BEDROCK	11/18/13	YOUNG ROAD	240	15-8	350	3	5	20	30	DOMESTIC DRINKING WATER
015.1595	BEDROCK	11/7/12	YOUNG ROAD	240	15-7	440	2	22	20	1.7	DOMESTIC DRINKING WATER
015.1635	BEDROCK	8/1/14	YOUNG ROAD	240	14-1	420	0		20	4	DOMESTIC DRINKING WATER
015.1613	BEDROCK	8/19/13	YOUNG ROAD	240	16-4	320	3		20	4	DOMESTIC DRINKING WATER
015.1312	BEDROCK	11/17/06	YOUNG RD	241-0004	101	620	25	20	101	7	DOMESTIC
015.1576	BEDROCK	10/11/11	YOUND RD	116	22	240	7	10	31	20	DOMESTIC DRINKING WATER
015.1300	BEDROCK	10/3/06	PROVINCE VALLEY RD			400	5		40	4	DOMESTIC
015.1453	BEDROCK	1/16/09	YOUNG RD		1	260	18		40	20	DOMESTIC
015.1561	BEDROCK	4/27/11	RAMSDELL LN	113	41-1	280	9		30	8	DOMESTIC DRINKING WATER
015.0276	BEDROCK	6/23/89	RTE 9	233	58	420	6	8	20	3	DOMESTIC
015.0621	BEDROCK	6/30/97	YOUNG RD	240	16	150	6		22	5	DOMESTIC
015.0343	BEDROCK	8/3/90	PROVINCE RD	233	43	365	40	15	50	4	DOMESTIC
015.0847	BEDROCK	12/11/98	PROVINCE RD	233	40	220	30	20	40	2	DOMESTIC
015.0155	BEDROCK	2/22/87	YOUNG RD	8	59	302	20	0	42	50	DOMESTIC
015.0344	BEDROCK	8/1/90	PROVINCE RD	233	43	765	50	15	60	1	DOMESTIC
015.0647	BEDROCK	11/28/97	ROSS RD	249	19	190	8	15	23	8	DOMESTIC
015.0415	BEDROCK	9/24/92	YOUNG RD	241	5	522				7	DOMESTIC
015.0170	BEDROCK	6/22/87	WILDCAT RD	8	75A	162	5		21	50	DOMESTIC
015.0866	BEDROCK	12/18/01	YOUNG RD	241	3	425	25	30	40	1.5	DOMESTIC
015.0482	BEDROCK	6/25/86	ROSS RD	249	15	100	28		38	30	DOMESTIC

Notes:
Data retrived from NH DES OneStop online database (June 2023).
-- = Data not available/noted in database
All wells located in the Town of Barrington
WRB Number is the NH DES database reference number.
Depths are typically provides as below ground surface

EDGEWATER STRATEGIES

ATTACHMENT A

Recommended Minimum Water Supply Capacity for Private Wells

ENVIRONMENTAL Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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.

ATTACHMENT B
Water Budget Calculations

Water Budget Analysis
Proposed Young Road Subdivision, Barrington, NH

This water budget analysis is not intended to provide actual volumes of water in the area as that data cannot be precisely quantified. Specific numbers are used in the analysis to help to assess general uses and availability of water in the area.

Study Area (3,600-foot radius circle)	40.72 x 10^6 ft^2
Annual Recharge to Bedrock	
Recharge Rate: Precipitation to Overburden:	1.71 ft/yr
Recharge Volume: Precipitation to Overburden:	69,623,950 ft^3
Recharge: Overburden to Bedrock:	0.70 ft/yr
Annual Estimated Recharge Volume: Recharge to Bedrock	**28.50 x 10^6 ft^3/yr**
Storage in Bedrock	
Thickness of Saturated Bedrock:	345.0 ft
Bedrock Porosity:	2%
Volume of Water in Bedrock Within 3,600 ft of project site	**280.91 x 10^6 ft^3**
Annual Withdrawals from Bedrock	
Estimated Well Withdrawals: *Average Consumption – 111 homes with combined 306 bedrooms, school, library, and recreation center.*	2,361,765 ft^3/yr
Total Estimated Current Withdrawals from Bedrock:	**2.36 x 10^6 ft^3/yr**
Proposed Residential Well Withdrawals: *13,800 gpd; based on 150 gpd per bedrooms, 92 bedrooms (@ 4br/lot)*	673,396 ft^3/yr
Percent increase from current bedrock aquifer withdrawals	28.5 %
Total Proposed Withdrawals from Bedrock:	**0.67 x 10^6 ft^3/yr**
Water Budget Analysis / Net Recharge	
Recharge minus Current Withdrawals:	**26.14 x 10^6 ft^3/yr**
Bedrock Recharge minus Current and Proposed Withdrawals:	**25.47 x 10^6 ft^3/yr**
Percent of Annual Recharge taken by Current Use and Proposed Lots:	*2.4%*

Notes:

Average annual recharge rate of precipitation to shallow overburden to groundwater value is based on USGS hydrogeologic studies, Flynn and Tasker (USGS 2004) at 21 inches per year and Bent (USGS 1998) with a range of 17.5 to 22.4 inches. The water budget utilizes the average of these reported recharge rates of precipitation to bedrock at 20.5 inches per year or 1.71 feet per year.

Recharge of overburden to bedrock values was derived from Lyford, et al, (USGS 2003) that focused on modeling fractured bedrock aquifer systems, cited recharge rates were 8.45 in/yr to 10-20 in/yr, calculating to an average of 13.0 in/yr. The water budget utilized the lowest, most conservative, recharge estimate of 8.45 inches per year.

Storage of groundwater within the bedrock aquifer is based on well construction data noting thickness of the bedrock and documented porosity of bedrock. This water budget utilizes the average static water level below ground surface of 17.6 feet to average depth of well (362.6 feet), resulting in an inferred thickness of 345.0 feet.

A porosity of 2% was utilized based on geology and published values of plutonic rocks as defined in Applied Hydrology (Fetter, 1988) as 2% and Groundwater and Wells (Driscoll, 1986) as 0-10%.

There are approximately 111 homes with a combined 306 bedrooms in the study area, equating to 45,900 gpd (306 bedrooms x 150 gpd per bedroom). This is based on the Town of Barrington online assessors GIS database. The school, library and recreation center are estimated to use a combined 2,500 gallons per day.