



October 13, 2021

Alex Sirois, Code Enforcement Officer
Town of Raymond
401 Webbs Mills Road
Raymond, ME 04071

**Re: Response to Comments for Amended Subdivision Application
Boulder Bend Subdivision – a 9-lot Open Space subdivision off Patricia Avenue
R.N. Willey & Sons, Inc. - Applicant**

Dear Alex and Planning Board Members:

On behalf of R.N. Willey & Sons, Inc. we have prepared the enclosed plans and supplemental information related to a proposed 9-lot Open Space Subdivision off Patricia Avenue. The following outlines the specific items that have been addressed with this submission:

Fire Department Review:

- A note has been added to the subdivision plan designating the hammerhead turnaround area as a fire lane that will not be used for vehicle parking.
- The RFRD approved Fire Lane Sign detail has been added to the detail sheet D-2. The location of the “Fire Lane No Parking” sign is shown on Plan Sheet 5 (Roadway Plan and Profile Drawing).
- A table was added to the Subdivision Plan to designate tax map & lot numbers and addresses for each of the proposed lots once they are assigned by the Town, which will be added to the Final Plan.

Town Planner Review:

- The project site does not include any mapped floodplain areas. We have included a FEMA Flood Insurance Rate Map for reference.
- The required setback between a septic leach field and a stormwater under-drained soil filter basin is 25 feet. All proposed septic systems for Lots 2-5 are located a minimum of 25 feet from the underdrained soil filter basins.
- A detail for erosion control installation for a typical lot development is included on Detail Sheet D-2.
- Well Exclusion Areas have been added to the Subdivision Plan. Proposed well locations are shown on the Roadway Plan & Profile drawings.
- Culvert sizing has been added to the Plan & Profile drawings along with riprap inlet and outlet aprons.
- Note #17 was added to the Subdivision Plan regarding the need for a MDEP Stormwater Permit and NRPA Permit-By-Rule for land disturbance within 75 feet of a Wetland of

Special Significance. The permits are still under review with MDEP and the permit order numbers will be added to the final plan once issued.

- Note 18 was added to the Subdivision Plan requiring the preparation and submission of site-specific grading and erosion control plans for each lot prior to construction.
- Note 19 was added to the Subdivision Plan requiring the placement of iron rebar at the approved limits of site disturbance along the Wetland of Special Significance.
- A culvert has been added to the design at intersection of Boulder Bend Drive and Patricia Avenue and beneath the adjacent driveway as requested.
- The Typical Roadway Section has been updated to match the revised road pavement standard of a total thickness of 3.0”.
- The sight distances have been added to Plan and Profile PP-1.
- Provided a gate and Knox box at the end of the roadway.
- We understand that a copy of the Stormwater Permit application was provided to the Town of Raymond, which included a Stormwater Management Report. If there are further questions on the report or if additional information is required, please contact us.
- A copy of the recorded access easement is attached for the roadway access to Patricia Avenue of land of Valente and Dodge.
- A hydrogeologic assessment was performed for the project, which is included for review. The report indicates that all 10 mg/l nitrate plumes are contained on the property.

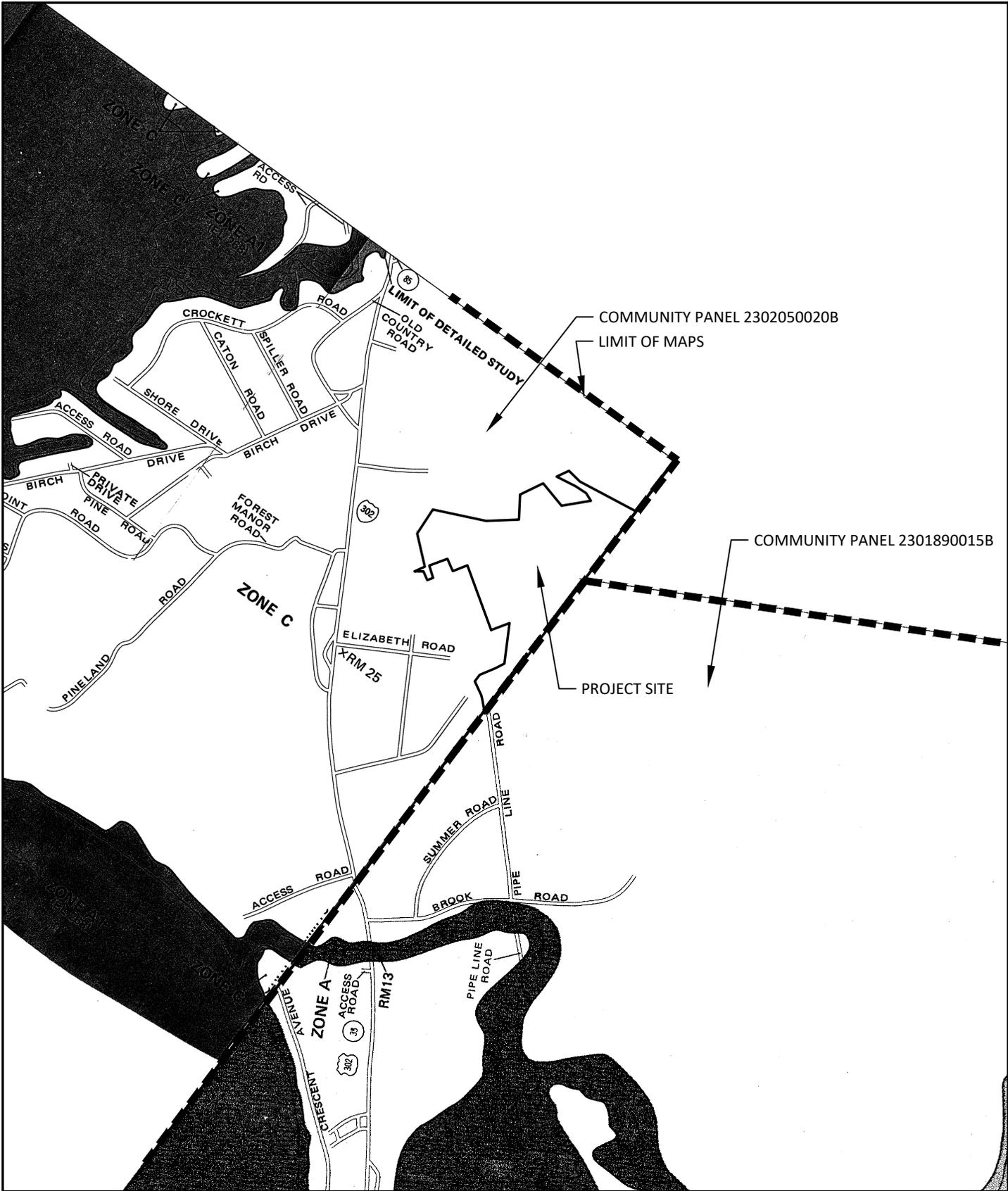
Upon your review of the enclosed information, please let us know if you have any questions or require additional information.

Sincerely,

DM ROMA CONSULTING ENGINEERS



Dustin M. Roma, P.E.
President



FEMA FLOOD HAZARD MAP

BOULDER BEND SUBDIVISION
 BOULDER BEND DRIVE
 RAYMOND, MAINE
 FOR RECORD OWNER:
R. N. WILEY & SONS, INC.
 P.O. BOX 28, 13 SCOTT DRIVE
 SOUTH CASCO, MAINE 04077

*MAPS OBTAINED FROM THE FEDERAL
 EMERGENCY MANAGEMENT AGENCY
 FLOOD MAP SERVICE CENTER WEBSITE

SCALE: 1"=1,000'
 DATE: 08-11-2021
 JOB NUMBER: 16041

DM ROMA
 CONSULTING ENGINEERS

P.O. BOX 1116
 WINDHAM, ME 04062
 (207) 310 - 0506

EASEMENT DEED

KNOW ALL PERSONS BY THESE PRESENTS, that **SALLY Q. DODGE** and **NANCY VALENTE** of the Town of Raymond, County of Cumberland and State of Maine, for consideration paid, **GRANTS** to **R.N. WILLEY & SONS EXCAVATING, INC. (AKA R.N. WILLEY & SON EXCAVATING, INC.)** whose mailing address is P.O. Box 28, South Casco, Maine, their heirs, successors, and assigns an easement affecting property located in the Town of Raymond, County of Cumberland and State of Maine, said easement being more particularly described to wit:

Beginning at a point marked with a 1-inch iron pipe found on the apparent easterly right-of-way limit of said Patricia Avenue. Said iron pipe being located about 47.5 feet off the center of the travel way of said Avenue at a point that is about 825 feet easterly of the intersection of said Patricia Avenue with the traveled way of Fairway Drive, so-called. Said iron pipe also marking the southwesterly corner of land now or formerly of Michael MacPherson, (Book 35692, Page 26).

Thence from said Point of Beginning South 51 degrees, 18 minutes, 36 seconds East over land of Grantors, (Book 23285, Page 163), for a distance of 160.37 feet to a point.

Thence North 62 degrees, 59 minutes, 31 seconds West along land of the Grantee for a distance of 180.40 feet to a point marked with a 5/8-inch rebar capped, "PLS #1271", set on the apparent easterly right-of-way limit of said Patricia Avenue.

Thence North 62 degrees, 59 minutes, 31 seconds East along the apparent easterly right-of-way limit of said Patricia Avenue for distance of 40.00 feet to a point marked with a 1-inch iron pipe found, and the Point of Beginning.

The above-described easement area containing 2090 square feet, more or less.

All bearings are referenced to Maine State Grid West Zone Nad-83.

The above-described easement area being located over the southwesterly corner of a parcel of land conveyed from Stanley P. Quinn Jr. to Nancy VQ Valente and Sally Q. Dodge by a deed dated August 25, 2005 and recorded in Book 23285, Page 163 at the Cumberland County Registry of Deeds.

This easement shall be for all purposes to benefit real estate shown on the above described Plan and shall include without limitation the following:

1. The right of ingress and egress by foot and by vehicle of any sort whatsoever;
2. The right to construct, maintain, repair, grade, excavate, fill and pave the portion of the property as shown on a plan drafted by DM Roma Consulting Engineers for R.N. Willey & Sons Excavating, Inc., entitled "Amended Subdivision Plan, Pipeline Road and Patricia Avenue, Raymond, Maine", unrecorded (the "Plan");

- 3. The right to construct, maintain, repair, grade, excavate, and fill as necessary the area on the above stated Plan;
- 4. The right to install within the right-of-way, both above and below the ground, utility services to include without limitation, facilities necessary or convenient for the transmission of electricity, gas, sewerage, water and such similar services which are currently available or in the future become available.

The Grantee herein assumes all costs of maintenance and repair associated with this easement and agrees to repair and replace any disturbed areas within a reasonable time.

Reserving to the Grantor the use and enjoyment of said parcel for any such purpose that will in no way substantially interfere with the safe and proper use of the easement granted herein by the Grantee for the purposes abovementioned, provided that no building or any kind of permanent structure shall be erected on said parcel by the Grantor.

TO HAVE AND TO HOLD the above-granted rights and easement to the Grantee herein, its successors or assigns, to their own use and behoof forever.

IN WITNESS WHEREOF, the said SALLY Q. DODGE and NANCY VALENTE have caused this instrument to be signed this 19 day of August, 2021.

Jennifer
Witness

Sally Q. Dodge
Sally Q. Dodge

Jennifer
Witness

Nancy Valente
Nancy Valente

State of Maine
Cumberland, ss.

August 19, 2021

Then personally appeared the above-named Sally Q. Dodge and Nancy Valente and acknowledged the foregoing instrument to be their free act and deed.

Before me,

Wanda Pollard
Notary Public/Attorney at Law
Print Name: Wanda Pollard

SEAL

WANDA POLLARD
Notary Public, Maine
My Commission Expires July 30, 2022

Received
Recorded Register of Deeds
Aug 27, 2021 01:21:05P
Cumberland County
Jessica M. Spaulding



Hydrogeologic Assessment of the Boulder Bend Subdivision Boulder Bend Drive, Raymond

Date: September 17, 2021

Purpose of the Assessment:

The purpose is to predict the locations and possible effects of wastewater plumes on ground water from the septic systems planned for the project, to satisfy the requirements of the *Raymond Subdivision Ordinance Article 9.13*.

Information used:

Information used in this study includes a plan of the project with topo and wetlands information by DM Roma Consulting Engineers., a wetlands delineation and report by Sweet Associates, soil test pit information by John Wiesemann, SE, and library research of published literature.

Project summary:

The project is a subdivision of nine residential dwelling lots on 28.9 acres. The residences will be served by individual disposal systems and drilled bedrock wells.

Summary of geology:

The property is located on the easterly side of a sandy terrace feature known as Brown's Point. To the east of the property is a hill feature generally referred to as Mount Hunger. The property occupies the geologic transition between the till covered high ground of Mount Hunger and the sands and gravels of Brown's Point.

Ground surface slopes on the property average 14%, from the high ground of lot 6 to the low gradients of the wetlands to the west. Locally, surface gradients range from greater than 20% to less than 5% on the lots.

The site is mapped as an association of glacial till on the high ground of Mount Hunger, Ice-Contact sands and gravels packed against the Mount Hunger and delta sands and gravels in the flat plains extending to Sebago Lake on the *Surficial Geology of the Raymond Quadrangle, Maine* by Michael J. Ratelle (ME Geol. Surv, Open-File 97-57) (see Figure 2).

This is confirmed by the soil test pits, which show a range of particle sizes and restrictive horizons at depth. Overall, the soil textures are coarse.

The site is underlain by granites of the Sebago batholith. No test pit revealed shallow bedrock. The Maine Water Well database reveals bedrock depths in the neighborhood to be 25 to 70 feet below the surface (see Figure 5).

Summary of hydrogeology:

The property is mapped as a Significant Sand and Gravel Aquifer on *Significant Sand and Gravel Aquifers of the Raymond Quadrangle, Maine* (Neil, Craig), 1998 ME Geol. Surv. Open-File 98-155). See Figure 3, which also defines the limits of the local watershed.

The source of ground water on this site is precipitation. Precipitation falling on this site seeps into the soil and descends until restrictive soil layers, bedrock or the water table is encountered. On this site the soils are medium textured sandy loams. Recharge is average over the entire property. Based on the guidelines for nitrogen impact assessment published by the Maine D.E.P., it is reasonable to assume that at least 50% of all precipitation recharges into the soils. This assumption is based on Section 17.B.2.d.i. of the Maine D.E.P. Site Location of Development Law.

The ground water flow directions on this property were determined by analysis of the topographic contours. The estimated hydraulic conductivity of the subsoils is assumed to be 40 feet per day, based on the textural description of the test pits. The hydraulic gradient is assumed to be 0.02 (2%) based on the surface slopes. The assumed effective porosity is 25%.

Impact on ground water quality:

Nitrate-nitrogen is the chemical to assess for impact on ground water. Nitrate-nitrogen is generated by subsurface wastewater disposal systems. It is a conservative contaminant, meaning it does not readily degrade in groundwater, nor does it attenuate or attach itself to soil particles. Nitrate-nitrogen is limited to 10 mg/liter in public drinking water supplies by the Primary Drinking Water Standard. The Raymond Ordinance requires the wastewater plumes to have a concentration no greater than 10 mg/liter at neighboring property owners' lines.

The analysis of nitrate-nitrogen impacts was calculated by SOLUTRANS, a 32-bit Windows program for modeling three-dimensional solute transport written by Dr. Charles R. Fitts of Fitts Geosolutions and the University of Southern Maine. The program is based on the analytical solutions of Liej *et. al.* (1991 and 1993). The solutions in SOLUTRANS all assume a uniform one-dimensional flow field, and allow three-dimensional dispersion, retardation and first-order decay.

Variables entered into the calculations include a hydraulic conductivity value of 40 feet per day, an effective porosity of 25% and a hydraulic gradient of 2%, giving a seepage velocity of 3.2 feet per day. Other assumed variables include an initial wastewater concentration of 40 mg/liter NO₃-N, retardation of 1, a decay constant of zero and longitudinal, lateral and vertical dispersivities of 6 feet, 2 feet and 0.2 feet, respectively. Calculations were made and reveal the 10 mg/liter NO₃-N plumes will be approximately 75 feet in length. The data curve is enclosed.

Using the ground water flow directions, the calculated 10 mg/liter plumes were drawn by Mark Cenci Geologic, Inc. All 10 mg/liter plumes will remain on the property from the disposal areas depicted on the subdivision plan. Water wells will be drilled into the bedrock, which is expected to be 25 to 70 feet below the ground surface, and will not be affected by wastewater plumes located in the upper portion of the sands and gravels of the site.

All wastewater plumes will move to wetlands located in the Open Space, where NO₃-N will be removed from groundwater bio-chemically to undetectable concentrations.

Phosphorous export from modern septic systems is not considered a concern, because the phosphorous remains in groundwater, where it binds chemically to soil particles.

Specifically, with regard to Article 9.13:

- A.1. The basic soil types are shown on the Soil Map (Figure 4).
- A.2. The depth to the water table is reported in the test pit logs and on the wetland map
- A.3. Drainage conditions are described.
- A.4. Potable water is commonly available in the neighborhood.
- A.5. The plan of the 10.0 mg/liter NO₃-N plumes is enclosed.
- A.6. A map showing existing and proposed septic system locations and the existing well on the property is enclosed.

Specifically, with regard to Article 9.13:

- B. Drought conditions are assumed in the computer flow model, as it is not a dilution model.
- C. The Standard of the Primary Drinking Water Standard is met.
- D. The secondary water standards will not be exceeded.

- E. This requirement is met.
- F. This requirement is met.

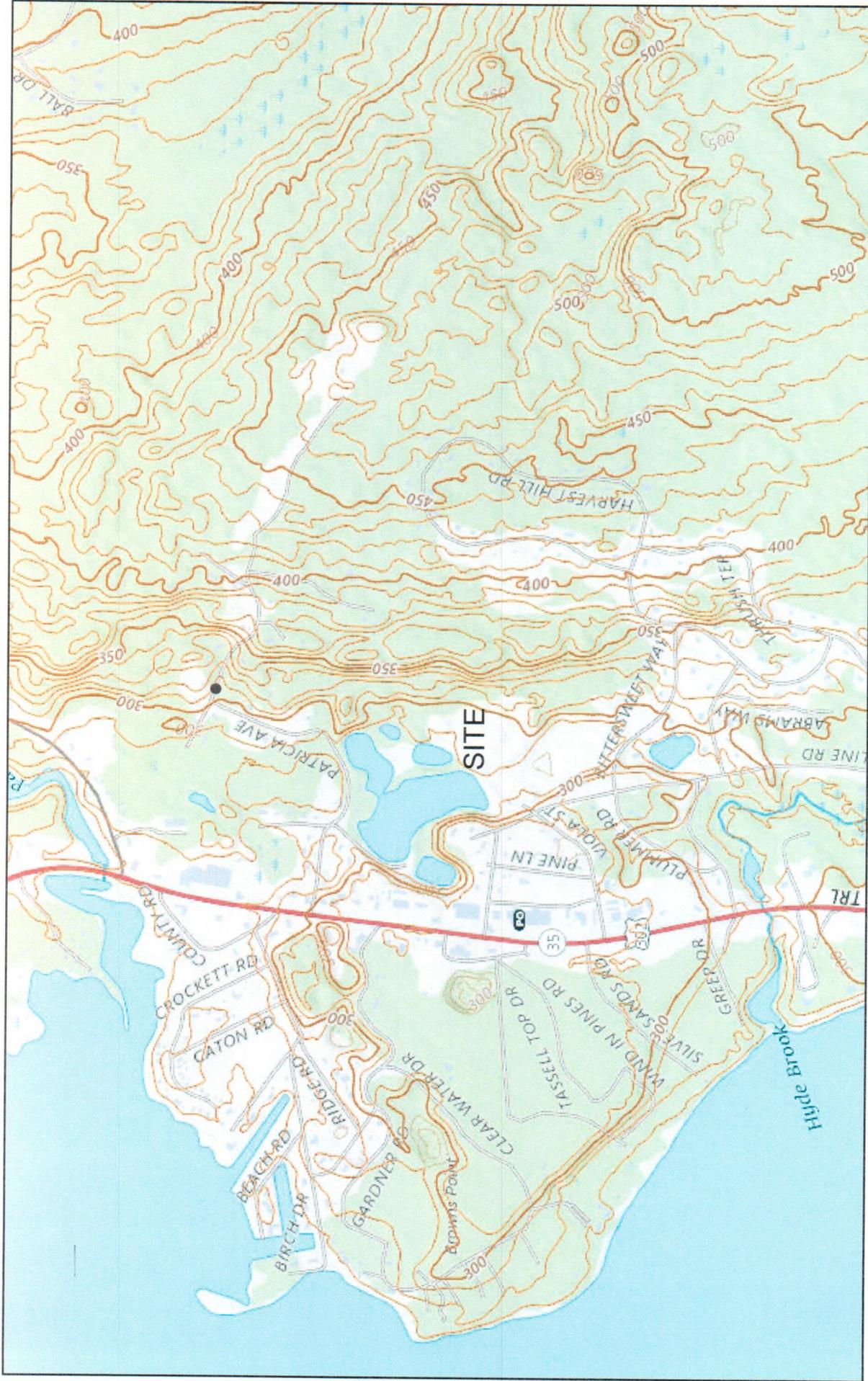
Conclusions:

The development of the nine dwellings as proposed on plan of DM Roma Consulting Engineers meets the requirements of the Town of Raymond regarding ground water quality.



Mark Cenci, Licensed Maine Geologist #467

Figure 1.



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- Normal Intermediate Contours
- Normal Index Contours

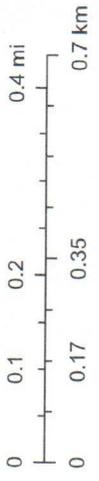


Figure 2. Surficial Geology 1:24,000



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Image



Green: Band_2



Blue: Band_3



Red: Band_1

Esri Community Maps Contributors, Esri Canada, Esri, HERE, Garmin, Esri, HERE, Garmin,

Maxar | Esri Community Maps Contributors, Esri Canada, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METINASA, USGS, EPA, NPS, US Census Bureau, USDA |
Maine Geological Survey

Figure 3. Aquifers 24K



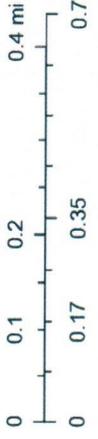
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Image

Red: Band_1

Green: Band_2

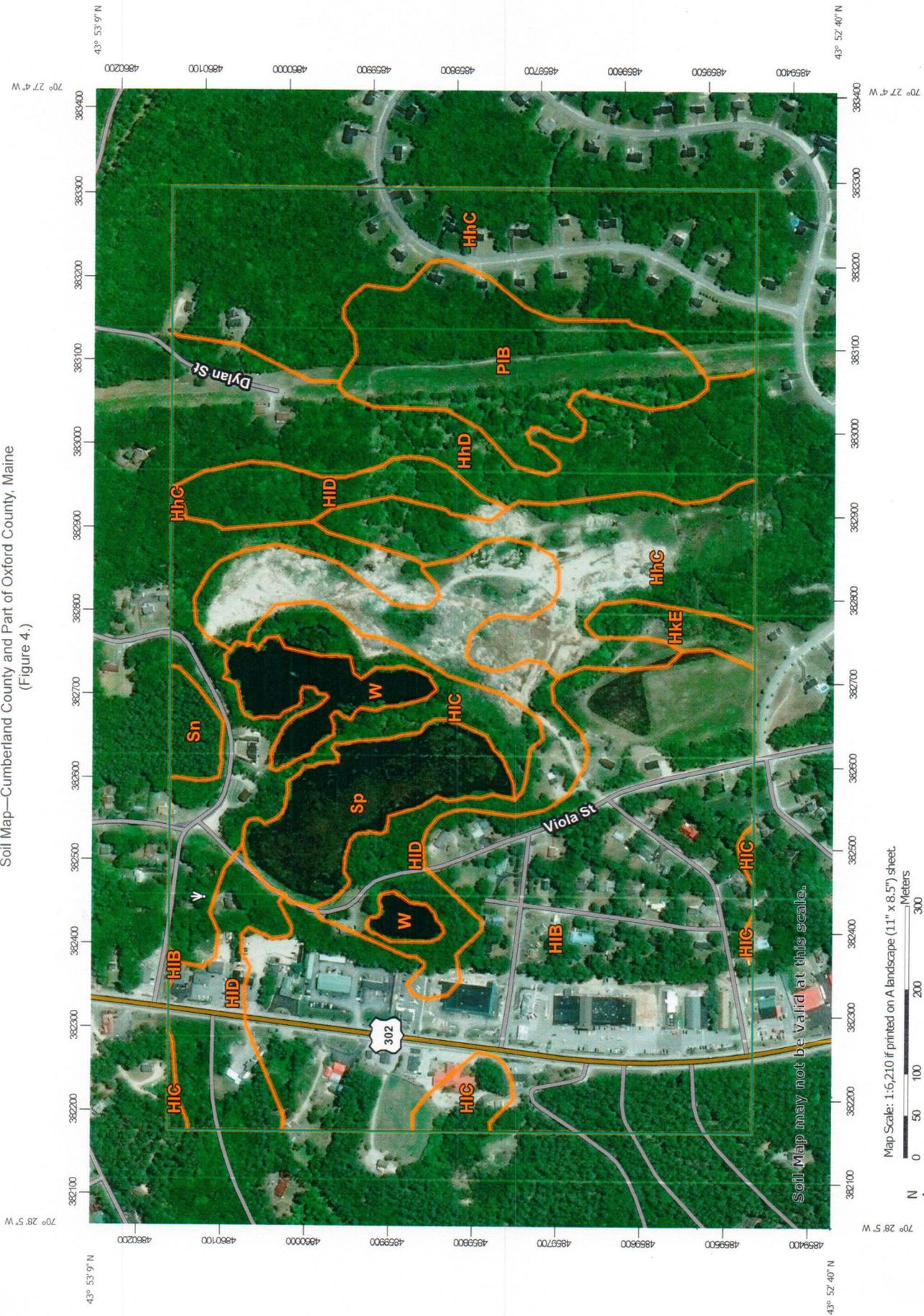
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Maine Geological Survey, Esri Community Maps Contributors, Esri Canada,

Maine Geological Survey | Maxar | Esri Community Maps Contributors, Esri Canada, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Soil Map—Cumberland County and Part of Oxford County, Maine
(Figure 4.)



Map Scale: 1:6,210 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

-  Area of Interest (AOI)
-  Area of Interest (AOI)
- Soils**
-  Soil Map Unit Polygons
-  Soil Map Unit Lines
-  Soil Map Unit Points
- Special Point Features**
-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features
- Water Features**
-  Streams and Canals
- Transportation**
-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads
- Background**
-  Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 17, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 7, 2019—Jul 2, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HhC	Hermon sandy loam, 8 to 15 percent slopes, very stony	43.2	22.1%
HhD	Hermon sandy loam, 15 to 35 percent slopes, very stony	17.8	9.1%
HkE	Hermon sandy loam, 20 to 60 percent slopes, extremely stony	2.1	1.1%
HIB	Hinckley loamy sand, 3 to 8 percent slopes	54.9	28.1%
HIC	Hinckley loamy sand, 8 to 15 percent slopes	19.3	9.9%
HID	Hinckley loamy sand, 15 to 25 percent slopes	28.2	14.4%
PIB	Peru fine sandy loam, 0 to 8 percent slopes, very stony	14.5	7.4%
Sn	Scantic silt loam, 0 to 3 percent slopes	1.7	0.8%
Sp	Sebago mucky peat	8.3	4.2%
W	Water	5.3	2.7%
Totals for Area of Interest		195.3	100.0%

Figure 5. Bedrock Depth, Maine Well Database



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- Overburden Thickness (ft)
- 0 - 5
 - 20.1 - 25
 - 25.1 - 30
 - 40.1 - 50
 - 50.1 - 75
 - 75.1 - 100
 - No Overburden Thickness Provided

1:9,028



Esri, HERE, Garmin, iPC, Maxar

Concentration of NO₃-N vs Distance from Source

