• Soil & Wetland Studies
• Ecology • Application Reviews
• Listed Species Surveys • GPS
• Environmental Planning & Management
• Ecological Restoration & Habitat Mitigation
• Expert Testimony • Permitting

June 2, 2025

Att. Chairman Robert Klee
Town of Woodbridge
Town Plan and Zoning Commission
11 Meeting Street
Woodbridge, CT 06525

RE: PRELIMINARY APPLICATION REVIEW
Proposed Residential Development, Fountain Street LLC
804 Fountain Street, Woodbridge, CT
REMA Job #: 25-2817-WDB5

Dear Chairman Klee and Commissioners:

At the request of an Intervenors, The Woodbridge Land Trust, Inc., and the Woodbridge Park Association, Inc., REMA ECOLOGICAL SERVICES ("REMA") has been asked to review the plans for this project, prepared by Rose, Tiso & Co. (3-27-25), and other supporting documentation for a proposed residential development at the above-referenced property. application.

The applicant proposes building a four-story, 0.35-acre building with 96 units on the mature, forested, steep hillside that occupies most of this 5.71-acre (98,086 sf) property in Woodbridge, Connecticut. Most construction will take place within the 73E soils mapping unit, with slopes over 45%. Extensive rock removal will be required, and a high, rear cliff will be created, also wrapping around the south side; the cliff will be up to sixty-feet tall and over 500 feet long. REMA staff reviewed the plan set dated 3-27-25, and other available mapping resources, and inspected the site (not posted) on May 21st and 23rd, 2025.

Attached to this report are several figures (i.e., Figures 1, 1A, 2, and A through D), which include current as well as archival aerials (e.g., 1965, 1951, 1934). We also include several annotated photographs of pertinent natural features of the subject site (i.e., Photos 1 through 14).

1.0 WATER QUALITY CONCERNS

The site is located in the West River watershed, along the New Haven town line, on the northwestern side of of Route 15. Downgradient of the site and on the southeastern side of the highway, and located within the City of New Haven, is a roughly 13.5 acre portion of the Yale Nature Preserve, an important tract of open space, which include wetlands and watercourses. The stormwater section of the application does not address discharges towards and potential adverse impacts to these sensitive off-site receptors. Is there drainage under Route 15, into the Yale Nature Preserve? What is the level of treatment from street drainage from this area, and the anticipated pollutant-loading, discharging into the West River?

The Sedimentation and Erosion Control Plan emphasizes that the below-grade excavation will itself trap and contain runoff. However, the potential for erosion from the hillside during the early stages of the project is of grave concern, due to the steep slopes and the erosible soils. The shallow soils on the site are in fact fine-textured and highly erosible, because they are underlain by well-foliated, fast-weathering, schists and mafic rocks – not the typical massive granitic gneiss. Based on REMA's soil probes, though mapped as Charlton-Chatfield, the subsoils are of finer texture than the typical examples of these soil series, like the Wethersfield and Wilbraham soils that develop over basalt and red sandstones.

Currently, precipitation is intercepted, and rain intensity is moderated by multiple, very large, mature hardwood trees, mostly oaks, on the eastern hillside (see attached figures). Soil is covered by leaf litter and forest herbs, and the humus-rich topsoil absorbs rain readily. Soil erosion risk will *increase substantially* after trees are felled, and as the overburden is removed and in the early stages of excavation. The fine sediment fraction takes a week or more to settle out in a temporary sediment basin; it passes through stretched silt fence mesh, and it is also is not removed, in the post-construction phase, by any of the swirl separators using centrifugal force. Fine sediment that reaches the roadway stormwater system carries excess

nutrients, especially phosphorus and adsorbs toxicants and fosters eutrophication and invasive proliferation in downgradient wetland and watercourse resources.

2.0 SPECIAL NATURAL FEATURES

Section 495-23 of the Woodbridge Zoning Regulations (Environmental Conditions) cites Preservation of Special Features and Air Pollution as criteria for consideration. Bishops Pond, just to the west of the site, is set within a preserve of the Woodbridge Land Trust. The pond itself and the ridge crest straddle the site's western boundary. They are important natural features that are currently in excellent condition. The ridge crest has multiple exposed bedrock outcrops in the Maltby Lakes metavolcanic complex per the Bedrock Geology Map of Connecticut (Rodger 1985). It has varied and interesting minerology and flora (mosses, lichens, and vascular plants), with high educational and scientific research potential. It is partly on the site, and partly on Land Trust property.

The distinctive plant communities on open or partly shaded rock outcrops, whether subacidic or acidic, are designated as *Critical Habitats* by CTDEEP, unusual ecological communities with elevated likelihood of uncommon and rare species.[i] Soils with distinct mineral profiles weather from these Paleocene rocks of volcanic origin, but transformed by metamorphism. This ridgetop vascular plant community has a full set of characteristic species of dry, rocky ridges, including chestnut oak, black birch, abundant, vigorous lowbush blueberry (*Vaccinium vacillans*), cow-wheat (M*elampyrum lineare*), marginal woodfern (*Dryopteris marginalis*), uncommon running Juneberry (*Amelanchier stolonifera*), and silverrod (*Solidago bicolor*). It is remarkably free of invasive species. Common native species in the southern two thirds of the forested eastern slope are not invasive-infested, and include species like maple-leaf viburnum, Christmas fern, beaked hazelnut, downy arrowwood, also found on forested traprock ridge slopes.

Interesting vegetation patterns were also noted on the open, exposed rock outcrops. In some areas multiple, closely spaced cracks between rock layers were vertical rather than horizontal, allowing water seepage, resulting in thick layers of moss on the rock surface and extremely lush plant growth in soil at the base of the exposed rock. This was not observed on several massive, foliated, but unfractured outcrops further east along the crest.

Lichen diversity and density is comparable to that on traprock ridges in rural areas with clean air; the suite of species photographed at this site are also typical for a traprock ridge

(*Aspicillia, Xanthoparmelia, Cladonia* (*Stereocaulon*?), *Aspicillia* and *Flavoparmelia* (Steve Messier, Personal Communication based on a photo review – author of Traprock Ridge Lichens, 2021).

3.0 IMPACTS TO ECOLOGICAL COMMUNITIES

The minimum setback to the Woodbridge Land Trust property boundary from the top of the proposed cliff is fifty feet, though the building setback is 76 feet. Although runoff from the site into Bishops Pond is not an issue, the loss of several acres of forest would be required for the proposed project on the east side of the ridge crest, with its series of sensitive, ecologically valuable bedrock outcrops. This forest loss will have a *major adverse impact* on its air quality. It will also reduce air quality in the nearby Yale Nature Preserve. The project will also reduce wildlife usage and ecological integrity in these preserved areas, cause invasive infestation, and much diminish potential use as a scientific-educational-aesthetic site.[ii]

Such a large influx of new residents will result in substantial additional foot traffic and some vandalism along the ridge crest and in the sensitive pond shore ecological community. Both mosses and lichens grow extremely slowly and lack root systems. They are therefore more vulnerable than flowering plants.

Invasives Colonization

The ridge crest community, both onsite and off-site, will be degraded by invasives without the protective barrier of hundreds of feet of tall mature forest. Currently, its ecological value as an example of a classic ridgetop plant community ("a unique natural feature"), is much enhanced by the fact that invasive plant species are almost entirely absent, although the disturbed swath bordering the highway and the former farm fields by Fountain Street are severely infested. The ridgetop is currently shielded by the long (about 150-foot), densely treed hillside, with limited bird activity due to highway noise. Forests "filter" windblown invasive seeds that do not germinate in forest shade, but sprout readily on open outcrops. Similarly, the taller traprock ridge crests, like most of Mount Higby in Middletown, have few invasives, due to long, forested protective slopes, though most low trap ridges are severely infested. For geology or earth science – or ecology - students at all levels, conduct field trips to this series of outcrops.

Note that to date, the plans lack an Invasive Plant Management Plan, to control the intense concentrated infestation, of Chinese Wisteria as well as many other invasives in the lower northeastern portion of the subject site.

Loss of Air Pollution Filtering

The loss of several acres of mature forest will also eliminate the existing excellent filter for of air pollutants generated by large volumes of heavy traffic along Route 15. This is not only a significant public health consideration, for surrounding residential neighborhoods, it is also vital for the diverse and beautiful mosses and lichens that abound on these mafic/highly foliated bedrock outcrops. These taxa are highly sensitive to air pollutants.

The existing mature forested hillside has multiple tall, trees over 20 inches in dbh with voluminous foliage, and also cools the surrounding area, including local neighborhoods, Bishops Pond Preserve, and Yale Nature Preserve, through both shade and evaporative cooling (transpiration by leaves). For in depth documentation, refer to the comprehensive final GC3 (Governor's Council on Climate Change) report by the Forest subgroup (2020), a well-referenced treatment of the many societal, ecological, and climate benefits of forest, recommending "No Net Loss of Forest."[iii]

4.0 CONCLUSION

Based on our preliminary analysis, as proposed, there is a reasonable likelihood of unreasonable pollution and destruction of natural resources and unique natural features both on site and off-site. Based on review of the Intervenors professional engineer's report, but also based on our review of all of the pertinent materials, it is our professional opinion that minimally treated stormwater will pollute and degrade receiving wetlands and watercourses, downgradient of the subject site.

The applicant should consider conducting a comprehensive ecological inventory and evaluation of the subject site, and providing alternatives that are sensitive to the sites unique resources, and its juxtaposition to preserved open space including Bishops Pond Preserve and the downgradient Yale Nature Preserve.

Respectfully submitted,

Rema Ecological Services, LLC

Sigrun N. Gadwa, MS, PWS
Ecologist, Professional Wetland Scientist
Registered Soil Scientist

George T. Logan, MS, PWS, CSE
Professional Wetland Scientist
Registered Soil Scientist
Certified Senior Ecologist

Attachments: Figures 1, 1A, 2, A through D; Photos 1 to 14

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[i] Connecticut Critical Habitats: A resource guide defining the Connecticut critical habitats and addressing their significance is at https://cteco.uconn.edu/guides/Critical Habitat.htm in the Additional Documentation section.

[ii] The ridge crest along the western property boundary should be preserved as a complementary adjunct to the Yale Forest! The site intersects two parallel, elongated Maltby mapping units: *Omau*, on the western side of the onsite ridge, extending west under Bishops Pond, and *Omal* on the east side of the ridge, extending north, to Fountain Street and southeast to Route 15. The rocks in this complex are metamorphosed, layered, oceanic basalt and sedimentary rocks with sediment originating in the Paleozoic period (505-440 million years ago). This is far earlier than arkose sandstone and nearby traprock basalt ridges, which formed during the Triassic period (248-213 million years ago). Trace mineral analysis was used to show original mid-oceanic origins.

The varied rock types able to be observed and studied on the site's outcrops, are expected to be those comprising the Omal and Omau Maltby mapping units. Foliated pelitic schists formed from metamorphosed shales and mudstone. Chunks of greenstone (appearing mostly gray prior to polishing), greenschist, and phyllite are metamorphic rock types which formed under high pressures but low or moderate temperatures (under special "subduction" conditions). The origin of phyllite is of special interest: submerged, stratified volcanic ash; it is a mafic mineral with elevated levels of positively changed minerals.

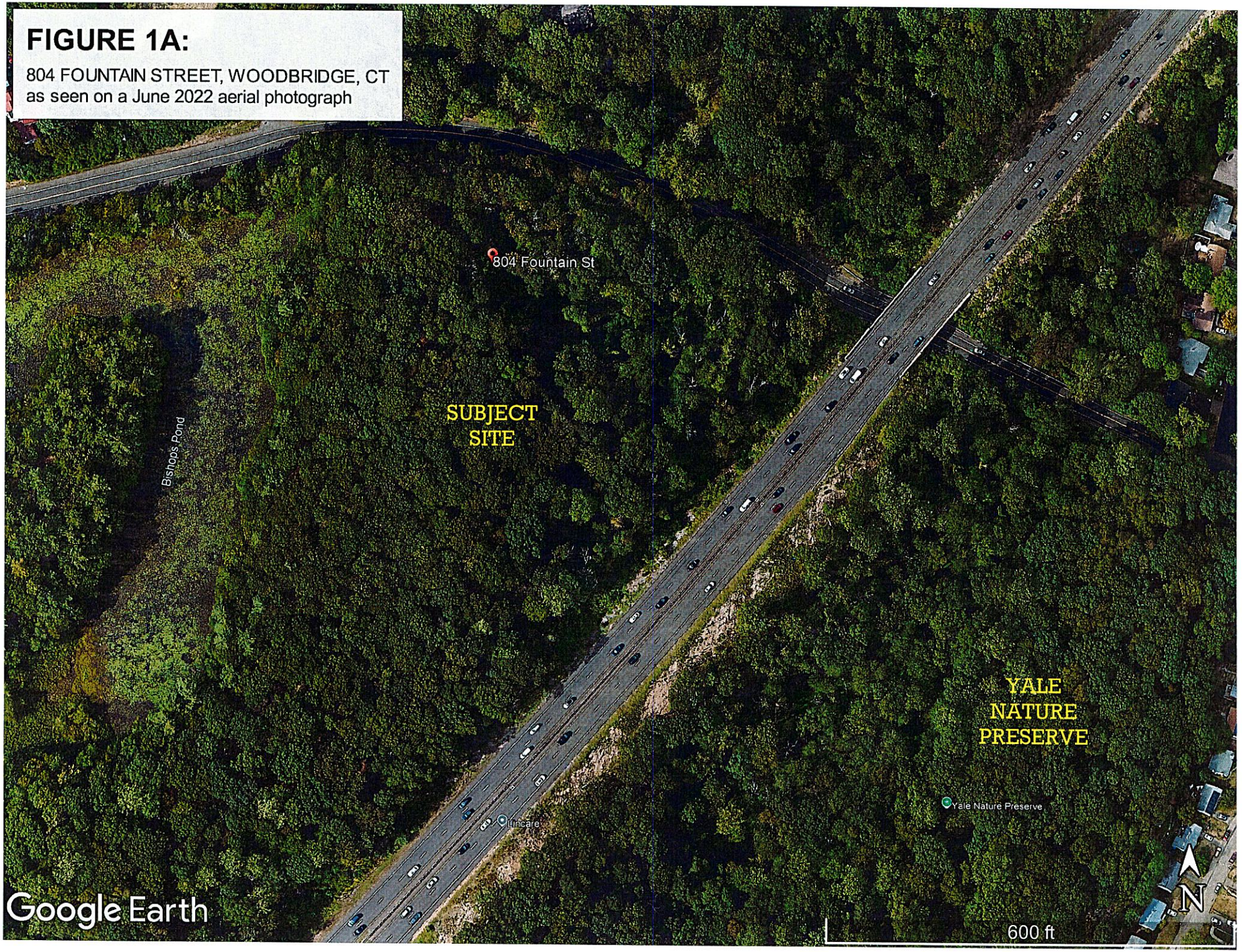
Reference:

[iii] Deasy, Ryan. 23-25 March, 2014. A New Interpretation of the Maltby Lakes "Volcanics" and related rocks. Western New Haven Quadrangle, Connecticut, USA., 49th Annual Meeting of the Northeastern Section, The Geological Survey. Paper # 3.

FIGURE 1
SITE LOCUS
804 Fountain Street, Woodbridge, CT

FIGURE 1A:

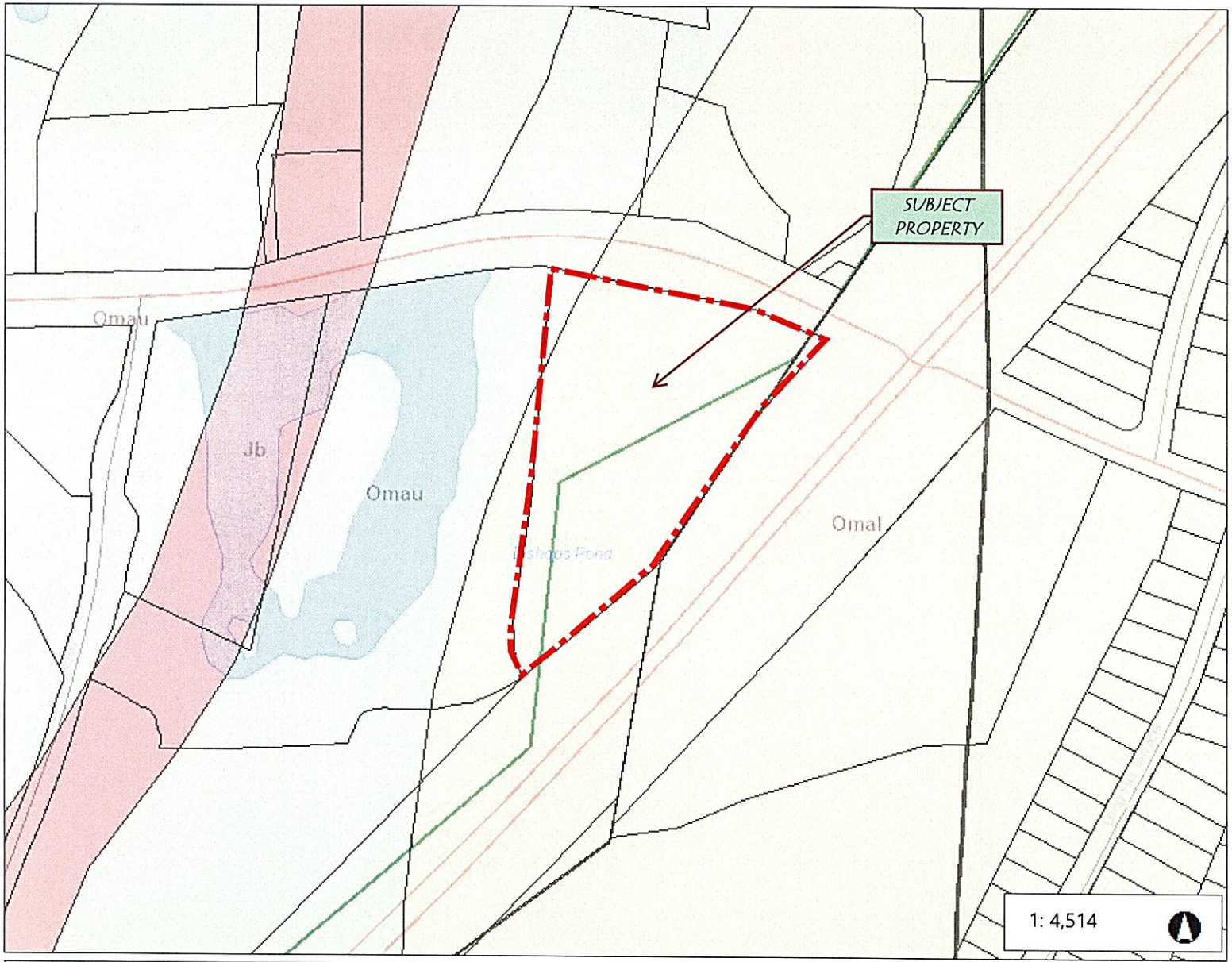
804 FOUNTAIN STREET, WOODBRIDGE, CT
as seen on a June 2022 aerial photograph

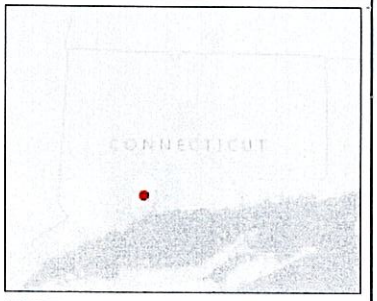


CT Environmental Conditions Online

FIGURE 2: BEDROCK GEOLOGICAL MAP

804 Fountain Street, Woodbridge, Connecticut





NOTE:

Close-up of bedrock geology at the site, located within the Omau and Omal mapping units, the upper and lower parts of the Maltby Lakes Metavocanics complex, from CTECO, with gray-green to green fine-grained, greenschist, schist, greenstone, and phyllite.

(Based on the Bedrock Geological Map of Connecticut)

Notes

THIS MAP IS NOT TO BE USED FOR NAVIGATION

FIGURE A: 804 Fountain Street, Woodbridge, Connecticut
as seen on a 2023 aerial photograph

1:1,800

0 90 180 360 ft

0 25 50 100 m

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Sources: Esri, Maxar, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland,

FIGURE B: 804 Fountain Street, Woodbridge, CT as seen on a 1965 aerial photograph

FIGURE C: 804 Fountain Street, Woodbridge, CT as seen on a 1951 aerial photograph

FIGURE D: 804 Fountain Street, Woodbridge, CT as seen on a 1934 aerial photograph

REMA	SITE/LOCATION:	Proposed Residential Development 804 Fountain Street Woodbridge, CT	REMA JOB NO.: 25-2817-WDB5	**ANNOTATED PHOTO LOG**
	INVESTIGATOR(S):	G.T. Logan, PWS; S.N. Gadwa, PWS		

DATE: May 21, 2025	**FACING:** SOUTHERLY	**PHOTO NO.:** 1

Comments: *Post-agricultural portion of site (northeasterly)*

DATE: May 21, 2025	**FACING:** NORTHEASTERLY	**PHOTO NO.:** 2

Comments: *Mature, second-growth woods; viewed from near the top of the parcel*

REMA	SITE/LOCATION:	Proposed Residential Development 804 Fountain Street Woodbridge, CT	REMA JOB NO.: 25-2817-WDB5	**ANNOTATED PHOTO LOG**
	INVESTIGATOR(S):	G.T. Logan, PWS; S.N. Gadwa, PWS		

DATE: May 21, 2025	**FACING:** NORTHERLY	**PHOTO NO.:** 5

Comments: *Ridgetop portion of subject site with unique bedrock geology and flora and lack of invasive plant species*

DATE: May 21, 2025	**FACING:** WESTERLY	**PHOTO NO.:** 6

Comments: *View of Woodbridge Land Trust property and Bishop's Pond (in background), as viewed from subject site within a few feet of the property boundary*

REMA	SITE/LOCATION:	Proposed Residential Development 804 Fountain Street Woodbridge, CT	REMA JOB NO.: 25-2817-WDB5	**ANNOTATED PHOTO LOG**
	INVESTIGATOR(S):	G.T. Logan, PWS; S.N. Gadwa, PWS		

DATE: May 21, 2025	**FACING:** NORTHERLY	**PHOTO NO.:** 9

Comments: *The subject site contains much exposed moss and lichen encrusted bedrock, which will be exposed to invasive species proliferation and desication; Note polyody fern.*

DATE: May 21, 2025	**FACING:** N/A	**PHOTO NO.:** 10

Comments: *Unique bedrock geology provides habitat for rock loving plants and mosses, and high aesthetic, educational, and recreational potential. Canada mayflower (Maianthemum canadense) patch in view.*

REMA	SITE/LOCATION:	Proposed Residential Development 804 Fountain Street Woodbridge, CT	REMA JOB NO.: 25-2817-WDB5	ANNOTATED PHOTO LOG
	INVESTIGATOR(S):	G.T. Logan, PWS; S.N. Gadwa, PWS		

DATE: May 21, 2025	FACING: NA	PHOTO NO.: 11

Comments: *Lichens and moss on west-facing rock.*

DATE: May 21, 2025	FACING: NA	PHOTO NO.: 12

Comments:
Lichens on light, metamrphic rock.

REMA	SITE/LOCATION:	Proposed Residential Development 804 Fountain Street Woodbridge, CT	REMA JOB NO.: 25-2817-WDB5	ANNOTATED PHOTO LOG
	INVESTIGATOR(S):	G.T. Logan, PWS; S.N. Gadwa, PWS		

DATE: May 21, 2025	FACING: Northerly	PHOTO NO.: 13

Comments: *Wildlife shelter beneath flat,norizontally bedded rock. Note white crustose lichens.*

DATE: May 21, 2025	FACING: Northerly	PHOTO NO.: 14

Comments:
Especially dense, vigorous marginal wood fern (Dryopteris marginalis) at base of layered, moisture trapping metamorphic bedrock.