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Land Use Department



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March 12, 2026

Town of Ledyard  
Inland Wetland and Watercourse Commission  
Ms. Elizabeth Burdick, Director of Planning  
741 Colonel Ledyard Highway  
Ledyard, CT 06339

**RE: WETLAND IMPACT EVALUATION  
PREPARED FOR MR. STEVEN RICE  
PROPOSED OPEN SPACE SUBDIVISION  
84 SILAS DEANE ROAD  
59 SEABURY AVENUE  
LEDYARD, CONNECTICUT**

Dear Ms. Burdick, Chairman, DeBrodtt and Commission Members:

**INTRODUCTION**

On behalf of the Applicant, Mr. Steven Rice, I have completed a wetland delineation and evaluation of the jurisdictional freshwater inland wetlands and watercourses at the above referenced Project Site. This evaluation was completed to provide a basis for determining the potential impacts associated with the proposed open space residential subdivision of these parcels. Details of the proposed development are presented in the Project Site Plans and the wetland application.

This evaluation identifies the site's natural resources, assesses the potential for adverse impacts to regulated resources and offers some practical recommendations that would further promote environmental protection. Field surveys were conducted on the site in the summer of 2024. The 2026 work builds upon biological and wetland surveys conducted on the site. GIS software (ArcMap v10.0) was used to review open source GIS data layers in order to catalog abiotic resources and understand the significance of the study area in relation to the entire watershed.

## **PROPOSED ACTIVITIES**

The Applicant is proposing to construct a 23 lot single family residential open space subdivision located on two parcels of land totaling 49.8 acres. The proposal will provide a dedication of 65.5% of the land or 31.83 acres to open space. The lots will be accessed by a new 900 foot long road (to be named Seabury Avenue Extension) that ends in a cul-de-sac. The new proposed road will extend from the terminus of Seabury Avenue. Each new lot will be serviced by individual on-site subsurface sewage disposal systems and water will be provided from a Southeastern Connecticut Water Authority (SCWA) installed waterline. Utilities will be underground and co-located alongside the roadway. The open space layout clusters the development to a 15-acre development envelope positioned on the high, level terrain that covers southwestern quadrant of the Project Site. Clustering the development in one area greatly reduces fragmentation of the overall 49.8 acre property and provides a substantial open space area.

The project will provide erosion and sedimentation controls during construction periods and will re-vegetate all disturbed areas for the long term stabilization of the site. The site has been designed with a conventional drainage system and stormwater from the new roadway will be collected by catch basins in the road and directed into a water quality detention basin for treatment prior to discharge.

The proposed development can be constructed with no direct wetland impact, with exception of a fire suppression dry hydrant to be installed in the subject pond per the request of the Town's fire marshal. Installation of the fire pond will result in the nominal disturbance of roughly 120 SF to facilitate the installation of the pipe. The new proposed stormwater discharge point for the water quality basin will be separated by 40 feet of undisturbed forest prior to reaching the receiving wetland. Flows from the water quality basin will discharge onto a rip-rap armored scour pad that will deenergize flows as non-erosive sheet flow which will promote infiltration into the undisturbed forested soils; recharging groundwater helping to maintain downstream wetland baseflows.

For more information, please refer to the plans entitled "*Plan Showing Open Space Conceptual Subdivision Property of Steven Rice 84 Silas Deane Road Shewville Road and Seabury Avenue, Ledyard, Connecticut,*" prepared by Dieter & Gardner dated March 2024, as amended.

## **EXISTING SITE CONDITIONS**

The combined 49.8-acre Project Site is vacant, undeveloped, and forested. The property is accessed from the terminus of Seabury Avenue between the driveways of #57 and #56 Seabury Avenue. There is additional road frontage on both Silas Deane Road and Shewville Road. A distinct ridgeline running north to south bisects the center of the property. The land west of the ridgeline ranges from a level till plateau to a gently eastern sloping landscape, in contrast to the east facing moderately sloping to steeply sloping hillside that defines the eastern half of the property down to Shewville Road.

The upland habit consists of a mature deciduous Oak-Hickory forest community. Prominent tree species observed include white, black and red oaks, shagbark hickory, red

and sugar maple, American beech, black cherry, black and white birch, aspen and tulip trees. Overall, where the forest community is dominated by large old growth trees the understory consists of a light shrub stratum of witch hazel, low-bush blueberry, green briar, and muscle wood (Photo 7). The forest floor ground cover includes species such as Christmas fern, service berry, Canadian mayflower intermingled with beds of hay-scented fern, and marginal wood fern. (Photo 8) Along the transitional forest ecotones that abut neighboring developments and the roadside is a cohort of smaller younger trees from past clearings, and the successional upland forest community has a heavier influence of birch, maple and tulip and a thicker undergrowth of Japanese barberry, an echo-signature of those past land disturbances.

The site is not located in aquifer protection zone. Lastly, the site is not located in a Connecticut Department of Energy and Environmental Protection (CTDEEP) designated Natural Diversity Data Base (NDDB) polygon per the CTDEEP 2026 NDDB mapper.

### **WETLAND DELINEATION**

The wetland delineation was completed in accordance with the standards of the Natural Resources Conservation Services (NRCS) National Cooperative Soil Survey and the definitions of inland wetlands and watercourses as found in the Connecticut General Statutes, Chapter 440, Sections 22a-36 through 22a-45 as amended. Wetlands, as defined by the Statute, are those soil types designated as poorly drained, very poorly drained, floodplain or alluvial in accordance with the NRCS National Cooperative Soil Survey. Such areas may also include disturbed areas that have been filled, graded, or excavated and which possess an aquic (saturated) soil moisture regime.

Watercourses means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs, and all other bodies of water, natural or artificial, vernal, or intermittent, public, or private, which are contained within, flow through or border upon the Town of Ledyard or any portion thereof not regulated pursuant to sections 22a-28 through 22a-35, inclusive, of the Connecticut General Statutes. Intermittent watercourses are defined as having a permanent channel and bank and the occurrence of two or more of the following characteristics: (a) evidence of scour or deposits of recent alluvium or detritus, (b) the presence of standing or flowing water for duration longer than a particular storm incident, and (c) the presence of hydrophytic vegetation.

The wetland delineation was completed in June and July of 2024. Four wetland areas were identified on the Project Site.

### **WETLAND AND WATERCOURSE DESCRIPTIONS**

The United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) Mapper shows the onsite wetlands as part of palustrine and riverine wetland group that classifies the forested wetland areas as a PFO1F, designating the jurisdictional feature as a forested wetland that is semi-permanently flooded, and notes the intermittent watercourse that flows to Silas Dean Road as R4SABC. Additionally the man-made pond is noted as PUBHh which denotes a fresh water unconsolidated bottom (mud, organics and silts) that was excavated (i.e. man-made). Generally, the wetland boundaries

are sharply distinct, marked by an abrupt rise in topography as poorly drained wetland soils quickly give rise to sandy well-drained soils.

Wetland #1 is a man-made pond created from excavation and damming of earth at the pond's easterly edge (Photo 1). The wetland is centrally located on the property. In the northeast corner of the pond is an excavated overflow channel that outlets seasonal and stormwater high flows from the pond. The overflow creates an ephemeral hanging intermittent watercourse (Photo 2) that flows down gradient roughly 125-150 feet to a flat plateau of sandy soils where the watercourse terminates as concentrated surface water runoff infiltrates back into the soils. Wetland flags 1 through 42 represent the limits of Wetland #1.

Wetland #2 is associated with two drainage flow paths that flow onto the northeastern corner of the property, east of the shared property line with 112 Silas Deane Road. The wetland is associated with a groundwater spring that forms the upper reaches of a short watercourse that flows to a culvert along the shoulder of Silas Deane Road. Bordering the watercourse is a confined area of poorly drained soils vegetated by a classic Red Maple swamp community (Photo 3). Wetland Flags 1A to 27A delineate Wetland #2 in the field.

Wetland #3 is an intermittent watercourse and associated with the extremely stony forested Red Maple wetland corridor (Photo 4) that originates on Avalonia Land Property to the west and drains east bisecting the low-lying center of the 7.47 acre 59 Seabury Avenue parcel. The forested wetland has extremely stony ground conditions and is associated with the source of an intermittent watercourse that flows to a headwall along Silas Dean Road (Photo 5). Wetland Flags 1B through 28B mark the edge of Wetland #3's boundary.

Wetland #4 is an excavated pool located at the bottom of the hillside where Shewville Road connects with the north of the property line at 837 Shewville Road (Photo 6). The pool is seasonally flooded and appears to dry up most years, with an estimated depth of 3-4 feet. The wetland margins are very well defined confined to the excavated 1:1 slopes that create the depression. The wetlands hydrology is both from groundwater and overland flow as the road, adjacent driveway and excavations retain and detain surface water runoff. Wetland flags 1C through 14C represent the wetland limits as marked in the field.

The overall wetland community exhibits classic Red Maple swamp vegetation, including:

Trees: Red Maple, yellow birch, swamp white oak, and shagbark hickory.

Shrubs: Highbush blueberry, spicebush, Japanese barberry, winterberry, ironwood, witch hazel, Asiatic bittersweet.

Herbaceous: Tussock sedge, sphagnum moss, stout wood reed, sensitive fern, royal fern, interrupted fern, cinnamon fern, skunk cabbage, false hellebore, jack-in-pulpit, jewelweed, fringe sedge, swamp dewberry and meadow rue.

The above is not an exhaustive list, but a sample of commonly encountered vegetation that characterizes the on-site wetland community. Representative photos of the site are attached below.

### **SOIL TYPES**

The soils identified on the site are a refinement of the Natural Resources Conservation Service (NRCS) Websoil survey. The on-site soils originated from dense glacial till parent material. The development area and western half of the property is relatively level in comparison to the eastern side of the site that is steeply sloping and has exposed bedrock that defines landscape. The site has varying slopes ranging from <1% to >35% and elevations ranging generally from 370 at the terminus of Seabury Avenue down to 180 at Shewville Road on the eastern limits of the site.

#### **Wetland Soils**

The wetlands soils are classified as (3) Ridgebury, Leicester, and Whitman fine sandy loams. The poorly drained soils along the wetland boundary belong to the Ridgebury and Leicester soil series. Ridgebury and Leicester soils are found within drainageways and depressions on glacial till landscapes. Ridgebury and Leicester soils have a seasonal high-water table at a depth of about 6 inches. Very poorly drained Whitman soils are found in the lowest lying areas within the interior of the wetlands where the water table is at the surface thought most of the growing season.

A typical soil profile along the wetland boundary consists of approximately 2"-0" of intermediately decomposed organic material (Oi), followed by 0"-6" of a thick dark topsoil horizon (A), underlain by 6-18" of a wet weakly developed grayish subsoil horizon (Bg) with common redoximorphic features (Common medium distinct strong brown mottles, masses) ranging from fine sandy loam to very fine sandy loam. This subsoil is underlain by a saturated sandy loam to fine sandy loam gray substratum (2Cg).

#### **Upland Soils**

The bulk of the uplands are mapped and classified as well-drained Canton and Charlton fine sandy loams in a north to south orientation. Shallow depth to ledge may be encountered along topographic ridgelines. In the center of the proposed development is a notable polygon of Sutton, extremely stony fine sandy loams. Sutton soils are typically associated with a perched high seasonal watertable due to an underlying dense till layer.

#### ***Surficial Geology***

Surficial geology refers to the distribution of surficial (unconsolidated) materials that lie between the land surface (below the pedogenic soil) and the bedrock surface. Surficial material in Connecticut ranges from a few feet to several hundred feet in thickness. These earth materials significantly affect anthropogenic land uses. Most of the unconsolidated materials are deposits of continental glaciers that covered all of New England at least twice during the Pleistocene ice age.

These glacial deposits are divided into two broad categories, glacial till and glacial stratified deposits. Surficial geology consists of thin glacial till. Till, the most widespread glacial deposit, was laid down directly by glacier ice and is characterized by a non-sorted matrix of sand, silt, and clay with variable amounts of stones and large boulders. Per the 1991 Surficial Materials Map of Connecticut (Stone et al.) the study area is located on the summit of a drumlin. Drumlins are formed over a short distance within the receding glacier ice and record the final direction of ice movement. Drumlins occur in symmetric, spindle, parabolic, and transverse asymmetrical forms.

#### *Bedrock Geology*

Bedrock underlying surficial material consists primarily of Quartzite with smaller fractions of Schist and Gneiss also present. Quartzite is metamorphosed sandstone composed primarily of quartz. It is light-colored to gray, massive to layered, medium-grained and very hard and resistant. Schist is light, silvery to dark, coarse-to very coarse-grained, strongly to very strongly layered metamorphic rock whose layering is typically defined by parallel alignment of micas. Primarily composed of mica, quartz, and feldspar; occasionally spotted with conspicuous garnets. Gneiss is light and dark, medium- to coarse-grained metamorphic rock characterized by compositional banding of light and dark minerals, typically composed of quartz, feldspar, and various amounts of dark minerals. Gneiss occurs with a variety of compositions and is a characteristic rock of CT uplands.

In summary, the site's geologic framework supports infiltration from the uplands and shallow groundwater discharge to the wetlands maintain the observed wetland hydrology. Understanding this interplay between surficial deposits, soil permeability, and local groundwater gradients is essential for designing site development features—such as drainage systems, stormwater management structures, and septic leach fields. Functioning compliant systems as provided will protect the hydrologic integrity and ecological function of the on-site regulated resources.

#### **RARE SPECIES HABITAT**

Consultation and a review of the Connecticut Department of Energy and Environmental Protection (CTDEEP) Natural Diversity Data Base (NDDB) mapping indicates the site is not listed as providing critical habitat and there are no state records of known state-listed species. A copy of the CTDEEP NDDB preliminary site assessment is attached for reference.

#### **VERNAL POOL EVALUATION**

With regards to the pond (Wetland #1) I have been on-site throughout various times of the year including the vernal pool breeding season from the end of February through the beginning of May. Over the course of many site investigations I found no evidence of facultative or obligate vernal pool organisms such as but not limited to wood frog, spotted salamander, fairy shrimp or fingernail snails. It is my professional opinion that pond includes fin-fish habitat which by definition excludes viable vernal pool habitat and sustainable vernal pool populations as a result of high predation of fish on amphibian populations.

However, Wetland #4 at the base of the hill along Shewville Road is an isolated seasonally to semi-permanently flooded wetland pocket that potentially could host vernal pool habitat for species such as wood frogs or yellow spotted salamanders. Because this wetland area will not be impacted by being far removed from the zone of influence of the project (over 550-feet away) and coupled with the fact the feature and the surrounding forest will be preserved in the open space area this wetland was never formally surveyed for vernal pool activity but is presumed as a vernal pool based on its physical characteristics and commonality to other nearby pools in Ledyard and on the neighboring Mashantucket reservation why are confirmed to host obligate vernal pool species.

### **WETLAND FUNCTIONS AND VALUES**

A wetland functional assessment was completed to assist in identifying impacts to the wetlands and the functions and services they provide. An evaluation of the wetlands functions and values was completed using the United States Army Corps of Engineers (USACE) Highway Methodology Workbook for Wetland Functions and Values: A Descriptive Approach, October 1993” (“Highway Methodology”) and best professional judgement. This wetland methodology describes the wetland functions and values holistically for the project area.

The USACE Highway Methodology evaluates 13 functions and values assigned to wetlands which include:

1. Groundwater recharge/discharge (GWR/D)
2. Flood flow alteration (FFA)
3. Fish and shellfish habitat (F&SH)
4. Sediment/toxicant/pathogen retention (S&TR)
5. Nutrient removal/retention/transformation (NR&T)
6. Production export (PE)
7. Sediment/shoreline stabilization (S&S)
8. Wildlife habitat (WLH)
9. Recreation (REC)
10. Education/scientific value (ED/S)
11. Uniqueness/heritage (U/H)
12. Visual quality/aesthetics (VO/A)
13. Threatened or endangered species habitat (T&E)

The functions and values of the wetland system is summarized in Table 1. The *Highway Methodology* recognizes 13 separate wetland functions and values. The degree to which a wetland provides each of these functions is determined by one or more of the following factors: landscape position, substrate, hydrology, vegetation, history of disturbance, and size. Each wetland may provide one or more of the listed functions at significant levels. The determining factors that affect the level of function provided by a wetland can often

be broken into two categories. The effectiveness of a wetland to provide a specified function is generally dependent on factors within the wetland whereas the opportunity to provide a function is often influenced by the wetland's position in the landscape as well as adjacent land uses. For example, a depressed wetland with a restricted outlet may be considered highly effective in trapping sediment due to the long residence time of runoff water passing through the system. If this wetland is located in gently sloping woodland, however, there is no significant source of sediment in the runoff therefore the wetland is considered to have a small opportunity of providing this function.

A variety of wetland characteristics affect a wetlands overall functions and values. The most important wetland characteristic influencing a wetlands functions and values is hydroperiod (i.e. depth and duration of standing water). Hydroperiod is related to a wetlands micro - topography and location on the landscape. Wetlands with a short hydroperiod tend to provide only limited functions and values and are often small and occur on moderate - steep slopes. Wetlands with longer hydroperiods tend to provide a wide range of functions and values and are often located at the base of the slope in valleys and drainageways.

The following site specific factors are important to the functional assessment and are listed here to provide context to the later discussion of functions and values.

1. Connecticut protected species are not known to be present on the site per the CTDEEP NDDB Mapper.
2. The wetlands are located in a dense glacial till landscape surrounded by well drained soils.
3. While similar in nature, the wetland on-site are four distinct and independent systems.
4. Fish populations are known to be present in the man-made pond.

Wetland Functions and Values	Groundwater Recharge/Discharge	Sediment/Shoreline Stabilization	Floodflow Alteration	Fish & Shellfish Habitat	Sediment/Toxicant/Pathogen Retention	Nutrient Removal/Attenuation	Production Export	Wildlife Habitat	Recreation	Educational/Scientific Value	Uniqueness/Heritage	Visual Quality/Aesthetics	Listed Species Habitat
WETLAND #1	P	S	P	P	S	S	S	P	S	S	S	S	U
WETLAND #2	P	U	U	U	S	S	S	S	U	U	U	U	U
WETLAND #3	P	U	U	U	S	S	S	S	U	U	U	S	U
WETLAND #4	P	U	S	U	S	S	U	S	U	S	U	S	S
<u>Suitability</u> P = principal function S = secondary function U = function unlikely to be provided at a significant level N/A = not applicable or unknown													

Table:1 Wetland Functions and Values

Groundwater recharge and discharge are a primary function of the wetland systems. All the wetlands show evidence of variable water levels, and while recharge / discharge of groundwater is a principle function, it is not anticipated that the proposed development will impact the groundwater levels.

Moreover, wetland system #1 near the development was identified to have the additional following principle functions:

1. Flood-flow alteration: the wetland is able to detain locally appreciable quantities of water during storm and flooding events.
2. Fish habitat, there are known fish presence in the pond.
3. Wildlife Habitat: Wetland dependent species such as Fish and waterfowl use of the wetlands and Pond.

The proposed activities will not negatively or adversely impact the functionality of the onsite wetland(s) as described above. These listed functions can be maintained and promoted by maintaining overall on-site drainage patterns, demonstrating a compliant septic system, maintaining erosion and sedimentation controls through construction,

stabilizing the bare ground with final vegetative cover and adherence to permit conditions.

### **IMPACT ASSESSMENT**

The site development plans have been designed to provide a feasible residential development while providing a reasonable use of the property with minimal impact on the wetland resources and the environment.

### **DIRECT IMPACTS**

The proposed development will have minor direct wetland impact with the installation of the proposed fire suppression dry hydrant to be located in the pond. No other inland wetland or watercourse will be directly impacted by the proposed activities. Impacts to the upland review area are limited to the areas proximal to the proposed water quality treatment basin and development limits for lots 9, 17 and a portion of lot 19.

Short-term direct impacts during construction can be managed and reduced through measures to control sedimentation and erosion and adherence to BMPs. These controls as well as compliance with permit approvals will ensure that no long-term adverse effects will impact on the natural capacity of the wetlands or detract from the functions and services they currently provide.

### **INDIRECT IMPACTS**

Indirect or secondary impacts to a wetland or watercourse can occur as a result of activities outside of the wetlands or watercourses. These impacts can be either short-term (*construction phase*) or long-term (*i.e., change in drainage patterns / whole-sale clear cutting*) and are typically associated with erosion and sedimentation during construction, removal or disturbance of vegetation in adjacent upland areas, alteration of ground / drainage patterns that could affect the flow regime of a watercourse, and the discharge of degraded or insufficiently treated surface or groundwater, which may adversely impact the water quality of the regulate resource.

The potential for any of these indirect impacts to occur at the site as a result of the development depends on the quality of the regulated resources, the sensitivity to said resources, the resource's physical and ecological characteristics, and the degree to which those resources provide recognized functions and values, and the nature of the activities proposed in areas surrounding or which contribute flow (either surface water or groundwater to the regulated resource). These potential impacts are described in detail below.

### **ERISION AND SEDIMENT CONTROLS**

Short term impacts will be mitigated with standard construction best management practices and adherence to the erosion and sediment control plan. The development respects the watershed hydrology and will not direct discharge to the wetland features without proper treatment. The proposed site plan includes an erosion and sedimentation control plan designed following the 2024 Connecticut Guidelines for Soil Erosion and

Sediment Control. Silt fencing, anti-tracking pads and other E&S measures are proposed to control sediment from construction activities.

The risk for potential adverse impacts from erosion and sedimentation is considered low to moderate because 1.) A detailed erosion and sediment control plan has been prepared, 2) the site's in-situ undisturbed soils are for the most part low to moderately erosive. 3) the site is vegetated, and topography is easily managed, and 4) there is no need for large scale tree removal, only sites under active construction will be cleared to keep the building area envelope to a manageable size. Therefore, it is my professional opinion that with coordination and watchful monitoring and maintenance of erosion and sediment controls until construction is completed and restoration activities have stabilized the ground conditions there will be no anticipated adverse impacts to the regulated resources resulting from sedimentation discharging from the development of the parcel as proposed.

### **VEGETATION REMOVAL AND HABITAT LOSS**

Habitat loss associated with land clearing is a consequence of land development which has the potential of impacting wetlands and watercourses. Clustering the development in one area greatly reduces the fragmentation of the overall 49.8 acre property. As such the project reduces a significant landscape conversion. The proposed development will keep clearing limits to a minimum by clearing what is physically needed for facilitating the construction site improvements, dwellings and associated appurtenances. The conversion of the vegetation cover within the development envelope will not change or diminish the ecological integrity of the open space uplands and/or the wetland communities. The site clearing planned on the western side of the Project site and grading activities will not de-water nor flood the nearby wetlands or alter surface water drainage patterns in a significant manner that exacerbates erosion or causes downstream issues.

The project will result in the conversion of roughly 15 acres of forest to single-family residential suburban neighborhood. Provided in the following sections are the implications of that habitat conversion on the species confirmed present or those that could potentially occur on the site based on the presence of suitable habitat.

clustering the development in an open space concept allows the Project to permanently preserve 31.83 acres of contiguous forest that abuts three road frontages. The open space will also encompass and includes all four wetland resources areas identified on the property.

### **IMPACTS TO HYDROLOGY**

In Connecticut, the design and implementation of stormwater management measures are guided by the Connecticut Department of Energy and Environmental Protection (CT DEEP) Stormwater Quality Manual (2024), developed pursuant to Phase II of the federal Clean Water Act (CWA). The Manual provides a framework of BMPs demonstrated through research and field performance data to effectively reduce pollutant loads and mitigate hydrologic alteration associated with land development. While these guidelines do not replace the engineering judgment or site-specific design developed by a licensed

professional engineer, they establish performance criteria intended to preserve the physical, chemical, and biological integrity of receiving waters, including wetlands and watercourses.

The proposed site improvements will not impact overall drainage patterns. The site improvements will not increase the potential for downstream flooding. The stormwater management system for this site has been designed utilizing best management practices (BMPs) to meet or exceed the stormwater management standards in accordance with CT DEEP 2024 Connecticut Stormwater Quality Manual and the Ledyard Zoning Regulations. The proposed project will provide; pollutant reduction by providing via treatment of the water quality volume and water quality flows through stormwater BMPs; peak runoff attenuation through use of stormwater BMPs; and conveyance protection through structural stormwater BMPs.

All runoff from proposed impervious surfaces will be conveyed to the water quality system for detention and treatment. The site has been designed with a conventional drainage system. Catch basins with deep sumps will capture and convey stormwater runoff, via an underground pipe system, to the water quality basin. The treated discharge of this stormwater will issue to the upland review area +/- 40 feet away from the wetland boundary and will beneficially infiltrate into the upland soil recharging the nearby wetland baseflow. The proposed development will not holistically alter surface or subsurface flow conditions or directions in a substantially impactful way.

The runoff volume and pollutant reduction criterion are designed to preserve pre-development hydrology and pollutant loads to protect water quality and maintain groundwater recharge. The proposed stormwater management as designed will provide a decrease in peak rates of runoff for the 2-, 10-, 25- and 100-year design storm events in accordance with the 2024 Connecticut Stormwater Quality Manual and the Ledyard Zoning Regulations. The proposed development stormwater management system reduces peak rates of stormwater runoff from the subject site when compared to pre-development conditions for the analyzed storm events. The project engineer has certified for the record that the proposed stormwater management system as discussed herein and shown on the referenced plans is appropriate for the proposed development on the subject site, is consistent with Town and State requirements, and should not pose any detrimental impacts to the surrounding environment.

#### ***Nutrient Loading and Water Quality Assessment***

When a residential subdivision with individual septic systems is proposed upgradient of a wetland or waterbody or surface water, the potential for nutrient loading represents a primary concern. A portion of three (Lots 6, 17, 19) of the twenty-three proposed septic systems will be located within 100 feet of the Wetland #1, the man-made pond centrally located on the site, yet all are fully compliant with separation distances required under the Connecticut Public Health Code. The firm subsoils will encourage lateral groundwater flow in a northerly direction, promoting additional subsurface renovation of septic leachate as it moves through the forested buffer before discharging to the wetland system.

The wooded swamp provides favorable conditions for denitrification and nutrient attenuation. The forested buffer between the proposed development and subject wetland ranges from 40 to 100 feet in width. Within this buffer, groundwater flows are diffuse and slow-moving through saturated soils, creating extended residence times that enhance biogeochemical processing. The high organic matter content, combined with root uptake by trees and shrubs, facilitates removal of nitrogen and phosphorus from shallow groundwater. Where preserved, deep-rooted perennial forbs along the swales will further contribute to nutrient uptake. Based on field observations and GIS-based watershed analysis it is unlikely water quality and aquatic habitat will be negatively or adversely affected by the proposed residential development and associated septic systems.

The engineered subsurface sewage disposal system requires health department approval. Human health water quality criteria are based on the toxicity of a contaminant and the amount of the contaminant consumed through ingestion of water and fish regardless of the type of water. Therefore, both the EPA and State chemical-specific human health criteria are directly applicable to wetlands. Consequently, demonstrating the project meets health department criteria implies the activity will not adversely affect the wetland resources.

### **RECOMMENDATIONS**

1. Where activities are within 50 feet of a regulated wetland provide a double row of silt fencing and/or erosion & sediment control measures, particularly between the limits of disturbances and the man-made pond (WELAND #1) centrally located on the site.
2. Prior to the start of construction the wetland boundary should be re-flagged with new hi-visibility flagging so the line is readily identifiable to civil contractors completing site work.

### **SUMMARY**

The project has been designed so that there will be no direct impacts on wetlands and watercourses. Furthermore, it is my professional opinion that the project will not have negative secondary or indirect impacts to wetlands or watercourses. Strict adherence to the detailed erosion and sediment control plan and stormwater pollution prevention plan will minimize any impacts to water quality during construction.

The project will result in some loss of native upland forest habitat, as clearing and grading of approximately 15 total acres of the site will be required, resulting in the conversion of mixed hardwood forest habitat to residential single family subdivision neighborhood. Biological surveys did not reveal the presence of any State of Connecticut or Federally listed species. The impacts to habitat and wildlife are expected to be less significant when compared to impacts associated with a traditional residential development which would fragment the parcel and result in a larger disruption to the ecosystem. The proposed project will result in a concentration of activity and will preserve a large contiguous block of forest as undisturbed natural open space.

The proposed activities are not likely to have a significant effect on the environment for the following reasons:

1. The proposed activities have very limited direct disturbance to wetlands and as such the project does not substantially change or negatively inhibit the natural dynamics or the natural capacity of the wetland system(s).
2. The erosion and sediment controls will protect the environment from the proposed activities and if appropriately installed, monitored and maintained will not likely cause or have the potential to cause substantial turbidity, siltation or sedimentation in a wetland or watercourse.
3. The proposed stormwater treatment system will collect and renovate stormwater quality and volume generated from the site development and therefore is unlikely to cause or have the potential to cause pollution of the wetland. Additionally, the project is providing a local and state compliant sewage treatment system which by approval is required to meet or exceeds health code requirements which will further eliminate pollution.
4. The wetland features are not unique, nor do they provide demonstrable scientific or educational value.

In considering feasible and prudent alternatives, the current proposal respects the integrity of the environment, requires no physical impact on the wetland resources. The project implements best management practices that will protect the regulated areas. The open space design is a feasible and prudent alternative for the development of this property giving consideration to balancing the protection of the inland wetlands and watercourses while fostering reasonable development and use of the site for residential uses as zoned R60.

In my professional opinion there will be no significant adverse impacts resulting from the development of the project as proposed. The design has avoided wetland disturbance and reduced environmental impacts by:

1. Avoiding direct impacts to the wetland resources.
2. Providing and maintaining erosion and sediment controls during construction.
3. Providing stormwater management and treatment.
4. Commitment to adhering to permit conditions and construction industry standard BMPs.
5. Compliance with regulatory standards.
6. The plans are consistent with and satisfy the statutory factors for consideration provided by Section 22a-41 of the Connecticut General Statutes; and
7. Are consistent with and satisfy the criteria for consideration provided by the Town of Ledyard Inland Wetlands and Watercourses Regulations dated February 25, 2025.



PHOTO 1: WETLAND #1 – MAN-MADE POND IN CENTER OF SITE



PHOTO 2: DISCHARGE FROM WETLAND #1 WHICH FORMS THE “HANGING” WATERCOURSE THAT INFILTRATES BACK INTO THE SANDY UPLAND SOIL ROUGHLY 150’ DOWN HILL OF THE POND’S OVERFLOW OUTLET.



PHOTO 3: WETLAND #2



PHOTO 4: WETLAND #3 THAT FLOWS TO SILAS DEANE ROAD HEADWALL.



PHOTO 5: HEADWALL AT SILAS DEANE ROAD THAT INTERCEPTS FLOWS FROM WETLAND #3 AND CARRIES THE STREAM CHANNEL UNDER SILAS DEANE ROAD.



PHOTO 6: WETLAND #4 – ISOLATED WETLAND POCKET NEXT TO 837 SHEWVILLE ROAD



PHOTO 7: GENERAL UPLAND CONDITIONS IN AREA OF PROPOSED DEVELOPMENT



PHOTO 8: EXAMPLE OF THE UPLAND CONDITIONS THAT TYPIFY THE PROPOSED OPEN SPACE

If you have any questions or comments, please do not hesitate to contact me at [itcole@gmail.com](mailto:itcole@gmail.com) or (860) 514-5642.

Sincerely,



Ian T. Cole  
Professional Registered Soil Scientist  
Professional Wetland Scientist #2006

**ATTACHMENTS**

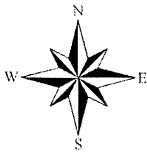
SITE PHOTOS

GIS MAP(S)

USFWS NWI

NRCS SOIL MAP

CTDEEP NDDDB PRELIM SITE ASSESSMENT



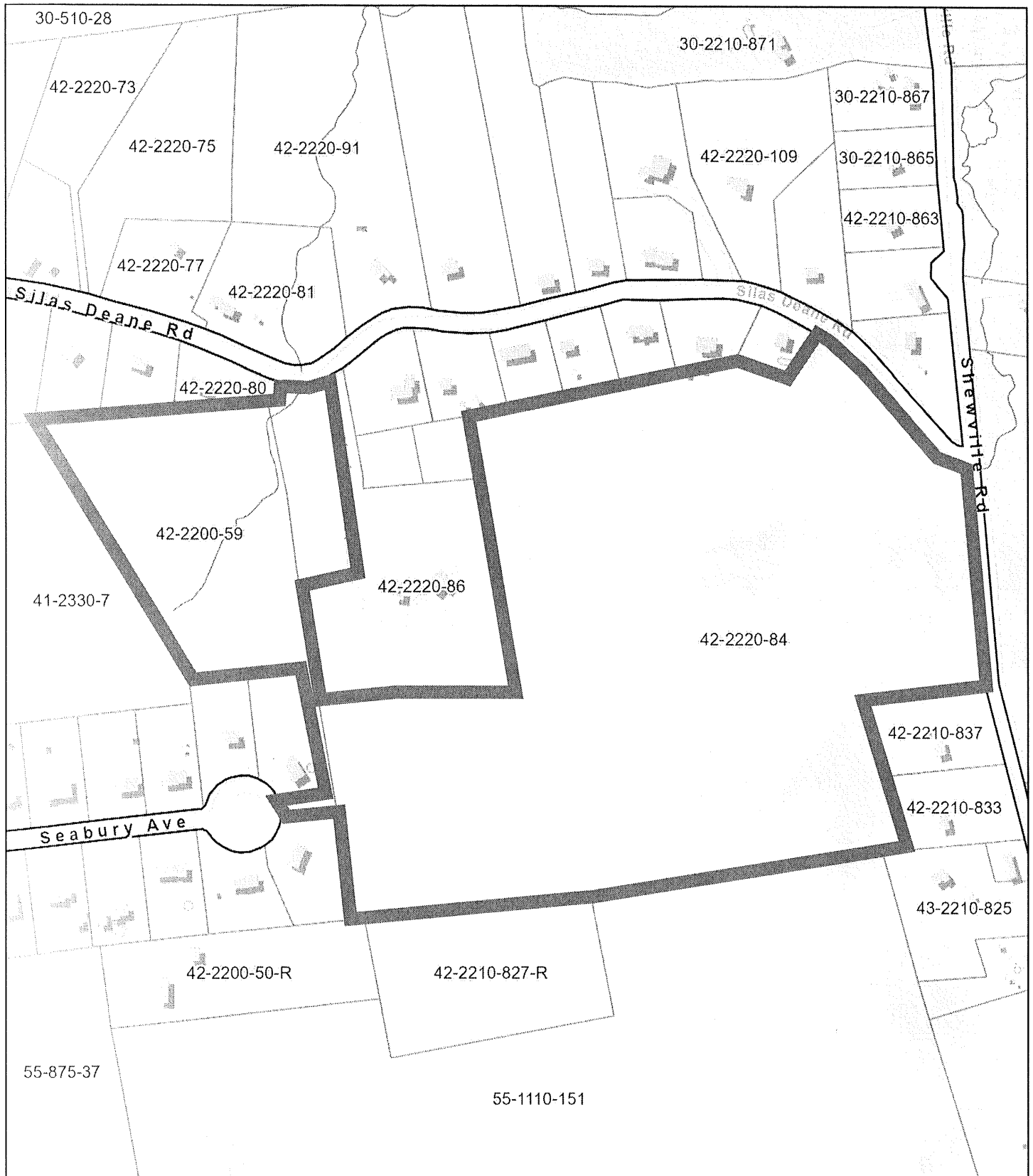
Ledyard, CT

1 inch = 354 Feet

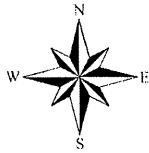


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March 7, 2026



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Ledyard, CT

1 inch = 354 Feet

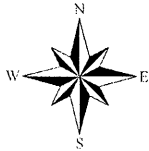


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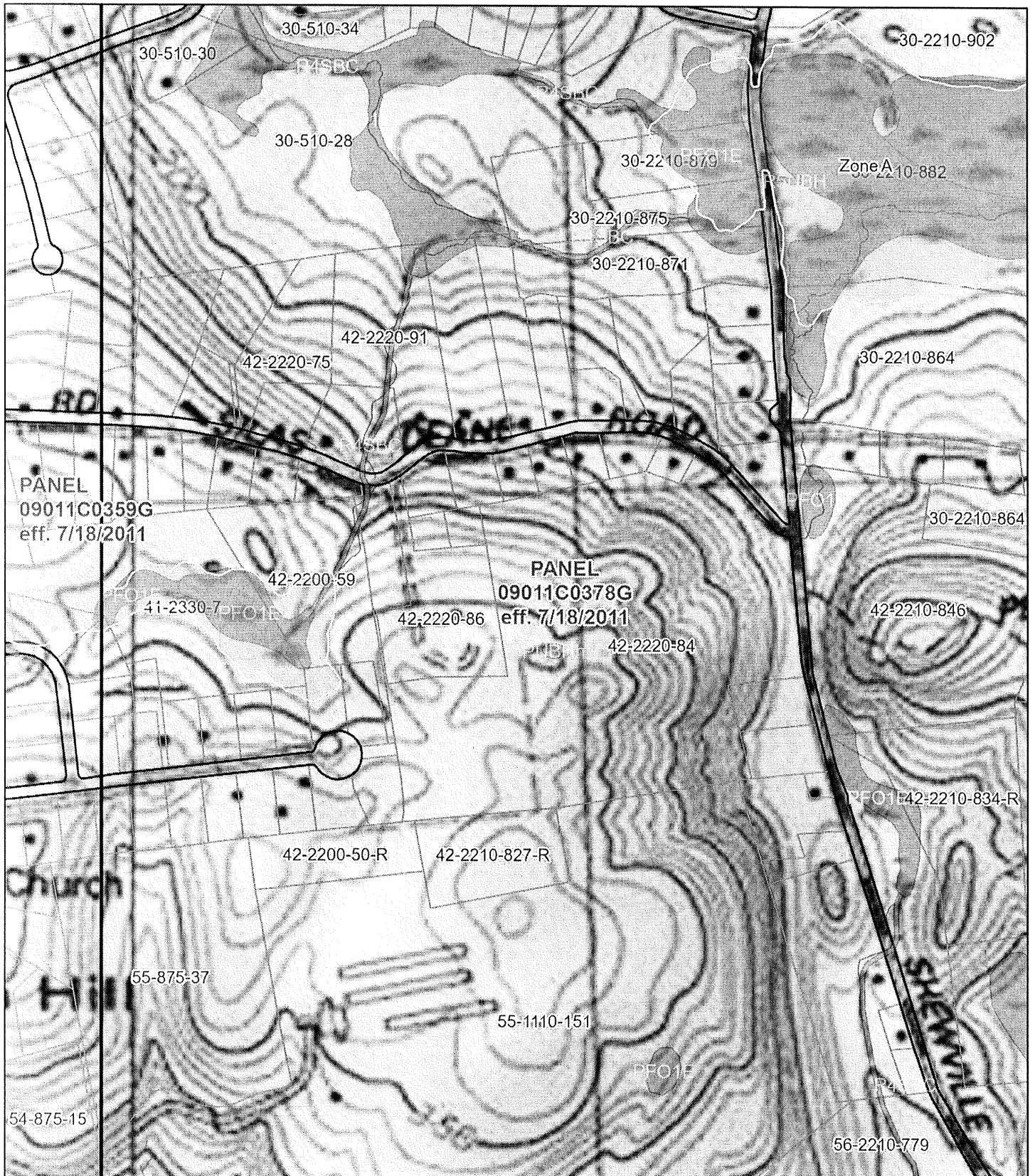
Ledyard, CT

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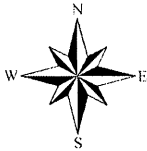
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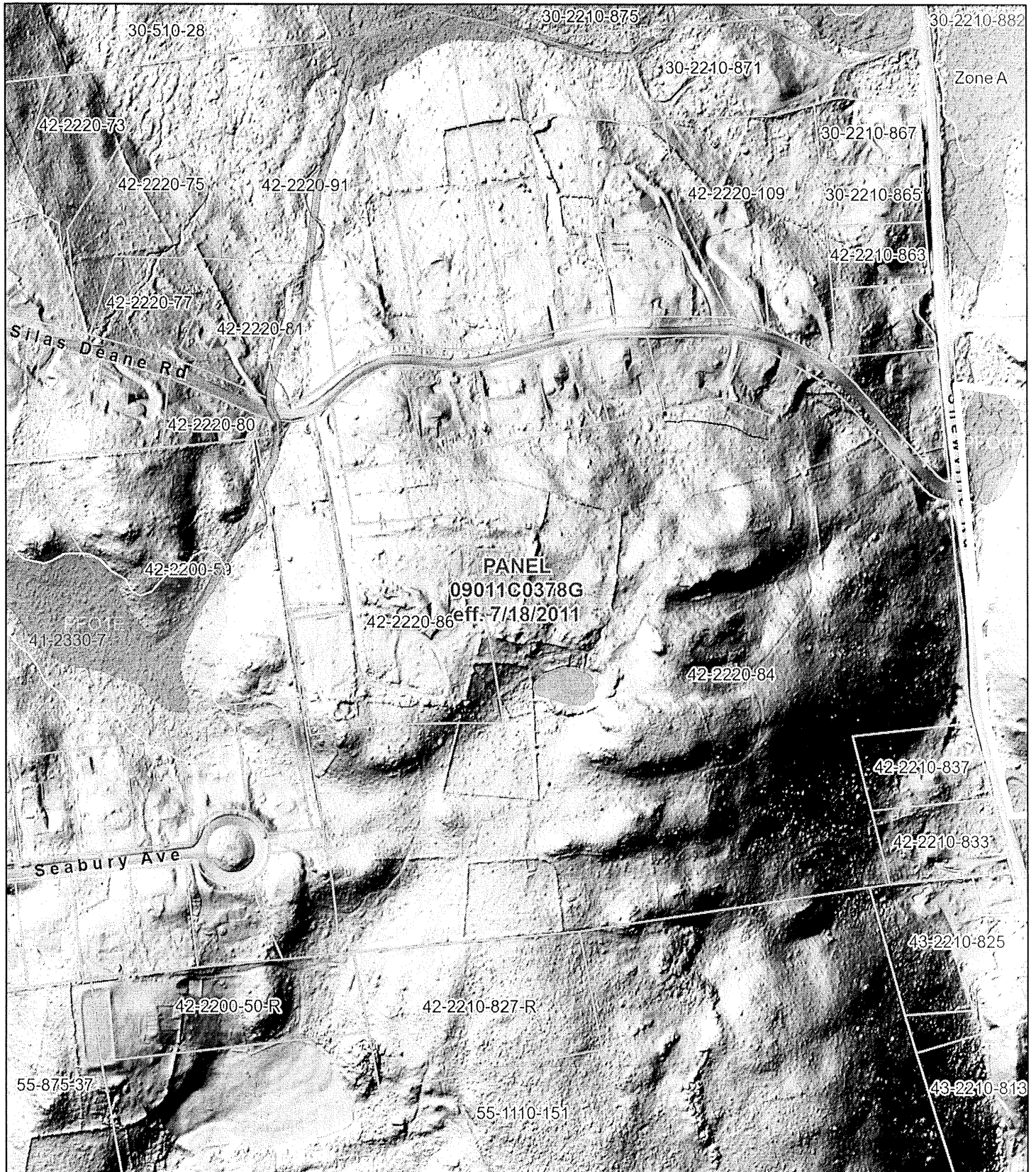
Ledyard, CT

1 inch = 355 Feet



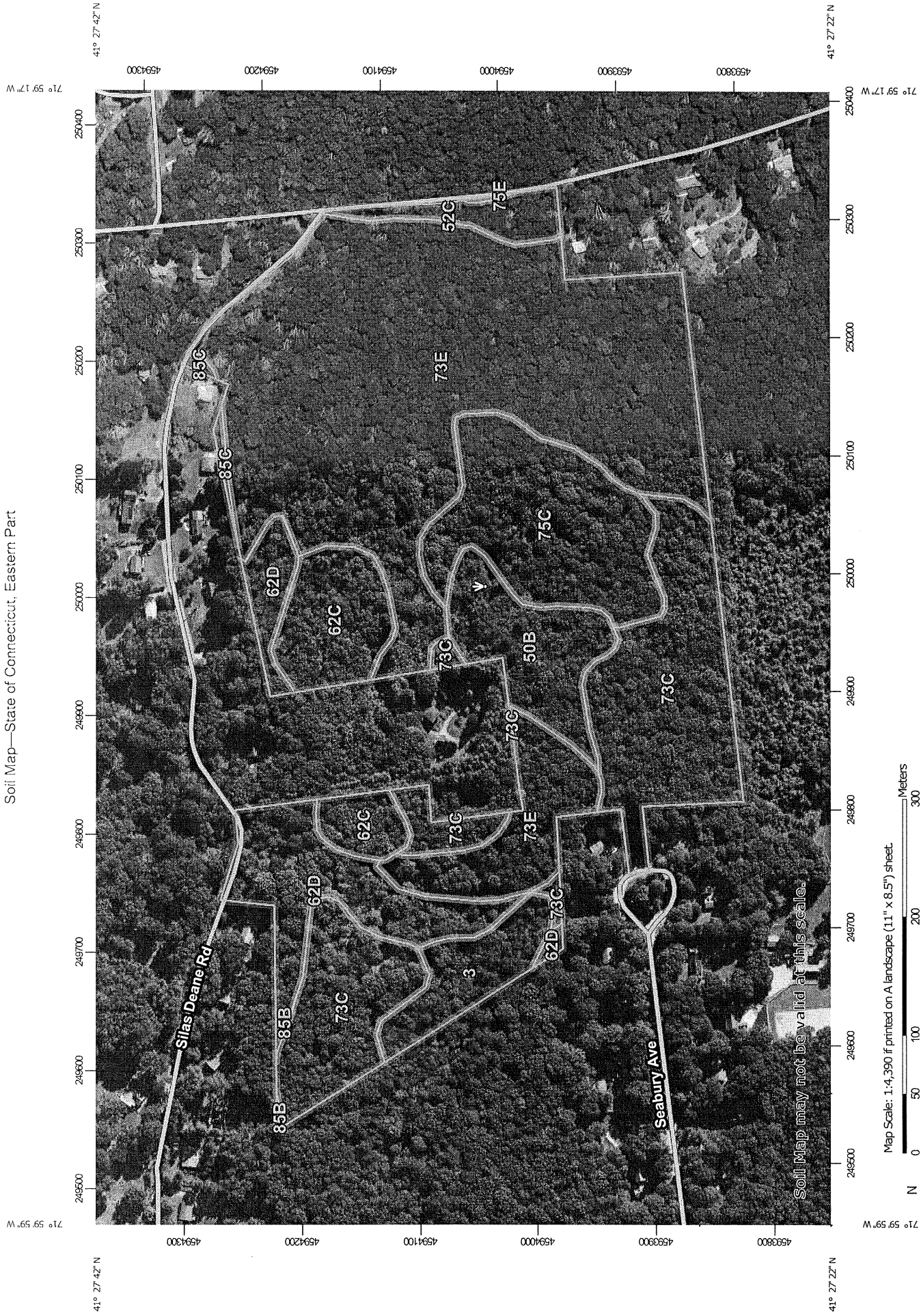
www.cai-tech.com

March 7, 2026



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Soil Map—State of Connecticut, Eastern Part



Map Scale: 1:4,390 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)
- 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
- 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 1:12,000.

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: State of Connecticut, Eastern Part  
 Survey Area Data: Version 6, Sep 16, 2025

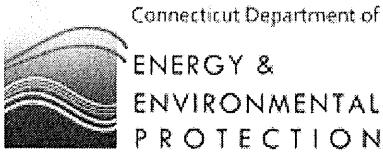
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	2.0	3.6%
50B	Sutton fine sandy loam, 3 to 8 percent slopes	3.1	5.5%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	1.1	1.9%
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	3.3	6.0%
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	4.8	8.6%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	10.3	18.5%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	24.9	44.8%
75C	Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes	5.8	10.5%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	0.0	0.0%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	0.1	0.1%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	0.2	0.3%
<b>Totals for Area of Interest</b>		<b>55.6</b>	<b>100.0%</b>



Generated by eNDDDB on:  
3/7/2026

Ian Cole  
Towns: Ledyard  
Preliminary Site Assessment: 1518612540

Subject: 54 SILAS DEANE RD

Current data maintained by the Natural Diversity Database (NDDDB) and housed in the DEEP ezFile portal, indicates that no populations of State Endangered, Threatened, or Special Concern species (RCA Sec. 26-306), and no Critical Habitats have been documented within or in close proximity to the area delineated.

Please be advised that this is a preliminary assessment and not a Natural Diversity Database determination. The purpose of this information is to provide a general planning tool which identifies those species that have been reported and may occur on or near the mapped area. A more detailed application and review will be necessary to move forward with any environmental authorization, permit, license, or registration applications submitted to DEEP. If such review is required, please return to the DEEP's ezFile Portal and select [Natural Diversity Database Review](#) to begin the review process.

This Preliminary Site Assessment does not preclude the possibility that species not previously reported to the Natural Diversity Database may be encountered on the site. You are encouraged to report incidental observations to the Natural Diversity Database using the [appropriate survey form](#) and follow the instructions for submittal. We recommend field surveys be conducted in order to evaluate potential habitat and species presence. Field surveys should be performed by a qualified biologist with the appropriate scientific collecting permits at a time when these target species are identifiable. A report summarizing the results of such surveys should include:

1. Survey date(s) and duration
2. Site descriptions and photographs
3. List of component vascular plant and animal species within the survey area (including scientific binomials)
4. Data regarding population numbers and/or area occupied by State-listed species
5. Detailed maps of the area surveyed including the survey route and locations of State listed species
6. Statement/résumé indicating the biologist's qualifications

The site surveys report should be sent to the CT DEEP-NDDDB Program ([deep.nddbrequest@ct.gov](mailto:deep.nddbrequest@ct.gov)) for further review by program biologists.

Natural Diversity Database information includes all information regarding listed species available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units

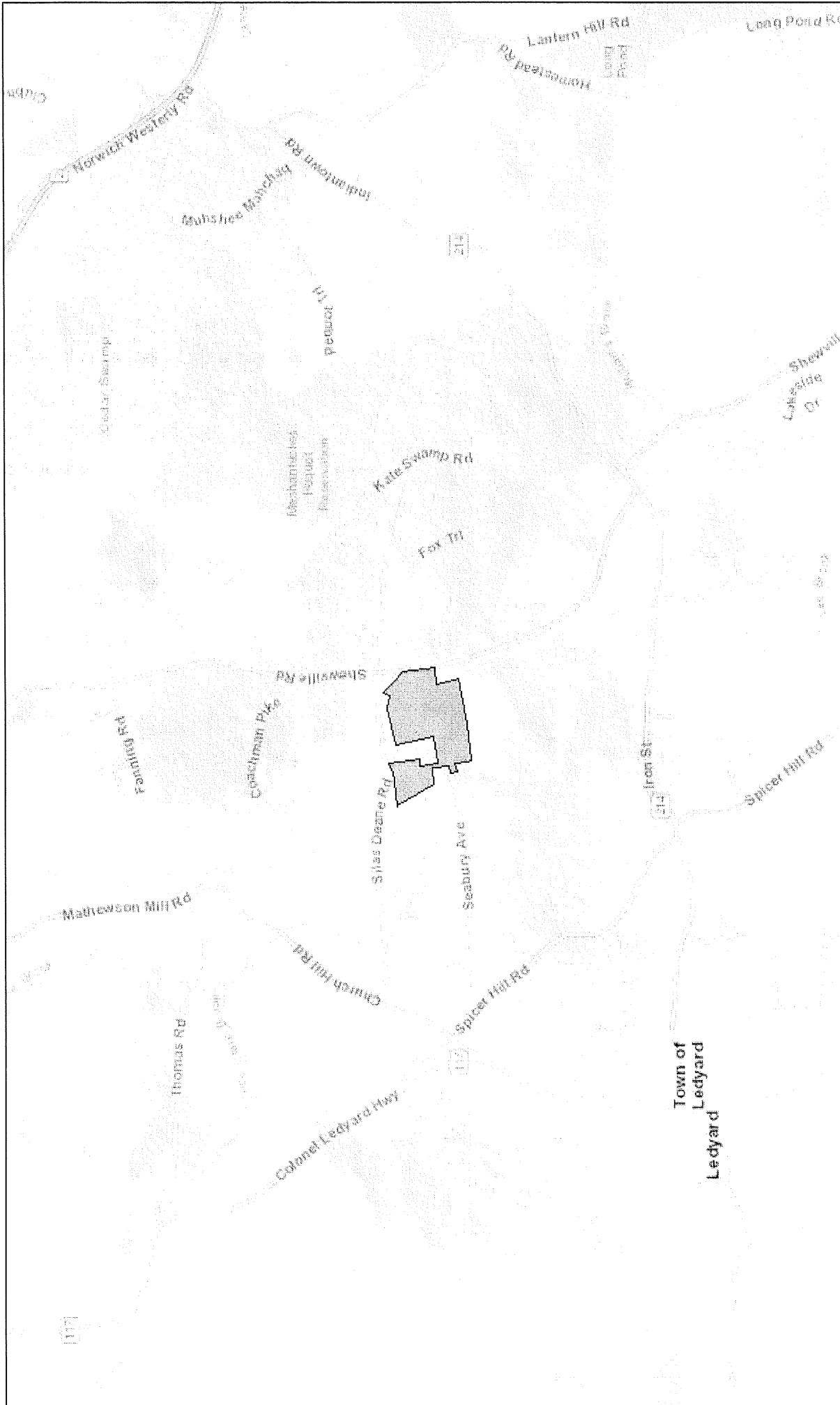
of DEEP, land owners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Database and accessed through the ezFile portal as it becomes available.

This letter is computer generated from our existing records and carries no signature. If however, any clarification/error is noted, or, if you have further questions, please contact the following:

CT DEEP Bureau of Natural Resources  
Wildlife Division  
Natural Diversity Database  
79 Elm Street  
Hartford, CT 06106-5127  
(860) 424-3011  
[deep.nddbrequest@ct.gov](mailto:deep.nddbrequest@ct.gov)

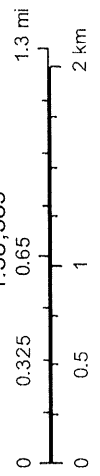
Please include a snapshot of the map, your last name, and the subject area town when you e-mail or write. Thank you for consulting the Natural Diversity Data Base.

# 54 SILAS DEANE RD Map



2026

1:38,389



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri, Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

