

# CONSERVATION RESTRICTION AREA AND ADJACENT WETLAND - IMPACT ANALYSIS OF THE PROPOSED SITE IMPROVEMENTS

AT

**50 ROSEVILLE ROAD  
WESTPORT, CT**



PREPARED BY:  
**ALEKSANDRA MOCH**  
SOIL & WETLAND SCIENTIST  
LANDSCAPE DESIGNER  
GEOLOGIST/HYDROGEOLOGIST  
CPESC

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## LOCATION AND SITE PHYSICAL CHARACTERISTIC

This 0.95-acres site is an undeveloped flag-lot located on the eastern side of Roseville Road in Westport, CT. The access to the site is gained via a 325-foot long and 20-foot wide strip of land which is partially paved. This access is being shared with two other properties. The first 90 feet is paved. Further east, the access forks-off the pavement into an area which is partially improved but maintained as a lawn with several trees growing along the edge. At its terminus, the access opens up to a wide area of the lot. The area is divided into a wooded southern section protected as a Conservation Restriction Area (CRA) and a cleared northern area prepared to accommodate the new development. The terrain transitions from a moderate slope containing the most of the clearing into a steep and very steep gradient dominating the CRA. Even though the area is surrounded by wetland/watercourse systems; no wetland/watercourse was found at the site. The property is located within the Muddy Brook watershed and residential zone A.



Google, aerial photograph of the site taken in 2023

## SCOPE OF THE PROJECT

The purpose of this report is to evaluate a wetland/watercourse area located off-site along the access way and the Conservation Restriction Area situated within the southeastern

section of the property. In addition, the proposed site improvements will be examined to identify potential impacts to the wetland/watercourse and Conservation Restriction Area.

### WETLAND/WATERCOURSE AREAS

There are three regulated areas surrounding the site. All of them are part of a single wetland/watercourse system which was separated by an access created during the development associated with the approved subdivision. One of the elements of this corridor is located off-site along the eastern property line. This intermittent watercourse receives overflow from a wetland located to the north. The area of the channel is wooded and carved into the ledge. The slope here is very steep so the flow velocity creates a strong erosional force resulting in a deep and well-established channel. Heavily armored stream bed with stone, boulders and pebbles help to dissipate the energy of the flow and moderates the velocities. This stream was flagged in the field by Aleksandra Moch, on March 18, 2023. The channel is located more than 50 feet from the proposed development.



Upstream

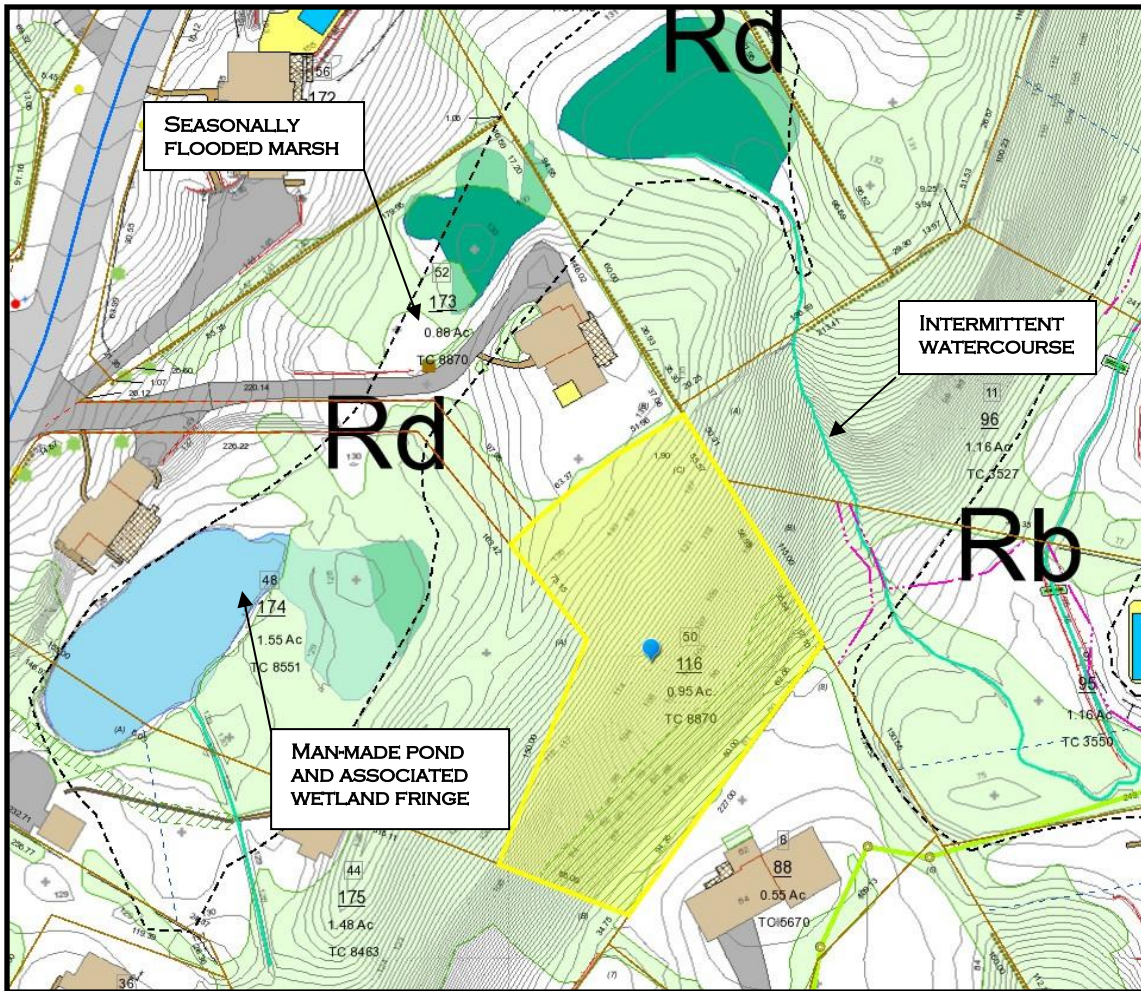
Mid-stream

Downstream

The second component of this wetland/watercourse system is situated off-site on the northern side of the access. This seasonally flooded marsh is surrounded by a wetland fringe. The distance to this wetland exceeds the width of the regulated 50' upland review area.

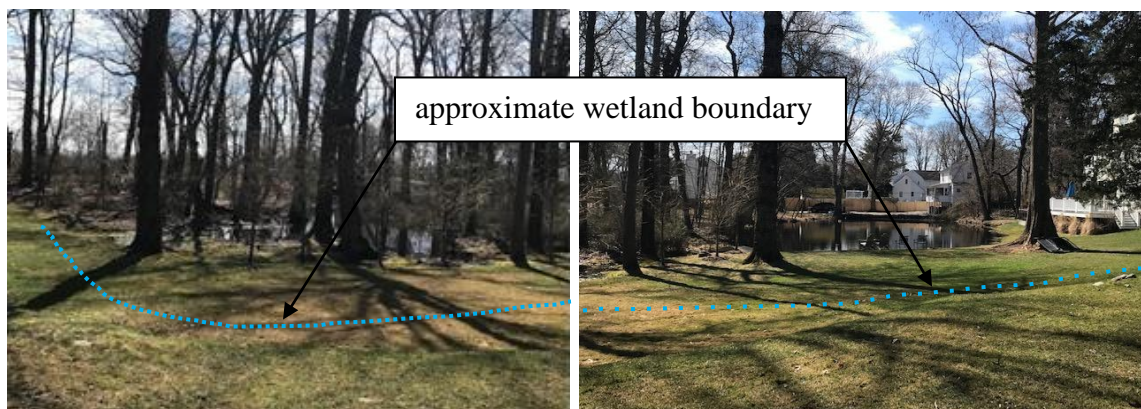


A view from the proposed driveway



Wetland/watercourse system surrounding the site, <https://www.axisgis.com/WestportCT/>

The third component of this wetland/watercourse system is situated off-site along the southern edge of the access. This area consists of a man-made pond and associated wetland fringe. The proposed access driveway and associated in-ground detention system falls within its regulated upland review area, therefore it will be focused on in this report.



A view of the wetland/watercourse area from the proposed driveway.

## CONSERVATION RESTRICTION AREA

This 11,899 sf area is located with the southeastern section of the lot and it is defined by the property lines and the 100 foot contour line to the north. While the majority of the northern section of the lot was cleared in preparation for the future development, this portion remains intact. This CRA was created during the tree-lot subdivision approved by P&Z on June 10, 1987. The original boundary was determined by elevation 110 contour line. Subsequent combining of two lots on April 12, 1989 and an additional subdivision approved in early 1990 had set the final boundary at elevation 100. The area was selected to be set aside to protect the wooded steep slope.

The existing large trees and understory growth provide deep root systems helping to anchor the soil and maintain the stability of the slope. The vegetative cover in this area is dominated by a significant amount of invasive species. Among them are invasive vines. Their dense cover has been impacting the vigor and the health of the woody plant material. Vine strangled trees struggle to stretch their branches. They bend under the heavy load. Dense cover affects air circulation, shade over the affected plant species and interfere with their ability to photosynthesize. A noticeable number of native trees in this area show varying stages of decay and loss of branches either to diseases and/or natural decline. Tall trees on the steep slope are exposed to wind. Shallow ledge limits their ability to deeply anchor making them prone to windthrow. Deteriorating trees are being gradually replaced with invasives. Young disease free population of invasive plants has been aggressively pursuing the area.

## GEOLOGY, SOILS AND HYDROLOGY

The area is underlined with shallow ledge formation consisting of metamorphic rocks such as mica shist and gneiss interrupted by granitic intrusions. The ledge outcrops at two locations: within the small area of the access and at the entrance to the site.

Based on the wetland delineation performed by James McManus, Soil Scientist dated January 12, 2023 and subsequent wetland verification done by Jay Fain, Soil Scientist, the Conservation Commission approved an amendment to the wetland map on March 15, 2023. By consensus the commission agreed there was no wetland/watercourse at the site.

To designate the boundary of the wetland closest to the property lines, additional wetland delineation was performed by Aleksandra Moch, Soil Scientist on March 18, 2023. The flagged area consisted of an off-site wetland located to the south which supports Ridgebury, Leicester, and Whitman, extremely stony soils. This soil series occurs in depressions and/or drainage ways and consists of poorly drained soils underlined by a restrictive layer (hardpan) at the depth between 20 and 80 inches. Approximately 9% of the surface is covered with cobbles, stones or boulders. The parent material for this soil consists of a coarse-loamy melt-out till derived from granite, shist, and/or gneiss. The slopes in this area range from 0 to 5% and the depth to the groundwater table varies from 0 to 18 inches.

The hydrological connections within the wetland/watercourse corridor surrounding the site was interrupted by the existing driveway crossing. The current hydrological connections are limited to the ground water. Ground water replenished by precipitation is the major source of saturation within the wetland, supplies base flow to the streams and fills the permanent pond and seasonally flooded depressions. Perched ground water over the hardpan assures prolonged wetness. Ground water levels depend on precipitation. Storm events provide direct contribution to the wetland/watercourse hydrology when rain drops falling over the area and indirect one via ground water and sheet flow darning from the upland area.

The proposed driveway crossing is situated over a hump which serves as a divider between two sub-basins. The southern pond located at 48 Roseville Road overflows to a stream channel. The channel leads the flow down a steep slope towards Long Lots Road. The northern pond/marsh area is situated at 52 Roseville Road and overflows into a wet meadow sloping towards the south. The meadow fed by a spring empties into a stream channel heading down slope towards the perennial channel parallel to Fresenius Road.

## VEGETATIVE COVER

- Off-site wetland/watercourse: the area is maintained as a lawn with a line of trees and shrubs growing along the edge of the pond. The existing vegetated cover anchoring the soil include Red maple (*Acer rubrum*) and Sweet pepperbush (*Clethra alnifolia*) with occasional Japanese barberry (*Berberis thunbergia*), Multiflora rose (*Rosa multiflora*) and Spicebush (*Lindera benzoin*). Several Weeping willows (*Salix babylonica*) were planted along the edge to enhance the area and help with water absorption. Also located within the buffer are trees which grow within the area of the proposed driveway. The species include Sweet birch (*Betula lenta*), Ailanthus, Black walnut (*Juglans nigra*), four Eastern white pines (*Pinus strobus*), Black locust (*Robinia pseudoacacia*), Red maple (*Acer rubrum*), White oak (*Quercus alba*) and 2 Pin oaks (*Quercus palustris*). Those trees grow in a row individually or in groups.
- Conservation Restriction Area is imbedded into a wide belt of woodland stretching along the ridge throughout the neighborhood. This area supports an understory growth and herbaceous ground cover. The plant assembly consists of Norway maple (*Acer platanoides*), Ailanthus, Tulip tree (*Liriodendron*), Black locust (*Robinia pseudoacacia*), White oak (*Quercus alba*), Pin oak (*Quercus palustris*), Black oak (*Quercus velutina*), Sassafras, American sycamore (*Platanus occidentalis*), American holly (*Ilex opaca*), Shugar maple (*Acer saccharum*), Black birch (*Betula lenta*), Black cherry (*Prunus serotina*), Black walnut (*Juglans nigra*), etc.

Shrubby layer is dominated by invasive species such as: Wineberries (*Rubus phoenicolasius*), Muliflora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergia*), and Burning bush (*Euonymus alatus*).

Invasive vines such as Oriental bittersweet (*Celastrus orbiculatus*), Mile-a-Minute (*Persicaria perfoliate*), Tatarian honeysuckle (*Lonicera Tatarica*), and Porcelain berries (*Ampelopsis glandulosa* var.).

The herbaceous ground cover supports invasive Garlic mustard (*Alliaria petiolate*), a variety of mosses such as Tree Climacium moss (*Climacium dendroides*), a variety of grasses and sedges. The ground cover was identified in March 2023, prior to the official beginning of the growing season. The early ephemeral flowers found at the site consisted of Glory of the snow (*Chionodoxa*) which blanketed several sections with its blue color. Fig buttercup (Lesser Celandine) an invasive yellow flowering plant was found along the toe of the slope. This plant is known from aggressively taking over the natural environments in CT. It spreads through bulblets and tubers.

## WETLAND/WATERCOURSE HABITAT

A wildlife study was performed on March 18, 2023. The study was based on the prevalent characteristic of the habitat. This work included evaluation of plant communities, structure and stratification, wetland/watercourse hydrology, soil types, presence of cavities, snags, woody debris, boulders, and other natural features. Presence of wildlife was determined by visual observations, listening to calls, locating wildlife tracks, and detecting any other signs of wildlife presence.

Based on the vegetative cover, the off-site wetland/watercourse area most likely supports a variety of wildlife that is known to use the existing plants as their primary food source. Red maple dominating the tree canopy provides flowers that are pollinated by variety of bees, flies, and moths. The seeds provide food for squirrels and other rodents. Rabbits and deer eat the shoots and leaves. Squirrels, eastern chipmunks, voles, and white-footed mice collect the seeds when matured in spring.

Weeping willow are not native to CT, but their flowers produce pollen and nectar valuable to feed bees, attract butterflies and moths, which often use weeping willows as their hosts. In their larval stage, caterpillars feed on the foliage. Birds in their young stage use caterpillars to satisfy their need for animal protein. Willows also provides browse food for rabbits and deer as well as nesting sites for numerous birds and mammals.

The Eastern White Pine and oak trees found within the buffer area are considered to be among the most valuable trees for wildlife in eastern North America. They provide food and habitat for numerous species. Songbirds and small mammals eat eastern white pine seeds. White-tailed deer and cottontails browse the foliage and the bark is eaten by various mammals. Similar to white pine, oaks' leaves, twigs, and young shoots provide browse for deer and rabbits. Caterpillars are usually found on oak trees during spring and summer. In tree canopy they find shelter and feed on leaves and buds. Caterpillars providing food for a variety of birds and other animals.



The understory growth of a narrow portion of the forested wetland is dominated by spicebush that is an excellent source of nectar for butterflies and other pollinators in early spring. In addition, this shrub provides cover and nesting site as well as red berries to various birds. Sweet pepperbush accompanying spicebush is mostly valued for its flowers. A wide variety of bees and butterflies, visit the plant collecting both nectar and pollen.

The herbaceous plant cover is dominated by skunk cabbage, which is the first source of pollen in spring for honeybees. The leaves and the spathe are eaten by slugs, snails and caterpillar of the ruby tiger moth. During summer and fall, rotting leaves of skunk cabbage attract tiny flies and moths.

The edge of the wetland area located in the closest proximity to the proposed access driveway is maintained as a lawn. Lawns are known as biological deserts, but not all lawns are created equal. When allowed to grow a variety of other plants, they may function as a meadow. Mowed, but not on regular basis lawn, allows certain plants to flower and develop seeds. The off-site lawn provides a home for several insects that are eaten by birds and other wildlife. The soil rich in organic matter most likely have good numbers of earthworms which are the primary diet for birds such as song thrush, robin and blackbird in winter and spring. This wetland lawn supports some of the annual meadow grass, plantain, buttercup and dandelion offering their seeds to a variety of birds. Longer grass provides shelter and egg-laying opportunities for the insects on which birds and other wildlife feed.

No mammal limits its life to the wetland area; they utilize both the wetland and the upland in search for food and shelter. The edge of the wooded portion of the wetland is most likely visited by white tailed deer, which feeds in wooded wetlands and uses them for refuge. Other common edge species include: wild turkey, raccoon, opossum, fox, squirrels, short-tailed shrews, red-back voles, and white-footed mice. These species are drawn to the pond as a water source needed for survival.

This wetland/watercourse area is well connected to the Conservation Restriction Area. Together they are a part of much larger green corridor which crosses throughout the neighborhood. The area is protected by the mixture of steep slopes, wetlands and conservation areas which together offer refuge, habitat and migratory way to local wildlife.

The Conservation Restriction Area is wooded. The woodland functions; however, had been declining over the years. Matura trees weakly anchored into shallow soil placed over a steep slope are prone to windthrow and gravity. Native trees uprooted during the severe storms are easily replaced by invasive species getting their stronghold in this area. In addition, the old growth had been ravaged by diseases. If not attended, a dense population of Ailanthus may bring more devastation to this area in the near future. This tree is a well-known host to the Spotted Lanternfly (*Lycorma delicatula*) which has not been seen at the site, but with its population rapidly expanding, the possibility of the spread is very real.

Snags and decaying wood has an important role in the woodland setting. Lifeless material full of recycled nutrients gives birth to new life. Dead parts of live trees and dead trees, whether standing (snags) or fallen (logs), are important elements of wildlife habitat. They offer both shelter and food to many wildlife species. A fallen tree becomes a habitat for fungi and insects. As a tree decomposes, nutrients are returned back to the soil making the area favorable for the growth of new seedlings. Insects, amphibians, mice, and shrews seek refuge in rotting logs. Skunks and woodpeckers relay on them for easy pickings. In some instances a grouse may use it as a drumming site.

Accumulation of organic material, including damp, rotting wood and leaves, favorably affects mushroom populations. Mushrooms are food for insects, turtles, birds, mice, squirrels, and deer. Some of these species relay on them during winter. Mushrooms are highly nutritious and can compensate for nutrient deficiencies.

Several bird species nest under partially elevated logs. Depending on their size, hollow logs can shelter a variety of forest mammals such as shrews, chipmunks, and foxes. Snakes use logs for shelter and food-seeking activity. The eastern garter snake likes to hibernate in rotting wood.

As much as dead wood is an important element of the habitat it should not be the dominated one. This area needs help and it should be restored so there will be a better balance between new native growth and the old decaying one.

## **VALUES AND FUNCTIONS OF THE OFF-SITE WETLAND**

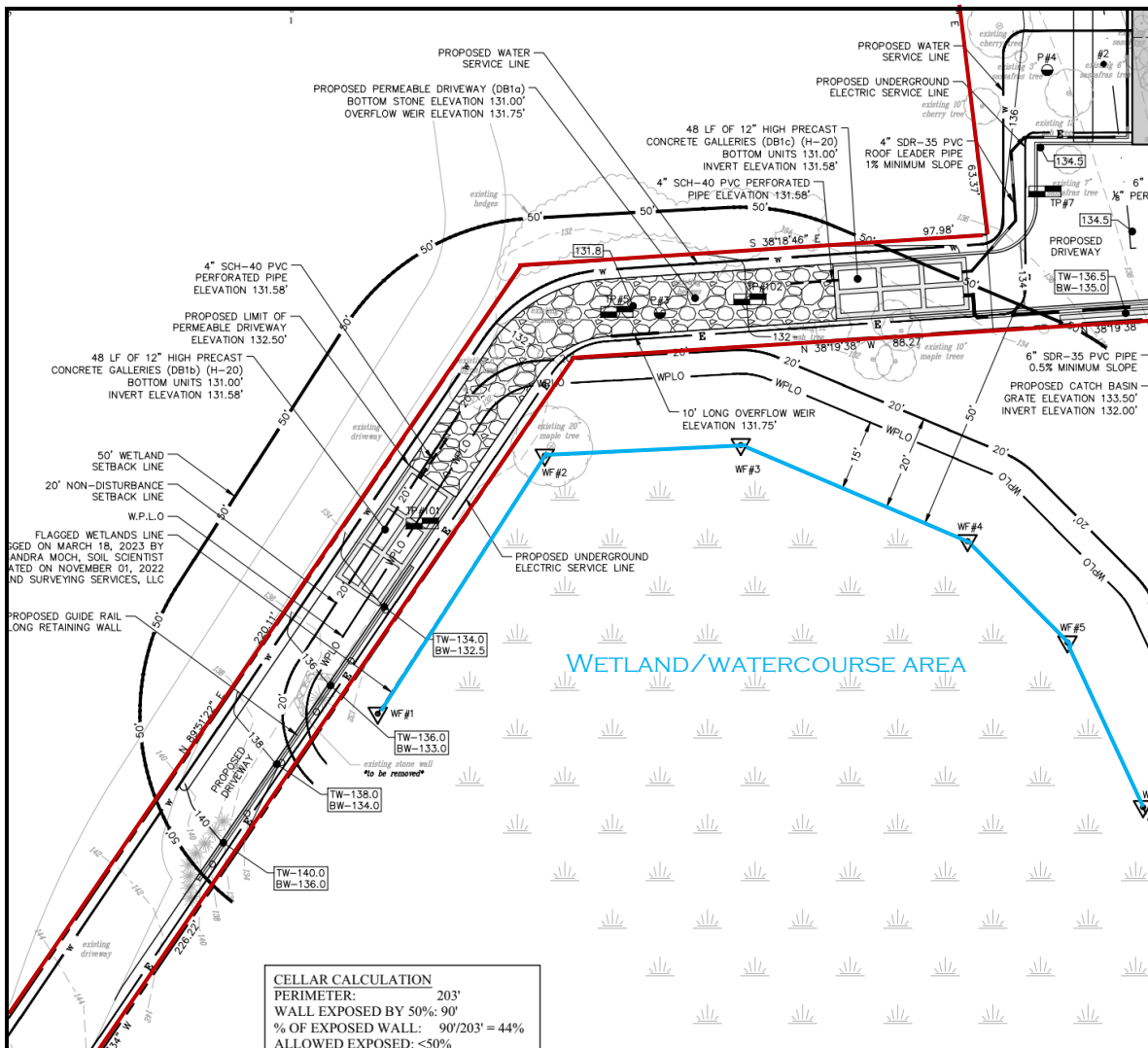
*The Highway Methodology Workbook – Supplement* was used to evaluate the wetland/watercourse functions and values at the site. The workbook was prepared by US Army Corps of Engineers – New England District. The most prominent values and functions of this wetland include: groundwater discharge, floodflow alteration, nutrient retention/transformation, fish habitat, sediment retention, shoreline stabilization, production/export, and aesthetics. The minor functions and values of this system include: groundwater recharge, nutrient removal, wildlife habitat, and recreation. This wetland does not support a threatened or endangered species habitat, educational/scientific opportunities, or uniqueness/heritage.

## **SITE IMPROVEMENTS**

The proposed site improvements include the construction of a single-family residence with a driveway, a stone retaining walls, an associated septic system, stormwater detention, site clearing and grading. The residence was placed over the most level section of the lot with a close access to the site entrance. The driveway will approach the residence from the west to provide a direct access to the garage. This approach results in fairly small area of the asphalt cover. The septic system will be located below the driveway and pulled up as far as the ledge underlying the area allows. The new septic will be installed within fill supported by a retaining wall. The height of this wall will not exceed four feet. A propane tank will be installed on the northern side of the residence.

To accommodate a walk out basement a pair of retaining walls will be installed on the eastern side of the residence. The increase of storm water runoff associated with new impervious surfaces will be addressed with a storm water detention system consisting of two sets of high precast galleries installed under the driveway apron. In addition a section of a permeable driveway stretching between these in-ground infiltration units will encourage storm water to infiltrate through the driveway bed into the ground.

As much as the residence and the septic system are not located within the 50-foot upland review area, the majority of the driveway is. A short stretch of the driveway also encroaches on the WPLO line and 20-foot non disturbance zone. The wetland setback for the driveway is 30 feet and the drainage needs only 20 foot buffer.



Access drive looping around the wetland/watercourse area.

The driveway encroachment into these regulated areas is unavoidable due to the location of the access way and its narrow nature. A portion of the access will be using the existing paved driveway. A section of the driveway will be accompanied by an 83-foot long stone

wall. The wall will not exceed 4 feet in height. This wall is needed to supported fill required for leveling the currently steeply sloping shoulder. This activity will eliminate eight trees growing along the access way and within the regulated wetland/watercourse upland review area.

### **SHORT-TERM IMPACTS**

Any soil disturbance, site clearing, and grade modification exposes soil to potential erosion. The construction of the access driveway and associated retaining wall will result in tree loss, soil disturbance and site grading.

### **LONG-TERM IMPACTS**

The long-term impacts will be associated with tree loss and introduction of impervious surfaces. The new driveway pavement and the stone wall will cover the soil and increase the area of impervious surface. The hard surface will also replace the biologically active vegetative area resulting in the increase of storm water runoff.

Tree removal takes away their functions they perform in the natural environment including temperature moderation, storm water absorption and filtration, wildlife habitat, reduction of air pollution, absorption of noise, wind protection, food source and shelter for wildlife, carbon sequestration, soil protection and formation. Eight medium-size trees will be removed along the driveway to accommodate pavement and the proposed drainage.

The proposed in-ground infiltration will receive the storm water from the roof and a portion of the driveway which is located within a different sub-watershed. The collected runoff will be infiltrated and directed via groundwater table towards the off-site pond area. The flow will be released slowly and it will not effect the peak flow during storm events. The pond and the associated wetland area has a large flood storage capacity. Therefore, the slight increase of hydration getting to the pond area will not cause any additional flooding reaching beyond the wetland line. The water level in the pond is controlled by the elevation of the overflow point where the water enters a stream channel. The overflow will not be affected so the water level in the pond will be kept steady.

### **MITIGATION MEASURES**

The short-term impacts will be addressed with the use of proper soil erosion and sediment control measures. A double line of silt fence reinforced with haybales will be used along both sides of the driveway to protect the adjacent wetlands and prevent from sediment being moved to the areas of the neighboring properties. An anti-tracking pad will be installed at the construction access to prevent the movement of the sediment from the construction site on the road and the shared driveway. The above soil erosion and sediment control measures will also provide a temporary solution to the lost functions of tree canopy and deep root anchoring the soil. The measures will contain the sedimentation and dissipate the storm water flow.

Slope disturbance associated with the new residence and the septic system will be located more than 25 feet away from the edge of the CRA. The fill associated with the septic will be installed after the protective retaining wall is constructed. The wall will become a physical barrier preventing soil erosion. After the septic installation the area will be immediately seeded and mulched to encourage lawn establishment. The level spreader taking the flow from the footing drain will provide for a slow release over the steep slope and prevent slope erosion. Two lines of silt fence enforced with haybales will provide a sufficient protection for the CRA during the construction phase.

The potential long-term impact will be addressed with the proposed storm water management plan and site's landscaping. The proposed pre-cast concrete galleries will detain and infiltrate the increased storm water runoff generated by the pavement. A 100-foot long section of a permeable driveway will allow direct infiltration into the ground. Storm water moving through the soil profile will receive renovation before reaching the pond via the groundwater discharge. The new storm water filtration system will improve the runoff quality. Permeable driveway will need less conditioning during the winter month because it does not puddle water causing icing and sustains snow cover for much shorter period of time comparing to the conventional driveway.

As stated in the description of the Conservation Restriction Area, the area suffers from a dense cover of invasive species, dying trees and lack of native understory growth. The proposed planting plan offers 20 native trees and 22 native shrubs. In addition, the CRA will be liberated from invasive species. For more details see the proposed restoration plan by A. Moch, Landscape Designer dated August 9, 2023. This new plantings will compensate for the trees lost for the driveway installation from the upland review area. Due to the very narrow driveway shoulder no woody vegetation will be planted along the access.

## **ALTERNATIVES**

The initial plan which was submitted for the record could be used as one of the alternative designs. The plan called for a very tall wall and a huge amount of fill needed to support the septic system and the drainage. A new design placing the storm water management system underneath the driveway allowed to relocated the septic and eliminate the enormous wall. At this point there is no more room to minimizing the site disturbance. The only better alternative will be the use of a sewer. The owner devoted several months to negotiate sewer connection with the adjacent neighbors. This expensive process involving legal cancelers turned to be fruitless.

The lot created via a subdivision process inherited several hardships. Steep slope is one of them followed by the Conservation Restriction Area. Both limit the developable area to 13,231 sf. The proposed size of the residence has been drastically reduced and a pool eliminated to satisfy the coverage limitations. The proposed footprint of the residence is only 2000 sf which is modest comparing to the neighboring houses. Long access consumes almost half of the allowable site coverage. The layout is directed by the extensive area of a very steep slope consuming a significant portion of the site.

## SUMMARY

There are no wetlands/watercourses at the site. The regulated area includes a wetland buffer which will be interrupted by the installation of the driveway, supporting retaining wall and drainage. The installation of the driveway will result in clearing of eight trees. Narrow shoulder prevents from planting along the wetland/watercourse buffer. The lost trees will be compensated by the proposed CRA restoration plan. The new native shrubs and trees will enhance the area and boost its environmental values. In addition invasive species will be removed to open up the area to the sun light and release the trees from a heavy load of invasive vines. The increased impervious surface will be mitigated by the professionally designed storm water management. If the proposed soil erosion and sediment control plan is properly implemented there should be no impact to the adjacent wetland/watercourses or the CRA during the site development phase. The proposed CRA restoration plan will provide a net benefit for the entire green corridor which includes the wetland/watercourse network crossing the neighborhood.

