

9.11 VILLAGE OF NELSONVILLE

9.11.1 VILLAGE OF NELSONVILLE PROJECT DESCRIPTION

The Village of Nelsonville is located within the Town of Philipstown in Putnam County, New York on the eastern side of the Hudson River. General boundaries of locations where activities associated with the repair and rehabilitation would occur within the Village of Nelsonville and partially within the Town of Philipstown, are shown on **Figure 9.11-1**. The Village of Nelsonville encompasses approximately 1 square mile.

The Catskill Aqueduct stretches for approximately 1 mile in a southeast direction through the Village of Nelsonville. Notable sites along the aqueduct within the Village of Nelsonville include the Foundry Brook Steel Pipe Siphon North Chamber and Foundry Brook Bridge. Because the Foundry Brook Steel Pipe Siphon South Chamber is located in the Town of Philipstown, the southeastern portion of the Fishkill Road Study Area extends beyond the Village boundary (see **Figure 9.11-1**). The repair and rehabilitation work activities within the Village of Nelsonville would occur within two study areas as shown in **Table 9.11-1**. Repair and rehabilitation work activities within the Town of Philipstown Study Areas are analyzed in Section 9.12, “Town of Philipstown.”

Table 9.11-1: Schedule of Work Activities within the Village of Nelsonville

Work Activity	Study Area	
	Gatehouse Road	Fishkill Road
Staging and Access Improvements	✓	✓
Blow-off Chamber Reconstruction	-	✓
Bridge Repair	-	✓
Streambank Restoration and Protection	-	✓
Boathole Preparation	✓	-
Boathole Installation	✓	-
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	✓	✓
Notes: - = Work activity not proposed. ✓ = Work activity proposed.		

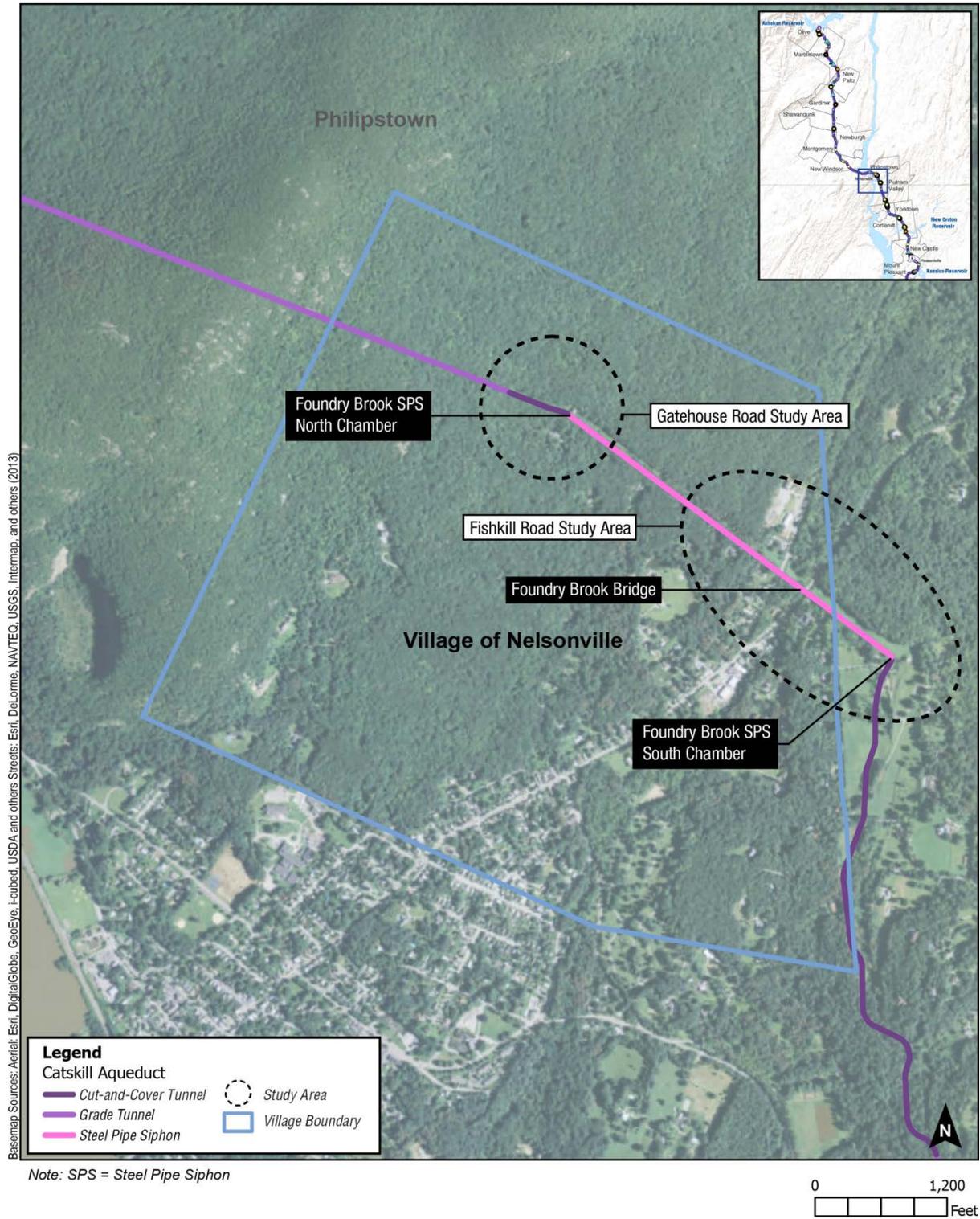


Figure 9.11-1: Village of Nelsonville Study Areas



The Gatehouse Road and Fishkill Road study areas encompass the majority of work that would occur as part of the repair and rehabilitation in this municipality. Additional work activities in the Village do not warrant further assessment. Work sites located outside the study area include activities that would primarily be conducted within the aqueduct interior (see Section 9.3, “Screening Assessment and Impact Analysis Methodology”). In the Village of Nelsonville, they include biofilm removal and condition assessment at access manholes not located in these study areas. See Section 9.2, “Project Description,” for an overall project description of the repair and rehabilitation. Section 9.12.2, “Town of Philipstown Impact Analysis,” provides a discussion of local regulations and those work activities associated with the Fishkill Road Study Area within the Town’s jurisdictional limits. The following sections provide a description of the study area, proposed activities, and impact analysis for the two study areas:

- Section 9.11.2 – Gatehouse Road Study Area Impact Analysis
- Section 9.11.3 – Fishkill Road Study Area Impact Analysis

9.11.2 GATEHOUSE ROAD STUDY AREA IMPACT ANALYSIS

Within the Gatehouse Road Study Area, the aqueduct transitions from the Bull Hill Cut-and-Cover Tunnel to the Foundry Brook Steel Pipe Siphon at the Foundry Brook Steel Pipe Siphon North Chamber (North Siphon Chamber) (see **Figure 9.11-2**).

Work activities within the Gatehouse Road Study Area would include: staging and access improvements; boathole preparation and installation; biofilm removal and condition assessment; and small-scale wash water treatment.

9.11.2.1 Study Area Location and Description

The Gatehouse Road Study Area is located along the upper Catskill Aqueduct in the Village of Nelsonville. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. The proposed limits of construction are surrounding the North Siphon Chamber, accessible by an access road that connects to Gatehouse Road. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work site. **Figure 9.11-2** shows an aerial photograph of the study area, including the path of the aqueduct, the limits of construction for each work site, and the proposed access route.

The study area is heavily forested and consists of residential, open space and recreation, and public services land uses. The limits of construction for the work sites are located in a public services corridor, which is owned and maintained by DEP. Access would require crossing residential property. **Figure 9.11-3** shows a map of the land uses in the study area and its surroundings.

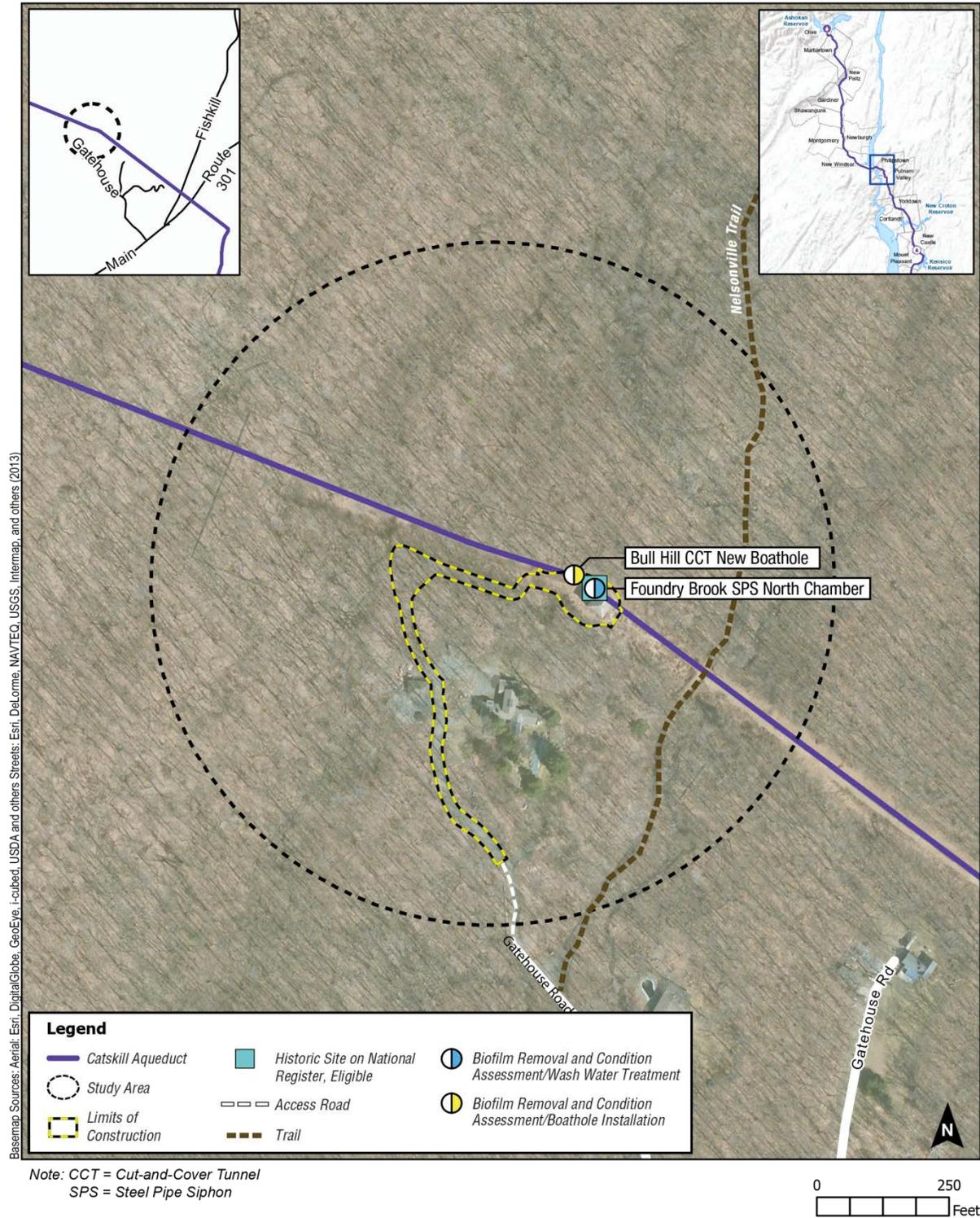
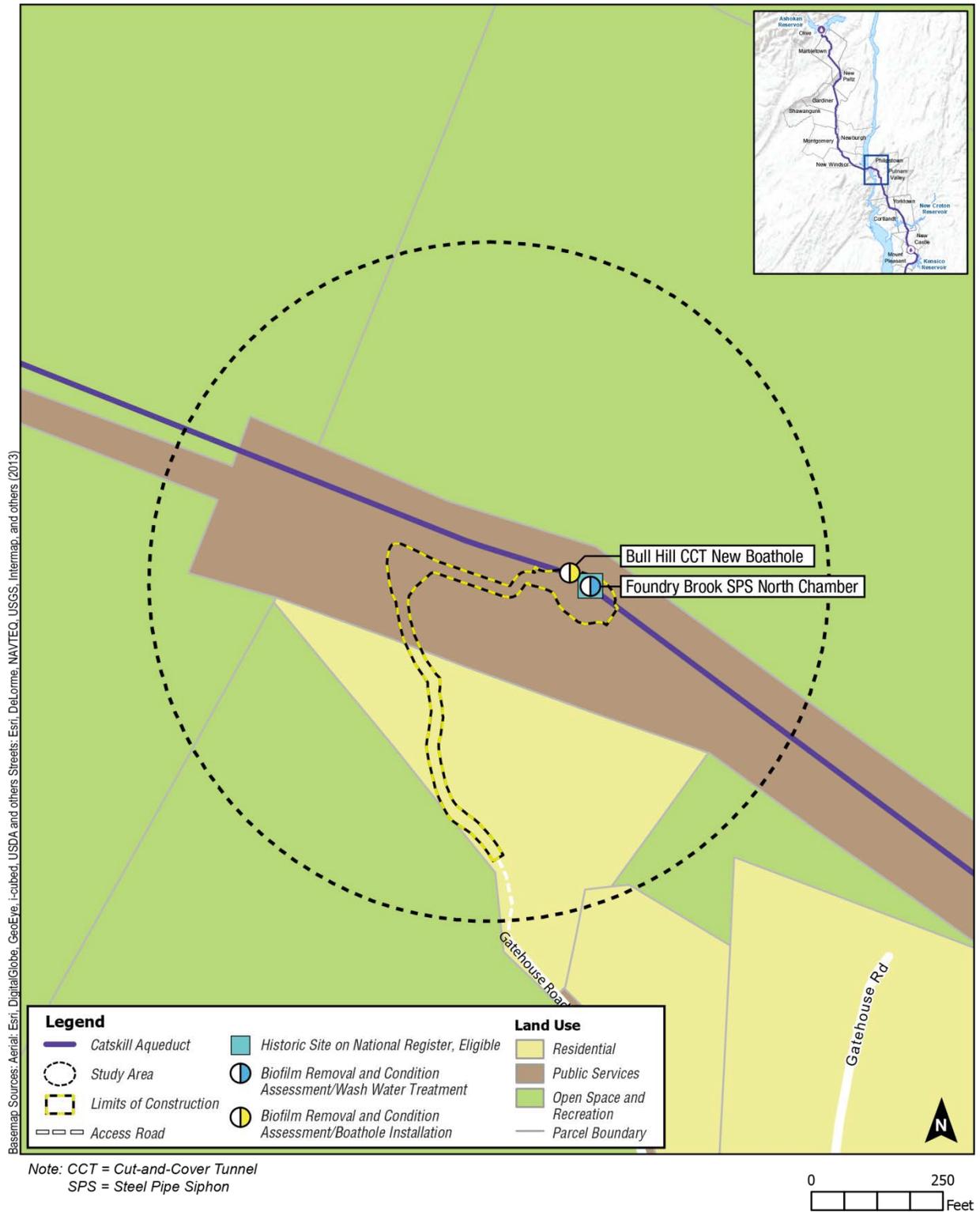


Figure 9.11-2: Study Area – Gatehouse Road





Zoning in the Gatehouse Road Study Area includes two residential districts; mountain residential

Figure 9.11-3: Land Use – Gatehouse Road Study Area



(MR) and hillside residential (HR), as designated by the Village of Nelsonville Zoning Code (see **Figure 9.11-4**). The Catskill Aqueduct is located entirely in the mountain residential (MR) zoning district, which provides for residential development accommodating one or two families per lot. The Catskill Aqueduct is a permitted use as a public utility facility within the mountain residential (MR) zoning district.

The North Siphon Chamber, a structure eligible for listing on the National Register of Historic Places, is located in the study area. There are no other federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

9.11.2.2 Proposed Activities within the Gatehouse Road Study Area

To support activities within the Gatehouse Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas would provide additional parking. Equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work site as needed. A site plan showing a layout of the limits of construction for the work site, which would occupy a total of 0.8 acre, is shown on **Figure 9.11-5**. The schedule for work within the study area is shown in **Table 9.11-2**. The duration of active construction within the Gatehouse Road Study Area is estimated to total 13 weeks over 1.5 years.

Table 9.11-2: Schedule of Work Activities within the Gatehouse Road Study Area

Work Activity	Dates	Duration	Work Hours	Crew Size ¹
Staging and Access Improvements ²	Summer 2019 2018	2 weeks	Monday to Friday, 7 AM to 5 PM	8
Boathole Preparation	Summer 2019 2018	3 weeks	Monday to Friday, 7 AM to 5 PM	10
Boathole Installation	Fall 2019 2018 (Second 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	8
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	Fall 2020 2019 (Third 10-week shutdown)	6 weeks	7 days a week, 7 AM to 7 PM	21
Notes:				
¹ Crew size refers to the number of people anticipated at the work site(s).				
² Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>).				

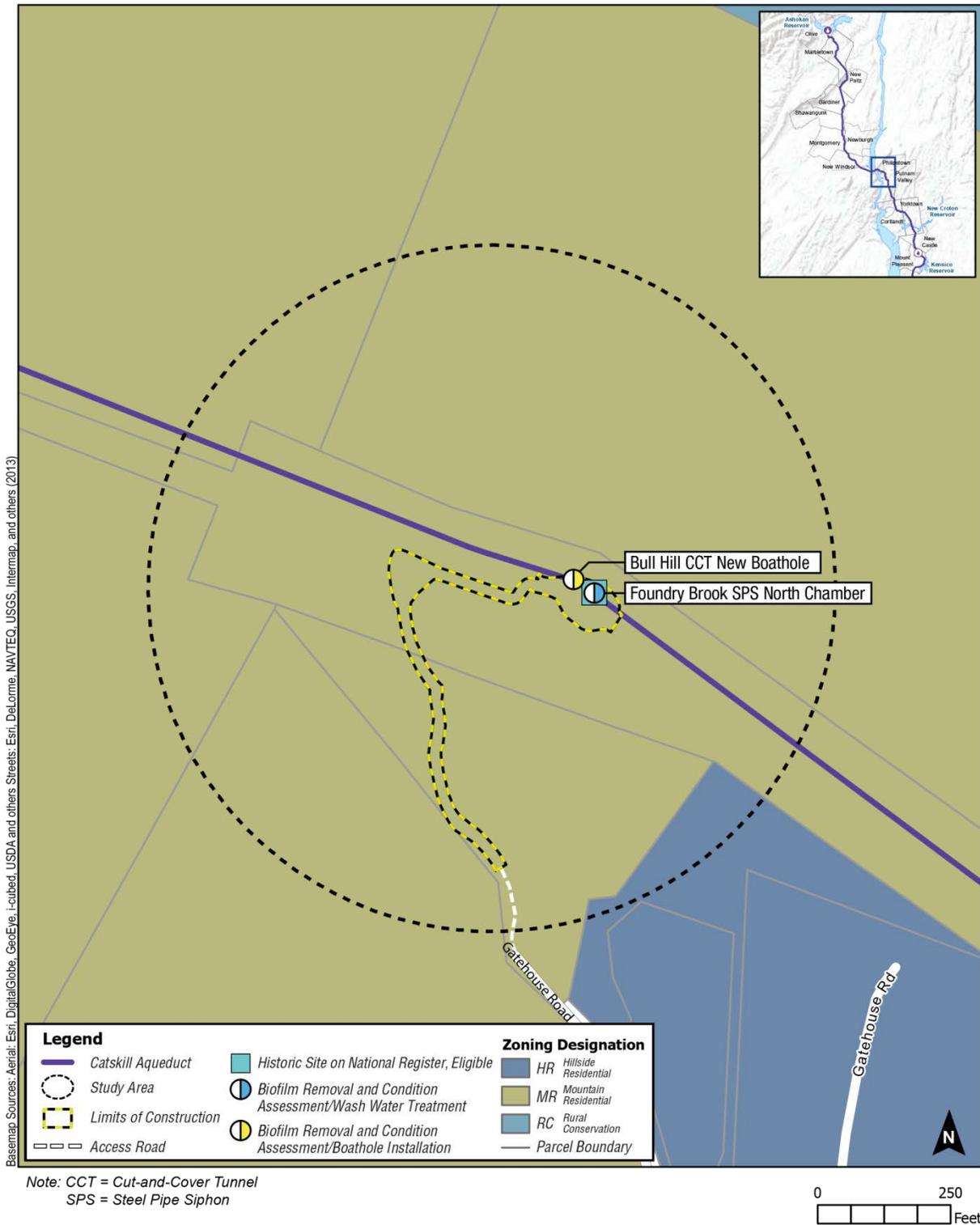


Figure 9.11-4: Zoning – Gatehouse Road Study Area



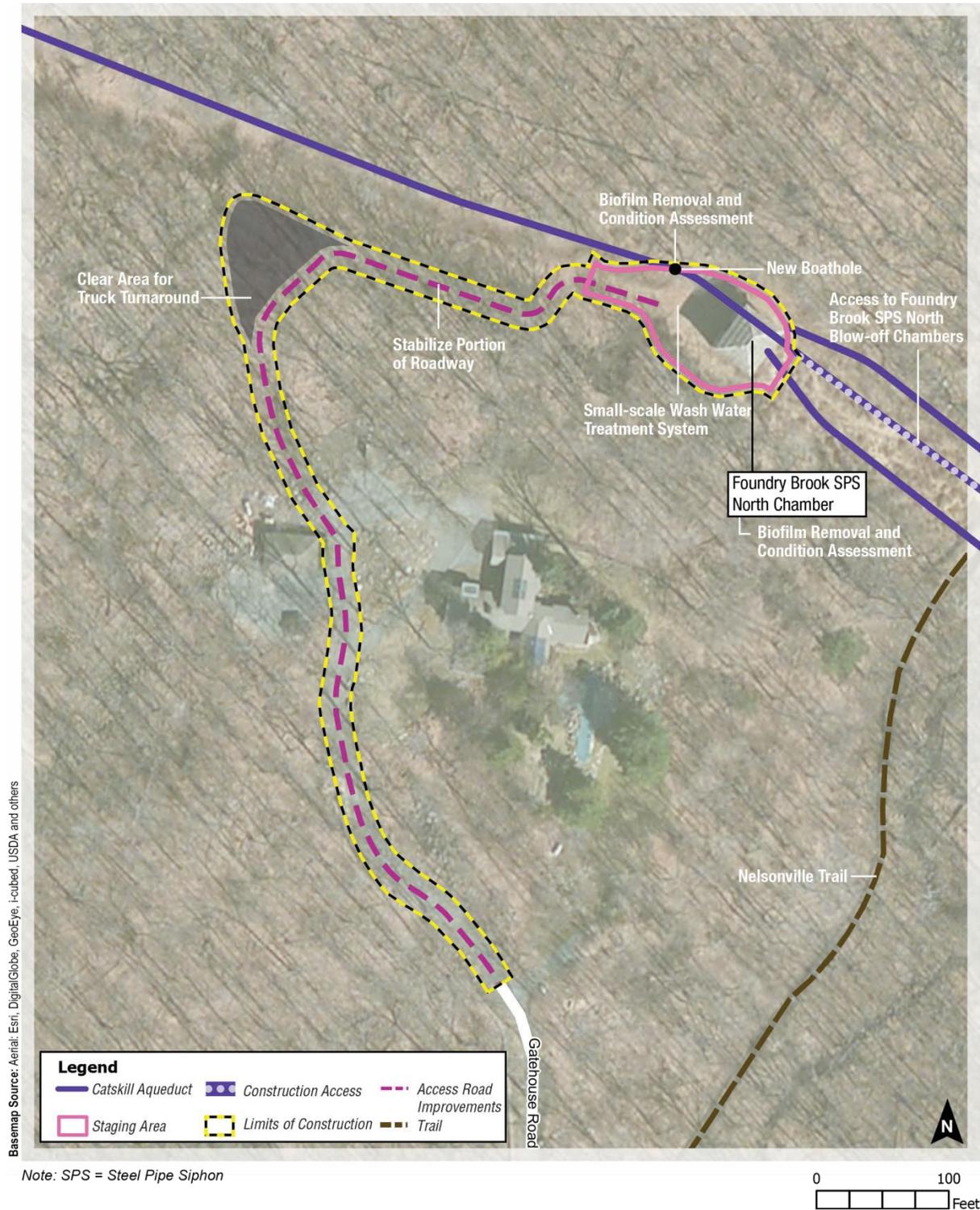


Figure 9.11-5: Site Plan – Gatehouse Road Study Area



Work in the study area would begin with staging and access improvements in summer ~~2019~~2018. Improvements would involve grading, the removal of up to 14 trees along the access road, and the clearing of an approximately 4,100-square foot area along the access road for a truck turn-around. Work to stabilize portions of the roadway between the turn-around and the staging area may also be required, in addition to underbrush clearing and gravel placement for leveling and erosion control.

Preparation of the new boathole would also take place in summer ~~2019~~2018. The work would consist of the excavation of approximately 45 cubic yards of soil and construction of a cast-in-place concrete collar. Boathole installation, which requires unwatering of the aqueduct to tie into the crown of the cut-and-cover tunnel, would take place during the second 10-week shutdown in fall ~~2019~~2018.

Lastly, biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019, with access into the aqueduct provided by the new boathole and the North Siphon Chamber. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Potential treatment locations include the North Siphon Chamber, at which a small-scale treatment system could be established. Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Gatehouse Road Study Area are presented in Section 9.11.2.3, “Open Space and Recreation,” through Section 9.11.2.9, “Neighborhood Character,” and include: open space and recreation; visual resources; natural resources, including terrestrial resources and federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise, and neighborhood character. As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” an impact analysis related to: land use and zoning; socioeconomic conditions; community facilities and services; historic and cultural resources; the remaining natural resources subcategories, including geology and soils, water resources, aquatic and benthic resources, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area is not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

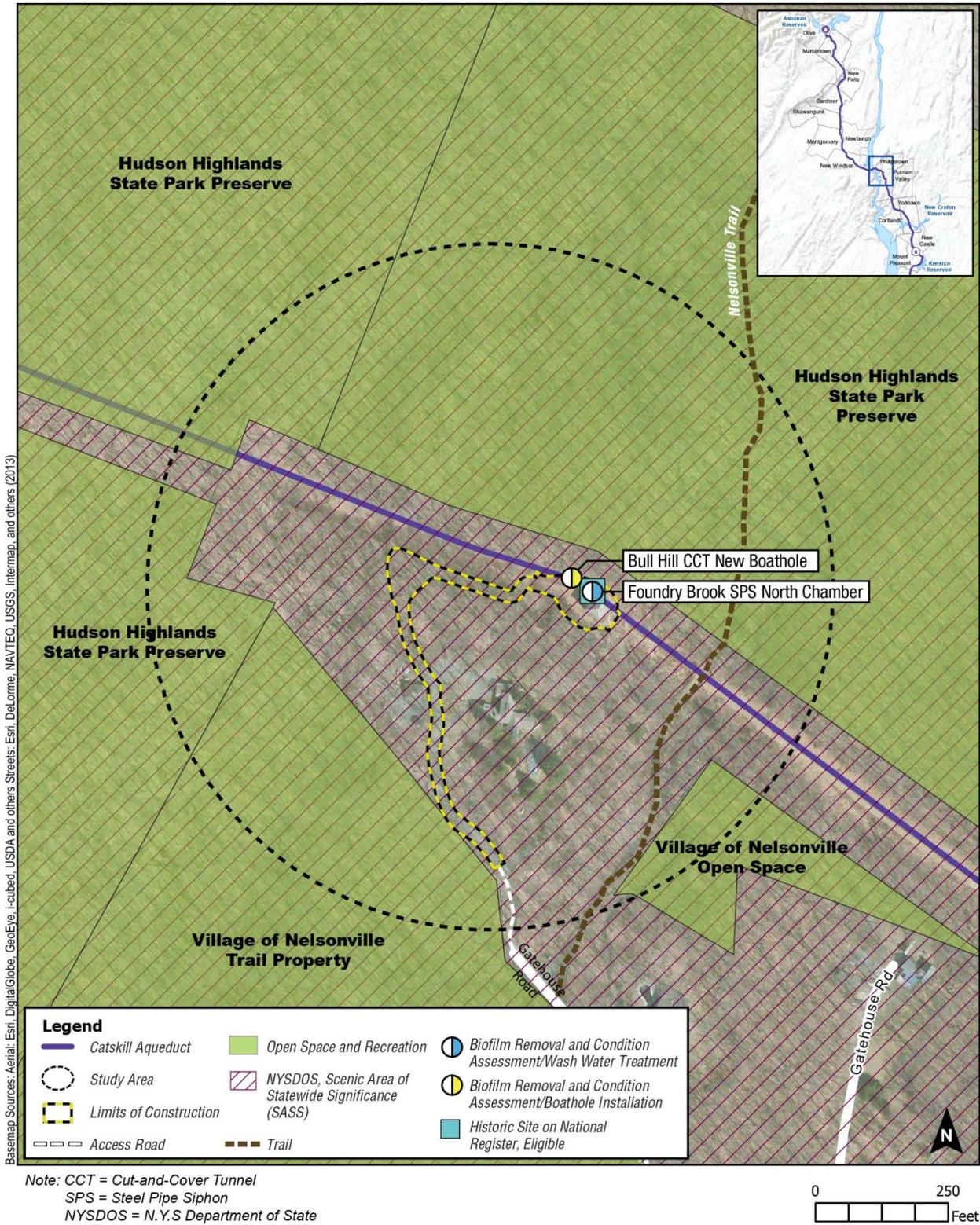
9.11.2.3 Open Space and Recreation

As shown on **Figure 9.11-6**, three open space and recreation resources exist within the Gatehouse Road Study Area: Hudson Highlands State Park Preserve, open space owned by the Village of Nelsonville, and the Nelsonville Trail. Approximately 5 acres of the Hudson Highlands State Park Preserve are located within the northern and western portions of the Gatehouse Road Study Area. Hudson Highlands State Park Preserve is an approximately 6,000-acre State park, which provides outdoor activities for the public such as hiking, fishing, and hunting to the public. One hiking trail, the Hudson Highlands State Park's Nelsonville Trail, has been identified within the Gatehouse Road Study Area. Approximately 760 feet of the trail is located outside of the park and travels north to south. This trail connects to a 100-acre forested parcel of open space owned by the Village of Nelsonville in the southern portion of the study area. The trail is approximately 150 feet east of the North Siphon Chamber. There are approximately 4 acres of open space owned by the Village of Nelsonville in the Gatehouse Road Study Area.

DEP has consulted with the Village of Nelsonville and Putnam County, and it is DEP's understanding that no plans to expand or create new open space or recreational resources are anticipated within the Gatehouse Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open spaces is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Gatehouse Road Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities within the Gatehouse Road Study Area would be short-term (intermittently over 1.5 years; see **Table 9.11-2**). The North Siphon Chamber limits of construction, with minor clearing of trees and shrubs, would be located south and east of the Hudson Highlands State Park Preserve. In the southern portion of the study area, the access road leading to the work area is located on a residential road which crosses the Nelsonville Trail. The residential road is used regularly by vehicles for access to homes in the area. Construction vehicles would proceed with caution while driving on the residential street and in the vicinity of the hiking trail, and would yield to rail trail users. Therefore, repair and rehabilitation work activities would not disrupt any recreational uses within the Hudson Highlands State Park Preserve.

As discussed in Section 9.11.2.8, "Noise," below for the Gatehouse Road Study Area, there could be temporary increases in noise levels within the Gatehouse Road Study Area that may affect hiking along the Nelsonville Trail of the Hudson Highlands State Park Preserve. However, upon completion of the repair and rehabilitation work activities, the recreational uses within the Hudson Highlands State Park Preserve would be unaffected.



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.11-6: Open Space and Visual Resources – Gatehouse Road Study Area



Following construction, all equipment would be removed from the Gatehouse Road Study Area and staging areas would be restored to baseline conditions. The new boathole at the North Siphon Chamber and access road improvements would be permanent and would remain following construction. Following the repair and rehabilitation within the Gatehouse Road Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not disrupt recreational uses of adjacent open spaces. As such, the repair and rehabilitation would not encroach upon, cause a loss of open space, impact the use or physical character of, or disrupt views from the Hudson Highlands State Park Preserve and Village of Nelsonville.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Gatehouse Road Study Area.

9.11.2.4 Visual Resources

The study area for the visual resources analysis is the area within the Gatehouse Road Study Area. It also includes view corridors that extend beyond the study area based on the locations that are publicly accessible.

Five visual resources were identified within the Gatehouse Road Study Area consisting of: one site eligible for listing on the National Register of Historic Places (see **Figure 9.11-2**), the North Siphon Chamber; one site listed as a State park, Hudson Highlands State Park Preserve; one Scenic Area of Statewide Significance, Hudson Highlands; and two locally significant resources, an open space owned by the Village of Nelsonville and the Nelsonville Trail (see **Figure 9.11-6**).

The North Siphon Chamber is a DEP-owned structure associated with the Catskill Aqueduct. As noted in Section 9.3.7, “Historic and Cultural Resources,” no changes would occur to the siphon chamber structure, as all work would be internal and the new boathole would be west of the structure. The siphon chamber is only visible from limited locations due to dense forests along the Catskill Aqueduct. Hudson Highlands State Park Preserve is a State park, which provides outdoor activities for the public such as hiking, fishing, and hunting. Approximately 5 acres of the Hudson Highlands State Park Preserve are located within the northern and western portions of the Gatehouse Road Study Area. The North Siphon Chamber is not located within Hudson Highlands State Park Preserve, but is located in a forested area. Along any trails outside of the study area, dense vegetation would screen any views. There are no views of the North Siphon Chamber from within Hudson Highlands State Park Preserve.

The entire 66 acres of the Gatehouse Road Study Area are also a designated Scenic Area of Statewide Significance (see **Figure 9.11-6**).¹ The Gatehouse Road Study Area is within Hudson Highland HH-25 Cold Spring subunit of the Hudson Highlands Scenic Area of Statewide Significance. Views within the subunit are along east to west roads that extend uphill from the Hudson River. These roads are not located within the Gatehouse Road Study Area.

¹ In July 1993, the State designated six Scenic Areas of Statewide Significance in the Hudson River Valley as part of its implementation of the Coastal Management Program.

Approximately 760 feet of the Nelsonville Trail outside of the Hudson Highlands State Park Preserve travels north to south in the study area, east of the North Siphon Chamber. The Nelsonville Trail, as it crosses the aqueduct, has views towards the North Siphon Chamber. This trail connects to a 100-acre forested parcel of open space owned by the Village of Nelsonville in the southeastern portion of the study area. There are approximately 4 acres of open space owned by the Village of Nelsonville in the Gatehouse Road Study Area. The North Siphon Chamber is not located within the open space owned by the Village of Nelsonville, but rather is located in a forested area with limited views to the North Siphon Chamber due to dense vegetation.

DEP has consulted with the Village of Nelsonville and Putnam County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated in the Gatehouse Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Gatehouse Road Study Area would be the same as baseline conditions.

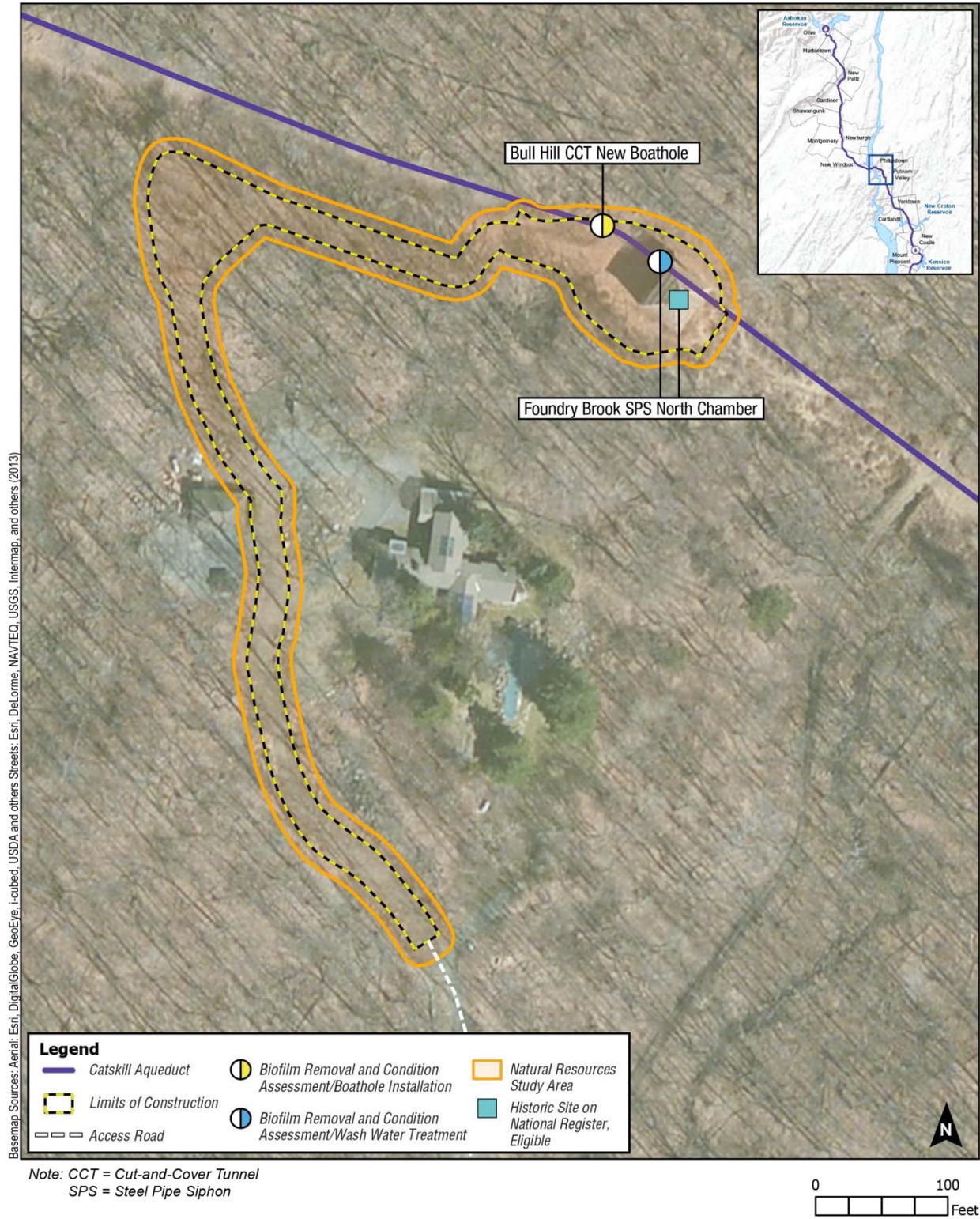
During construction, the work activities would be short-term (intermittently over 1.5 years; see **Table 9.11-2**). As stated above, the North Siphon Chamber is visible from the Nelsonville Trail as the trail travels outside and south of the Hudson Highlands State Park Preserve. The new boathole would be constructed on the opposite side of the North Siphon Chamber and would not be visible as the trail crosses the aqueduct. The area surrounding the chamber could be utilized for a staging area, and with the proposed tree removal, could be visible as the trail crosses the aqueduct.

Following construction, all equipment would be removed from the Gatehouse Road Study Area, and the area would be restored to baseline conditions. The new boathole at the North Siphon Chamber and access road improvements would be permanent, would remain following construction, and would not affect views from the Nelsonville Trail. Following the repair and rehabilitation, operation of the Catskill Aqueduct within the Gatehouse Road Study Area would be consistent with baseline conditions. It would not result in changes to the visual and aesthetic resource conditions of the views from the North Siphon Chamber, Hudson Highlands State Park Preserve, the open space owned by the Village of Nelsonville, the Nelsonville Trail, or the Scenic Area of Statewide Significance.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Gatehouse Road Study Area.

9.11.2.5 Natural Resources

The study area for the natural resources analysis is the area surrounding the limits of construction, including the North Siphon Chamber (see **Figure 9.11-7**).



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.11-7: Natural Resources – Gatehouse Road Study Area



Based on a field visit conducted on August 10, 2015, the natural resources study area surrounding North Siphon Chamber is a rich mesophytic forest that has the potential to support terrestrial resources and protected wildlife species. An analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Terrestrial Resources

Consultation with NYNHP identified two ecological communities of significance within the natural resources study area: oak-tuliptree forest and chestnut oak forest. Based on the August 2015 tree survey, the natural resources study area is dominated by a rich mesophytic forest. Observed species include sweet birch (*Betula lenta*), sugar maple (*Acer saccharum*), basswood (*Tilia americana*), black oak (*Quercus velutina*), tuliptree (*Liriodendron tulipifera*), and flowering dogwood (*Cornus florida*), with no subcanopy of small trees and shrubs. Groundcover was sparse in the study area; observed species were Pennsylvania sedge (*Carex pensylvanica*), striped wintergreen (*Chimaphila maculata*), New York fern (*Parathelypteris noveboracensis*), and marginal woodfern (*Dryopteris marginalis*).

While there is overlap in species composition between the rich mesophytic forest and oak-tuliptree forest communities, these communities are distinct from one another. Rich mesophytic forests have a canopy of co-dominant species, typically no subcanopy, and a diverse herbaceous groundlayer (Edinger et al. 2014). The chestnut oak forest community was not observed within the natural resources study area. Therefore, no NYNHP ecological communities of significance are present within the natural resources study area.

The Village of Nelsonville regulates the removal of trees within 20 feet of watercourses, excluding incidental tree removal (Nelsonville Village Code Chapter 99: Freshwater Wetlands). While tree removal associated with the repair and rehabilitation may not be subject to Village review and approval because there are no watercourses within the study area, terrestrial resources within the study area warrant an analysis.

DEP has consulted with the Village of Nelsonville and Putnam County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Gatehouse Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the natural resources study area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would include minor tree clearing and shrub removal for the purpose of improving site access and staging areas. Along the access road, up to 14 trees consisting of four species with a range of average diameter at breast height (dbh) of between 8 and 14.2 inches may be removed to widen the existing road to provide a suitable truck-turning radius. The four species of trees that may be removed include five basswood, seven sweet birch, one black oak, and one sugar maple. All tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Tree removal would occur in discrete

locations along the densely forested areas south of the aqueduct along the existing access road, and would not dramatically change the character of the area or affect surrounding trees.

The limits of construction for the repair and rehabilitation work activities would be confined to the immediate vicinity of the North Siphon Chamber and access road and would not disturb ecological communities beyond the natural resources study area. Work activities would occur on existing roads and maintained areas of the Catskill Aqueduct. While minor tree removal is required to create a suitable turning radius for construction vehicles, no significant encroachment on terrestrial resources would be expected.

Following construction, all equipment would be removed and the staging areas would be restored to natural conditions. Vegetated areas temporarily cleared during construction are anticipated to grow back with similar communities. Following the repair and rehabilitation within the natural resources study area, operation of the Catskill Aqueduct would be consistent with baseline conditions and natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Gatehouse Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected within the study area, species that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” nine species were identified to have the potential to be affected by the repair and rehabilitation within the natural resources study areas. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these nine species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.11-3**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and field visits, as applicable.

Table 9.11-3: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Gatehouse Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visit on August 10, 2015. Potential habitat exists within the surrounding mesophytic forest. While work activities would be largely confined to previously disturbed areas, if any isolated areas of potential habitat exist at the sites, as a highly mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Fence Lizard	<i>Sceloporus undulatus</i>	Unlisted	Threatened	No individuals were incidentally observed during the field visit on August 10, 2015. According to NYNHP, no records of fence lizards were identified within 1.5 miles of the study area. Potential basking habitat exists within the study area. Cut-and-cover tunnels and steel pipe siphons provide open areas with sun exposure that could be used for basking, as does the cleared area surrounding the North Siphon Chamber. Temporary effects to basking habitat are possible; however, upon completion of the repair and rehabilitation, the staging areas would be restored to natural conditions, and the new boathole is not anticipated to affect basking habitat. Therefore, there are no effects anticipated and no further analysis for eastern fence lizards is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visit on August 10, 2015. Potential habitat exists within the adjacent mesophytic forest; however, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated, and no further analysis for eastern hognose snakes is warranted for this study area.	No

Table 9.11-3: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Gatehouse Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Timber Rattlesnake	<i>Crotalus horridus</i>	Unlisted	Threatened	No individuals were incidentally observed during the field visit on August 10, 2015. According to NYNHP, no records of timber rattlesnakes were identified within 1.5 miles of the study area. Potential basking habitat exists within the study area. Cut-and-cover tunnels and steel pipe siphons provide open areas with sun exposure that could be used for basking, as does the cleared area surrounding the North Siphon Chamber. Temporary effects to basking habitat are possible; however, upon completion of the repair and rehabilitation, the staging areas would be restored to natural conditions, and the new boathole is not anticipated to affect basking habitat. Therefore, there are no effects anticipated and no further analysis for timber rattlesnakes is warranted for this study area.	No
Wood Turtle	<i>Glyptemys insculpta</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visit on August 10, 2015. Potential habitat exists within the adjacent mesophytic forest; however, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated, and no further analysis for wood turtles is warranted for this study area.	No
Common Wormsnake	<i>Carphophis amoenus</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visit on August 10, 2015. Potential habitat exists within the adjacent mesophytic forest; however, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for common wormsnares is warranted for this study area.	No

Table 9.11-3: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Gatehouse Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	A summer habitat assessment was conducted on August 10, 2015. No bat habitat was identified. If needed, tree removal would be conducted from November 1 through March 31. Therefore, there are no effects anticipated and no further analysis for Indiana bats is warranted for this study area.	No
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened None	A summer habitat assessment was conducted on August 10, 2015. No bat habitat was identified. If needed, tree removal would be conducted from November 1 through March 31. Therefore, there are no effects anticipated and no further analysis for northern long-eared bats is warranted for this study area.	No
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	No individuals were incidentally observed during the site visit on August 10, 2015. No suitable cottontail habitat was identified within the study area during presence absence surveys. Therefore, there are no effects anticipated and no further analysis for New England cottontails is warranted for this study area.	No

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*), eastern fence lizards (*Sceloporus undulates*), eastern hognose snakes (*Heterodon platyrhinos*), timber rattlesnakes (*Crotalus horridus*), wood turtles (*Glyptemys insculpta*), common wormsnares (*Carphophis amoenus*), Indiana bats, northern long-eared bats, or New England cottontails (*Sylvilagus transitionalis*) associated with the repair and rehabilitation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Gatehouse Road Study Area.

9.11.2.6 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Gatehouse Road Study Area, a Phase I Environmental Site Assessments (ESA) was conducted in general conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Practice E 1527-13 and City Environmental Quality Review (CEQR) requirements to identify Recognized Environmental Conditions (RECs). The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a geotechnical investigation and environmental health and safety sampling, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Geotechnical environmental investigations and sampling were undertaken for contaminants of concern including asbestos, lead, volatile and semivolatile organics, polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons along the aqueduct within the study area. Chromium was noted in the soil sampling results. Total chromium was reported in the sample collected at the North Siphon Chamber. Chromium concentrations, however, were consistent over a widespread sampling area and are more likely associated with background concentrations. Along the Catskill Aqueduct, there are widespread occurrences of chromium, which are attributed to the existing geological formations. The legacy data also revealed that lead-containing paints are present on the door and gate valve of the North Siphon Chamber. Materials sampled did not identify asbestos-containing materials or PCB-containing paint or mercury-containing paint. In addition, gasoline range organic compounds and total petroleum hydrocarbons were also detected, but at low concentrations that are not considered to be indicative of contamination that warrants remedial actions.

Based on the results of the environmental investigations completed within the Gatehouse Road Study Area, no other hazardous materials are known to exist. The soil results support the reuse of excavated materials associated with the boathole installation as backfill and do not suggest the need for special management, handling, or health and safety measures at this time.

DEP has consulted with the Village of Nelsonville and Putnam County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Gatehouse Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Gatehouse Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. DEP would handle all materials in accordance with applicable federal, State, and local regulations and guidelines. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage, and spill reporting requirements. Furthermore, excavation associated with the work activities for the installation of a new boathole would occur on previously disturbed soils. Following construction, all equipment would be removed from the Gatehouse Road Study Area. Staging areas would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Gatehouse Road Study Area.

9.11.2.7 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Gatehouse Road Study Area.

Access to the repair and rehabilitation limits of construction for the work sites within the Gatehouse Road Study Area would be via Gatehouse Road to an existing access road that briefly traverses a private driveway and leads to DEP property (see **Figure 9.11-2**). Gatehouse Road is a two-way, one-lane local roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Gatehouse Road Study Area. There is no public transportation and little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site. However, no DEP employees work at or visit the study area on a daily basis, and the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Village of Nelsonville, Town of Philipstown, and Putnam County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Gatehouse Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Gatehouse Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be the basis of this transportation analysis. Of these activities, biofilm removal and condition assessment would generate the most vehicle trips. Biofilm removal and condition assessment would occur in fall ~~2020~~2019 between the hours of 7 AM and 7 PM, 7 days a week for approximately 6 weeks during the third 10-week shutdown.

In the future with the repair and rehabilitation, construction vehicles would travel along Gatehouse Road to the access road. The estimated number of peak-day one-way vehicle trips associated with the biofilm removal and condition assessment is 33 vehicles, or approximately 66 peak-day vehicle round trips that would travel to and from the study area. The majority of the peak daily vehicle round trips, approximately 42 vehicle round trips or 42 Passenger Car Equivalents (PCEs), would be workers traveling directly to and from the staging area, with an additional 8 daily shuttle trips between the study area and the staging area. The remaining approximately 16 peak-day vehicle round trips (21 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with biofilm removal and condition assessment is approximately 33 peak-hour vehicle trip ends (36 PCEs). This includes approximately 21 vehicle trip ends (21 PCEs) from workers traveling directly to and from the staging area, approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 8 vehicle trip ends (11 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 12-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 36 peak-hour PCEs along Gatehouse Road, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, "Transportation." The work activities at the Gatehouse Road Study Area would be short-term (totaling 13 weeks over 1.5 years for; see **Table 9.11-2**) and would not generate public parking or transportation demands or pedestrian activity within the Gatehouse Road Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Gatehouse Road Study Area.

9.11.2.8 Noise

As described in Section 9.3.15, "Noise," mobile noise associated with the repair and rehabilitation within the Gatehouse Road Study Area does not warrant analysis.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation work activities as shown in **Figure 9.11-8**.

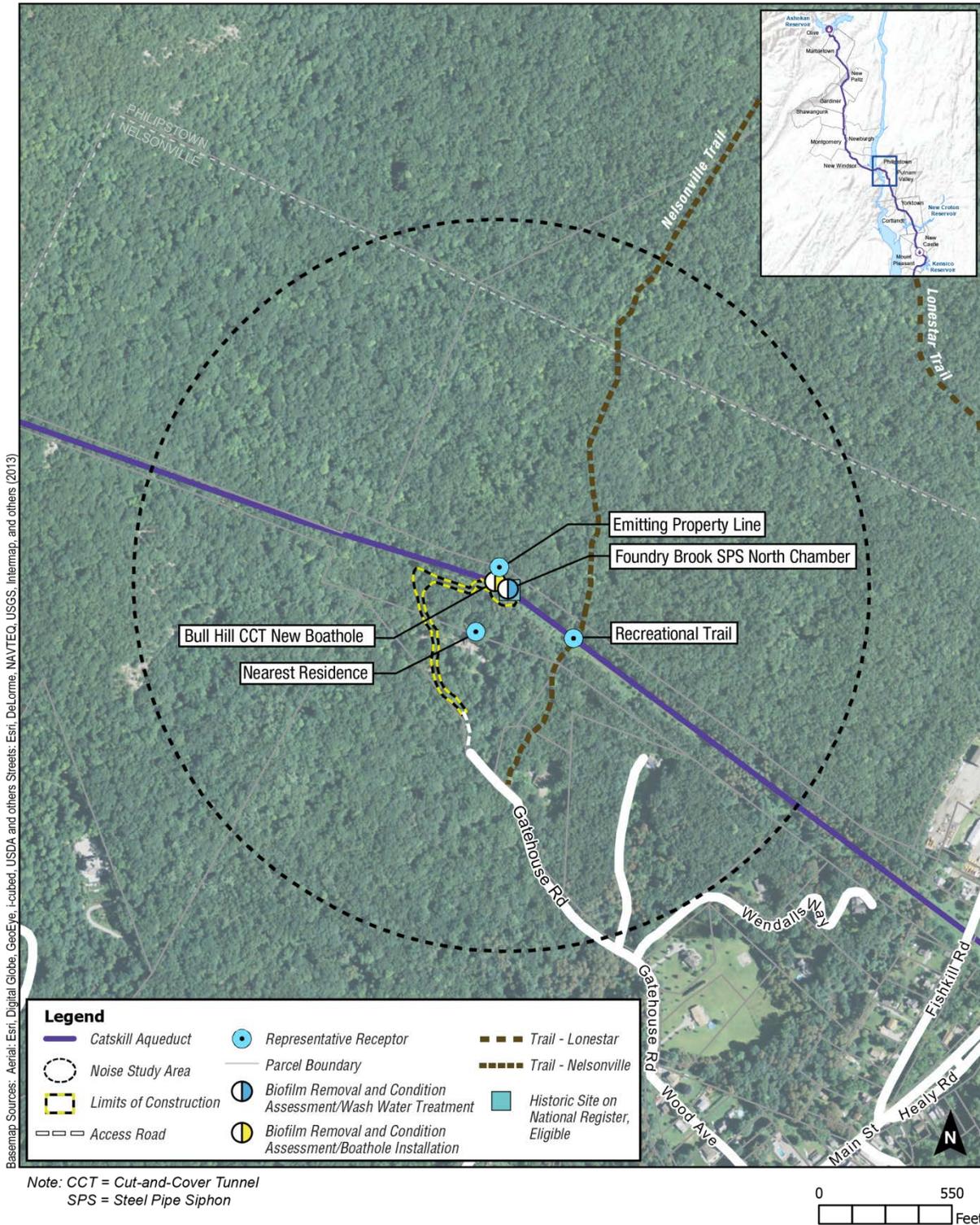


Figure 9.11-8: Noise – Gatehouse Road Study Area



The Gatehouse Road Noise Study Area includes residential parcels and a recreational trail within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Village of Nelsonville Noise Control Laws. The Village of Nelsonville Noise Control Law (§188-26) limits noise levels at the emitting property line. Noise levels in all districts except commercial cannot exceed 60 dBA and noise levels in commercial districts cannot exceed 65 dBA. The study area also includes land in the Town of Philipstown. However, there are no noise-sensitive receptors within the Gatehouse Road Study Area in the Town of Philipstown.

Existing ambient noise levels within the Gatehouse Road Study Area are influenced by vehicular traffic traveling on Main Street, Gatehouse Road, and other local roadways. The existing noise levels within the study area are comparable to a quiet suburban residential environment based on the distance from major transportation corridors and the population density of the area. Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Village of Nelsonville and Putnam County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Gatehouse Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Gatehouse Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Gatehouse Road Study Area would occur on one site. The stationary noise-generating equipment that would be used within the Gatehouse Road Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with the installation of the boathole is expected to emit the most noise at noise-sensitive receptors. Boathole installation would occur in fall ~~2019~~2018 between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the second 10-week shutdown (see **Table 9.11-2**).

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the boathole installation. Associated equipment reference noise levels are shown in **Table 9.11-4**. The Village of Nelsonville code defines maximum noise levels (L_{max}) at the emitting property line. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.11-4: Stationary Source Construction Equipment Modeled of at the Gatehouse Road Study Area – Noise Analysis and Reference Noise Levels (L_{max})

Equipment Type	Reference Noise Level (L_{max}) at 50 feet (dBA)
Crane	85
Generator	82
Concrete Mixer Truck	85

Note:
¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.

Table 9.11-5 shows the results of the stationary construction noise analysis. The Village of Nelsonville code defines allowable noise levels at the emitting property line; therefore, noise levels were calculated at the nearest emitting property line for comparison with the local noise ordinance. However, the nearest noise-sensitive receptor is a residence approximately 220 feet away from the work activities. Boathole installation within the Gatehouse Road Study Area during the repair and rehabilitation would emit a noise level (L_{max}) of approximately 76 dBA at the nearest residence and 73 dBA at the nearby recreational trail, Nelsonville Trail. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities, however, this equipment would not be expected to be louder than those associated with boathole installation. Since the repair and rehabilitation within the Gatehouse Road Study Area would emit noise levels greater than allowed by the Village of Nelsonville noise code, DEP would work with the Village of Nelsonville as appropriate.

Table 9.11-5: Stationary Noise Analysis Results (L_{max}) at the Nearest Noise-Sensitive Receptors within the Gatehouse Road Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{max}) at Noise-Sensitive Receptor (dBA)	Village of Nelsonville Noise Limit (dBA)	Potential for Exceedance (Yes or No)
Emitting Property Line	64	87	60 ¹	Yes
Nearest Residence	222	76	NA	NA
Recreational Trail	307	73	NA	NA

Notes:
NA = Not Applicable
¹ Noise limit is applicable for all districts except commercial "C."

Following completion of the repair and rehabilitation work activities, the construction equipment and vehicles would be removed from the Gatehouse Road Study Area. The repair and rehabilitation work activities would be temporary with peak work activities occurring during boathole installation in summer and fall 20192018 for a limited period (5 weeks).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Gatehouse Road Study Area.

9.11.2.9 Neighborhood Character

The character of the Gatehouse Road Study Area is largely defined by a mix of residential, open space and recreation, and public services land uses as well as its physical setting within a rural/suburban location (see **Figure 9.11-3**). The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. The study area is located north of Gatehouse Road and includes portions of the Hudson Highlands State Park Preserve in its northern and western portions. The limits of construction for the work sites are located in a public services corridor which is owned and maintained by DEP. Access to the work site would be provided by an access road that connects to Gatehouse Road.

DEP has consulted with the Village of Nelsonville and Putnam County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Gatehouse Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use, zoning, and public policy; socioeconomic conditions; and historic and cultural resources, an impact analysis for the Gatehouse Road Study Area was not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," Section 9.3.4, "Socioeconomic Conditions," and Section 9.3.7, "Historic and Cultural Resources," respectively. As described in Section 9.11.2.3, "Open Space and Recreation," and Section 9.11.2.4, "Visual Resources," the work activities would not affect open space and recreation and visual resources in the Gatehouse Road Study Area.

As described in Sections 9.11.2.7, "Transportation," and 9.11.2.8, "Noise," during construction, the work activities in the Gatehouse Road Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area, and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Gatehouse Road Study Area.

9.11.3 FISHKILL ROAD STUDY AREA IMPACT ANALYSIS

Within the Fishkill Road Study Area, the aqueduct begins as the Foundry Brook Steel Pipe Siphon. At Foundry Brook, the siphon is housed in a reinforced concrete box that crosses over the stream (the Foundry Brook Steel Pipe Siphon Bridge, or Foundry Brook Bridge), adjacent to

which are located three over-stream blow-offs and associated valves within the Foundry Brook Steel Pipe Siphon South Blow-off Chambers (South Blow-off Chambers). An additional set of blow-off chambers (the Foundry Brook Steel Pipe Siphon North Blow-off Chambers, or North Blow-off Chambers) are located approximately 750 feet to the northwest. At the south end of the study area, the Foundry Brook Steel Pipe Siphon transitions to the Foundry Brook Cut-and-Cover Tunnel at the Foundry Brook Steel Pipe Siphon South Chamber (South Siphon Chamber). Two sets of access manholes are also located within the study area (see **Figure 9.11-9**).

Work activities within the Fishkill Road Study Area would include: staging and access improvements; bridge repair; blow-off chamber reconstruction and associated streambank restoration and protection; biofilm removal and condition assessment; and small-scale wash water treatment.

9.11.3.1 Study Area Location and Description

The Fishkill Road Study Area is located along the upper Catskill Aqueduct in the Village of Nelsonville and Town of Philipstown. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. The study area is traversed from north to south by Fishkill Road, Main Street (State Route 301), and Foundry Brook. Proposed work sites within the study area include one at the North Blow-off Chambers, one at the South Blow-off Chambers, and Foundry Brook Bridge. The work site at the South Siphon Chamber is located in the Town of Philipstown. The North Blow-off Chambers would be accessed via an access road that connects to Fishkill Road to the south and then by driving north over the aqueduct. The South Blow-off Chambers would be accessed by a new access road connecting to Fishkill Road (and to the south). The South Siphon Chamber would be accessed by driving over the siphon from an entrance off Healy Road. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work sites. **Figure 9.11-9** shows an aerial photograph of the study area, including the path of the aqueduct, the limits of construction for the work sites, and the proposed access routes. **Figure 9.11-10** shows photographs of Foundry Brook and Foundry Brook Bridge in the study area.

The study area consists of residential, open space and recreation, community facilities, and public services land uses, in addition to some vacant parcels. The study area is generally wooded with some residential and commercial development adjacent to the roadways. The limits of construction for the work sites and associated access routes are located in a public services corridor with grassy cover, which is owned and maintained by DEP. **Figure 9.11-11** shows a map of the land uses in the study area and its surroundings.

Zoning in the Fishkill Road Study Area includes mountain residential (MR), hillside residential (HR), and Village secondary residential (SR), as designated by the Village of Nelsonville Zoning Code, as well as rural conservation (RC) and single-family residential (R-80) as designated by the Town of Philipstown Zoning Code (see **Figure 9.11-12**).

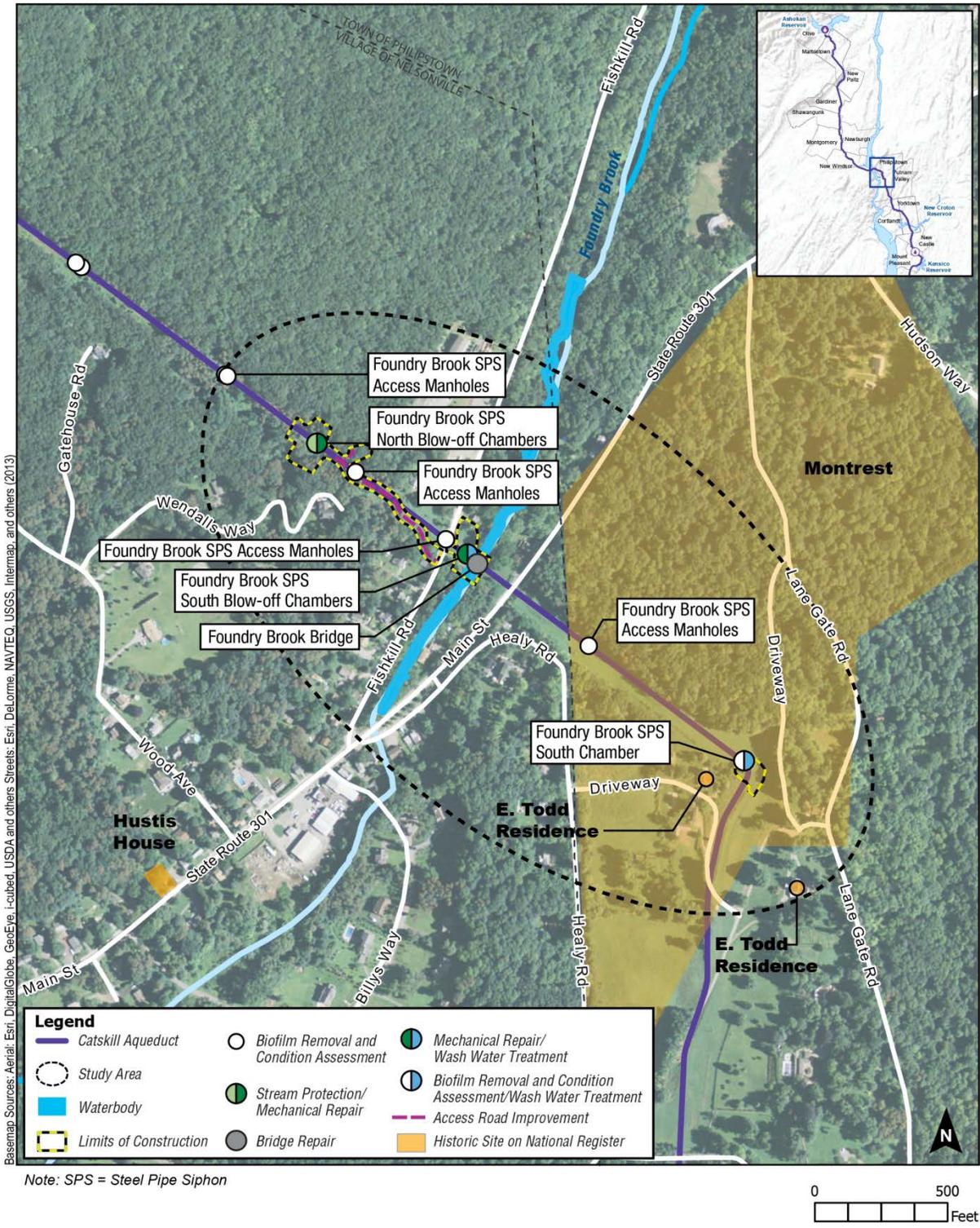


Figure 9.11-9: Study Area – Fishkill Road





Photograph 1: Foundry Brook Bridge.



Photograph 2: Foundry Brook in the vicinity of Foundry Brook Bridge.

Figure 9.11-10: Photographs – Fishkill Road Study Area



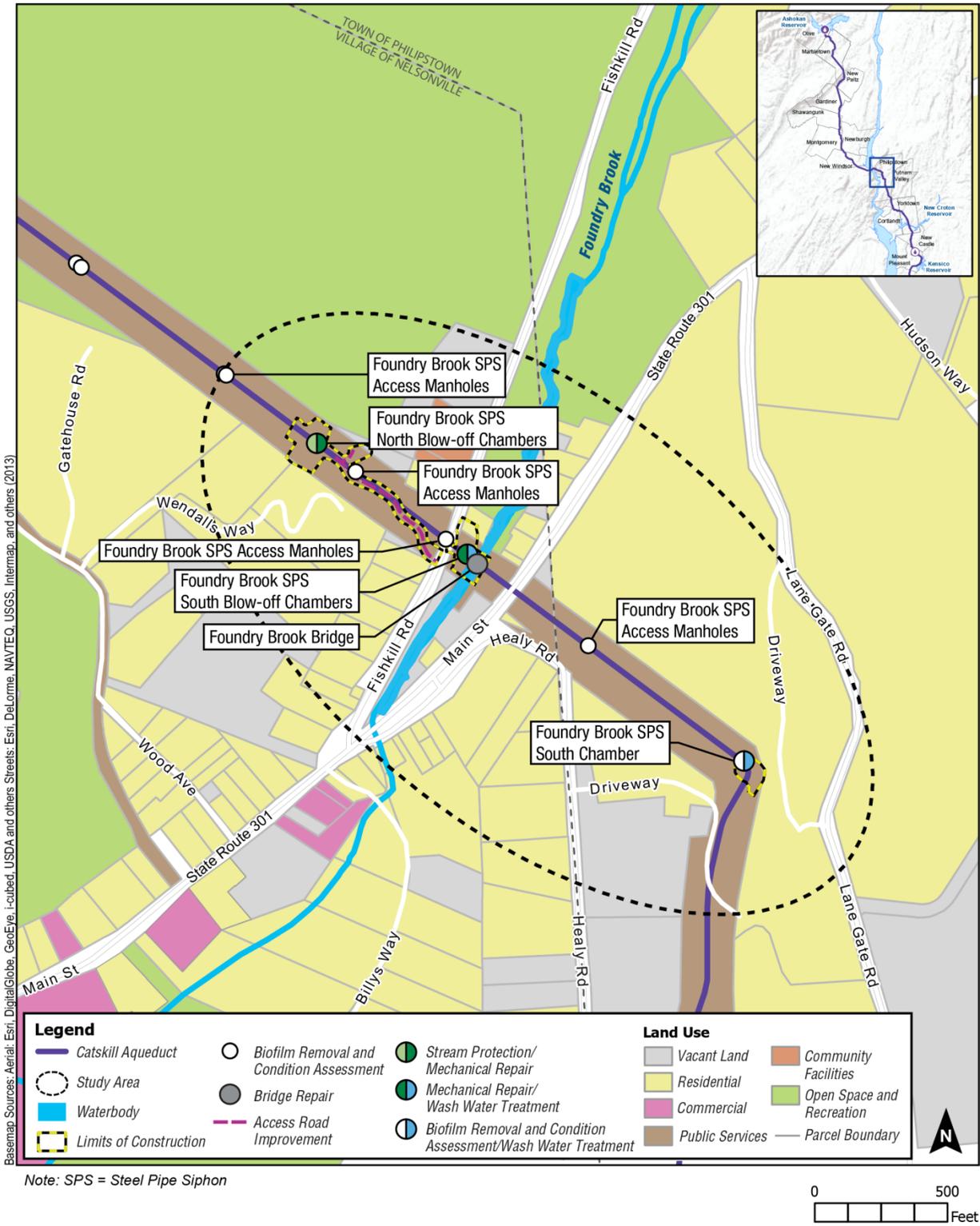


Figure 9.11-11: Land Use – Fishkill Road Study Area



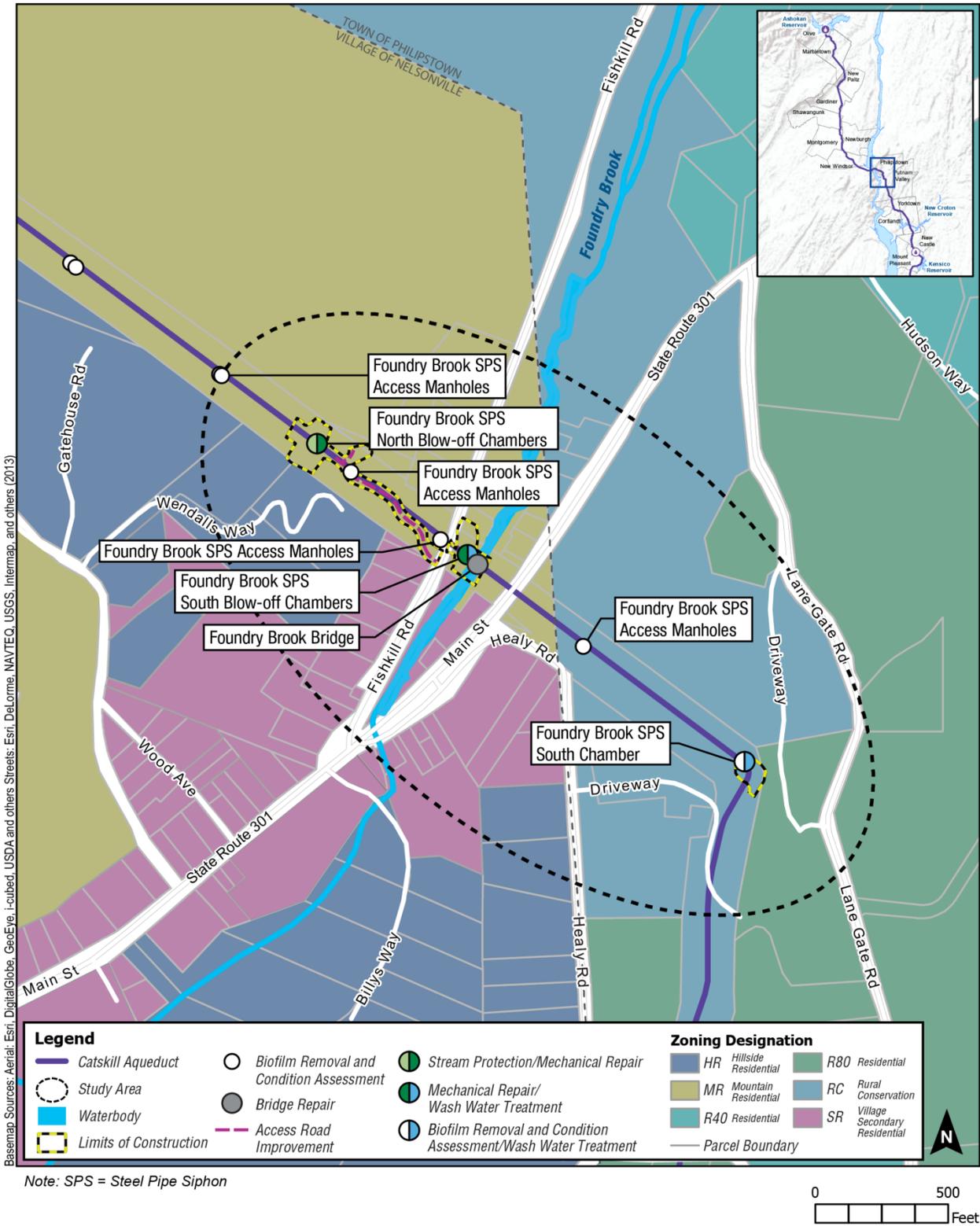


Figure 9.11-12: Zoning – Fishkill Road Study Area



The Catskill Aqueduct and limits of construction for the work sites are located primarily in the mountain residential (MR) zoning district, which provides for residential development accommodating one or two families per lot, with a short length in the rural conservation (RC) zoning district. The Catskill Aqueduct is a permitted use as a public utility facility within the mountain residential (MR) and rural conservation (RC) zoning districts.

Three historic sites, Montrest and two structures referred to as E. Todd Residences, listed on the National Register of Historic Places, are located within the study area (see **Figure 9.11-9**). There are no other federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

9.11.3.2 Proposed Activities within the Fishkill Road Study Area

To support activities within the Fishkill Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas would provide additional parking, and equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. Site plans showing layouts of the limits of construction for the work sites, which would occupy a total of ~~1.31~~1.9 acres, are shown on **Figure 9.11-13**, **Figure 9.11-14**, and **Figure 9.11-15**. The schedule for work within the study area is shown in **Table 9.11-6**. The duration of active construction within the Fishkill Road Study Area is estimated to total 35 weeks over 1.5 years.

Table 9.11-6: Schedule of Work Activities within the Fishkill Road Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Staging and Access Improvements ³	Summer 2019 <u>2018</u>	2 weeks	Monday to Friday, 8 AM to sunset	8
Bridge Repair	Summer 2019 <u>2018</u>	8 weeks	Monday to Friday, 8 AM to sunset	13
Streambank Restoration and Protection	Summer 2019 <u>2018</u>	3 weeks	Monday to Friday, 8 AM to sunset	10
Blow-Off Chamber Reconstruction	Summer 2019 <u>2018</u>	18 weeks	Monday to Friday, 7 AM to 5 PM	12
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	Fall 2020 <u>2019</u> (Third 10-week shutdown)	4 weeks	7 days a week, 7 AM to 7 PM	21

Notes:

¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, in accordance with the Town of Philipstown Noise Control Law §175 40(C).

² Crew size refers to the number of people anticipated at the work site(s).

³ Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*).

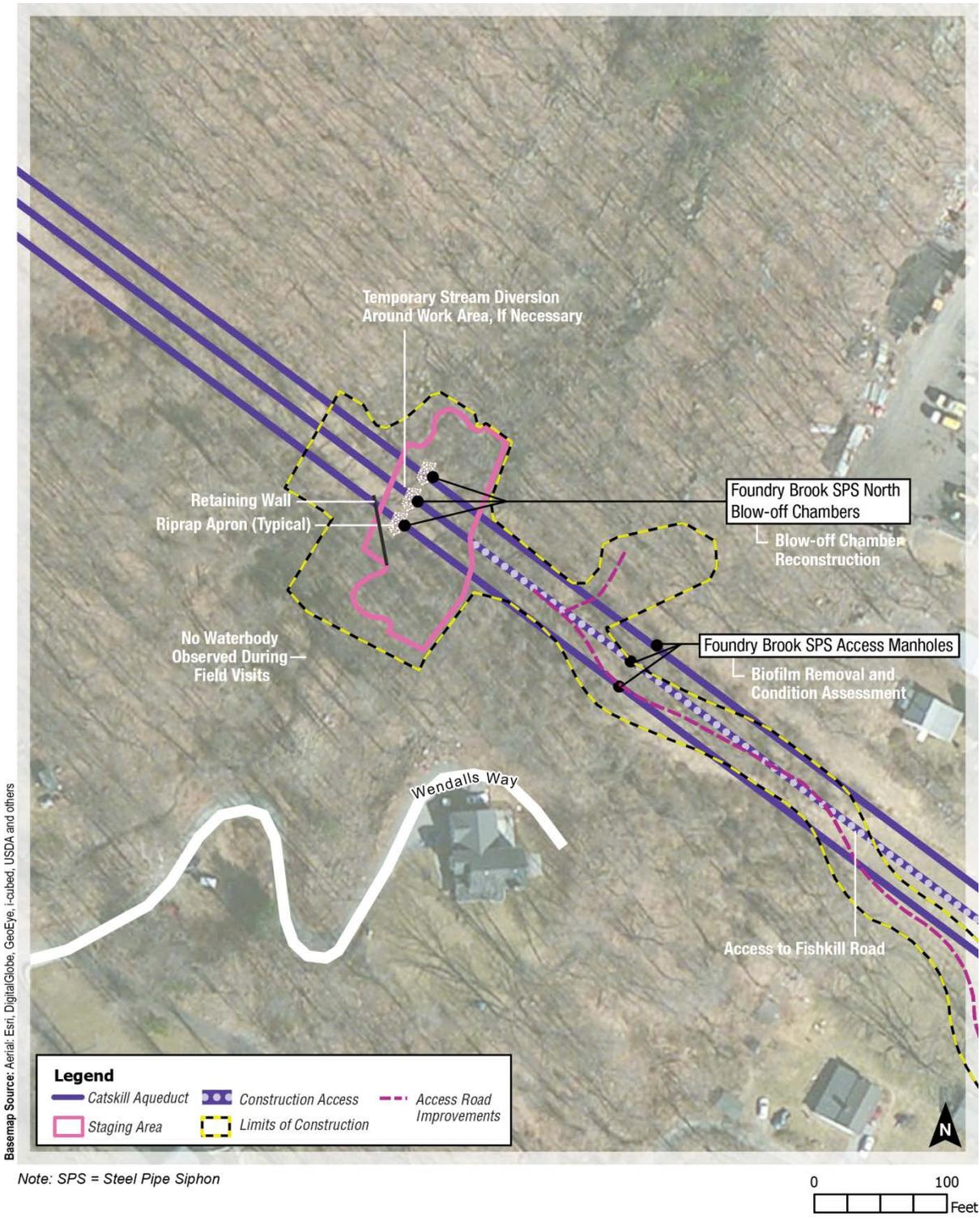


Figure 9.11-13: Site Plan for Foundry Brook SPS North Blow-off Chambers – Fishkill Road Study Area



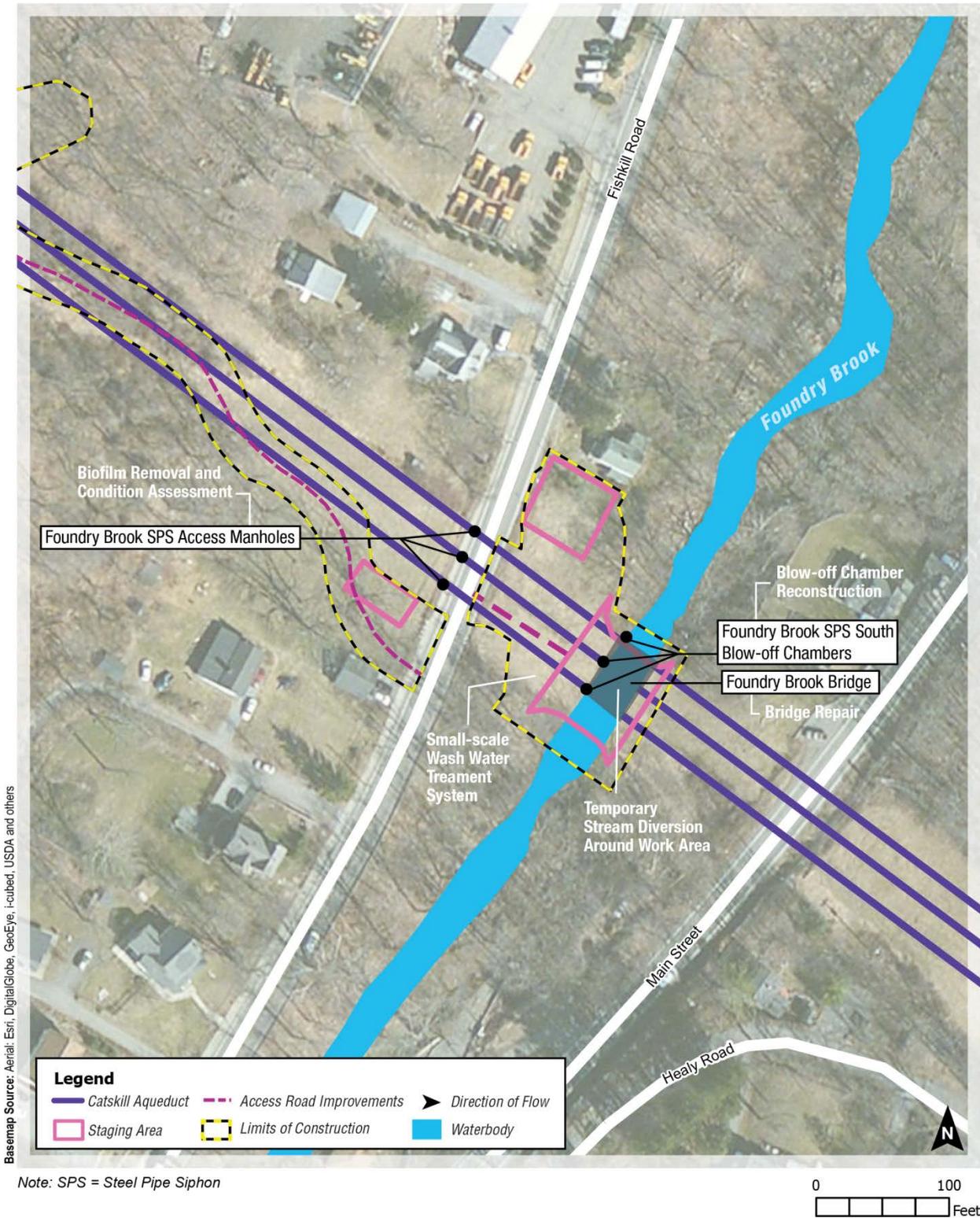


Figure 9.11-14: Site Plan for Foundry Brook SPS South Blow-off Chambers and Foundry Brook SPS Bridge – Fishkill Road Study Area



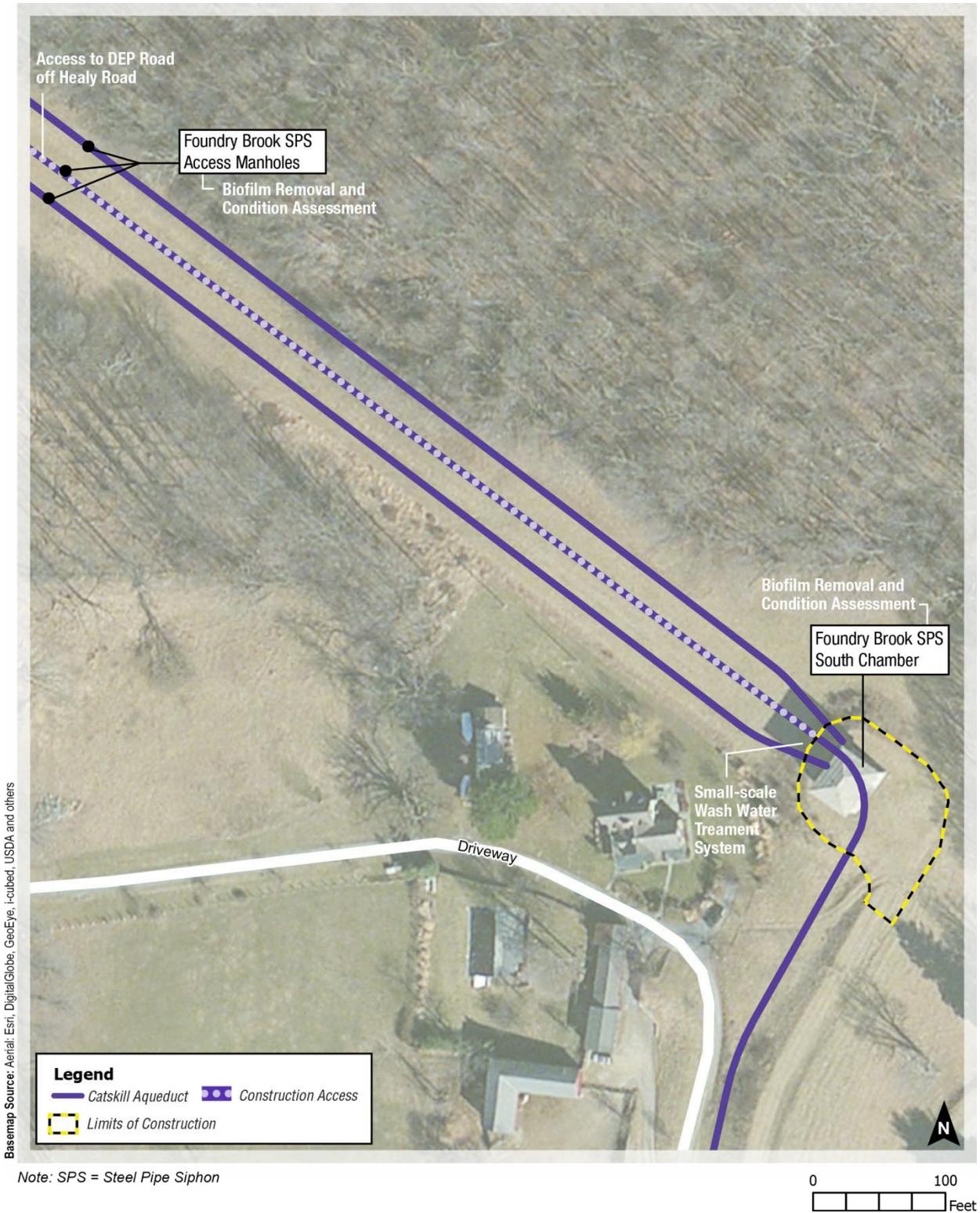


Figure 9.11-15: Site Plan for Foundry Brook SPS South Chamber – Fishkill Road Study Area



Work in the study area would begin with staging and access improvements in summer ~~2019~~2018. Improvements would involve the removal of three trees to access Foundry Brook Bridge, in addition to underbrush clearing and gravel placement for leveling and erosion control at all sites.

Following staging and access improvements, repairs to Foundry Brook Bridge would be conducted. Work would entail inspection of the bridge structure and repairs to corroded support structures, deteriorated concrete, and other surface defects as described in Section 9.2, “Project Description.” All repairs would be in-kind and would not alter the external appearance of the bridge. Site modifications for the bridge repair may require in-water work and would include temporary protection of the brook. To ensure a dry working environment, a temporary stream diversion would be installed, serving to partially divert the stream around the work area. A turbidity curtain would be installed to prevent sediment from moving downstream. For bridge repair (described below), temporary in-stream disturbance would cover a total area of approximately 3,020 square feet, and permanent in-stream disturbance would cover approximately 40 square feet. There are no watercourses at the North Blow-off Chambers and therefore, no stream disturbance.

Restoration and protection of the dry channel adjacent to the North Blow-off Chambers would also occur in summer ~~2019~~2018. Work would include regrading, permanent riprap aprons, and a retaining wall to stabilize the area surrounding the new blow-off chamber. A temporary stream diversion and a turbidity curtain would be installed if needed in the event there are flows occurring during work activities. Reconstruction of the North and South Blow-off Chambers, includes replacement of the blow-off valves, discharge pipes, and chamber covers, repair of the concrete walls, and removal of the access ladders. This would also take place in summer ~~2019~~2018 (small portions of the work that require shutdowns would be performed in spring and fall of that year). At the North Blow-off Chambers, the work would require excavation of 70 cubic yards of soil and 870 cubic yards of soil for fill, resulting in a net fill of 800 cubic yards of soil. At the South Blow-off Chambers, the work would require excavation of 30 cubic yards of soil and 20 cubic yards of soil for fill, resulting in a net cut of 10 cubic yards of soil. Afterwards, the blow-off valves would be used to unwater the aqueduct for future shutdowns during the repair and rehabilitation, and for future maintenance.

Finally, biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019, with access into the aqueduct provided by the four sets of access manholes and the South Siphon Chamber. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Potential treatment locations within the study area include the South Blow-off Chambers and the South Siphon Chamber, at which small-scale wash water treatment system could be established. Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Fishkill Road Study Area are presented in Section 9.11.3.3, “Open Space and Recreation,” through Section 9.11.3.10, “Neighborhood Character,” and include: open space and recreation; historic and cultural resources; visual resources; natural resources including water resources, terrestrial resources, and federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” an impact analysis related to land use and zoning; socioeconomic conditions; community facilities and services; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area is not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.11.3.3 Open Space and Recreation

As shown on **Figure 9.11-16**, one open space and recreation resource, the Hudson Highlands State Park Preserve, exists within the Fishkill Road Study Area. Approximately 8 acres of the Hudson Highlands State Park Preserve are located within the northeastern portions of the Fishkill Road Study Area. Hudson Highlands State Park Preserve is an approximately 6,000-acre State park, which provides outdoor activities such as hiking, fishing, and hunting to the public. No State hiking trails have been identified within the Fishkill Road Study Area.

DEP has consulted with the Village of Nelsonville, Town of Philipstown, and Putnam County, and it is DEP’s understanding that no plans to expand or create new open spaces or recreational resources are anticipated within the Fishkill Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open spaces is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Fishkill Road Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities within the Fishkill Road Study Area would be short-term (intermittently over 1.5 years; see **Table 9.11-6**). None of the repair and rehabilitation work activities are located within Hudson Highlands State Park Preserve and are not located near any hiking trails within the Hudson Highlands State Park Preserve. Minor clearing of trees and shrubs for access and staging improvements near Foundry Brook Bridge and other work activities in the study area would not disrupt views from Hudson Highlands State Park Preserve. Therefore, work activities within the Fishkill Road Study Area would not disrupt views from the Hudson Highlands State Park Preserve.

Following construction, all equipment would be removed from the Fishkill Road Study Area and staging areas would be restored to baseline conditions, with recreational uses remaining unaffected. The bridge repair and streambank protection measures within the Fishkill Road Study Area would be permanent and would remain following construction. Following the repair and rehabilitation within the Fishkill Road Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not disrupt recreational use of adjacent open spaces. As such, the repair and rehabilitation would not encroach upon, cause a loss of open space, affect the use or physical character of, or disrupt views from Hudson Highlands State Park Preserve.

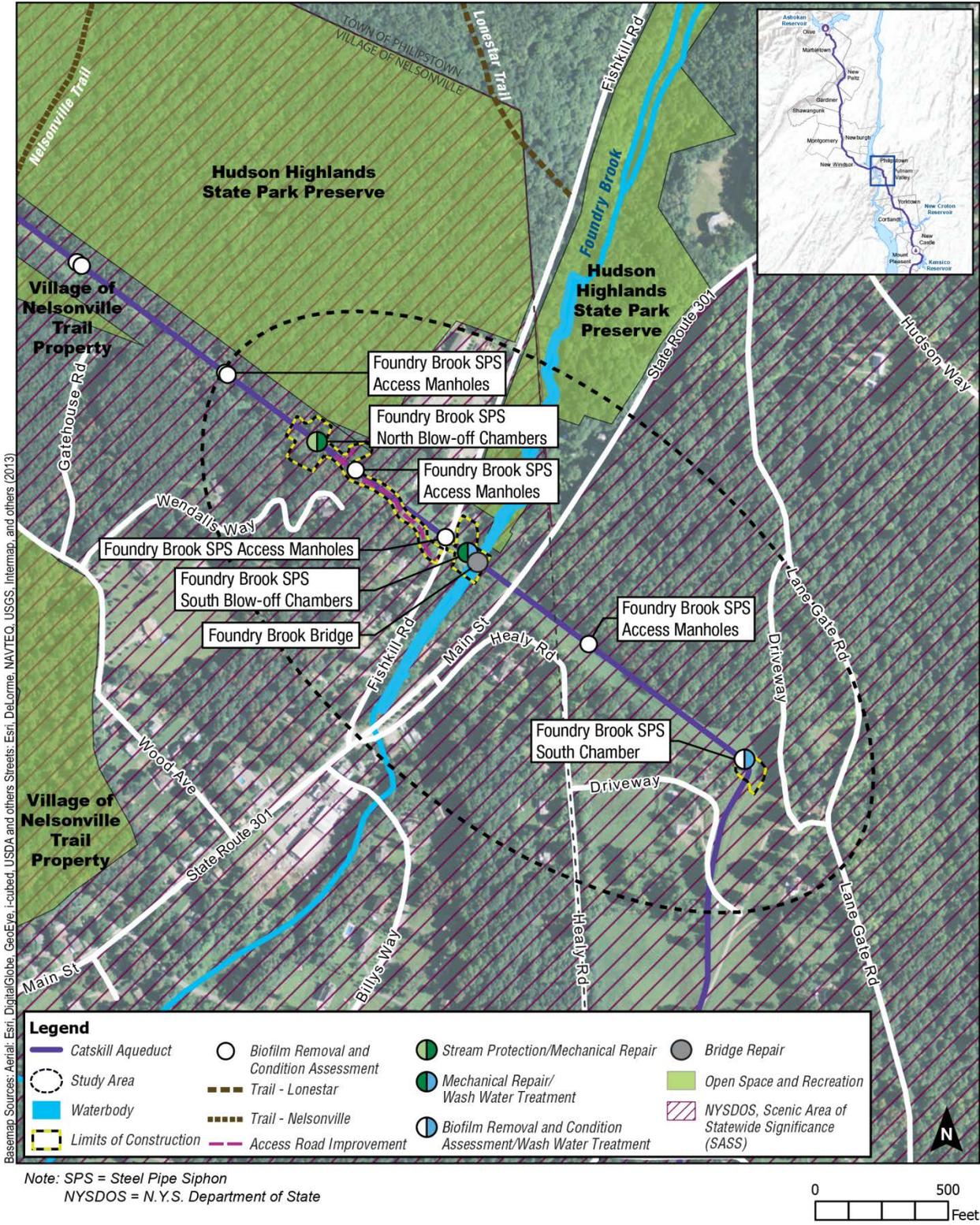


Figure 9.11-16: Open Space and Visual Resources – Fishkill Road Study Area



Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Fishkill Road Study Area.

9.11.3.4 Historic and Cultural Resources

As shown on **Figure 9.11-17**, there are three sites listed on the National Register of Historic Places located within the Fishkill Road Study Area: Montrest (NR Number 90NR02371) and two structures, each referred to as the E. Todd Residence (NR Numbers 07904.000025 and 07904.000027). Montrest is an approximately 160-acre site that includes several buildings on the property. The two structures, both named E. Todd Residence, are also listed on the National Register. A review of the State Historic Preservation Office (SHPO) GIS database indicates that approximately 34 acres of Montrest are located within the Fishkill Road Study Area, and the study area does not have the potential to contain historical or archeological resources. The South Siphon Chamber and an access manhole are also located within Montrest. The South Siphon Chamber is approximately 175 and 475 feet from the two E. Todd Residences.

In the future without the repair and rehabilitation, it is assumed that historic and cultural resources within the Fishkill Road Study Area would be the same as baseline conditions.

Areas of previous disturbance associated with construction of the Catskill Aqueduct were identified. These were compared to the potential for ground disturbance within the Fishkill Road Study Area to determine if the repair and rehabilitation could affect archeological resources. The Fishkill Road Study Area is not located in an area with the potential to contain archeological resources and all work activities would be located within the areas of previous soil disturbance. SHPO reviewed the repair and rehabilitation work activities. SHPO concluded in letters dated April 17, 2015 and July 6, 2015 that there were no concerns regarding potential impacts to historic or archeological resources associated with the repair and rehabilitation work activities within the study area and no additional archeological investigations are necessary.

The repair and rehabilitation work activities would be short-term (intermittently over 1.5 years; see **Table 9.11-6**). The Foundry Brook Steel Pipe Siphon Bridge and the 1.3-acre work area for repair and rehabilitation work activities related to the Foundry Brook Steel Pipe Siphon Bridge (i.e., bridge repairs) would not be located in Montrest within the Fishkill Road Study Area. The biofilm removal and condition assessment activities at the South Siphon Chamber would not affect the historic structures or views from the structures, as the work activities would be within the existing South Siphon Chamber. The area surrounding the chamber could be used for a staging area, and could be visible. Following construction, all equipment would be removed from the Fishkill Road Study Area, and staging areas would be restored to baseline conditions. The bridge repair within the Fishkill Road Study Area would be permanent and would remain following construction, although it would not result in an addition to any structures. Following the repair and rehabilitation within the Fishkill Road Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not affect historic and cultural resources.

Therefore, although there is one site and two structures within the Fishkill Road Study Area listed under the National Register of Historic Places, the repair and rehabilitation would not result in significant adverse impacts to historic and cultural resources within the Fishkill Road Study Area.

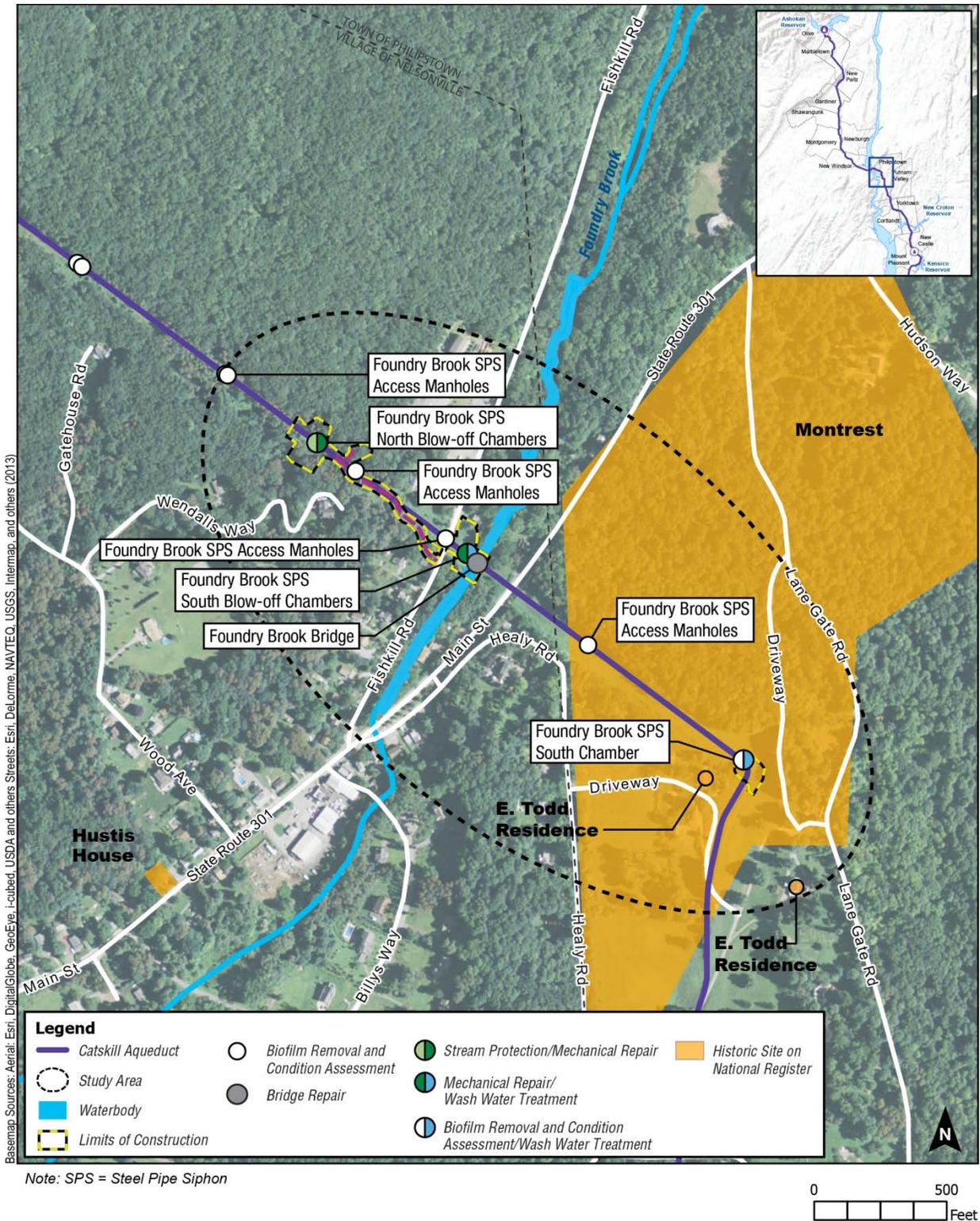


Figure 9.11-17: Historic and Cultural Resources – Fishkill Road Study Area



9.11.3.5 Visual Resources

The study area for the visual resources analysis is the area within the Fishkill Road Study Area, and also includes view corridors that extend beyond the study area based on the locations that are publicly accessible.

As shown on **Figure 9.11-16** and **Figure 9.11-17**, six visual resources, consisting of: three sites (one area and two individual structures) listed on the National Register of Historic Places; one State park, Hudson Highlands State Park Preserve; and two Scenic Areas of Statewide Significance were identified within the Fishkill Road Study Area.

As described in Section 9.11.3.4, “Historic and Cultural Resources,” approximately 34 acres of Montrest, listed on the National Register of Historic Places, are located within the Fishkill Road Study Area. Montrest is an approximately 160-acre site and includes several buildings on the property. Only one of the listed structures is located within the Fishkill Road Study Area. There are no views of the Foundry Brook Steel Pipe Siphon Bridge from the main buildings on Montrest, and the Foundry Brook Steel Pipe Siphon Bridge is not located within Montrest. The second E. Todd Residence is not located within Montrest, but is located within the study area. The South Siphon Chamber is visible from the two E. Todd Residences.

Approximately 8 acres of the Hudson Highlands State Park Preserve are located within the northwestern and eastern portions of the Fishkill Road Study Area. Hudson Highlands State Park Preserve is a State park that provides outdoor activities such as hiking, fishing, and hunting to the public. No State hiking trails have been identified within the Fishkill Road Study Area. There are no views of the Foundry Brook Steel Pipe Siphon Bridge or South Siphon Chamber from the Hudson Highlands State Park Preserve.

A majority of the Fishkill Road Study Area is also designated Scenic Area of Statewide Significance.² The Fishkill Road Study Area is within two Scenic Areas of Statewide Significance, the Hudson Highland HH20 Garrison Four Corners subunit and the HH-25 Cold Spring subunit of the Hudson Highlands Scenic Area of Statewide Significance. Views within the HH20 Garrison Four Corners subunit vary between views from hillside estates and broad meadows on the lowland. Views from the Hudson River include the wooded bluffs and historic estates. One of the estates noted is Montrest with noted views of the Hudson River and Breakneck Mountain. Views to and from Montrest would not be affected by the bridge repairs at Foundry Brook Steel Pipe Siphon Bridge, or biofilm removal and condition assessment activities at the North Blow-off Chambers, South Blow-off Chambers, and South Siphon Chamber.

Views within the HH-25 Cold Spring subunit are along a road, Main Street, that travels in an east and west direction and extend uphill from the Hudson River. Main Street is located within the Fishkill Road Study Area, although the Foundry Brook Steel Pipe Siphon Bridge, North Blow-off Chambers, South Blow-off Chambers, and South Siphon Chamber are not within the viewshed along the road, towards the Hudson River.

² In July 1993, the State designated six Scenic Areas of Statewide Significance in the Hudson River Valley as part of its implementation of the Coastal Management Program.
<http://www.dos.ny.gov/opd/programs/consistency/scenicass.html>

DEP has consulted with the Village of Nelsonville, Town of Philipstown, and Putnam County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Fishkill Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Fishkill Road Study Area would be the same as baseline conditions.

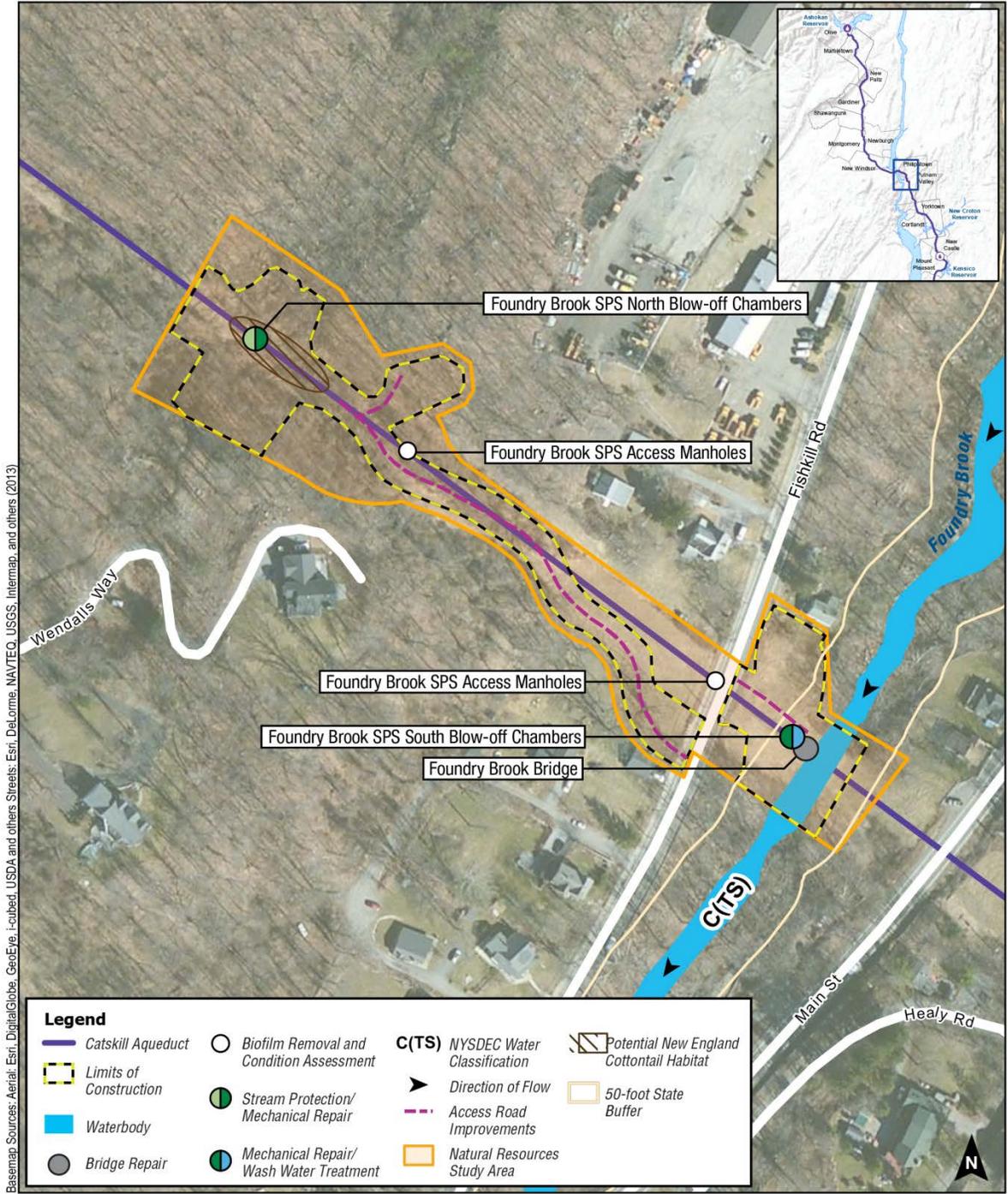
During construction, the work activities would be short-term (intermittently over 1.5 years; see **Table 9.11-6**) and would not affect Hudson Highlands State Park Preserve, Montrest, or the Scenic Areas of Statewide Significance. The biofilm removal and condition assessment activities at the South Siphon Chamber would not affect views to or from any visual resources, as the work activities would be within the existing South Siphon Chamber, although the area surrounding the chamber could be used for a staging area and could be visible from the two E. Todd Residences. The repair and rehabilitation work activities and biofilm removal and condition assessment activities at the North Blow-off Chambers and South Blow-off Chambers would not affect views to or from any visual resources. They would not affect Montrest as the activities would be approximately 0.3 mile northwest of the main building of Montrest and would be screened by vegetation. The Foundry Brook Steel Pipe Siphon Bridge and the staging area related to the Foundry Brook Steel Pipe Siphon Bridge (i.e., bridge repairs) would be located adjacent to a small portion of Hudson Highlands State Park Preserve that falls between Fishkill Road and Main Street. The work activities and staging area near the Foundry Brook Steel Pipe Siphon Bridge would include limited clearing of trees and shrubs.

Following construction, all equipment would be removed from the Fishkill Road Study Area and staging areas would be restored to baseline conditions. The bridge repair would be permanent, but would not include any additional structures. It would not disrupt views looking west from Montrest towards the Foundry Brook Steel Pipe Siphon Bridge, any views from any hiking trails within Hudson Highlands State Park Preserve, or any views associated with the Scenic Areas of Statewide Significance. Following the repair and rehabilitation within the Fishkill Road Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions. It would not result in changes to the future visual and aesthetic resource conditions of the views to or from the Hudson Highlands State Park Preserve, any views to or from Montrest, or any views from either Scenic Area of Statewide Significance subunit.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Fishkill Road Study Area.

9.11.3.6 Natural Resources

The study area for the natural resources analysis encompasses the area surrounding the limits of construction, including the North Blow-off Chambers west of Fishkill Road, and follows the steel pipe siphon southeast to the Foundry Brook Bridge (see **Figure 9.11-18**). A natural resources study area was also established for the South Siphon Chamber and includes the limits of construction (see **Figure 9.11-15**). These areas are collectively referred to as the natural resources study area.



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Note: SPS = Steel Pipe Siphon
NYSDEC = N.Y.S. Department of Environmental Conservation

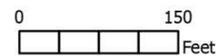


Figure 9.11-18: Natural Resources – Fishkill Road Study Area



Based on the field visits conducted on October 7, 2014, October 9, 2014, and October 10, 2015, the natural resources study area is composed of successional southern hardwoods and mowed lawn (Edinger et al. 2014) on and adjacent to the aqueduct. A portion of Foundry Brook flows through the natural resources study area. These habitats have the potential to support protected water resources, terrestrial resources, and wildlife species. Therefore, an analysis of the potential effects to natural resources from the repair and rehabilitation activities is presented below.

Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the Foundry Brook-Hudson River subwatershed (hydrologic unit code [HUC] 020200080505) of the Hudson-Wappinger watershed (HUC 02020008).

Work activities within water resources, including bridge repairs and blow-off chamber reconstruction, are subject to federal, State, and municipal regulations. The surface water in the natural resources study area is subject to jurisdiction under Sections 401 and 404 of the Clean Water Act, and the floodplains are subject to jurisdiction under federal and local floodplain management regulations. As a Class C(TS) stream, Foundry Brook is subject to State Protection of Waters regulations with a regulated 50-foot buffer to protect the streambed and banks. Based on consultations with NYSDEC, this watercourse may support trout spawning and construction activities would be subject to time of year restrictions for trout spawning waters.

In addition, the Village of Nelsonville regulates development activities within wetlands, watercourses, and the 100-year floodplain (Nelsonville Town Code Chapter 99: Freshwater Wetlands). Work activities within the stream and floodplain may be subject to municipal review and approval; however, the Village of Nelsonville does not regulate a protective buffer around these resources. Water resources were not identified in the vicinity of the South Siphon Chamber in the Town of Philipstown and, therefore, the Philipstown town codes are not applicable. No surface water is located at the Foundry Brook North Blow-off Chambers.

Surface Water

Surface water in the natural resources study area was assessed on October 9, 2015 according to the Cowardin System (Cowardin et al. 1979). The water resource name, length, area, and classification is shown in **Table 9.11-7**.

Table 9.11-7: Water Resources and Classifications within the Fishkill Road Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Foundry Brook	3,280	150	Riverine, Upper Perennial, Rock Bottom, Rubble (R2RB2)

Surface water within the study area was identified in the field and delineated through a desktop evaluation of NYSDEC water classification data, historic USGS topographic maps, and national hydrography data. Foundry Brook flows north to south through the western portion of the study area (see **Figure 9.11-18**).

Foundry Brook

Foundry Brook is a perennial watercourse that drains to the Hudson River. The stream bottom is dominated by rocks and rubble. The stream consists of many riffles and rivulets with depths ranging from 1 to 4 inches in shallow areas, and up to 12 inches in deeper pools. The watercourse is best classified as a “Riverine, Upper Perennial, Rock Bottom, Rubble” (Cowardin et al. 1979).

Floodplains

FEMA’s Flood Insurance Rate map number 36079C0083E, effective March 4, 2013, was reviewed. As shown on **Figure 9.11-19**, the floodway of Foundry Brook runs through the study area. The floodway is flanked by a FEMA designated 100-year floodplain (Zone AE), which depicts areas subject to inundation by the 1 percent Annual Chance Flood. Areas within Zone AE are within the Special Flood Hazard Area and are subject to floodplain management regulations.

Future Without the Repair and Rehabilitation

DEP has consulted with the Village of Nelsonville, Town of Philipstown, and Putnam County, and it is DEP’s understanding that no projects or developments are anticipated to occur within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the Fishkill Road Study Area would be the same as baseline conditions.

Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Fishkill Road Study Area.

Construction

There is no surface water associated with the North Blow-off Chambers or the South Siphon Chamber. Therefore, work activities related to the repair and rehabilitation would be limited to the existing drainage channel/culvert. Repair and rehabilitation at the South Blow-off Chambers has the potential to temporarily affect vegetated riparian areas and alter flows in Foundry Brook.

The Foundry Brook Bridge may be accessed multiple times during construction. As Foundry Brook supports wild trout and can be designated as a coldwater fishery, in-water construction activities are generally prohibited from October 1 to April 30, unless otherwise authorized. While DEP anticipates that the majority of in-water construction would occur during the summer months and outside of the October 1 to April 30 prohibition, construction activities may need to occur within the restricted period. If this is required, as presented within Section 9.19, “Project-wide Impact Analysis,” DEP would implement additional measures to limit potential adverse impacts to trout.

Prior to commencing the repair and rehabilitation, temporary sediment and erosion control measures, such as silt fences and haybales, would be installed at the perimeter of land-based construction. Within the limit of construction, localized construction dewatering (i.e., installing a barrier and pump to keep the work area dry) may be necessary to facilitate excavation for the

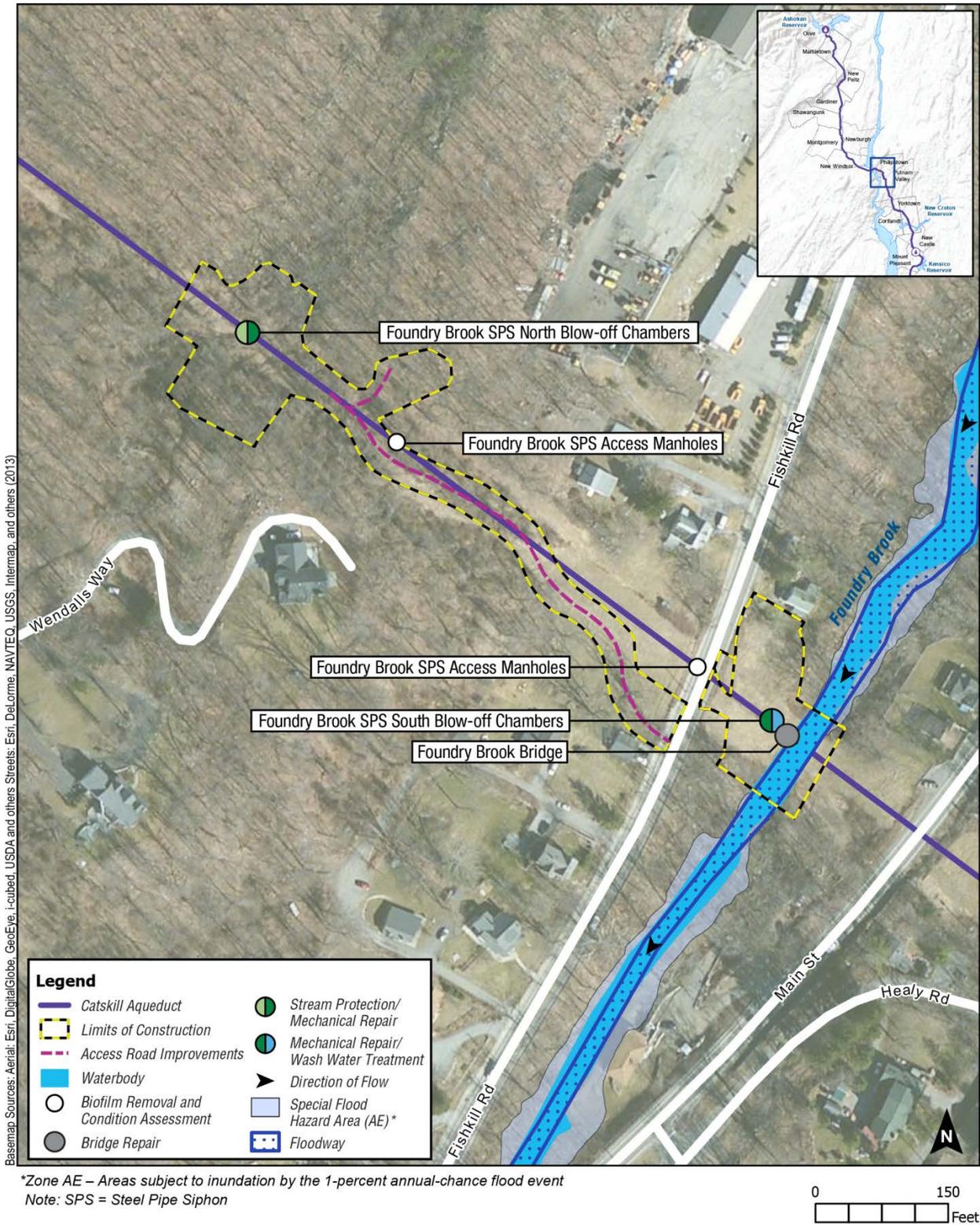


Figure 9.11-19: Floodplains – Fishkill Road Study Area



blow-off chambers and discharge pipe replacement. Temporary protection of Foundry Brook would be provided while undertaking interior and exterior repairs of the bridge. Exterior repairs of the bridge or blow-off chamber reconstruction might require in-stream work. If needed, a temporary stream diversion and a downstream turbidity curtain would be installed.

To ensure that the river and its streambanks are protected, aquatic life movement is uninhibited, and sediment and other pollutants are prevented from entering the waterway, these temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements.

Exterior repairs of the bridge and blow-off chamber reconstruction might require streambank and in-stream work. The blow-off chambers are located below ground, adjacent to the stream, and the larger replacement chambers would be similarly buried so there would be minimal change to streambank contours. Grading activities would not increase impervious surface and would not alter runoff to Foundry Brook.

While the activities fall within the limits of a Special Flood Hazard Area, these repairs represent upgrades and maintenance to existing infrastructure that would not result in an alteration of elevations or alteration of flood capacity. Due to the fixed location of the repairs, work activities would need to take place within the designated Special Flood Hazard Area. Replacement of the chambers would generally occur below the ground surface. Little change to the existing contours and no change to base flood elevations are anticipated to occur as part of the work activities related to the siphon chamber and the bridge repairs. DEP would coordinate with the Village of Nelsonville and FEMA, as necessary, to comply with all applicable floodplain management requirements.

Anticipated temporary and permanent disturbance to water resources and regulated buffers were quantified based on the limits of construction and proposed work activities (see **Table 9.11-8**). Construction staging would occur on top of the aqueduct and the temporary stream diversion would extend into the stream, resulting in the temporary disturbance of approximately 3,020 square feet within Foundry Brook and approximately 6,130 square feet within the State Protection of Waters buffer. Blow-off chamber reconstruction would result in the permanent disturbance of approximately 40 square feet within Foundry Brook and 2,820 square feet within the State Protection of Waters buffer (see **Table 9.11-8**). Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native vegetation. Permanent disturbance is further analyzed in Section 9.19, "Project-wide Impact Analysis."

The South Blow-off Chambers and the South Siphon Chamber have been identified as potential wash water treatment locations for the repair and rehabilitation. Biofilm wash water would be treated to meet acceptable water quality standards for reuse in the removal operation or for discharge back into the Catskill Aqueduct, or to Foundry Brook at the South Blow-off Chambers. Treated wash water would be discharged at low flows that would not result in scour, or other physical changes to the stream. The South Blow-off Chambers currently discharge through a 12-inch drainage pipe, which daylights through concrete retaining walls several feet above the bank of Foundry Brook. The discharge velocity would be relatively low for over-stream configurations. Since the streambanks are characterized by a rocky terrain, no streambank improvements are proposed at this location.

Table 9.11-8: Estimated Disturbance to Water Resources within the Fishkill Road Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Foundry Brook	3,280	3,020 <i>Construction staging area</i>	40 <i>Blow-off chamber reconstruction</i>
50-foot Protection of Waters Buffer	13,530	6,130 <i>Construction staging area</i>	2,820 <i>Regrading following blow-off chamber reconstruction</i>

This study area has also been identified as a location for discharging raw aqueduct water while unwatering the aqueduct. Reconstruction of the blow-offs would require the siphons to be unwatered. This initial unwatering of the siphons would occur with temporary measures in place to protect the brook from erosion. Unwatering events would also occur at any time after stream protection measures are in place during and following construction. These are described in “Operation” below.

Operation

Once blow-off repairs are complete, the function of the blow-off chambers would be restored. Discharges of raw water to Foundry Brook could occur in the future during DEP’s typical operations. The aqueduct could be unwatered via blow-off chambers to conduct maintenance or inspection. This is expected to occur infrequently.

The Foundry Brook Steel Pipe Siphon would primarily be drained from the South Blow-off Chambers into Foundry Brook. The North Blow-off Chambers would be used to drain the remaining volume. This would result in discharges to a normally dry drainage ditch at a flow of approximately 3,100 gpm at initial valve opening to a maximum flow of approximately 11,700 gpm. New streambank protection would be in place at the north blow-offs to prevent scour during an unwatering event. During unwatering events, new valves at the south blow-offs with larger discharge pipes would be operated to moderate discharge flows to Foundry Brook. This would result in discharges from each chamber of approximately 8,100 gpm at initial valve opening to a maximum flow of approximately 28,700 gpm. It would take approximately 7 hours to unwater the Foundry Brook Steel Pipe Siphon, as each siphon pipe would be unwatered separately.

An analysis was conducted to determine if the discharge associated with an unwatering event would be greater than the bankfull stream flow. Bankfull flow is the flow that just fills the channel to the top of its banks (i.e., stream capacity), and at the point in which water begins to flow onto the floodplain. Bankfull flow was predicted for Foundry Brook at the South Blow-off Chambers using the USGS StreamStats Program. This would be the primary location used to unwater the Foundry Brook Steel Pipe Siphon. If the discharge associated with an unwatering event would be greater than the bankfull flow, indirect downstream effects (i.e., an increase in erosion and scouring over the baseline) could occur. The maximum discharge flows to Foundry Brook would be approximately 102,800 gpm when the blow-offs discharge during a 1.5-year storm event. This is less than the calculated bankfull flow of Foundry Brook of approximately

105,500 gpm, making it similar to baseline conditions. The discharge velocity would be relatively low for over-stream configurations, and because the stream is characterized by a rocky terrain, no streambank improvements are proposed at this location. Therefore, indirect downstream impacts such as increases in erosion and scouring would be minimal.

The secondary location used to unwater these siphon pipes would be from the North Blow-off Chambers to the drainage ditch. The maximum discharge flows would be approximately 26,100 gpm when the Blow-off Chambers are operated during a 1.5-year storm event. This would exceed the calculated bankfull flow of approximately 23,300 gpm. While a bankfull event is possible when unwatering the remaining portion of the siphons at this location, new blow-off valves would be operated to moderate discharge flows to the dry drainage ditch.

Flows would be moderated by throttling the valves. They would be monitored by an on-site crew to prevent the receiving stream from becoming inundated by discharges of raw water. In the event that inundation begins to occur during unwatering, the on-site crew would have the ability to cease unwatering at any time to allow streamflows to subside to baseline flows. Moreover, discharges from the North Blow-off Chambers would be restricted from occurring within 24 hours of predicted rain events, during rain events, and for a period of 48 hours after rain events or after streamflow returns to normal. Discharges from the Foundry Brook Steel Pipe Siphon would be limited to raw aqueduct unwatering events. These events would be infrequent and last several hours in duration, and are not anticipated to cause scouring or result in a bankfull event, or otherwise alter stream capacity of the receiving waters.

Water Resources Conclusions

Water resources in the natural resources study area are limited to Foundry Brook and its associated floodplain. While the majority of work activities would result in temporary disturbance, minor permanent disturbance would occur as part of the blow-off chamber reconstruction and associated streambank restoration and protection. Access improvements and repair activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct, would represent upgrades and maintenance to existing structures, and would be localized and confined to the immediate vicinity of the work sites. Access road improvements would be permanent. The staging areas would be restored to natural conditions following construction. Discharges would be limited to raw aqueduct unwatering events, which would be infrequent and last several hours in duration. Biofilm wash water would be discharged over the course of 4 weeks during the third 10-week shutdown.

Restoring the historic function of the blow-offs to discharge raw aqueduct water would be a change in baseline conditions. However, based on the above assessment, there would be minimal indirect effects to water resources. Repairs to the Foundry Brook Bridge would bring the bridge crossing to current DEP standards.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Fishkill Road Study Area.

Terrestrial Resources

Consultation with NYNHP identified two ecological communities of significance within the Fishkill Road Study Area: oak-tuliptree forest and chestnut oak forest. However, neither of these communities was observed within the natural resources study area during the 2014 and 2015 field visits. The natural resources study area is composed of successional southern hardwoods and mowed lawn (Edinger et al. 2014) on and adjacent to the aqueduct. Tree species include American elm (*Ulmus americana*), black cherry (*Prunus serotina*), black locust (*Robinia pseudoacacia*), red oak (*Quercus rubra*), black walnut (*Juglans nigra*), cottonwood (*Populus deltoides*), bigtooth aspen (*Populus grandidentata*), tuliptree (*Liriodendron tulipifera*), and sugar maple (*Acer saccharum*). At the North Blow-off Chambers, shrub species include tatarian honeysuckle (*Lonicera tatarica*), Oriental bittersweet (*Celastrus orbiculatus*), and black raspberry (*Rubus occidentalis*), and the understory is composed of Japanese honeysuckle (*Lonicera japonica*), maple (*Acer* spp.) saplings, and poison ivy (*Toxicodendron radicans*). At the Foundry Brook Bridge, the dense understory is composed of wineberry (*Rubus phoenicolasius*), barberry (*Berberis* spp.), multiflora rose (*Rosa multiflora*), saplings of black locust and black walnut, winged euonymus (*Euonymus alatus*), and Oriental bittersweet.

The Village of Nelsonville regulates the removal of trees within 20 feet of watercourses, excluding incidental tree removal (Nelsonville Village Code Chapter 99: Freshwater Wetlands); and therefore terrestrial resources within the study area warrant an analysis. No tree removal is proposed in the portion of the natural resources study area within the Town of Philipstown, and therefore the Philipstown town code is not applicable.

DEP has consulted with the Village of Nelsonville, Town of Philipstown, and Putnam County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Fishkill Road Study Area within the timeframe of the impact analysis. Natural processes such as changes in habitat due to natural vegetative succession are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be the similar to baseline conditions.

In the future with the repair and rehabilitation, work activities would include ~~minor~~ tree clearing and shrub removal for the purpose of improving site access and staging areas. Along the existing access road, three black locust trees with an average dbh of 10.3 inches may be removed along the steel pipe siphon berm to widen the existing access, and 20 trees including one black cherry, fifteen black locust, one oak (*Quercus* spp.), one cherry (*Prunus* spp.), and two locust (*Robinia* spp.), with dbh ranging from 3.5 to 14 inches, would be removed along the new permanent access road. These trees are located adjacent to the existing Catskill Aqueduct and would not affect significant natural communities that may exist outside of the natural resources study area. All tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Tree removal would occur in discrete locations along the densely forested areas south of the aqueduct along the existing access road, and would not dramatically change the character of the area or affect surrounding trees.

Following construction, all equipment would be removed from study area, and staging areas would be restored to natural conditions. Vegetated areas temporarily cleared during construction are anticipated to grow back with similar communities as baseline conditions. Following the repair and rehabilitation within the Fishkill Road Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions. Natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Fishkill Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. Species that could be affected within the study area and could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” nine species were identified to have the potential to be affected by the repair and rehabilitation within the natural resources study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these nine species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in populations resulting from habitat shifts due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.11-9**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and observations from field visits, as applicable.

Table 9.11-9: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Fishkill Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbances	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and October 10, 2015. Potential habitat exists within the hardwood forest that may be permanently affected by the repair and rehabilitation. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Eastern Fence Lizard	<i>Sceloporus undulates</i>	Unlisted	Threatened	No individuals were incidentally observed during the field visits on October 7, 2014 and October 10, 2015. Man-made basking habitat may be temporarily affected by repair activities. According to NYNHP, no records of fence lizards were identified within 1.5 miles of the study area. Potential basking habitat exists within the study area. The steel pipe siphon provides open areas with sun exposure that could be used for basking, as does the cleared area surrounding the Foundry Brook Bridge. Temporary effects to basking habitat are possible. However, upon completion of the repair and rehabilitation, the staging areas would be restored to natural conditions and the bridge repair and streambank restoration is not anticipated to affect basking habitat. Therefore, there are no effects anticipated and no further analysis for eastern fence lizards is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and October 10, 2015. Potential habitat exists within the adjacent hardwood forest and mowed lawn areas; however, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No

Table 9.11-9: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Fishkill Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbances	Warrants Further Analysis
Timber Rattlesnake	<i>Crotalus horridus</i>	Unlisted	Endangered	No individuals were incidentally observed during the field visits on October 7, 2014 and October 10, 2015. According to NYNHP, no records of timber rattlesnakes were identified within 1.5 miles of the study area. Potential basking habitat exists within the study area. The steel pipe siphon provides open areas with sun exposure that could be used for basking, as does the cleared area surrounding the Foundry Brook Bridge. Temporary effects to basking habitat are possible; however, upon completion of the repair and rehabilitation, the staging areas would be restored to natural conditions, and bridge repair and streambank restoration is not anticipated to affect basking habitat. Therefore, there are no effects anticipated and no further analysis for timber rattlesnakes is warranted for this study area.	No
Wood Turtle	<i>Glyptemys insculpta</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and October 10, 2015. Potential habitat exists within the adjacent hardwood forest and mowed lawn areas as well as adjacent to Foundry Brook; however, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. There would be minimal in-stream disturbance needed to reconstruct the South Blow-off Chambers and repair Foundry Brook Bridge because this is an over-stream crossing, where upland excavation and grading would be landside of the bridge abutments. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for wood turtles is warranted for this study area.	No
Common Wormsnake	<i>Carphophis amoenus</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and October 10, 2015. Potential habitat exists within the adjacent hardwood forest and mowed lawn areas; however, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for common wormsnares is warranted for this study area.	No

Table 9.11-9: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Fishkill Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbances	Warrants Further Analysis
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	A summer habitat assessment was conducted on October 10, 2015 and no bats were incidentally observed. None of the trees tagged for removal were identified as potential bat habitat. Potential foraging habitat exists near Foundry Brook. However, minor disturbance to the stream would not adversely affect bat foraging. Therefore, there are no effects anticipated and no further analysis for Indiana bats is warranted for this study area.	No
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened Unlisted	A summer habitat assessment was conducted on October 10, 2015 and no bats were incidentally observed. None of the trees tagged for removal were identified as a potential bat habitat. Foundry Brook Bridge is shaded and is likely not suitable roosting habitat; however, DEP would inspect the bridge prior to working to verify whether there are any roosting bats. Potential foraging habitat exists near Foundry Brook. However, minor stream disturbance would not adversely affect bat foraging. Therefore, there are no effects anticipated and no further analysis for northern long-eared bats is warranted for this study area.	No
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	A habitat survey was conducted on August 10, 2015 and identified potential cottontail habitat near the north blow-offs in the study area. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.

Eastern Box Turtle (Terrapene carolina)

The steel pipe siphon provides open areas with sun exposure that could be used for basking and nesting, as does the cleared area surrounding the Foundry Brook Bridge. Additionally, the North Blow-off Chambers are located in a deciduous forest with well-drained soils that provide suitable foraging and overwinter habitat. However, a number of protective measures would be in place that would further limit the potential for effects. Work activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, as a highly mobile species, any eastern box turtles (*Terrapene carolina*) are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. At the North and South Blow-off Chambers, the excavation and regrading necessary to replace the blow-off chambers and discharge pipes would not greatly increase the extent of impervious surface and would not alter runoff. Given that permanent disturbance from blow-off chamber reconstruction and streambank restoration and protection would be limited to a small portion of forested habitat at the North Blow-off Chambers and adjacent streambank habitat at the South Blow-off Chambers, effects to potential habitat would be minimal.

These effects would be negligible due to the surrounding basking, foraging, and overwintering opportunities of nearby habitats and short-term construction duration (totaling 35 weeks over 1.5 years). Upon construction completion, the staging areas and other temporarily disturbed areas would be restored to natural conditions and the operation of the Catskill Aqueduct would not affect breeding, nesting, or foraging habitat. Since eastern box turtle populations are stable within the Hudson River Valley region, the permanent disturbance to potential habitat as a result of the repair and rehabilitation in the study area would not result in significant adverse impacts to regional populations of eastern box turtles or their habitat.

In summary, given the schedule and temporary duration of the proposed activities and limited footprint of disturbance to potential basking areas, no significant effects are anticipated to eastern box turtles and their habitat. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, eastern box turtles in the natural resources study area.

New England Cottontail (Sylvilagus transitionalis)

A habitat survey was conducted on August 10, 2015 and identified potential New England cottontail (*Sylvilagus transitionalis*) habitat near the North Blow-off Chambers in the study area. However, no signs of current utilization were found on the site during the surveys. Disturbance associated with the work activities would affect approximately 4,200 square feet of potential habitat, but this would be minimal compared to adjacent habitat and would not deter individuals from utilizing surrounding suitable off-site habitats. Given that permanent disturbance from blow-off chamber reconstruction and streambank restoration and protection would be largely in-kind and limited to a small portion of forested habitat at the North Blow-off Chambers and adjacent streambank habitat at the South Blow-off Chambers, the repair and rehabilitation work activities would not result in significant loss or modification of suitable habitat for New England cottontails.

In summary, given the limited footprint of disturbance to potential habitat, as well as the schedule and temporary duration of the proposed activities, no significant effects are anticipated to New England cottontail and their habitat. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, New England cottontails in the natural resources study area.

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern fence lizards (*Sceloporus undulatus*), eastern hognose snakes (*Heterodon platyrhinos*), timber rattlesnakes (*Crotalus horridus*), wood turtles (*Glyptemys insculpta*), common wormsnares (*Carphophis amoenus*), Indiana bats, or northern long-eared bats associated with the repair and rehabilitation. Repair and rehabilitation may affect, but is not likely to adversely affect, eastern box turtles and New England cottontails.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Fishkill Road Study Area.

9.11.3.7 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Fishkill Road Study Area, a Phase I ESA was conducted in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify RECs. The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site itself and for its neighboring properties within appropriate search distance defined in the ASTM standard.

Based on the Phase I ESA investigations, there was no indication of an environmental impact that would constitute a REC as defined by the ASTM standard that would affect activities in the study area.

DEP has consulted with the Village of Nelsonville, Town of Philipstown, and Putnam County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Fishkill Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Fishkill Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage, and spill reporting requirements. Furthermore, excavation associated with the work activities for the streambank restoration and protection and the blow-off chamber reconstruction would occur on previously disturbed soils. Following the repair and rehabilitation,

all equipment would be removed from the Fishkill Road Study Area. The staging area would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Fishkill Road Study Area.

9.11.3.8 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Fishkill Road Study Area.

Access to the repair and rehabilitation limits of construction for the work sites within the Fishkill Road Study Area would be via State Route 301 (Main Street, see **Figure 9.11-9**). The North Blow-off Chambers would be accessed via an access road that connects to Fishkill Road to the south and then by driving north over the aqueduct. The South Blow-off Chambers would be accessed via a new access road connecting to Fishkill Road (and to the south). The South Siphon Chamber would be accessed via State Route 301 and Healy Road, then by driving directly on top of the aqueduct.

State Route 301 is a two-way, two-lane minor arterial roadway. Fishkill Road is a two-way, two-lane minor collector roadway. Healy Road is a two-way, one-lane local roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Fishkill Road Study Area. There is no public transportation and little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site. However, there are no DEP employees who work at or visit the study area on a daily basis, and the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Village of Nelsonville, Town of Philipstown, and Putnam County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Fishkill Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Fishkill Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and, therefore, be the basis of this transportation analysis. Of these activities, blow-off chamber reconstruction would generate the most vehicle trips. Blow-off chamber reconstruction would occur in summer ~~2019~~²⁰¹⁸ between the hours of 7 AM and 5 PM, Monday through Friday for approximately 18 weeks, with work that requires shutdowns being performed in spring or fall of that year.

In the future with the repair and rehabilitation, construction vehicles would travel along State Route 301 to access the study area, and along Fishkill Road to access the blow-off chamber reconstruction locations. The estimated number of peak-day one-way vehicle trips associated with the blow-off chamber reconstruction is 101, or approximately 202 peak-day vehicle round trips that would travel to and from the study area. Approximately 24 vehicle round trips or 24 PCEs would be workers traveling directly to and from the staging area, with an additional

4 daily shuttle trips between the study area and the staging area. The remaining approximately 174 peak-day vehicle round trips (423 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with blow-off chamber reconstruction is approximately 37 peak-hour vehicle trip ends (66 PCEs). This includes approximately 12 vehicle trip ends (12 PCEs) from workers traveling directly to and from the staging area, approximately 2 peak-hour shuttle trips between the study area and the staging area, and approximately 23 vehicle trip ends (52 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 12-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 66 peak-hour PCEs along State Route 301, which is above the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, "Transportation." The work activities at the Fishkill Road Study Area would be short-term (totaling 35 weeks over 1.5 years; see **Table 9.11-6**) and would not generate public parking or transportation demands or pedestrian activity within the Fishkill Road Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Fishkill Road Study Area.

9.11.3.9 Noise

As described in Section 9.3.15, "Noise," mobile noise associated with the repair and rehabilitation within the Fishkill Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation work activities as shown on **Figure 9.11-20**, which encompasses areas within the Village of Nelsonville and Town of Philipstown.

The Fishkill Road Noise Study Area includes residential parcels and recreational trails within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise codes. The study area is subject to the Village of Nelsonville and Town of Philipstown Noise Control Laws. The Village of Nelsonville Noise Control Law (§188-26) limits noise levels at the emitting property line. Noise levels in all districts except commercial cannot exceed 60 dBA and noise levels in commercial districts cannot exceed 65 dBA. The Town of Philipstown Noise Control Law §175-40(C) states that noise levels at the emitting property line shall not exceed 50 dBA between 7 AM and 8 PM, 40 dBA between 8 PM and 7 AM, or 5 decibels above the ambient noise at the point on the boundary of the lot where measured, whichever is greater. However, construction noise between 8 AM and sunset, Monday through Friday is exempt.

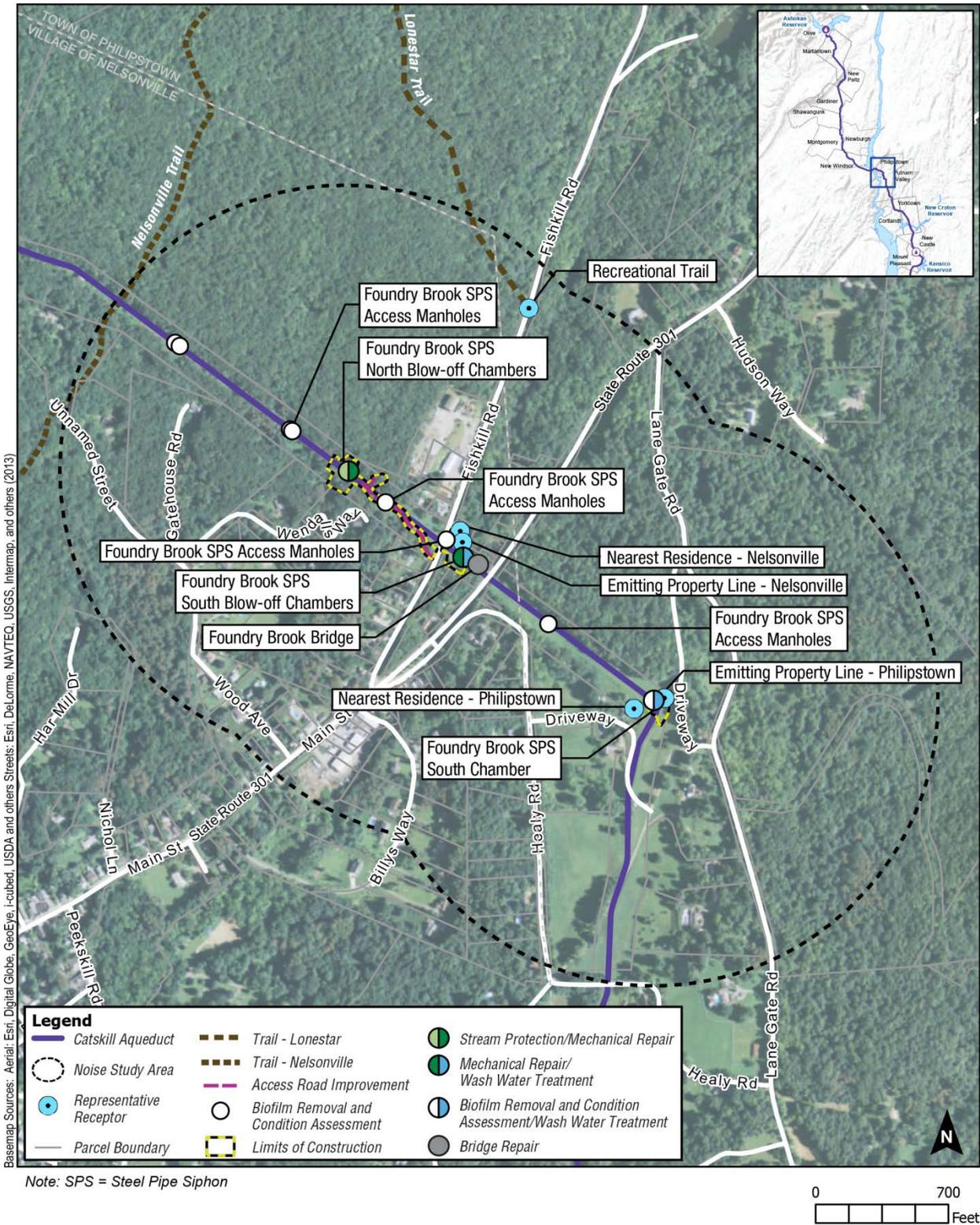


Figure 9.11-20: Noise – Fishkill Road Study Area



Existing ambient noise levels within the Fishkill Road Study Area are influenced by vehicular traffic traveling on Main Street (also known as State Route 301), Fishkill Road, and other local roadways. The existing noise levels within the study area are comparable to a quiet suburban residential environment based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements (e.g., commercial uses).

Typical noise levels (measured as L_{eq}) for quiet suburban and rural communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Village of Nelsonville, Town of Philipstown, and Putnam County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Fishkill Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Fishkill Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Fishkill Road Study Area would occur at three sites. The stationary noise-generating equipment that would be used within the Fishkill Road Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with the blow-off chamber reconstruction at the South Blow-off Chambers would emit the most noise in the portion of the study area in the Village of Nelsonville. The stationary noise-generating equipment associated with small-scale wash water treatment would emit the most noise in the portion of the study area in the Town of Philipstown. Blow-off chamber reconstruction would occur in summer ~~2019~~2018 between 7 AM and 5 PM, Monday through Friday for approximately 18 weeks. Small-scale wash water treatment would occur in fall ~~2020~~2019 between 7 AM and 7 PM, 7 days a week for approximately 4 weeks during the third 10-week shutdown (see **Table 9.11-6**).

This noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the blow-off chamber reconstruction and small-scale wash water treatment. Associated equipment reference noise levels are shown in **Table 9.11-10**. The Village of Nelsonville code defines maximum noise levels (L_{max}) at the emitting property line. The Town of Philipstown does not specify a metric, so the equivalent average sound level (L_{eq}) was used. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.11-11 shows the results of the stationary construction noise analysis. Both the Village of Nelsonville and the Town of Philipstown codes define allowable noise levels at the emitting property line. Therefore, noise levels were calculated at the nearest emitting property lines for comparison with the local noise ordinances. However, the nearest noise-sensitive receptor in the Village of Nelsonville is a residence approximately 120 feet away from the work activities, and the nearest noise-sensitive receptor in the Town of Philipstown is a residence approximately 110 feet away from the work activities. Repair and rehabilitation within the Fishkill Road Study Area would emit noise levels of approximately 82 dBA (L_{max}) at the nearest residence in the Village of Nelsonville and approximately 76 dBA (L_{eq}) at the nearest residence in the Town of Philipstown. Other noise-producing equipment would also be used within the study area for a

Table 9.11-10: Stationary Source Construction Equipment Modeled at the Fishkill Road Study Area – Noise Analysis and Reference Noise Levels (L_{max} and L_{eq})

Equipment Type	Reference Noise Level (L_{max}) at 50 Feet (dBA)	Reference Noise Level (L_{eq}) at 50 Feet (dBA) ¹
Blow-off Chamber Reconstruction		
Dozer	85	NA
Excavator	85	NA
Crane	85	NA
Small-Scale Wash Water Treatment		
Generator	NA	82
Pumps	NA	74
Light Plant	NA	58
Notes: NA = Not Applicable ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.		

Table 9.11-11: Stationary Noise Analysis Results (L_{max} or L_{eq}) at the Nearest Noise-Sensitive Receptors within the Fishkill Road Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{max} or L_{eq}) at Noise-Sensitive Receptor (dBA)	Town of Philipstown Noise Limit (dBA)	Village of Nelsonville Noise Limit (dBA)	Potential for Exceedance (Yes or No)
Emitting Property Line – Nelsonville	68	87 ¹	NA	60 ³	Yes
Nearest Residence – Nelsonville	121	82 ¹	NA	NA	NA
Emitting Property Line – Philipstown	61	81 ²	50 ⁴ /40 ⁵	NA	Yes
Nearest Residence – Philipstown	110	76 ²	NA	NA	NA
Recreational Trail	1287	60 ²	NA	NA	NA
Notes: NA = Not Applicable ¹ Metric for noise level is the maximum sound level (L_{max}), as required in the Village of Nelsonville ordinance. ² Metric for noise level is the hourly equivalent average noise level (L_{eq}). ³ Noise limit is applicable for all districts except commercial “C.” ⁴ Noise limit is applicable between the hours of 7 AM and 8 PM. ⁵ Noise limit is applicable between the hours of 8 PM and 7 AM.					

limited period during work activities. However, this equipment would not be expected to be louder than those associated with blow-off chamber reconstruction and small-scale wash water treatment. Since the repair and rehabilitation within the Fishkill Road Study Area would emit noise levels greater than allowed by the Village of Nelsonville and the Town of Philipstown noise codes, DEP would work with the Village of Nelsonville and Town of Philipstown, as appropriate.

Following completion of the repair and rehabilitation work activities, the construction equipment and vehicles would be removed from the Fishkill Road Study Area. The repair and rehabilitation work activities would be temporary in nature. Peak work activities would occur during blow-off chamber reconstruction in summer ~~2019~~²⁰¹⁸ and small-scale wash water treatment in fall ~~2020~~²⁰¹⁹ for limited periods.

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Fishkill Road Study Area.

9.11.3.10 Neighborhood Character

The character of the Fishkill Road Study Area is largely defined by a mix of residential, open space and recreation, community facilities, and public services land uses as well as its physical setting within a rural/suburban location (see **Figure 9.11-11**). The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. The study area is traversed from north to south by Fishkill Road, Main Street, and Foundry Brook. The limits of construction for the work site and associated access routes are located in a public services corridor with grassy cover, which is owned and maintained by DEP.

DEP has consulted with the Village of Nelsonville, Town of Philipstown, and Putnam County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Fishkill Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use, zoning, and public policy and socioeconomic conditions, an impact analysis for the Fishkill Road Study Area was not warranted; as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," and Section 9.3.4, "Socioeconomic Conditions." As described in Section 9.11.3.3, "Open Space and Recreation," Section 9.11.3.4, "Historic and Cultural Resources," and Section 9.11.3.5, "Visual Resources," the work activities would not affect open space and recreation, historic and cultural resources, or visual resources in the Fishkill Road Study Area.

As described in Sections 9.11.3.8, "Transportation," and 9.11.3.9, "Noise," during construction, the work activities in the Fishkill Road Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from

the study area, and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Fishkill Road Study Area.

9.12 TOWN OF PHILIPSTOWN

9.12.1 TOWN OF PHILIPSTOWN PROJECT DESCRIPTION

The Town of Philipstown is located in Putnam County, New York on the eastern side of the Hudson River. It is bounded by the Towns of Fishkill to the north and East Fishkill to the northeast in Dutchess County, New York; the Town of Kent to the northeast and Town of Putnam Valley to the east in Putnam County; the Town of Cortlandt to the south in Westchester County, New York; and the Hudson River to the west. The Town of Philipstown encompasses approximately 51.5 square miles. It includes the incorporated Village of Nelsonville, through which the Catskill Aqueduct traverses. General boundaries of locations where activities associated with the repair and rehabilitation would occur within the Town of Philipstown are shown on **Figure 9.12-1**.

The Catskill Aqueduct stretches for approximately 10 miles in a southerly direction through the Town of Philipstown. Notable sites along the aqueduct within the Town of Philipstown include the Indian Brook Steel Pipe Siphon North Chamber and South Chamber, and the Sprout Brook Steel Pipe Siphon North Chamber and South Chamber, and Indian Brook Bridge. The repair and rehabilitation work activities within the Town of Philipstown would occur within the Indian Brook Road, Old Albany Post Road, and Sprout Brook Road study areas as shown in **Table 9.12-1**. As shown on **Figure 9.12-1**, the Fishkill Road Study Area is located within the Town of Philipstown. However, since the majority of the Fishkill Road Study Area is in the Village of Nelsonville, the repair and rehabilitation work activities within the Fishkill Road Study Area is analyzed in Section 9.11, “Village of Nelsonville.”

Table 9.12-1: Schedule of Work Activities within the Town of Philipstown

Work Activity	Study Area		
	Indian Brook Road	Old Albany Post Road	Sprout Brook Road
Staging and Access Improvements	✓	✓	✓
Bridge Repair	✓	-	-
Blow-off Chamber Reconstruction	✓	-	✓
Boathole Preparation	✓	✓	-
Boathole Installation	✓	✓	-
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	✓	✓	✓
Streambank Restoration and Protection	-	-	✓
Notes: - = Work activity not proposed. ✓ = Work activity proposed.			

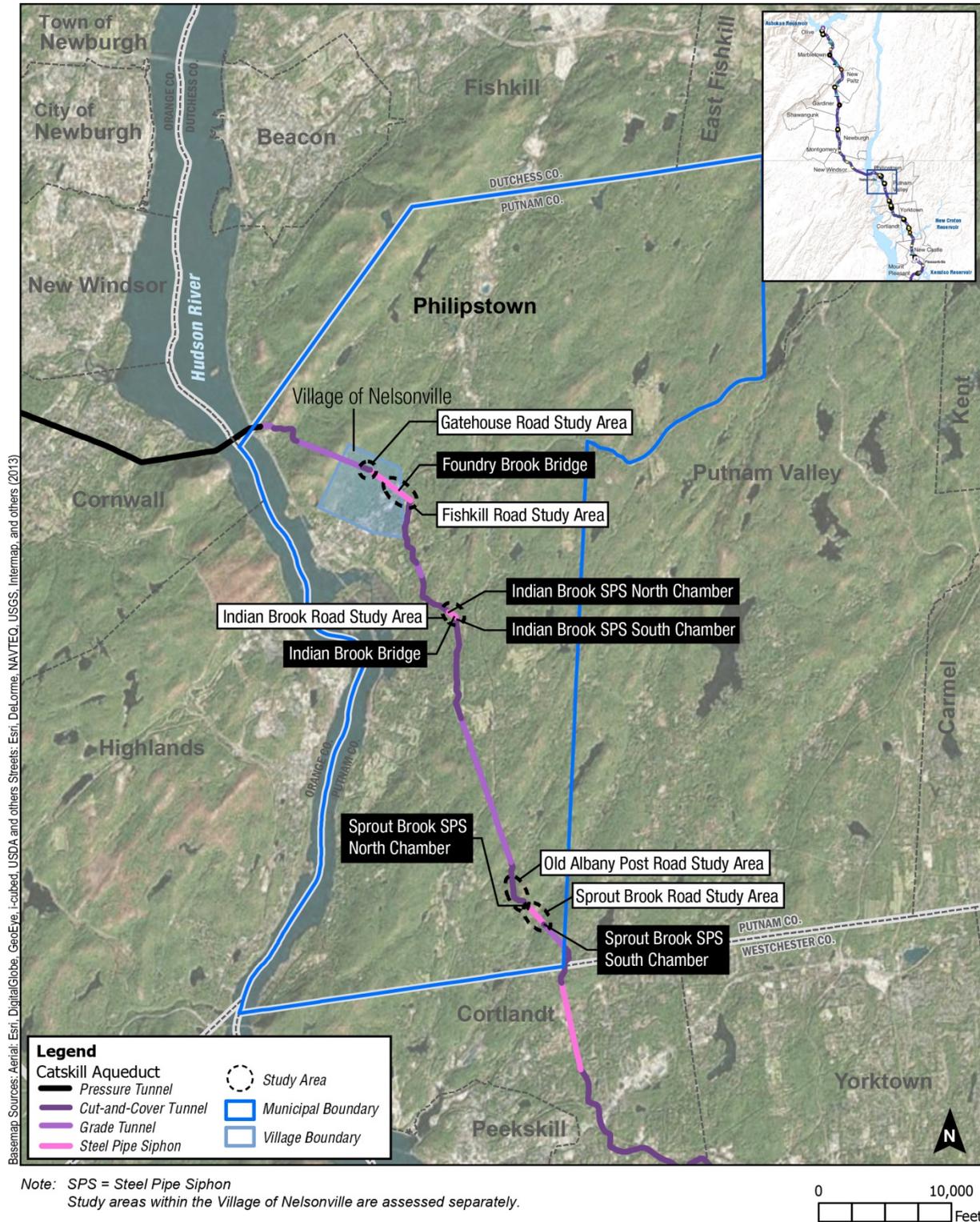


Figure 9.12-1: Town of Philipstown Study Areas



These three study areas in the Town of Philipstown encompass the majority of work that would occur as part of the repair and rehabilitation in this municipality. Additional work activities in the town do not warrant further analysis. Work sites located outside the study area include activities that would primarily be conducted within the aqueduct interior (see Section 9.3, “Screening Assessment and Impact Analysis Methodology”). In the Town of Philipstown, they include biofilm removal and condition assessment at access manholes not located in these study areas and permanently sealing four culvert drain sluice gates. See Section 9.2, “Project Description,” for an overall project description of the repair and rehabilitation. Section 9.12.2, “Town of Philipstown Impact Analysis,” below provides a discussion of local regulations in the Town of Philipstown jurisdictional limits, including those activities proposed for the southeastern portion of the Fishkill Road Study Area that would occur within the Town. The following sections provide a description of the study area, proposed activities, and impact analysis for the three study areas:

- Section 9.12.3 – Indian Brook Road Study Area Impact Analysis
- Section 9.12.4 – Old Albany Post Road Study Area Impact Analysis
- Section 9.12.5 – Sprout Brook Road Study Area Impact Analysis

9.12.2 TOWN OF PHILIPSTOWN IMPACT ANALYSIS

9.12.2.1 Public Policy

Because local public policies would not vary for study areas in the same town, public policies are evaluated on a town-wide basis. As discussed in Section 9.3.3, “Land Use, Zoning, and Public Policy,” the repair and rehabilitation’s consistency with the applicable policies of the Town of Philipstown Comprehensive Plan (Philipstown 2006) within the Indian Brook Road, Old Albany Post Road, and Sprout Brook Road study areas are analyzed as follows. Work activities at the Foundry Brook Steel Pipe Siphon South Chamber in the southeastern portion of the Fishkill Road Study Area are also analyzed below for consistency with the Town of Philipstown Comprehensive Plan.

Town of Philipstown Comprehensive Plan (2006)

The Town of Philipstown Comprehensive Plan is a plan to help guide the town and its future growth, development, and protection. Recommendations found in the Comprehensive Plan broadly address topics in order to maintain and enhance the traditional qualities of the town. The Comprehensive Plan does not discuss topics related to construction of individual projects or specific parcels or tracts of land. However, the Comprehensive Plan cites Foundry Brook as an environmentally sensitive area. Based upon review of these recommendations, the potential effects of the repair and rehabilitation work activities within the Indian Brook Road, Old Albany Post Road, and Sprout Brook Road study areas, as well as the repairs to the Foundry Brook Bridge in the Fishkill Road Study Area were evaluated relative to compatibility with the following applicable recommendation:

- *Protect Philipstown’s natural resources:*
 - *Protect environmentally sensitive areas, including:*
 - i. *Cold Spring Reservoir and Foundry Brook*

Water resources and land resources within the Indian Brook Road, Old Albany Post Road, and Sprout Brook Road study areas are discussed in detail within the “Natural Resources” Sections. The potential for impacts to Foundry Brook associated with the repair and rehabilitation work activities are evaluated in Section 9.12.3.6 “Natural Resources,” of the Fishkill Road Study Area in the Village of Nelsonville. Within these study areas, anticipated activities would include staging and access improvements, blow-off chamber reconstruction, streambank restoration and protection, bridge repair, boathole preparation and installation, biofilm removal and condition assessment, and small-scale wash water treatment.

Under this recommendation, the Comprehensive Plan recommends the protection and enhancement of priority aquatic systems in order to balance natural resources with the other goals of the Plan. This recommendation was analyzed for repair and rehabilitation as work in the study area would potentially impact existing natural resources directly or indirectly.

As part of the work, unwatering of the aqueduct would be required and this would result in raw water discharges to Indian Brook, Canopus Creek, and Foundry Brook within the Indian Brook Road, Sprout Brook Road, and Foundry Brook Road study areas, respectively. There are no water resources in the Old Albany Post Road Study Area. Additionally, in-stream work would be required in order to complete certain work elements. Finally, the discharge of treated biofilm wash waters to surface water may also be required.

The proposed actions would not be expected to affect water resources. Sediment and erosion control measures would be put in place for all construction activities. Discharge of treated biofilm wash water that would be temporarily discharged to Indian Brook, Canopus Creek, and Foundry Brook would be conducted in accordance with applicable regulatory requirements established as part of required discharge permits. As a result, work activities are not anticipated to result in significant increases in turbidity, scouring, or other adverse impacts to these streams.

Select tree removal on DEP property may be needed in the Town of Philipstown and along Foundry Brook to establish better access to the proposed work sites. However, this would not permanently affect critical environmentally sensitive areas within the study areas. The work sites occur in previously disturbed areas at existing DEP facilities. Tree removal is required because access to these areas has not been needed for some time, and trees have grown in unmaintained areas along the aqueduct. Furthermore, following construction, areas temporarily disturbed during construction would be restored to baseline conditions.

As such, the repair and rehabilitation within the Indian Brook Road, Old Albany Post Road, and Sprout Brook Road study areas, as well as the Fishkill Road Study Area, would not affect environmentally sensitive areas in the Town of Philipstown and would be consistent with this recommendation.

Repair and rehabilitation would therefore be consistent with the Town of Philipstown Comprehensive Plan and would not result in significant adverse impacts to public policy within the Indian Brook Road, Old Albany Post Road, and Sprout Brook Road study areas, as well as the Fishkill Road Study Area.

9.12.3 INDIAN BROOK ROAD STUDY AREA IMPACT ANALYSIS

Within the Indian Brook Road Study Area, the aqueduct consists of two segments of the Garrison Cut-and-Cover Tunnel, between which lies the Indian Brook Steel Pipe Siphon. The transition from the northern segment of the cut-and-cover tunnel to the steel pipe siphon occurs at the Indian Brook Steel Pipe Siphon North Chamber (North Siphon Chamber). The transition from the steel pipe siphon to the southern segment of the cut-and-cover tunnel occurs at the Indian Brook Steel Pipe Siphon South Chamber (South Siphon Chamber). At Indian Brook, the steel pipe siphon is housed in a reinforced concrete box that crosses over the stream (the Indian Brook Bridge), adjacent to which are located three over-stream blow-offs and associated valves within the Indian Brook Steel Pipe Siphon Blow-off Chambers (Blow-off Chambers). An access manhole along the steel pipe siphon is also located within the study area (see **Figure 9.12-2**).

Work activities within the Indian Brook Road Study Area would include: staging and access improvements; bridge repair; blow-off chamber reconstruction; boathole preparation; boathole installation; and biofilm removal and condition assessment and small-scale wash water treatment.

9.12.3.1 Study Area Location and Description

The Indian Brook Road Study Area is located along the upper Catskill Aqueduct in the Town of Philipstown. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction, bending towards the south at Avery Road. In addition to Avery Road, which crosses the eastern portion of the study area, the study area is traversed by Indian Brook and Indian Brook Road, which parallel each other from north to south. Moog Road connects to Indian Brook Road in the northern portion of the study area.

Proposed work sites within the study area include the North Siphon Chamber, the Indian Brook Bridge, Blow-off Chambers, access manholes, and the South Siphon Chamber. Access to the North Siphon Chamber would be provided via an access road from Moog Road. Access to the Indian Brook Bridge and Blow-off Chambers would be via Indian Brook Road to a private drive and across a privately owned bridge. Access to the South Siphon Chamber would be provided directly from Avery Road. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work sites. **Figure 9.12-2** shows an aerial photograph of the study area, including the path of the aqueduct, the limits of construction for the work sites, and the proposed access routes. **Figure 9.12-3** shows photographs of the access bridge and Indian Brook Bridge within the study area.

There are no federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

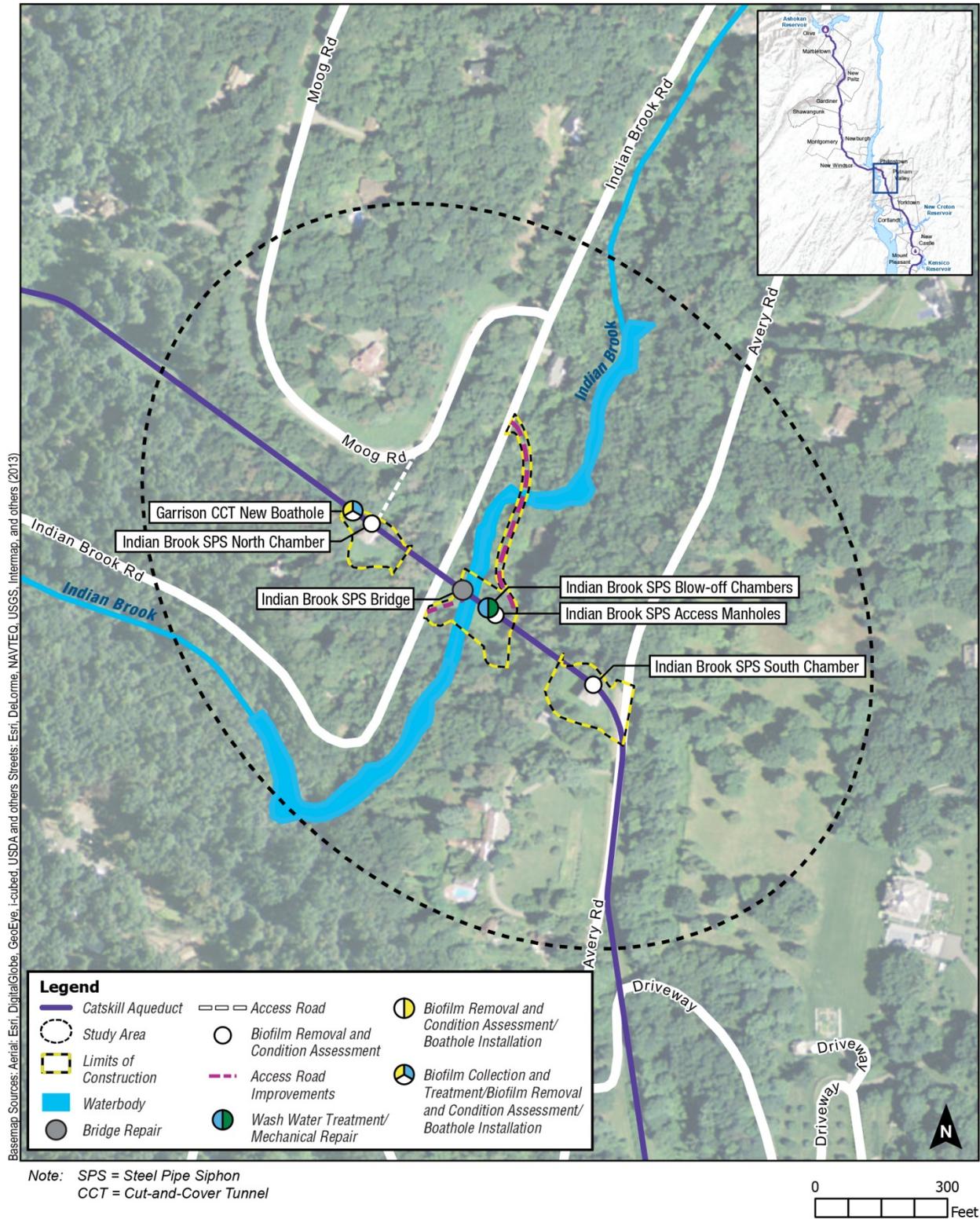


Figure 9.12-2: Study Area – Indian Brook Road





Photograph 1: Access bridge on private driveway to Indian Brook Bridge and Blow-off Chambers.



Photograph 2: Indian Brook Bridge.

Figure 9.12-3: Photographs – Indian Brook Road Study Area



9.12.3.2 Proposed Activities within the Indian Brook Road Study Area

To support activities within the Indian Brook Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas, including one at the North Siphon Chamber, would provide additional parking. Equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. A site plan showing layout of the limits of construction for the work sites, which would occupy a total of 1.5 acres, is shown on **Figure 9.12-4**. The schedule for work within the study area is shown in **Table 9.12-2**. The duration of active construction within the Indian Brook Study Area is estimated to total 25 weeks over 1.5 years.

Work in the study area would begin in summer ~~2019~~²⁰¹⁸ with staging and access improvements. In addition to underbrush clearing and gravel placement for leveling and erosion control, access to the ~~North Siphon Chamber~~ Blow-off Chambers would require grading and the removal of up to ~~three~~¹⁶ trees. ~~Access to the Blow-off Chambers would require, and~~ the rehabilitation of a privately owned bridge. This would include concrete encasement of the existing bridge pedestals, modification of the connections from the girders to the pedestals, in-kind replacement of the decking, and riprap installation at the bridge abutments and wing walls for scour protection. For both the rehabilitation of this bridge and repairs to the Indian Brook Bridge (described below), temporary in-stream disturbance would cover a total area of approximately 3,000 square feet, and permanent in-stream disturbance would cover approximately 460 square feet. To ensure a dry working environment, a temporary stream diversion would be installed, serving to partially divert the stream around the work areas. A turbidity curtain would be installed to prevent sediment from moving downstream.

After the staging and access improvements, repairs to the Indian Brook Bridge would be conducted in summer ~~2019~~²⁰¹⁸. Work would entail inspection of the bridge structure and repairs to corroded support structures, deteriorated concrete, and other surface defects as described further in Section 9.2, “Project Description.” All bridge repairs would be in-kind and would not alter its external appearance. Site modifications for the bridge repair would include a temporary stream diversion, as described above.

Blow-off chamber reconstruction would include replacement of the blow-off valves, discharge pipes and chamber covers, repair of the concrete walls, and removal of the access ladders. This would also take place in summer ~~2019~~²⁰¹⁸. Small portions of the work that require shutdowns would be performed in spring and fall of that year. In total, the work would require the excavation of 80 cubic yards of soil and 60 cubic yards of soil for fill, resulting in a net cut of 20 cubic yards of soil. Afterwards, the blow-off valves would be used to unwater the aqueduct for future shutdowns during the repair and rehabilitation and future maintenance.

Preparation of the new boathole upstream of the North Siphon Chamber would occur during the same time period. The work would consist of the excavation of approximately 45 cubic yards of soil and construction of a cast-in-place concrete collar. Boathole installation, which requires unwatering of the aqueduct to tie into the crown of the cut-and-cover tunnel, would take place during the second 10-week shutdown in fall ~~2019~~²⁰¹⁸.

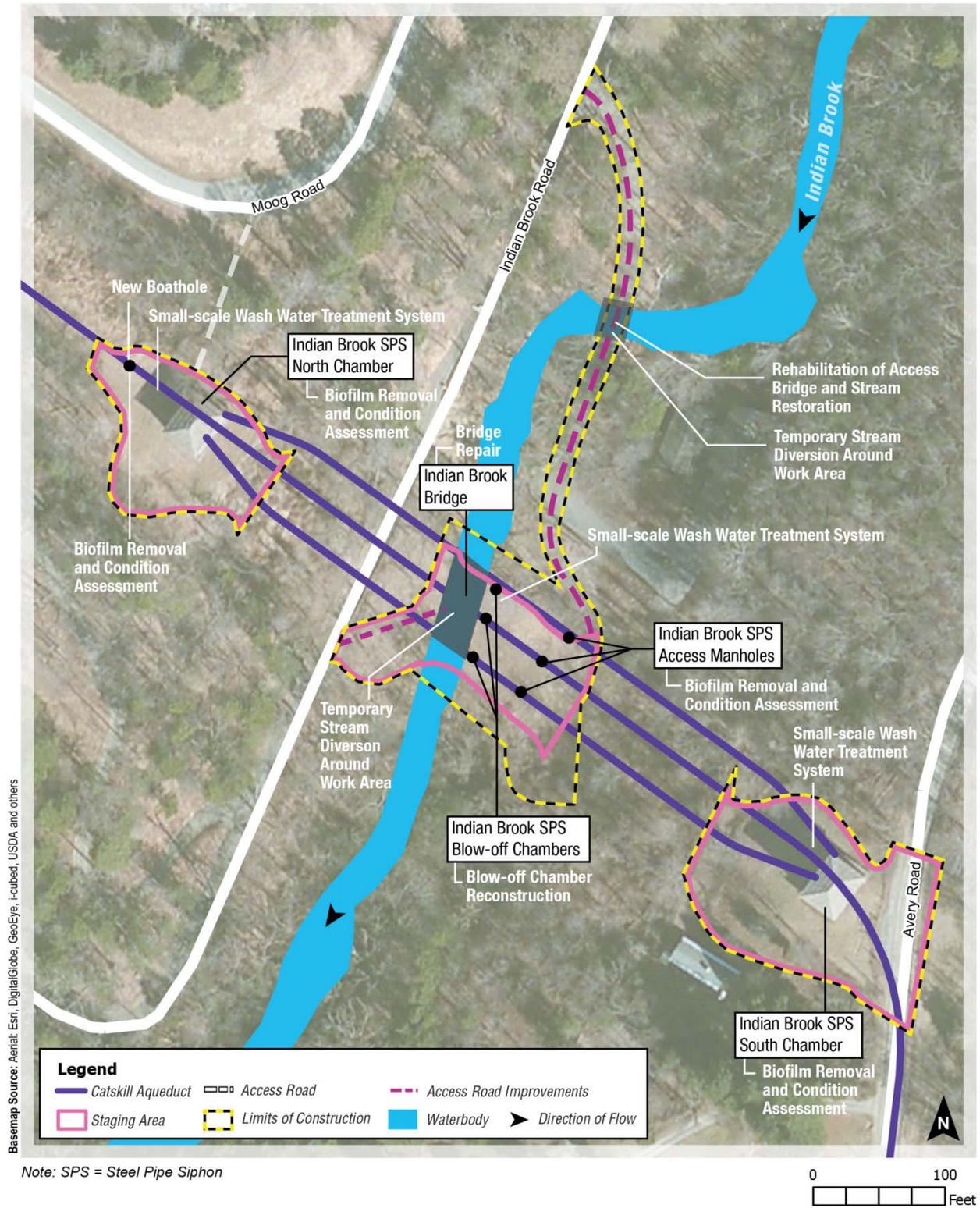


Figure 9.12-4: Site Plan – Indian Brook Road Study Area



Table 9.12-2: Schedule of Work Activities within the Indian Brook Road Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Staging and Access Improvements ³	Summer 2019 2018	4 weeks	Monday to Friday, 8 AM to sunset	12
Bridge Repair	Summer 2019 2018	4 weeks	Monday to Friday, 8 AM to sunset	13
Blow-off Chamber Reconstruction	Summer 2019 2018	9 weeks	Monday to Friday, 8 AM to sunset	12
Boathole Preparation	Summer 2019 2018	3 weeks	Monday to Friday, 8 AM to sunset	10
Boathole Installation	Fall 2019 2018 (Second 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	8
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	Fall 2020 2019 (Third 10-week shutdown)	3 weeks	7 days a week, 7 AM to 7 PM	21
Notes:				
¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per the Town of Philipstown Noise Control Law §175-40.				
² Crew size refers to the number of people anticipated at the work site(s).				
³ Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>).				

Lastly, biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019. Access into the aqueduct would be provided by the new boathole, the set of access manholes, the North Siphon Chamber, and the South Siphon Chamber. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary wash water treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Potential treatment locations within the study area include the North Siphon Chamber, the South Siphon Chamber, and the Blow-off Chambers, at which small-scale wash water treatment systems could be established. Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Indian Brook Road Study Area are presented in Section 9.12.3.3, “Land Use and Zoning,” through Section 9.12.3.10, “Neighborhood Character,” and include: land use and zoning; socioeconomic conditions; visual resources; natural resources including water resources, terrestrial resources, federal/State Threatened and Endangered Species, and State Species of Special Concern; hazardous materials; transportation; stationary

noise; and neighborhood character. Additionally, the study area's compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.12.2, "Town of Philipstown Impact Analysis." As described in Section 9.3, "Screening Assessment and Impact Analysis Methodology," an impact analysis in the study area is not warranted in relation to: community facilities and services; open space and recreation; historic and cultural resources; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.18, "Project-wide Impact Analysis."

9.12.3.3 Land Use and Zoning

The study area consists of residential, public services (Catskill Aqueduct), and vacant land uses (see **Figure 9.12-5**). The area is wooded, with sparsely spaced residential properties and some grassy fields to the southeast. Limits of construction for all three work sites are located within a public services corridor with grassy cover, which is owned and maintained by DEP. As described above, access to the Indian Brook Bridge, Blow-off Chambers, and access manholes would require crossing private property with permission from the landowner.

Zoning within the Indian Brook Road Study Area is classified as rural conservation (RC) and rural residential (RR), as designated by the Town of Philipstown Zoning Code (see **Figure 9.12-6**). The Catskill Aqueduct is a permitted use as a public utility facility within the rural conservation (RC) zoning district.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no major projects or programs are planned that would change land use or zoning within the Indian Brook Road Study Area within the timeframe of the repair and rehabilitation impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that land use and zoning within the Indian Brook Road Study Area would be similar to baseline conditions.

The repair and rehabilitation would involve the acquisition of an 0.28-acre easement within a 3.56-acre parcel in the Town of Philipstown, identified on the Putnam County Tax Map as Tax ID 49.-1-70. Under the rural conservation (RC) zoning designation, which provides for residential uses in a rural setting, the minimum lot size required for a residential land use is 5 acres. Therefore, further subdivision of the lot would not be allowable under the current zoning. The easement would preclude the landowner from any activity that would interfere with or is inconsistent with the rights conveyed to the City. However, it would not impose any other restrictions on the landowner's use of the existing driveway and access bridge to the Indian Brook Bridge, Blow-off Chambers, and access manholes. Acquisition of the easement is consistent with adjacent land uses, conforms to the existing zoning regulations, and would not result in residential or business displacement.

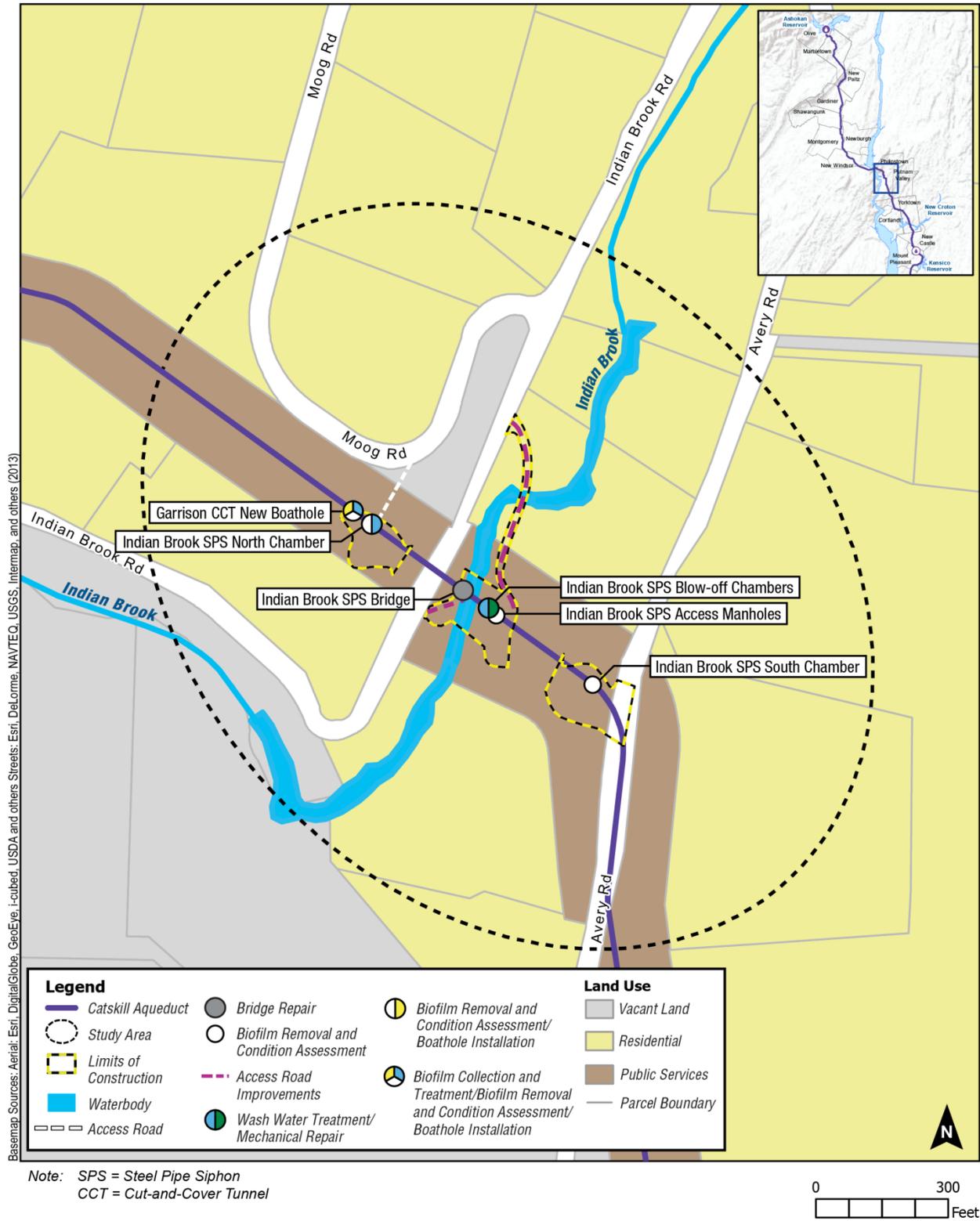


Figure 9.12-5: Land Use – Indian Brook Road Study Area



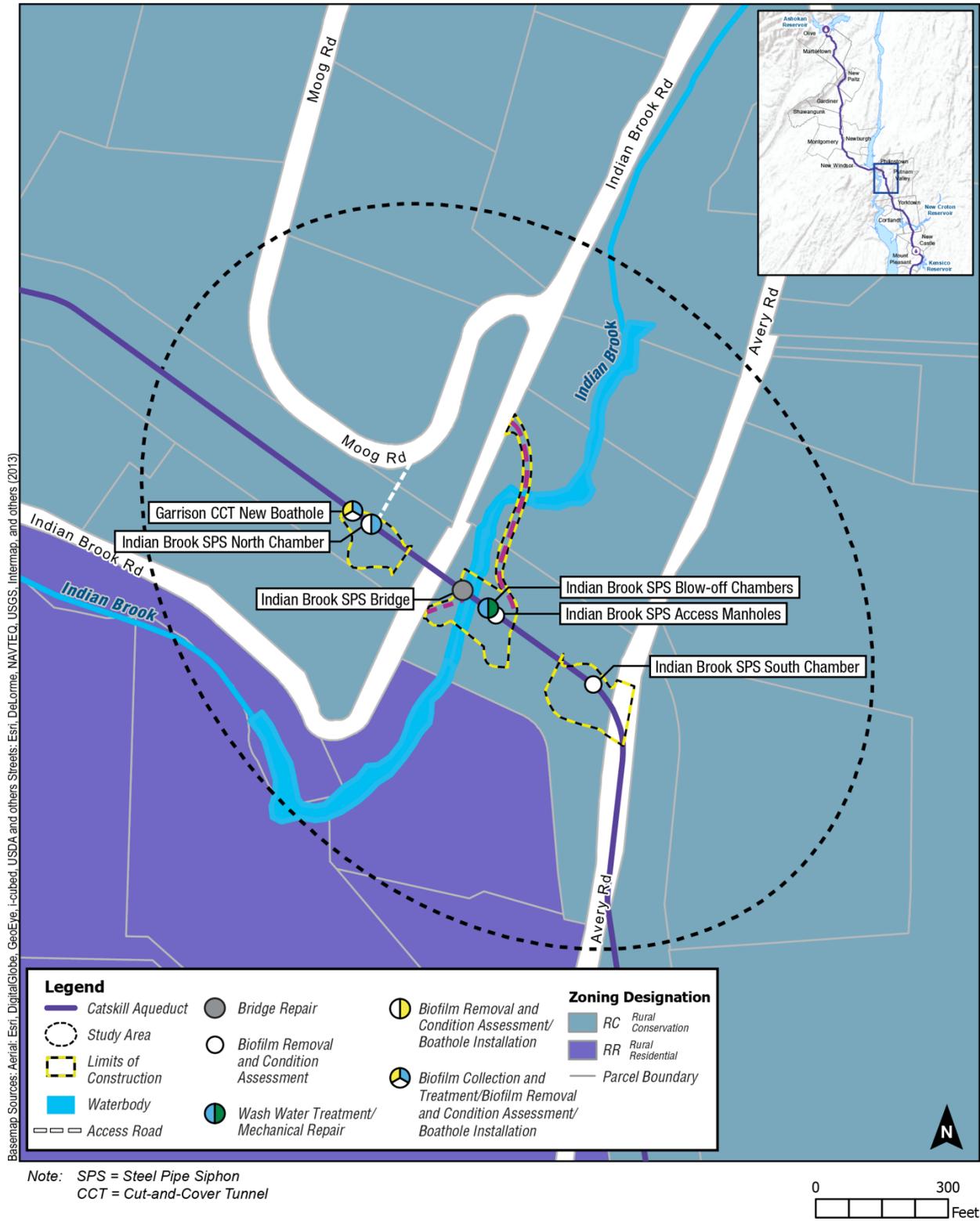


Figure 9.12-6: Zoning – Indian Brook Road Study Area



Following construction, all equipment would be removed from the Indian Brook Road Study Area and staging areas would be restored to baseline conditions. Operation of the Catskill Aqueduct would be consistent with baseline conditions and would conform with adjacent land uses and zoning. The access requirements would not be anticipated to result in a significant adverse land use impact to the owner. As such, the property affected by the easement is expected to be able to continue its existing use after repair and rehabilitation. The permanent easement would not result in any displacement, and overall, there would be no change to land use and zoning.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to land use or zoning within the Indian Brook Road Study Area.

9.12.3.4 Socioeconomic Conditions

The study area consists of residential areas, public services (Catskill Aqueduct), and vacant land uses (see **Figure 9.12-5**). The area is wooded, with sparsely spaced residential properties and some grassy fields to the southeast. Limits of construction of all three work sites are located within a public services corridor with grassy cover, which is owned and maintained by DEP. Access to the Indian Brook Bridge, Blow-off Chambers, and access manholes would require crossing private property with permission from the landowner.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no major developments or programs are planned within the Indian Brook Road Study Area within the timeframe of the impact analysis. In the future without the repair and rehabilitation, it is assumed that land use, population, housing, and economic activity within the Indian Brook Road Study Area would be similar to baseline conditions.

As described in Section 9.12.3.3, "Land Use and Zoning," the proposed repair and rehabilitation would require the acquisition of an approximately 0.28-acre easement within a 3.56-acre parcel (Tax ID 49.-1-70). The easement acquisition would not alter the obligation for payment of property taxes on the parcel. The landowner would continue to pay taxes on the full-assessed value of the property, and there should be no significant impact to the tax base. Therefore, tax burdens would not shift because of this proposed acquisition. Thus, it is not anticipated that displacement of businesses or residences would occur as a result of this acquisition.

Construction and access would occur within DEP-owned property and a small portion within this private property proposed for acquisition. Following construction, all equipment would be removed and staging areas would be restored to baseline conditions. The private landowner is expected to be able to continue existing uses after repair and rehabilitation. The proposed acquisition would not preclude future development of the remaining portion of the parcel. As a result, the repair and rehabilitation would not directly displace businesses (or employees) or residences.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to socioeconomic conditions within the Indian Brook Road Study Area.

9.12.3.5 Visual Resources

The study area for the visual resources analysis is the area within the Indian Brook Road Study Area. It also includes view corridors that extend beyond the study area based on the locations that are publicly accessible.

As shown on **Figure 9.12-7**, one visual resource, consisting of one Scenic Area of Statewide Significance, was identified within the Indian Brook Road Study Area. The entire Indian Brook Road Study Area is within a designated Scenic Area of Statewide Significance.¹ The Indian Brook Road Study Area is within the HH22 Nelson Corners subunit of the Hudson Highlands Scenic Area of Statewide Significance. The Nelson Corners subunit features a wooded landscape, with structures screened by topography and vegetation. The Nelson Corners subunit and the Indian Brook Road Study Area are located outside of the Hudson River viewshed, with no direct views of the river. The Nelson Corners subunit is considered significant due to scenic components such as rolling uplands, streams, ponds, wetlands, woodlands, and meadows. The North Siphon Chamber, Indian Brook Bridge and Blow-off Chambers, and South Siphon Chamber are located in wooded areas with limited views to or from this resource.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Indian Brook Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Indian Brook Road Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities would be short-term (intermittently over 1.5 years; see **Table 9.12-2**) and would include minor clearing of trees and shrubs. Tree removal would occur in discrete locations and would not dramatically change the character of the area or affect surrounding trees. See Section 9.12.3.6, "Natural Resources," for details on tree removal.

Following construction, all equipment would be removed from the Indian Brook Road Study Area and staging areas would be restored to baseline conditions. The new boathole at the Indian Brook North Siphon Chamber would be a permanent structure that would remain following construction. Repairs of the access bridge and Indian Brook Bridge would be permanent and are in-kind repairs that would not result in any new structures. Following the repair and rehabilitation, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not result in changes to the future visual and aesthetic resource conditions of the views within the Scenic Area of Statewide Significance.

¹ In July 1993, the State designated six Scenic Areas of Statewide Significance in the Hudson River Valley as part of its implementation of the Coastal Management Program.

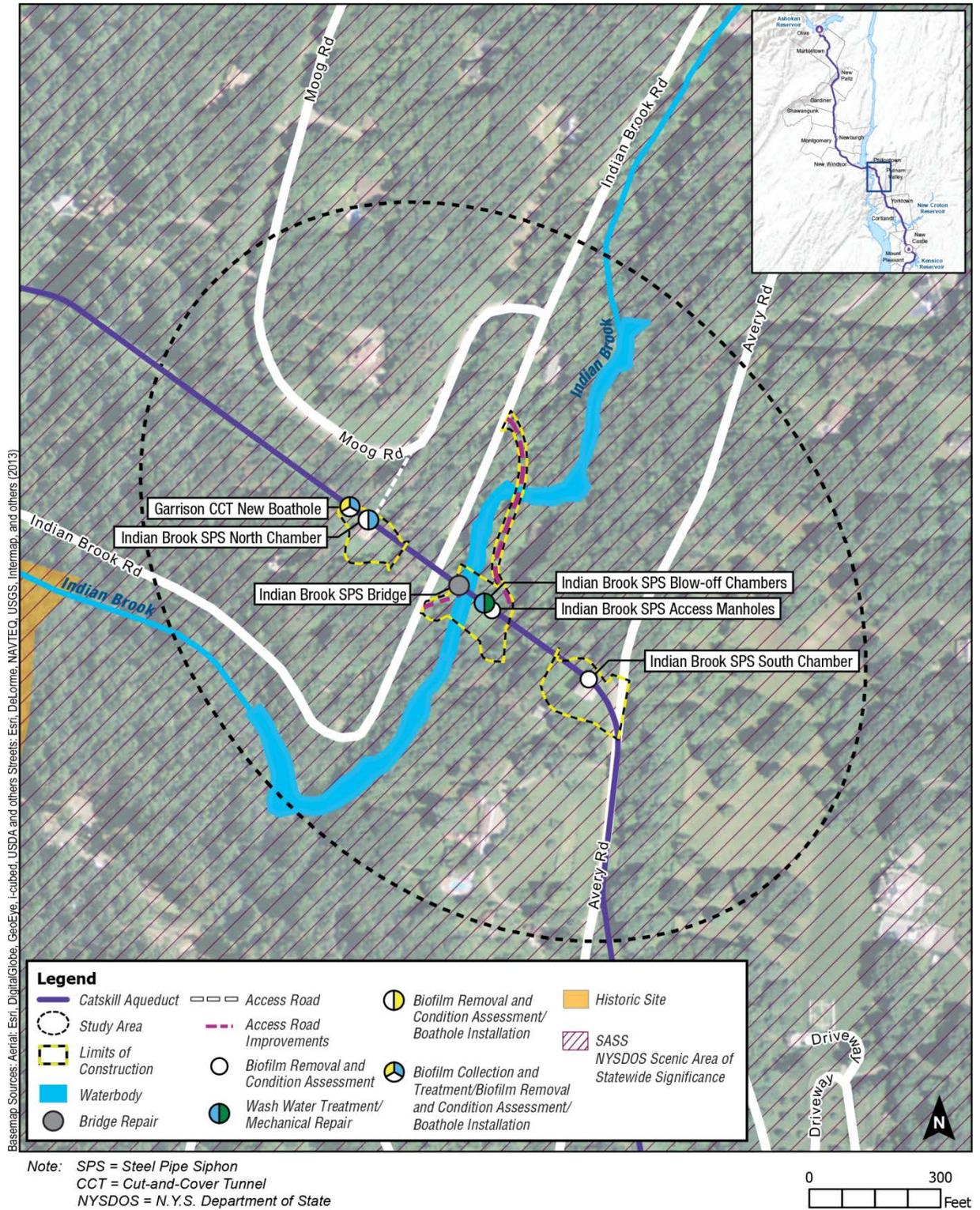


Figure 9.12-7: Visual Resources – Indian Brook Road Study Area



Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Indian Brook Road Study Area.

9.12.3.6 Natural Resources

The study area for the natural resources analysis is the immediate area surrounding the limits of construction, including the North Siphon Chamber, Indian Brook Bridge, Blow-off Chambers, and South Siphon Chamber (see **Figure 9.12-8**). These three sections are collectively referred to as the natural resources study area.

Based on the field visits conducted on October 9, 2014 and August 10, 2015, the ecological communities in the natural resources study area are dominated by a successional southern hardwood forest within the aqueduct right-of-way, a hemlock-northern hardwood forest adjacent to the aqueduct, and mowed lawn. There is a steep ravine leading to the perennial stream identified as Indian Brook. Based on a desktop analysis, the North and South Siphon Chambers are best characterized as mowed lawn surrounded by successional southern hardwood forest.

These habitats have the potential to support protected water resources, terrestrial resources, and wildlife species. Therefore, an analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Water Resources

The natural resources study area is within the lower Hudson River drainage basin. More specifically, it is within the Foundry Brook-Hudson River subwatershed (hydrologic unit code [HUC] 020200080505) of the Hudson-Wappinger watershed (HUC 02020008). Surface water within the study area was identified through a desktop evaluation of NYSDEC water classification data, historic USGS topographic maps, national hydrography data, and field delineation.

Indian Brook is subject to federal jurisdiction under Sections 401 and 404 of the Clean Water Act for proposed work activities. As a Class C(TS) stream within the natural resources study area, Indian Brook is subject to State Protection of Waters regulations with a regulated 50-foot buffer to protect the streambed and banks. Based on consultations with NYSDEC, this watercourse may support trout spawning and construction would be subject to time of year restrictions for trout spawning waters. In addition, the Town of Philipstown regulates activities within watercourses and a regulated 100-foot buffer (Philipstown Town Code Chapter 93: Freshwater Wetlands and Watercourses) and has jurisdiction over activities within floodplains (Philipstown Town Code Chapter 90: Flood Damage Prevention). This municipal buffer encompasses the area on top of the aqueduct as well as forested areas adjacent to the stream. Therefore, work activities that would occur within the stream, the 100-foot watercourse buffer, and floodplain are anticipated to require town review and approval. There is no other surface water identified within the natural resources study area.

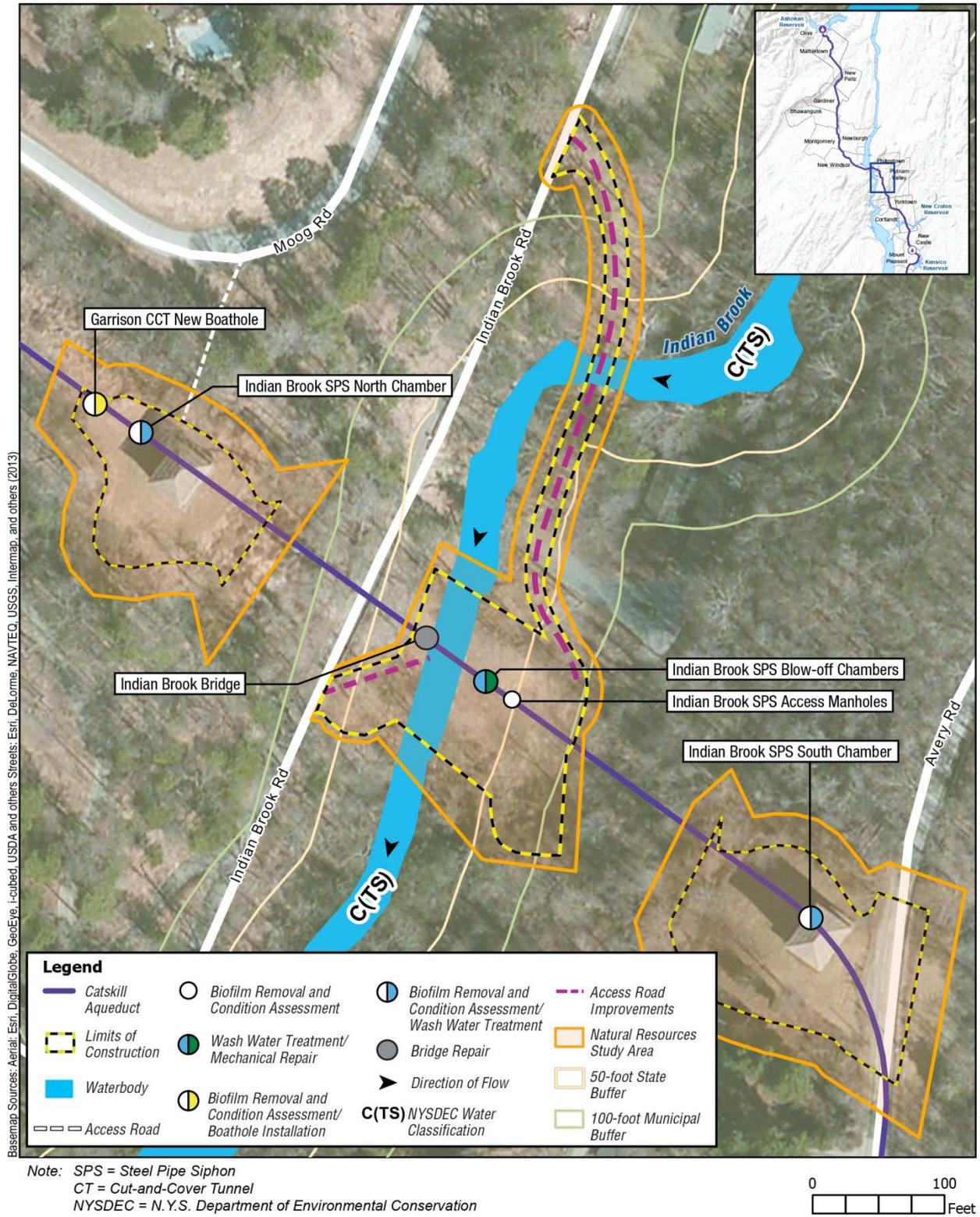


Figure 9.12-8: Natural Resources – Indian Brook Road Study Area



Surface Water

The surface water delineation in the natural resources study area was conducted on August 10, 2015. The water resource name, length, area, and classification are shown in **Table 9.12-3**.

Table 9.12-3: Water Resources and Classifications within the Indian Brook Road Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Indian Brook	5,160	280	Riverine, Upper Perennial, Unconsolidated Bottom, Cobble-Gravel (R3UB1)

Indian Brook

Indian Brook is a perennial watercourse that enters the natural resources study area by crossing under the access road, turning south, and then flowing under the Indian Brook Bridge crossing of the Catskill Aqueduct. Outside of the study area, Indian Brook flows into Constitution Marsh approximately 0.75 mile downstream and eventually joins the Hudson River. The stream bottom is dominated by cobble, sand, and gravel with variable ordinary high water marks ranging from approximately 10 to 20 feet in width. The stream morphology consists of many riffles and runs with depths ranging from 1 to 12 inches in shallow areas, and up to 24 inches in deeper pools. The watercourse is best classified as a “Riverine, Upper Perennial, Unconsolidated Bottom, Cobble-Gravel” (Cowardin et al. 1979).

Floodplains

FEMA’s Flood Insurance Rate map number 36079C0093E, effective March 4, 2013, was reviewed. As shown on **Figure 9.12-9**, a FEMA designated 100-year floodplain (Zone A) runs through the center of the study area, which depicts areas subject to inundation by the one percent Annual Chance Flood. Zone A Special Flood Hazard Areas are generally determined using approximate methods.

Areas within Zone A are within the Special Flood Hazard Area and are subject to local floodplain management regulations. There are no FEMA designated floodways in this study area.

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP’s understanding that no projects or developments are anticipated to occur within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the Indian Brook Study Area would be the same as baseline conditions.

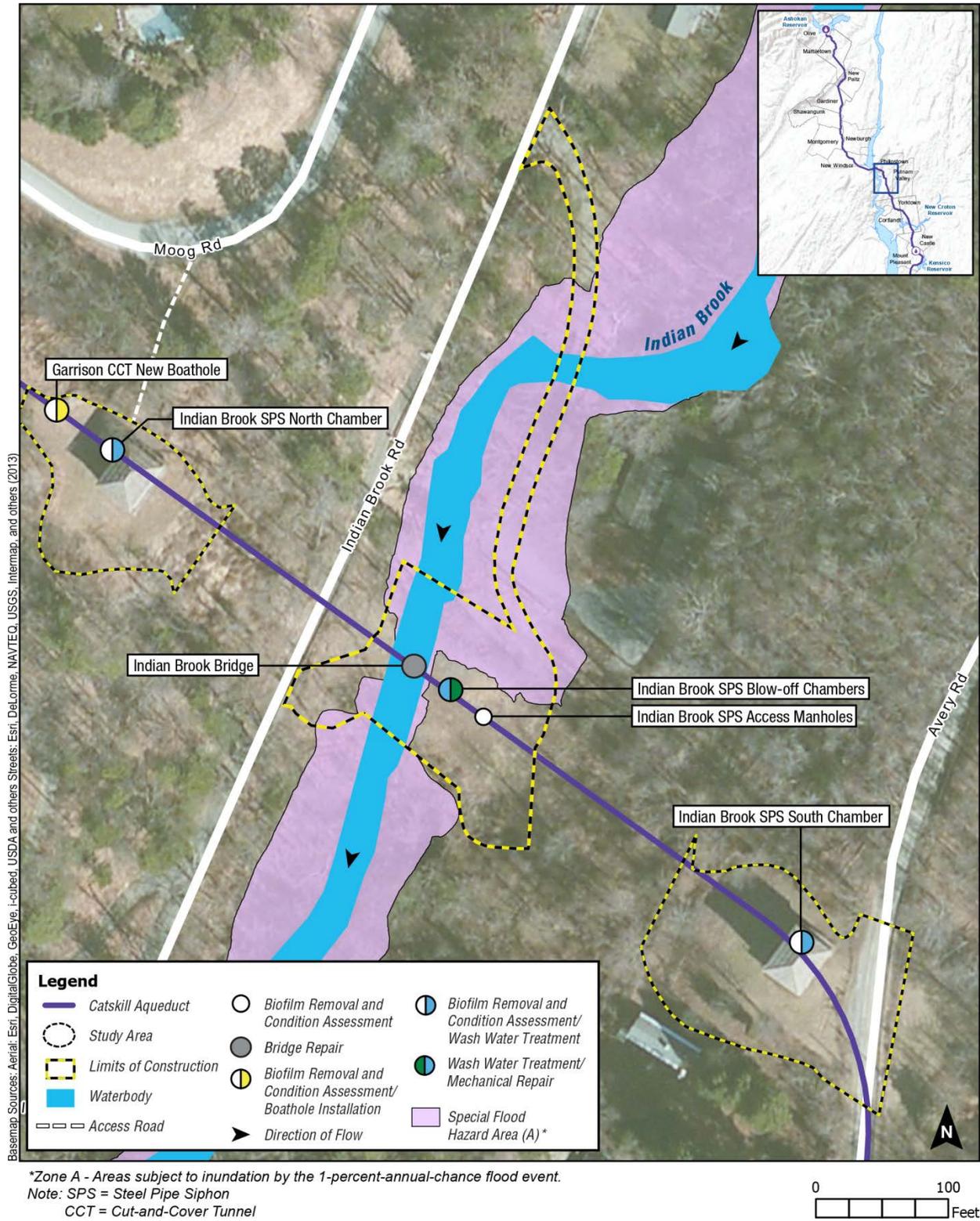


Figure 9.12-9: Floodplains – Indian Brook Road Study Area



Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Indian Brook Study Area.

Construction

Work activities related to the repair and rehabilitation at the Indian Bridge and Blow-off Chambers would temporarily disturb surface water and vegetated riparian areas, restore stream contours, and have the potential to temporarily alter flows in Indian Brook.

The Blow-off Chambers may be accessed multiple times during construction. As the Indian Brook supports wild trout and can be designated as a coldwater fishery, in-water construction activities are generally prohibited from October 1 to April 30, unless otherwise authorized. While DEP anticipates that the majority of in-water construction would occur during the summer months, and outside of the October 1 to April 30 prohibition period, construction activities may need to occur within the restricted period. If this is required, as presented within Section 9.18, "Project-wide Impact Analysis," DEP would implement additional measures to limit potential adverse impacts to trout.

Prior to commencing the repair and rehabilitation, temporary sediment and erosion control measures, such as silt fences and haybales, would be installed at the perimeter of land-based construction. Within the limit of construction, localized construction dewatering (e.g., by installing a barrier and pump to keep the work area dry) may be necessary to facilitate excavation at the Blow-off Chambers and discharge pipe replacement. Bridge repairs would also require in-stream access. A temporary stream diversion and a downstream turbidity curtain would be installed. Temporary stream diversions at each bridge would be conducted in sequence, not concurrently.

If stream diversions are necessary to complete external bridge repairs, there would be short-term disturbance of the flow of Indian Brook. To protect the stream and its banks, aquatic life movement, and prevent sediment and other pollutants from entering the waterway, temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements.

To accommodate construction equipment needed to repair the Indian Brook Bridge and Blow-off Chambers, the access bridge north of the Indian Brook Steel Pipe Siphon would require enhancements. Riprap would be placed within the streambed to restore original streambed contours and prevent future scour. A review of original streambed contours in comparison to proposed fill shows the proposed contours to be comparable. Pier enlargement on the access bridge would be a permanent change with a minor effect on stream width.

Once the access bridge is established, exterior repairs of the Indian Brook Bridge and blow-off chamber reconstruction would require in-stream work. Minor in-stream work is required to drill 24-inch holes in the bridge abutment for the new blow-off discharge pipes. The Blow-off Chambers are located below-ground adjacent to the stream. The larger replacement chambers would be similarly buried so there would be minimal change to streambank contours. Grading

activities would not increase impervious surface and would not alter runoff to Indian Brook. Upon completion of construction, temporarily disturbed areas would be restored to natural conditions and planted with native vegetation. Anticipated temporary and permanent disturbance to water resources was quantified based on the limits of construction and proposed work activities (see **Table 9.12-4**). Construction staging would occur on top of the aqueduct and the temporary stream diversion would extend into the stream for repairs to the access bridge and Indian Brook Bridge, resulting in approximately 3,000 square feet of temporary disturbance within Indian Brook. Approximately 4,700 square feet associated with State Protection of Waters buffers and 11,030 square feet associated with municipal water resource buffers would be temporarily affected due to staging. Approximately 460 square feet of permanent disturbance to Indian Brook would primarily be associated with rehabilitation of the access bridge. Access road improvement and upgrades and maintenance to the Blow-off Chambers would disturb approximately 8,250 square feet within State Protection of Waters buffers and 11,060 square feet within municipal water resource buffers. Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native vegetation. Permanent disturbance is further analyzed in Section 9.18, “Project-wide Impact Analysis.”

Table 9.12-4: Estimated Disturbance to Water Resources within the Indian Brook Road Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Indian Brook	5,160	3,000 <i>Temporary stream diversions and temporary downstream turbidity curtains for access bridge and Indian Brook Bridge</i>	460 <i>Construction activities associated with rehabilitation of the access bridge</i>
State Protection of Waters Buffer	22,760	4,700 <i>Construction staging area</i>	8,250 <i>Construction activities associated with rehabilitation of the access bridge, regrading following blow-off chamber reconstruction</i>
Water Resources Municipal Buffer	35,520	11,030 <i>Construction staging area</i>	11,060 <i>Construction activities associated with rehabilitation of the access bridge, regrading following blow-off chamber reconstruction</i>

The North Siphon Chamber, the South Siphon Chamber, and the Blow-off Chambers, have been identified as potential discharge points for treated wash water. Any wash water generated from the siphons would be treated to meet applicable discharge limits, water quality standards and/or other requirements for reuse in the removal operation, or for discharge back to the Catskill Aqueduct or to Indian Brook. No biofilm would be discharged to surface water. Treated wash water would be discharged at low flows that would not result in scour or other physical changes to the stream. In the event alum is added as part of the treatment process, flocculated particles would primarily settle prior to treated wash water being discharged to the stream. Given the short-term, temporary nature of the discharges (approximately 3 weeks), discharges to Indian

Brook are not anticipated to cause turbidity, scouring, inundate the receiving stream, or affect stream substrate.

This study area has also been identified for discharging raw aqueduct water while unwatering the aqueduct. Reconstructing the blow-offs requires the siphons to be unwatered, and this initial unwatering of the siphons would occur with temporary measures in place to protect the stream from erosion. Unwatering events to surface water would also occur at any time after stream protection measures are in place during and following construction and therefore are described in “Operation” below.

Operation

Upon completion of blow-off chamber repairs and streambank restoration and protection, the function of the Blow-off Chambers would be restored and discharges of raw water to Indian Brook could occur in the future during DEP’s typical operations. The aqueduct could be unwatered via the Blow-off Chambers to conduct maintenance or inspection. This is expected to be an infrequent event.

During unwatering events, new blow-off valves with larger discharge pipes would be operated to moderate discharge flows. This would result in discharges from each chamber of approximately 4,900 gpm at initial valve opening to a maximum flow of approximately 17,500 gpm when the valves are fully open. It would take approximately 30 minutes to unwater each Indian Brook Steel Pipe Siphon, for a total of approximately 2 hours of discharges. The Blow-off Chambers currently discharge through a 12-inch drainage pipe, which daylight through a concrete retaining wall several feet above the bank of the adjacent stream. Discharge velocity would be relatively low for over-stream configurations, and because the stream is characterized by a rocky terrain, no streambank improvements are proposed at this location.

An analysis was conducted to determine if the discharge associated with an unwatering event would be greater than the bankfull stream flow. Bankfull flow is the flow that just fills the channel to the top of its banks (i.e., stream capacity), and at the point in which water begins to flow onto the floodplain. Bankfull flow was predicted for Indian Brook using the USGS StreamStats Program. If the discharge associated with an unwatering event is greater than the bankfull flow, indirect downstream effects, such as an increase in erosion and scouring over the baseline could occur. The maximum discharge flows to Indian Brook would be approximately 105,900 gpm when the blow-offs discharge during a 1.5-year storm event. This is less than the calculated bankfull flow of Indian Brook of approximately 109,100 gpm, making it similar to baseline conditions. Therefore, indirect downstream impacts such as increases in erosion and scouring would be minimal.

Additionally, flows would be moderated by throttling the valves, and would be monitored by an on-site crew to prevent the receiving stream from becoming inundated by discharges of raw water. In the event that inundation begins to occur during unwatering, the on-site crew would have the ability to cease unwatering at any time to allow streamflows to subside to baseline conditions. Therefore, the proposed raw water discharges would be short-term and temporary in nature (up to 2 hours total), are not anticipated to cause scouring, and would not result in a bankfull event or alter stream capacity of Indian Brook.

Alterations to the two bridges, while minor, may result in changes to the base flood elevation of Indian Brook. Therefore, a hydrologic and hydraulics analysis would be completed to assess the collective effect of these activities and verify any potential changes to base flood elevations. DEP would coordinate with the Town of Philipstown and FEMA, as necessary, to ensure all local and federal requirements pertaining to floodplain management are satisfied. The minor encroachment on the floodplain would not displace a significant portion of the cross-sectional area of the stream, and would not result in greater than a 1 foot rise in base flood elevations.

Water Resources Conclusions

Water resources in the natural resources study area are limited to Indian Brook, which is adjacent to the Indian Brook Bridge and Blow-off Chambers. While the majority of the work activities would result in temporary disturbance, minor permanent disturbance would occur as part of the access bridge repairs and blow-off chamber reconstruction. The access bridge and Indian Brook Bridge would be properly stabilized, bringing these structures to current design standards. Treated biofilm wash water would be discharged over the course of 3 weeks during the third 10-week shutdown. Permanent in-stream disturbance would result from repairs to the existing access bridge, needed to access the aqueduct. Additionally, streambank disturbance would entail upgrades to existing infrastructure and would be limited to a small area that would be revegetated. Therefore, there would be no long-term impacts to water resources. Given that permanent disturbance would result from maintenance and upgrades to the existing Blow-off Chambers and limited to a small portion of the streambank, there would therefore be minimal effects to water resources.

DEP would coordinate with the Town of Philipstown and FEMA, as necessary to ensure all local and federal requirements pertaining to floodplain management are satisfied.

Discharges, to conduct maintenance and inspection, would be limited to raw aqueduct unwatering events. These would be infrequent and last several hours in duration. Restoring the historic function of the blow-offs to discharge raw aqueduct water would be a change in baseline conditions. However, based on the above analysis, there would be minimal indirect effects to water resources.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Indian Brook Road Study Area.

Terrestrial Resources

Based on the tree survey conducted on August 10, 2015, the natural resources study area is primarily composed of a successional southern hardwood forest within the aqueduct right-of-way and mowed lawn. A hemlock-northern hardwood forest community is also adjacent to the aqueduct at the Indian Brook Bridge. Tree species in the southern hardwood forest include red maple (*Acer rubrum*), sweet birch (*Betula lenta*), black cherry (*Prunus serotina*), black locust (*Robinia pseudoacacia*), red oak (*Quercus rubra*), hickory (*Carya* spp.), and sugar maple (*Acer saccharum*). Shrubs include Japanese barberry (*Berberis thunbergii*) and blackberry (*Rubus* L.). The herbaceous layer includes New York ironweed (*Vernonia noveboracensis*), milkweed (*Asclepias syriaca*), Christmas fern (*Polystichum acrostichoides*), Japanese stiltgrass (*Microstegium vimineum*), and New England aster (*Aster novae-angliae*). Tree species in the

hemlock-northern hardwood forest include sugar maple, eastern hemlock (*Tsuga canadensis*), tuliptree (*Liriodendron tulipifera*), sweet birch, and American beech (*Fagus grandifolia*). The understory includes American beech saplings, Christmas fern, and lady fern (*Athyrium filix-femina*).

The area of hemlock-northern hardwood forest observed during the site visit is not mapped as a significant natural community by the NYNHP. Although the Town of Philipstown regulates tree removal (Philipstown Town Code Chapter 159: Timber Harvesting and Forest Management), areas of 40,000 square feet or less in size on any lot, or from a contiguous area of 2 acres or less in size on adjacent lots, are exempt. While tree removal may be an exempt activity, terrestrial resources within the study area warrant an analysis.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Indian Brook Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would include minor tree clearing and shrub removal for the purpose of improving site access and staging areas. A total of ~~three~~ 16 trees consisting of ~~two~~ six species with a range of average diameter at breast height (dbh) of between ~~4~~ 3 and ~~13~~ 18.5 inches may be removed to establish staging areas to the east of the Indian Brook Bridge. The ~~two~~ six species of trees to be removed include ~~one~~ five red maple ~~and~~ ~~two~~ seven sugar maple, one eastern hemlock, one Norway maple (*Acer platanoides*), one pignut hickory (*Carya glabra*), and one tuliptree. Tree removal would occur in discrete locations and would not dramatically change the character of the area or affect surrounding trees. All tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Additionally, tree removal would be conducted in accordance with applicable requirements set forth by the Town of Philipstown. Minor brush removal would occur along the access road from Moog Road to the North Siphon Chamber to improve access and clearance for construction equipment at the boathole.

Following construction, all equipment would be removed from the study area, and staging areas would be restored to natural conditions. Vegetated areas temporarily cleared during construction are anticipated to grow back with similar communities and natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time. Following the repair and rehabilitation within the natural resources study area, operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Indian Brook Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, "Natural

Resources,” as having the potential to be affected by activities within the natural resources study area. Species that could be affected within the study area and could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” 10 species were identified as having the potential to occur in the study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these 10 species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.12-5**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and observations during field visits, as applicable.

Table 9.12-5: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Indian Brook Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 9, 2014 and August 10, 2015. Potential habitat exists within the adjacent deciduous forest and within adjacent open grassy areas. Work activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, as a highly mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites. Finally, upon construction completion, the staging areas and most permanently disturbed areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Fence Lizard	<i>Sceloporus undulates</i>	Unlisted	Threatened	No individuals were incidentally observed during the field visits on October 9, 2014 and August 10, 2015. According to NYNHP, no records of fence lizards were identified within 1.5 miles of the study area. The cleared area surrounding the Indian Brook Steel Pipe Siphon could be used for basking. Temporary effects to basking habitat is possible. However, upon completion of the repair and rehabilitation, the staging areas would be restored to natural conditions and the new boathole is not anticipated to affect basking habitat. Therefore, there are no effects anticipated and no further analysis for fence lizards is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 9, 2014, and August 10, 2015. Potential habitat exists within the adjacent forest and mowed lawn areas. However, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Upon construction completion, the staging areas would be restored to natural conditions and the new boathole that remains would not affect potential habitat. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No

Table 9.12-5: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Indian Brook Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Timber Rattlesnake	<i>Crotalus horridus</i>	Unlisted	Threatened	No individuals were incidentally observed during the field visits on October 9, 2014 and August 10, 2015. According to NYNHP, no records of timber rattlesnakes were identified within 1.5 miles of the study area. The cleared area surrounding the Indian Brook Steel Pipe Siphon could be used for basking. Temporary effects to basking habitat is possible. However, upon completion of the repair and rehabilitation, the staging areas would be restored to natural conditions and the new boathole is not anticipated to affect basking habitat. Therefore, there are no effects anticipated and no further analysis for timber rattlesnakes is warranted for this study area.	No
Wood Turtle	<i>Glyptemys insculpta</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 9, 2014 and August 10, 2015. Potential habitat exists within the adjacent deciduous forest, riparian areas, and in-stream habitat. However, work activities would be largely confined to DEP facilities and previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Perimeter silt fencing would also help prevent individuals from entering study area during construction. Limited in-stream disturbance would be needed to rehabilitate the access bridge and reconstruct the Blow-off Chambers and Indian Brook Bridge. Any natural, gradually sloping streambank habitat would be restored to natural conditions following construction. Therefore, there are no effects anticipated and no further analysis for wood turtles is warranted for this study area.	No
Common Wormsnake	<i>Carphophis amoenus</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 9, 2014 and August 10, 2015. Repair activities may temporarily affect man-made basking habitats. Potential habitat exists within the forested and mowed lawn areas. However, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Upon construction completion, the staging areas would be restored to natural conditions and the new boathole that remains would not affect potential habitat. Therefore, there are no effects anticipated and no further analysis for common wormsnares is warranted for this study area.	No

Table 9.12-5: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Indian Brook Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Birds					
Bald Eagle	<i>Haliaeetus leucocephalus</i>	BGPA/MBTA	Threatened	NYNHP identified the nearest nest to be approximately 1,500 feet from the work sites, well beyond the USFWS and DEP buffer restriction of 330 and 660 feet, respectively. No impacts to eagle nesting, roosting, or foraging habitat is likely. Therefore, there are no effects anticipated and no further analysis for Bald Eagles is warranted for this study area.	No
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	A summer habitat survey was conducted August 10, 2015 and no bats were incidentally observed. There is no planned removal of potential bat roosting trees. Indian Brook provides potential foraging habitat. However, repair activities would result in minor, permanent fill within Indian Brook. Given that this would be limited to a small portion of the streambank, it would not adversely affect bat foraging within the study area. Therefore, there are no effects anticipated and no further analysis for Indiana bats is warranted for this study area.	No
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened Unlisted	A summer habitat survey was conducted August 10, 2015 and no bats were incidentally observed. There is no planned removal of potential bat roosting trees. Indian Brook Bridge is shaded and is likely not suitable roosting habitat. Prior to construction, DEP would inspect the Indian Brook Bridge and access bridge prior to working to verify whether there are any roosting bats. Indian Brook provides potential foraging habitat. However, repair activities would result in minor, permanent fill within Indian Brook. Given that this would be limited to a small portion of the streambank, it would not adversely affect bat foraging within the study area. Therefore, there are no effects anticipated and no further analysis for northern long-eared bats is warranted for this study area.	No
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	No suitable cottontail habitat was identified and no individuals were incidentally observed within the study area during presence/absence survey conducted on August 10, 2015 and no individuals were incidentally observed. Therefore, there are no effects anticipated and no further analysis for New England cottontails is warranted for this study area.	No
Notes: BGPA: Bald and Golden Eagle Protection Act MBTA: Migratory Bird Treaty Act					

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*), eastern fence lizards (*Sceloporus undulatus*), eastern hognose snakes (*Heterodon platyrhinos*), timber rattlesnakes (*Crotalus horridus*), wood turtles (*Glyptemys insculpta*), common wormsnares (*Carphophis amoenus*), Bald Eagles (*Haliaeetus leucocephalus*), Indiana bats, northern long-eared bats, or New England cottontails (*Sylvilagus transitionalis*) associated with the repair and rehabilitation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Indian Brook Road Study Area.

9.12.3.7 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Indian Brook Road Study Area, a Phase I Environmental Site Assessment (ESA) was conducted in general conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Practice E 1527-13 and City Environmental Quality Review (CEQR) requirements to identify Recognized Environmental Conditions (RECs). The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a geotechnical investigation and environmental health and safety sampling, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Geotechnical environmental investigations and sampling were undertaken for contaminants of concern including asbestos, lead, volatile and semivolatile organics, polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons along the aqueduct within the study area. Chromium was noted in the soil sampling results. Total Chromium was reported in the sample collected at the Indian Brook Steel Pipe North Siphon Chamber. Chromium concentrations, however, were consistent over a widespread sampling area and are more likely associated with background concentrations. Along the Catskill Aqueduct, there are widespread occurrences of chromium, which are attributed to existing geological formations. The legacy data also revealed that lead-containing paint is present on the door, gate valve, walls, and hoist of the North Siphon Chamber. Materials sampled did not identify asbestos-containing materials, PCB-containing paint or mercury-containing paint. Gasoline range organics were not detected in the samples. Total petroleum hydrocarbons were detected, but at low concentrations that are not considered to be indicative of contamination that warrants remedial or actions.

Based on the results of the environmental investigations completed within the Indian Brook Road Study Area, no other hazardous materials are known to exist. The soil results support the reuse of excavated materials associated with the boathole installation and blow-off chamber reconstruction as backfill and do not suggest the need for special management, handling or health and safety measures at this time.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Indian Brook Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Indian Brook Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. DEP would handle all materials in accordance with applicable federal, State, and local regulations and guidelines. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, excavation associated with the work activities for the installation of a new boathole and blow-off chamber reconstruction would occur on previously disturbed soils. Following repair and rehabilitation, all equipment and chemical storage would be removed from the Indian Brook Road Study Area. The staging areas would be restored, and operation of the repaired and rehabilitated Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Indian Brook Road Study Area.

9.12.3.8 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Indian Brook Road Study Area.

Access to the repair and rehabilitation limits of construction for the work sites within the Indian Brook Road Study Area would be via Moog Road, Indian Brook Road, and Avery Road (see **Figure 9.12-2**). Each of these are two-lane, two-way local roadways. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Indian Brook Road Study Area. There is no public transportation and little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site. However, there are no DEP employees who work at or visit the study area on a daily basis, and the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Indian Brook Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Indian Brook Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and, therefore, be the basis of this transportation analysis. Of these activities, local staging and access improvements would generate the most vehicle trips. Local staging and access improvements would occur in summer ~~2019~~2018 between the hours of 8 AM and sunset, Monday through Friday for approximately 4 weeks.

In the future with the repair and rehabilitation, construction vehicles would travel along Moog Road, Indian Brook Road, and Avery Road to DEP property. The estimated number of peak-day one-way vehicle trips associated with local staging and access improvements off Indian Brook Road is 27 vehicles, or approximately 54 peak-day vehicle round trips that would travel to and from the study area. Approximately 16 vehicle round trips or 16 Passenger Car Equivalents (PCEs), would be workers either traveling to and from the study area or traveling directly to and from the staging area (depending on parking capacity), with potentially 4 daily shuttle trips between the study area and the staging area. The remaining approximately 34 peak-day vehicle round trips (73 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with local staging and access improvements is approximately 27 peak-hour vehicle trip ends (48 PCEs). This includes approximately 8 vehicle trip ends (8 PCEs) from workers traveling directly to and from the staging area, approximately 2 peak-hour shuttle trips between the study area and the staging area, and approximately 17 vehicle trip ends (38 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 10-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 48 peak-hour PCEs along Indian Brook Road, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, “Transportation.” The work activities at the Indian Brook Road Study Area would be short-term (totaling 25 weeks over 1.5 years; see **Table 9.12-2**) and would not generate public parking or transportation demands or pedestrian activity within the Indian Brook Road Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Indian Brook Road Study Area.

9.12.3.9 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation within the Indian Brook Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation activities as shown on **Figure 9.12-10**.

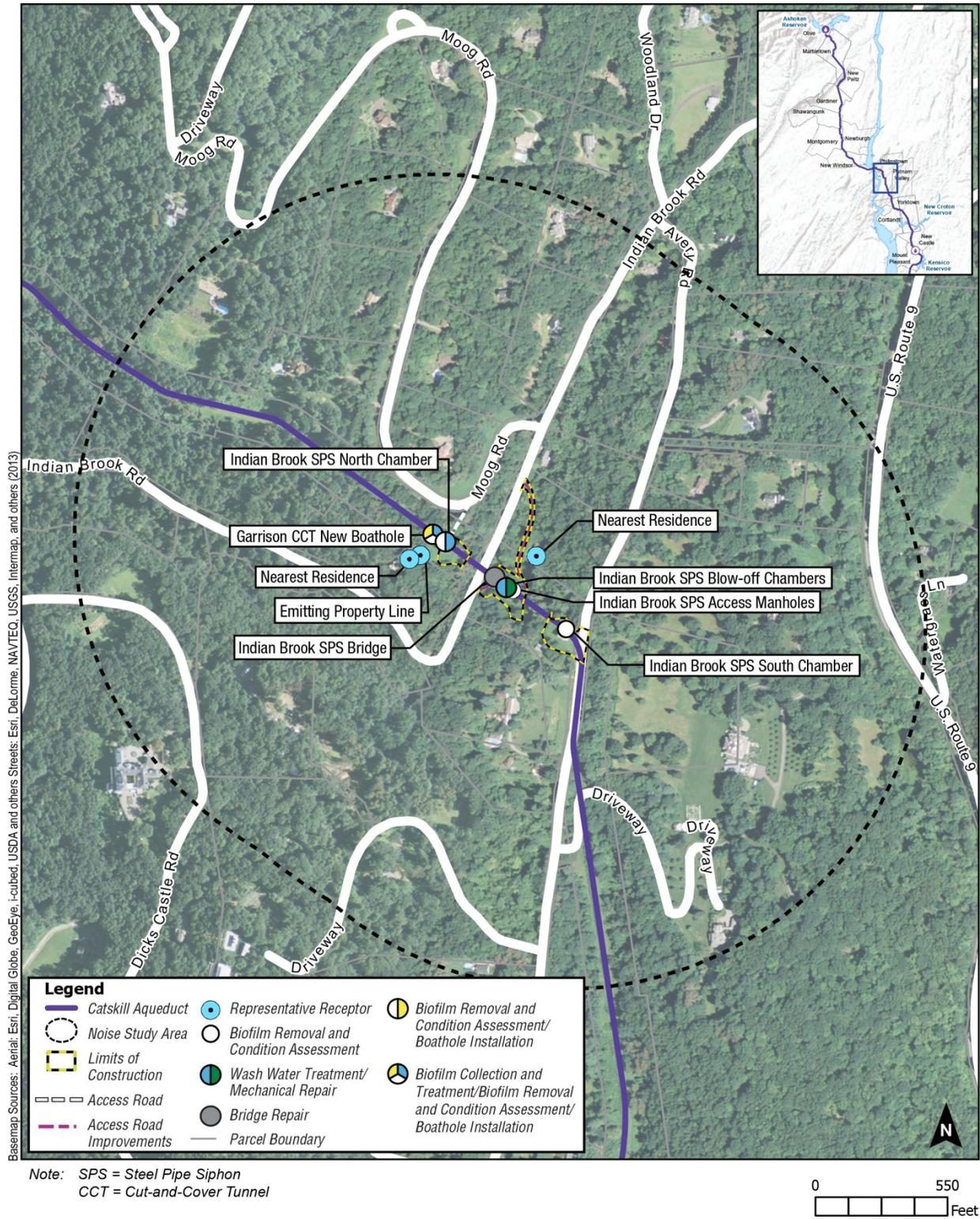


Figure 9.12-10: Noise – Indian Brook Road Study Area



The Indian Brook Road Noise Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise code. The study area is subject to the Town of Philipstown Noise Control Law §175-40(C) which states noise levels at the emitting property line shall not exceed 50 dBA between 7 AM and 8 PM, 40 dBA between 8 PM and 7 AM, or 5 decibels above the ambient noise at the point on the boundary of the lot where measured, whichever is greater. However, construction noise between 8 AM and sunset, Monday through Friday is exempt.

Existing ambient noise levels within the Indian Brook Road Study Area are influenced by vehicular traffic traveling on U.S. Route 9, Indian Brook Road, Avery Road, and other local roadways. The existing noise levels within the study area are comparable to a quiet suburban residential environment based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Indian Brook Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Indian Brook Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Indian Brook Road Study Area would occur at three sites. The stationary noise-generating equipment that would be used within the Indian Brook Road Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with the boathole installation would produce the most noise at the emitting property line, and the stationary noise-generating equipment associated with the blow-off chamber reconstruction would produce the most noise at the nearest residence. Boathole installation would occur in fall ~~2019~~2018 between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the second 10-week shutdown. Blow-off chamber reconstruction would occur in summer ~~2019~~2018 between the hours of 8 AM and sunset, Monday through Friday for approximately 9 weeks prior to the second 10-week shutdown. Work conducted while the aqueduct is in service would be adjusted to comply with allowable work hours per town noise codes. The boathole installation work hours cannot be modified because of the limited time to complete work activities during the 10-week shutdown (see **Table 9.12-2**).

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the boathole installation and blow-off chamber reconstruction. Associated equipment reference noise levels are shown in **Table 9.12-6**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.12-6: Stationary Source Construction Equipment Modeled at the Indian Brook Road Study Area – Noise Analysis and Reference Noise Levels (L_{eq})

Equipment Type	Reference Noise Level (L _{eq}) at 50 feet (dBA)
Boathole Installation	
Crane	77
Generator	82
Concrete Mixer Truck	81
Blow-off Chamber Reconstruction	
Ventilation Fan	85
Generator	82
Dozer	81
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	

Table 9.12-7 shows the results of the stationary construction noise analysis. The Town of Philipstown limits daytime and nighttime noise at the emitting property line. Therefore, noise levels at the emitting property line were calculated for comparison with the applicable noise limit. However, the nearest noise-sensitive receptor is a residence approximately 150 feet away from the work activities. Boathole installation within the Indian Brook Road Study Area during the repair and rehabilitation would produce a noise level (L_{eq}) of approximately 76 dBA at the nearest residence. Blow-off chamber reconstruction would produce a noise level (L_{eq}) of approximately 77 dBA at the nearest residence. However, this work would occur during hours that are exempt by the Town of Philipstown. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities. However, this equipment would not be expected to be louder than those associated with boathole installation and blow-off chamber reconstruction. Since the repair and rehabilitation within the Indian Brook Road Study Area would emit noise levels greater than allowed by the Town of Philipstown noise code, DEP would work with the Town of Philipstown, as appropriate.

Following completion of the repair and rehabilitation work activities, the construction equipment and vehicles would be removed from the Indian Brook Road Study Area. The repair and rehabilitation work activities would be temporary in nature. Peak work activities would occur during boathole installation in fall ~~2019~~2018 and blow-off chamber reconstruction in summer ~~2019~~2018 for limited periods (e.g., up to 9 weeks, per activity).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Indian Brook Road Study Area.

Table 9.12-7: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors within the Indian Brook Road Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)	Town of Philipstown Noise Limit (dBA)	Potential for Code Exceedance (Yes or No)
Boathole Installation (7 AM to 7 PM, 7 days a week)				
Emitting Property Line	104	79	50 ^{1, 2}	Yes
Nearest Residence	147	76	NA	NA
Blow-off Chamber Reconstruction (8 AM to sunset, Monday through Friday)				
Nearest Residence	176	77	NA	NA
Notes:				
NA = Not Applicable				
¹ Daytime noise limit is applicable between the hours of 7 AM and 8 PM.				
² The Town of Philipstown has a separate nighttime noise limit that is applicable between the hours of 8 PM and 7 AM. Activity is not anticipated during these hours.				

9.12.3.10 Neighborhood Character

The character of the Indian Brook Road Study Area is largely defined by a mix of residential, public services (Catskill Aqueduct), and vacant land uses and its physical setting within a rural location (see **Figure 9.12-5**). The Catskill Aqueduct traverses the study area in a general northwest to southeast direction, bending towards the south at Avery Road. In addition to Avery Road, which crosses the eastern portion of the study area, the study area is traversed by Indian Brook and Indian Brook Road, which parallel each other from north to south. Moog Road connects to Indian Brook Road in the northern portion of the study area. Limits of construction for all the work sites are located within a public services corridor with grassy cover, which is owned and maintained by DEP. Access to the North Siphon Chamber would be provided via an access off Moog Road. Access to the Indian Brook Bridge, Blow-off Chambers, and access manholes would be via Indian Brook Road to a private drive and across a privately owned bridge. Access to the South Siphon Chamber would be provided directly from Avery Road.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP’s understanding that no changes in land use and no new projects or structures are anticipated within the Indian Brook Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, “Neighborhood Character,” there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for open space and recreation and historic and cultural resources, an impact analysis for the Indian Brook Road Study Area is not warranted, as discussed in the following sections: Section 9.3.6, “Open Space and Recreation,” and Section 9.3.7, “Historic and Cultural Resources.” As described in Section 9.12.3.3, “Land Use and Zoning,” Section 9.12.3.4, “Socioeconomic Conditions,” and Section 9.12.3.5, “Visual Resources,” the work activities

would not affect land use and zoning; socioeconomic conditions; or visual resources in the Indian Brook Road Study Area. Furthermore, the public policy impact analysis provided in Section 9.12.2, “Town of Philipstown Impact Analysis,” concluded the work activities were consistent with applicable plans.

As described in Sections 9.12.3.8, “Transportation,” and 9.12.3.9, “Noise,” during construction, the work activities in the Indian Brook Road Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Indian Brook Road Study Area.

9.12.4 OLD ALBANY POST ROAD STUDY AREA IMPACT ANALYSIS

Within the Old Albany Post Study Area, the aqueduct consists of the Continentalville Cut-and-Cover Tunnel, which transitions to the Sprout Brook Steel Pipe Siphon at the Sprout Brook Steel Pipe Siphon North Chamber (North Siphon Chamber) (see **Figure 9.12-11**).

Work activities within the Old Albany Post Road Study Area would include: staging and access improvements; boathole preparation and installation; biofilm removal and condition assessment; and small-scale wash water treatment.

9.12.4.1 Study Area Location and Description

The Old Albany Post Road Study Area is located along the upper Catskill Aqueduct in the Town of Philipstown. The Catskill Aqueduct traverses the study area in a general north to south direction. An unnamed tributary to Canopus Creek intersects the northwest quadrant of the study area and parallels its western boundary flowing south. Old Albany Post Road traverses the length of the study area, and Sprout Brook Road is located just to the south. The proposed work sites within the study area are located at the entrance off Old Albany Post Road and at the North Siphon Chamber, accessible by driving south over the cut-and-cover tunnel from Old Albany.

The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work sites. **Figure 9.12-11** shows an aerial photograph of the study area, including the path of the aqueduct, and the location of the limits of construction for the work sites. **Figure 9.12-12** shows photographs of the North Siphon Chamber within the study area.

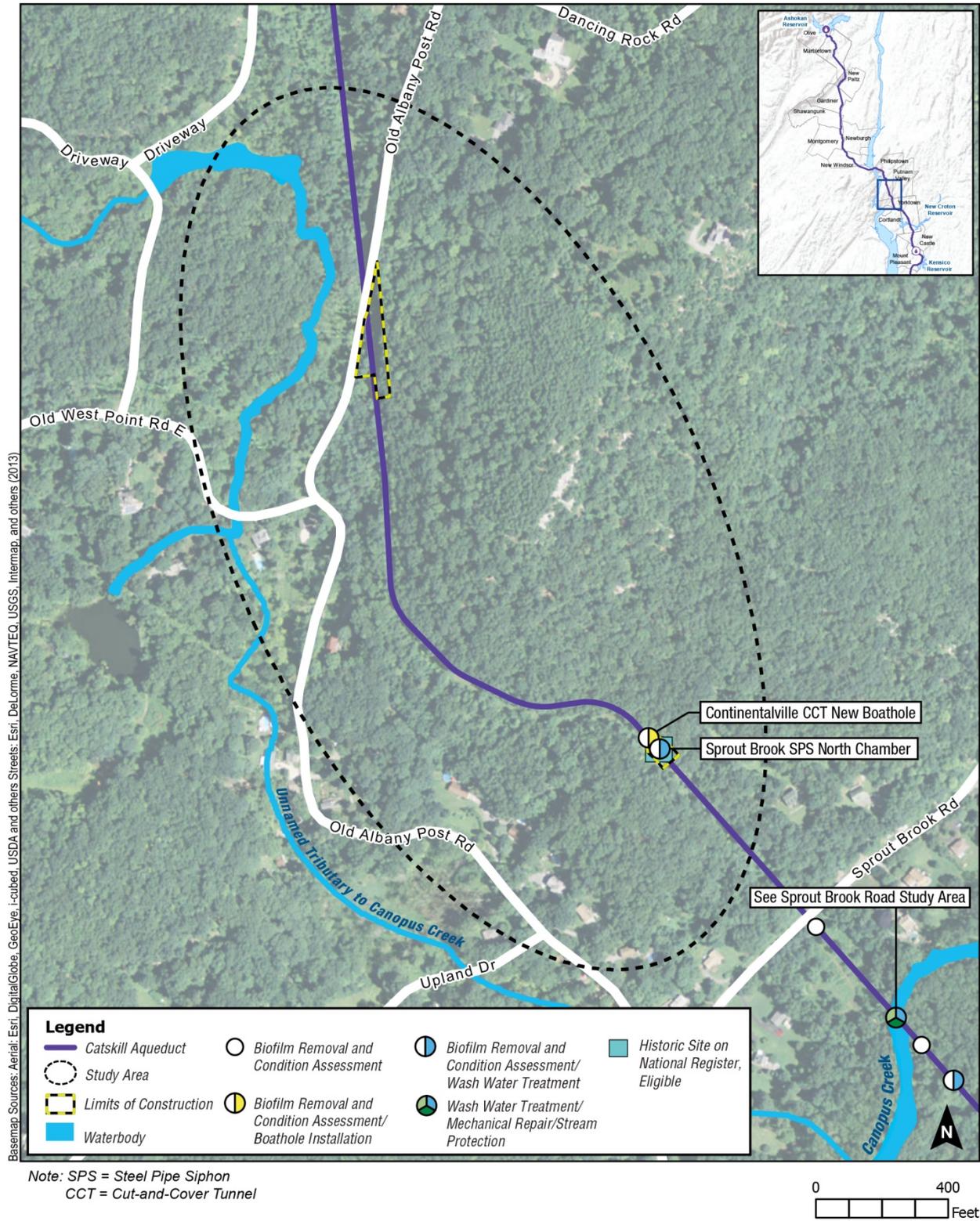


Figure 9.12-11: Study Area – Old Albany Post Road





Photograph 1: Looking north from the Sprout Brook Steel Pipe Siphon North Chamber at the location of the new boathole.



Photograph 2: Looking south from the Sprout Brook Steel Pipe Siphon North Chamber from the location of the new boathole.

Figure 9.12-12: Photographs – Old Albany Post Road Study Area



The study area consists of residential, community facilities, and public services land uses, with several vacant parcels. The limits of construction for the work sites and associated staging areas are located within a public services corridor with grassy cover, which is owned and maintained by DEP and separated from adjacent land by a forested area. **Figure 9.12-13** shows a map of the land uses in the study area and its surroundings.

Zoning within the Old Albany Post Road Study Area is primarily rural residential (RR), with a small area in the southwest within suburban residential (SR) zoning, and a small area in the northwest within institutional conservation (IC) zoning, each designated by the Town of Philipstown Zoning Code (see **Figure 9.12-14**). The Catskill Aqueduct is a permitted use as a public utility facility within the rural residential (RR) zoning district, which provides for low-density residential uses in a rural setting.

Old Albany Post Road is listed on the National Register of Historic Places. Starting at its intersection with Sprout Brook Road, Old Albany Post Road traverses through the study area as it extends north for 6.6 miles. Additionally, the South Siphon Chamber is eligible for listing on the National Register of Historic Places. There are no other federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

9.12.4.2 Proposed Activities within the Old Albany Post Road Study Area

To support activities within the Old Albany Post Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas would provide additional parking, and equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. Site plans showing layouts of the limits of construction for the work sites, which would occupy a total of 0.6 acre, are shown on **Figure 9.12-15** and **Figure 9.12-16**. The schedule for work within the study area is shown in **Table 9.12-8**. The duration of active construction within the Old Albany Post Road Study Area is estimated to total 10 weeks over 1.5 years.

Work within the study area would begin with staging and access improvements in summer 2019~~2018~~. In addition to underbrush clearing and gravel placement for leveling and erosion control, the grading of approximately 4,200 square feet would be required at the entrance off Old Albany Post Road. This would facilitate loading and unloading of heavy equipment restricted from traveling over the cut-and-cover tunnel. All grading would occur on DEP property.

Following the staging and access improvements, preparation of the new boathole would occur in summer 2019~~2018~~. The work would consist of the excavation of approximately 45 cubic yards of soil and construction of a cast-in-place concrete collar. Boathole installation, which requires unwatering of the aqueduct to tie into the crown of the cut-and-cover tunnel, would take place during the second 10-week shutdown in fall 2019~~2018~~.

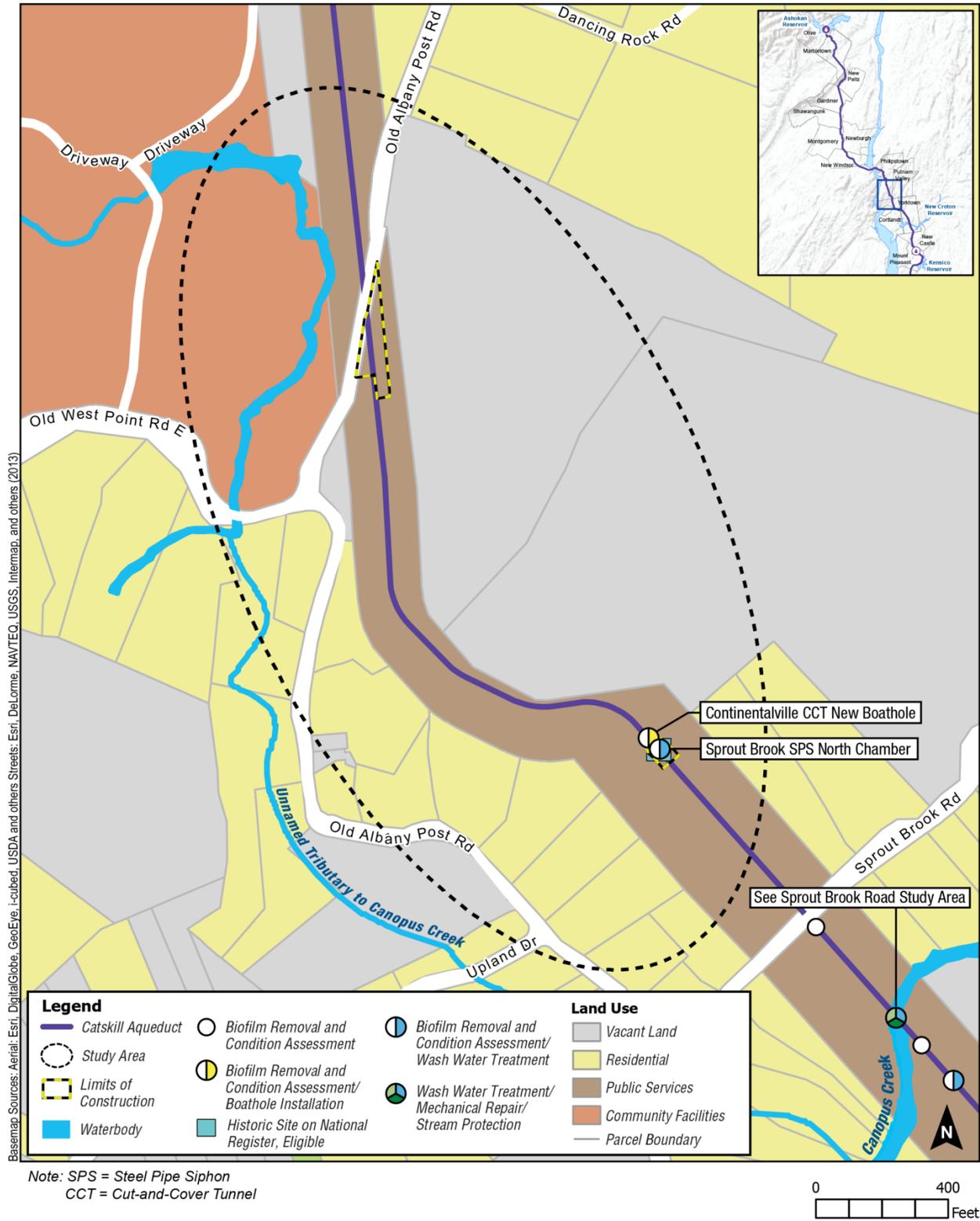


Figure 9.12-13: Land Use – Old Albany Post Road Study Area



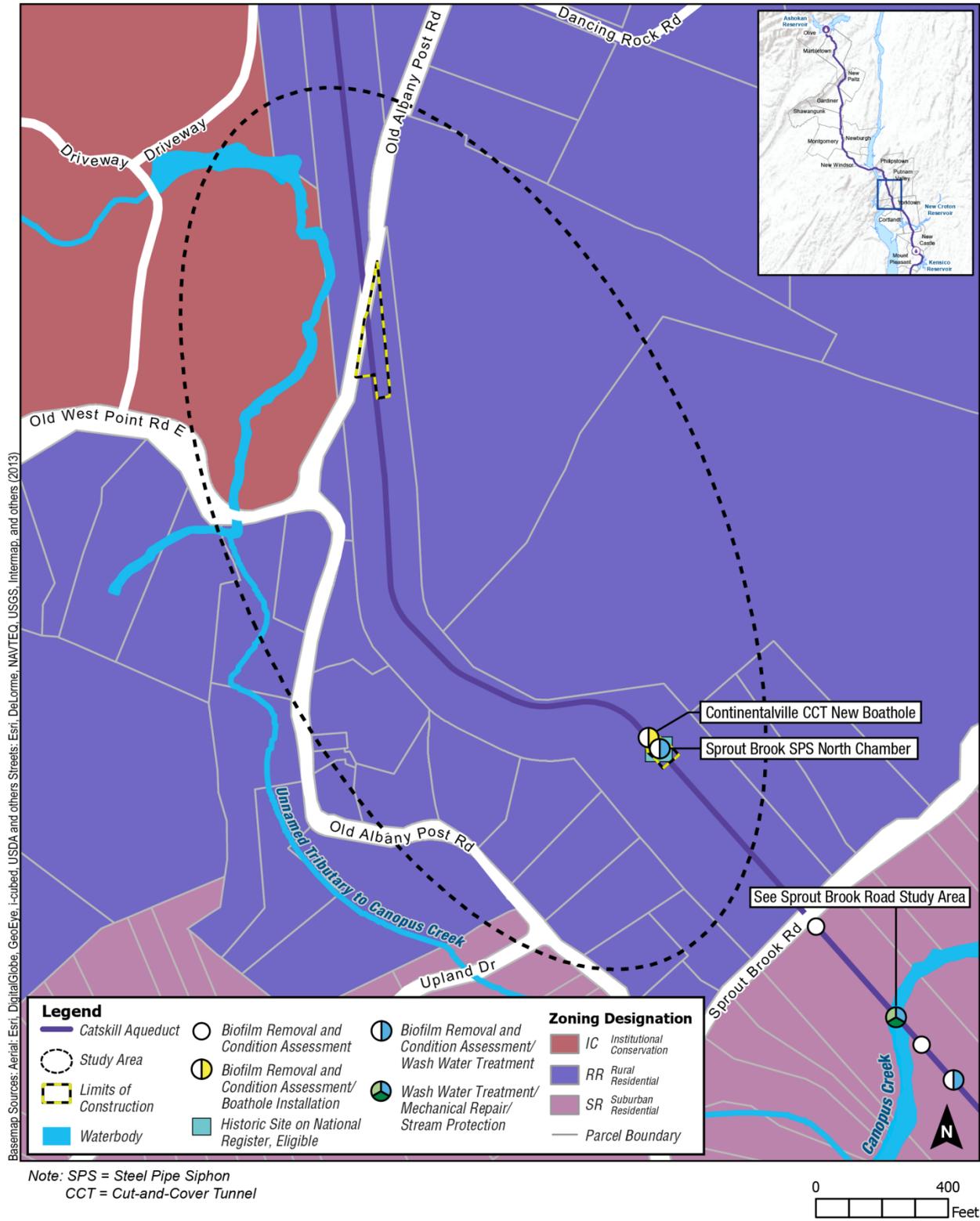


Figure 9.12-14: Zoning – Old Albany Post Road Study Area



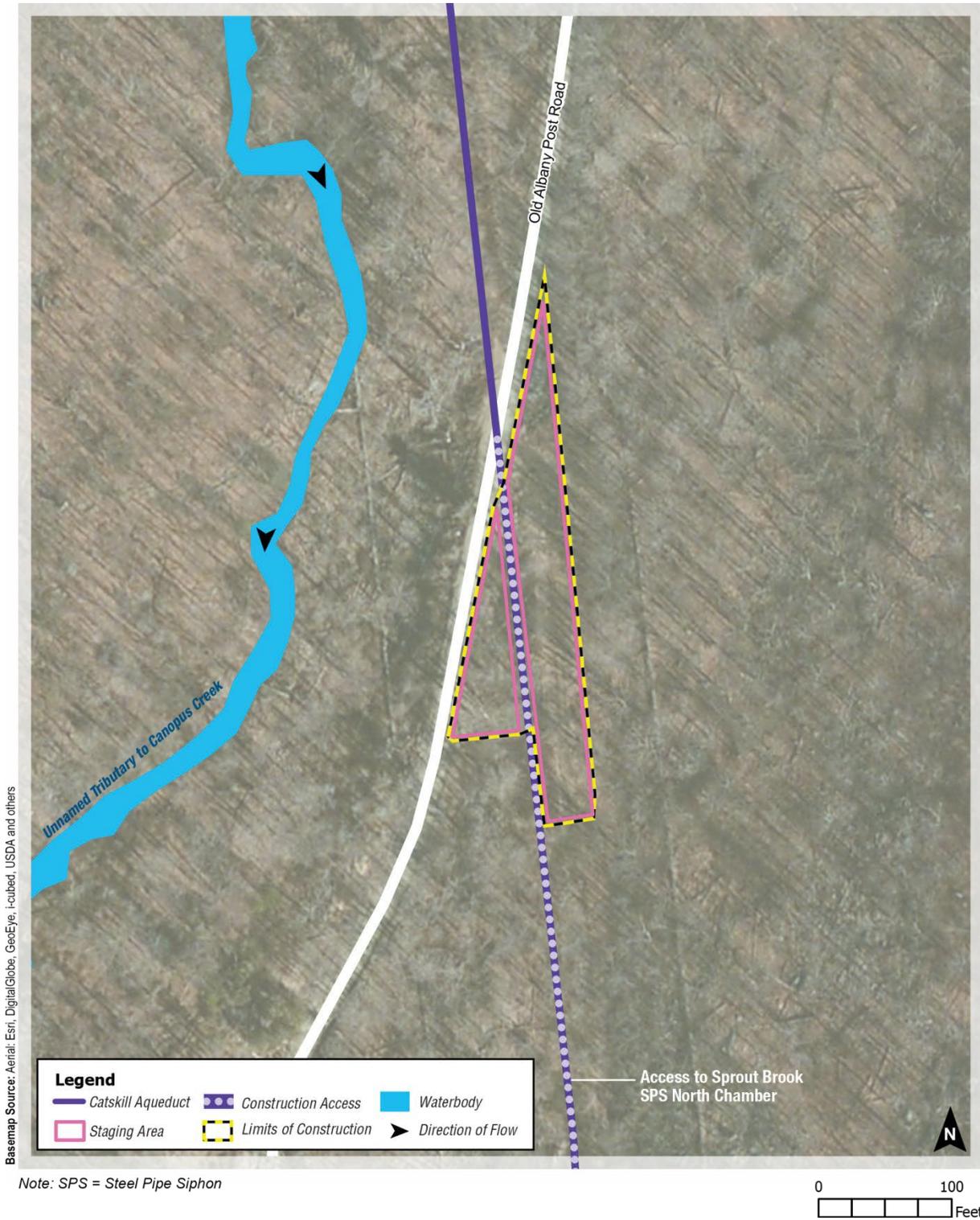


Figure 9.12-15: Site Plan for Entrance off Old Albany Post Road – Old Albany Post Road Study Area



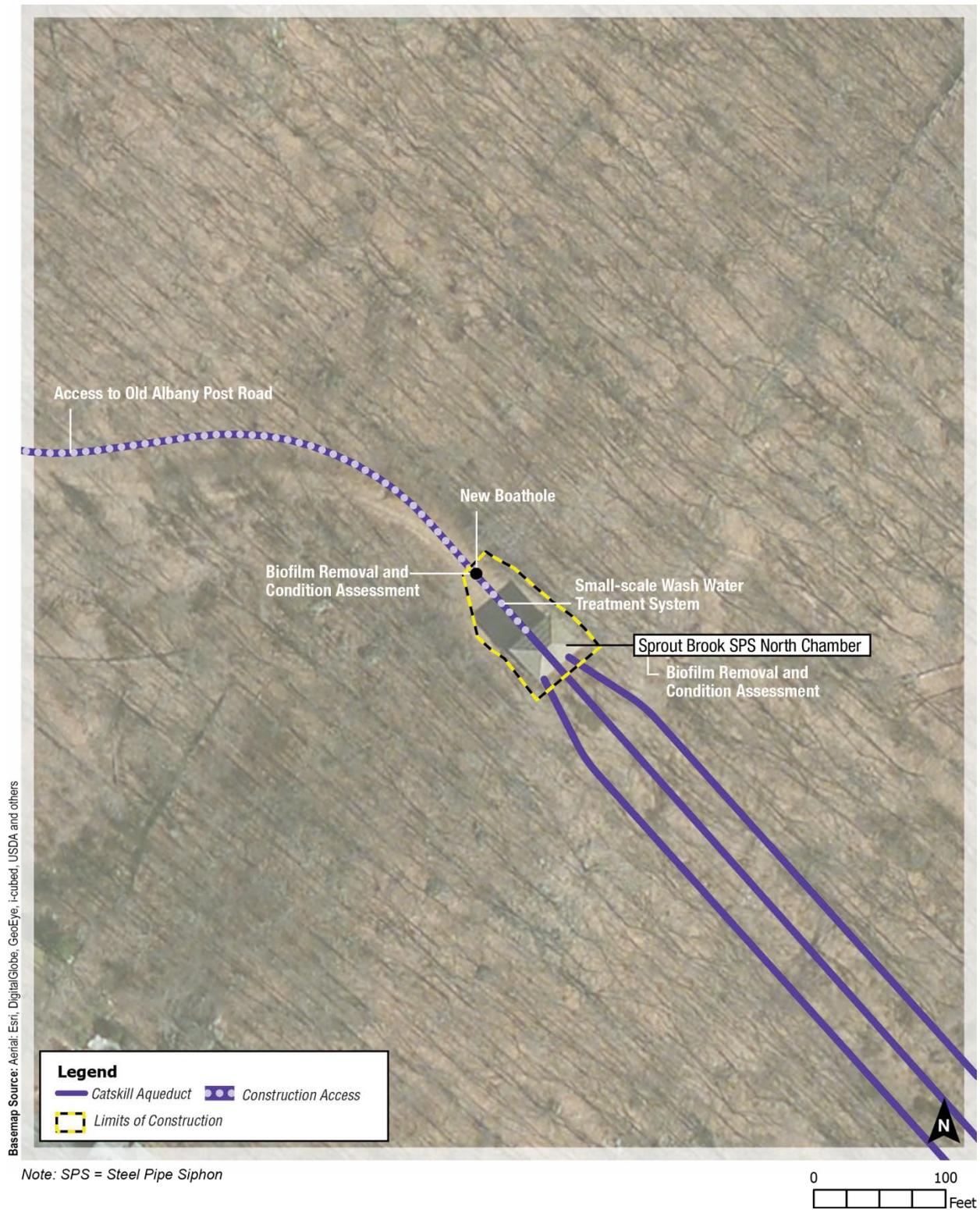


Figure 9.12-16: Site Plan for Sprout Brook SPS North Chamber – Old Albany Post Road Study Area



Table 9.12-8: Schedule of Work Activities within the Old Albany Post Road Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Staging and Access Improvements	Summer 2019 2018	2 weeks	Monday to Friday, 8 AM to sunset	8
Boathole Preparation	Summer 2019 2018	3 weeks	Monday to Friday, 8AM to sunset	10
Boathole Installation	Fall 2019 2018 (Second 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	8
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	Fall 2020 2019 (Third 10-week shutdown)	3 weeks	7 days a week, 7 AM to 7 PM	21
Notes:				
¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per the Town of Philipstown Noise Control Law §175-40.				
² Crew size refers to the number of people anticipated at the work site(s).				

Biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019, with access into the aqueduct provided by the new boathole and the North Siphon Chamber. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Potential treatment locations include the North Siphon Chamber, at which a small-scale wash water treatment system could be established. Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Old Albany Post Road Study Area are presented in Section 9.12.4.3, “Historic and Cultural Resources” through Section 9.12.4.9, “Neighborhood Character,” and include historic and cultural resources; visual resources; natural resources including federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.12.2, “Town of Philipstown Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” an impact analysis related to land use and zoning; socioeconomic conditions; community facilities and services; open space and recreation; the remaining natural resources subcategories, including geology and soils, water resources, aquatic and benthic resources, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area is not warranted. Finally, impacts related to project-wide natural resources, water and

sewer infrastructure, and public health were analyzed within Section 9.18, “Project-wide Impact Analysis.”

9.12.4.3 Historic and Cultural Resources

As shown on **Figure 9.12-17**, one site listed on the National Register of Historic Places: Old Albany Post Road (NR Number 90NR02363), is located within the Old Albany Post Road Study Area. A review of the State Historic Preservation Office (SHPO) GIS database indicates that approximately 0.6 mile of the 6.6-mile long dirt road of Old Albany Post Road traverses north to south within the Old Albany Post Road Study Area.

In the future without the repair and rehabilitation, it is assumed that historic and cultural resources within the Old Albany Post Road Study Area would be the same as baseline conditions.

The new boathole would not be located within Old Albany Post Road, although it would be located within a densely forested portion of the Old Albany Post Road Study Area. A temporary staging area would be located along Old Albany Post Road at the road crossing. Although the work would not include any clearing of trees, shrubs and underbrush would be removed and the roadside area regraded. All grading and clearing of shrubs and underbrush would occur on DEP property, with no grading or clearing to occur on Old Albany Post Road. Another temporary staging area would be established at the boathole, and no clearing or ground disturbance would be needed.

The Old Albany Post Road Study Area has the potential to contain archeological resources. Areas of previous disturbance associated with construction of the Catskill Aqueduct were identified and compared to the potential for ground disturbance within the Old Albany Post Road Study Area to determine if the repair and rehabilitation could affect archeological resources. The Old Albany Post Road Study Area is located in an area with the potential to contain archeological resources, although all work activities are located within the areas of previous soil disturbance. Following SHPO’s review of the repair and rehabilitation work activities, SHPO concluded in letters dated April 17, 2015 and July 6, 2015, that there were no concerns regarding potential impacts to historic or archeological resources associated with the repair and rehabilitation work activities within the study area, and no additional archeological investigations are necessary.

Following completion of the repair and rehabilitation work activities, construction equipment would be removed from the Old Albany Post Road Study Area and staging areas would be restored to baseline conditions. Construction would not affect Old Albany Post Road. The new boathole would be a permanent structure that would remain following construction. It is not located along Old Albany Post Road. Following the repair and rehabilitation within the Old Albany Post Road Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not affect historical and cultural resources.

Therefore, although there is one site within the Old Albany Post Road Study Area listed on the National Register of Historic Places, the repair and rehabilitation would not result in significant adverse impacts to historic and cultural resources within the Old Albany Post Road Study Area.

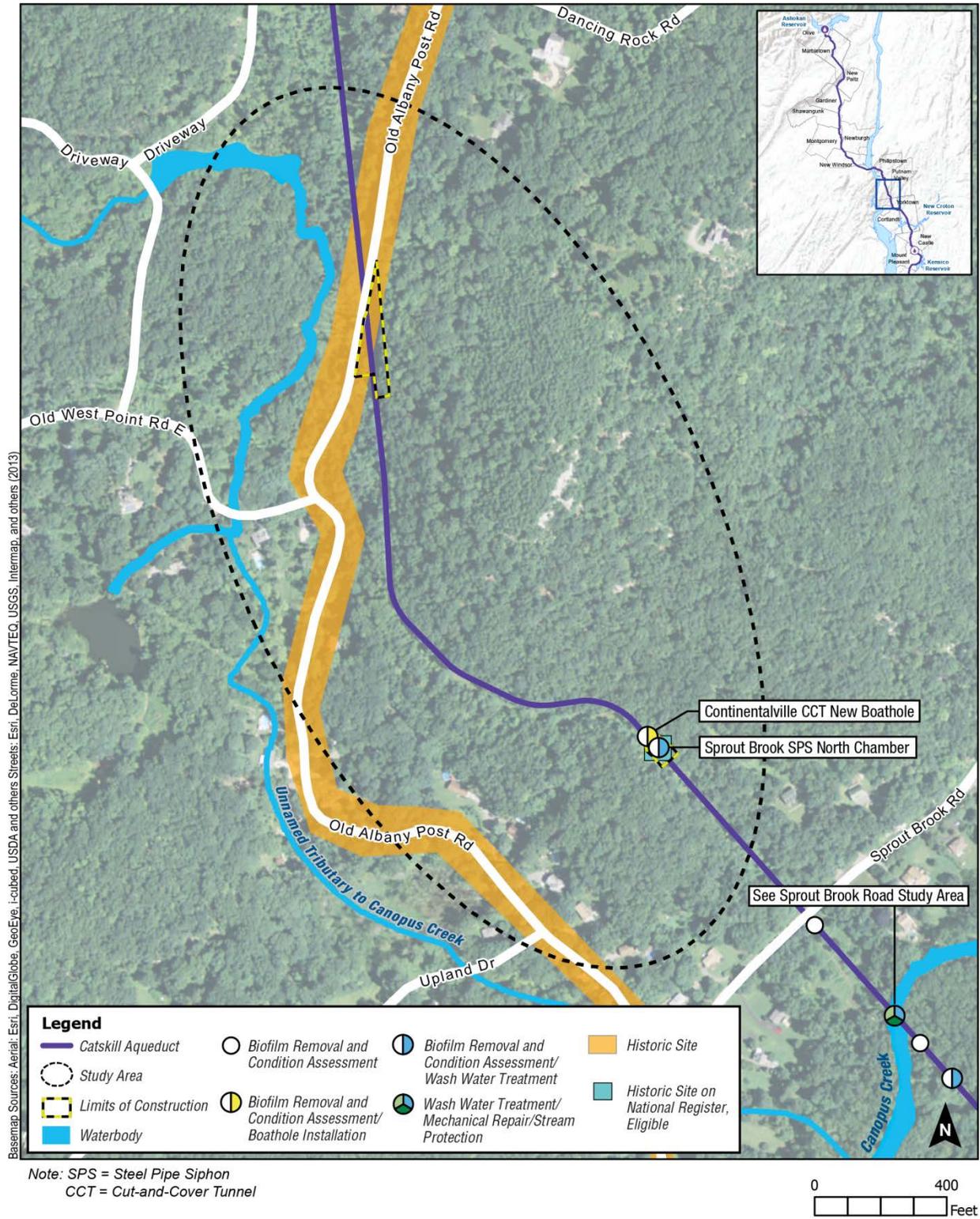


Figure 9.12-17: Historic and Cultural Resources – Old Albany Post Road Study Area



9.12.4.4 Visual Resources

The study area for the visual resources analysis is the area within the Old Albany Post Road Study Area. It also includes view corridors that extend beyond based on the locations that are publicly accessible.

As shown on **Figure 9.12-17**, two visual resources, consisting of one site listed on the National Register of Historic Places, Old Albany Post Road, and one site eligible for listing on the National Register of Historic Places, Sprout Brook North Siphon Chamber, were identified within the Old Albany Post Road Study Area.

As noted, approximately 0.6 mile of the 6.6-mile long Old Albany Post Road travels north to south within the Old Albany Post Road Study Area. However, the North Siphon Chamber and the boathole would not be located along Old Albany Post Road, and would be within a densely forested portion of the Old Albany Post Road Study Area. There are no views of the Sprout Brook Steel Pipe Siphon North Chamber from any portion of Old Albany Post Road. The siphon chamber is not visible from surrounding roadways, as it is located in a forested area with no public access.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Old Albany Post Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Old Albany Post Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would be short-term (intermittently over 1.5 years; see **Table 9.12-8**) and would not affect visual resources within the Old Albany Post Road Study Area. A temporary staging area would be located along Old Albany Post Road at the road crossing. Although it would not require any clearing of trees, shrubs and underbrush would be removed and the roadside area regraded. However, all grading and clearing of shrubs and underbrush would occur on DEP property, with no grading or clearing on Old Albany Post Road. The North Siphon Chamber is a DEP-owned structure associated with the Catskill Aqueduct. As noted in Section 9.3.7, "Historic and Cultural Resources," there would be no changes to the siphon chamber structure, as all work would be internal.

Following construction, all equipment would be removed from the Old Albany Post Road Study Area and staging areas would be restored to baseline conditions. The new boathole at the North Siphon Chamber would be a permanent structure and would remain following construction. Following the repair and rehabilitation within the Old Albany Post Road Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not result in changes to the future visual and aesthetic resource conditions of the views from Old Albany Post Road or the Sprout Brook North Siphon Chamber.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Old Albany Post Road Study Area.

9.12.4.5 Natural Resources

The study area for the natural resources analysis is the immediate area surrounding the limits of construction, including the entrance off Old Albany Post Road (see **Figure 9.12-18**). Another section of the natural resources study area located at the North Siphon Chamber corresponds to the limits of construction (see **Figure 9.12-16**). These two sections are collectively referred to as the natural resources study area.

Based on a field visit conducted on August 10, 2015, the ecological communities in the natural resources study area are characterized by a seasonally mowed roadside/pathway surrounded by a young upland deciduous forest. Similar communities are anticipated to occur at the North Siphon Chamber based on a desktop analysis. These habitats have the potential to support protected wildlife species. Therefore, analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

No water resources were identified proximate to the North Siphon Chamber or proposed staging areas along the easterly shoulder of Old Albany Post Road.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. Species that could be affected, and that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” eight species were identified as having the potential to occur in the study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these eight species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.12-9**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and observations from field visits, as applicable.

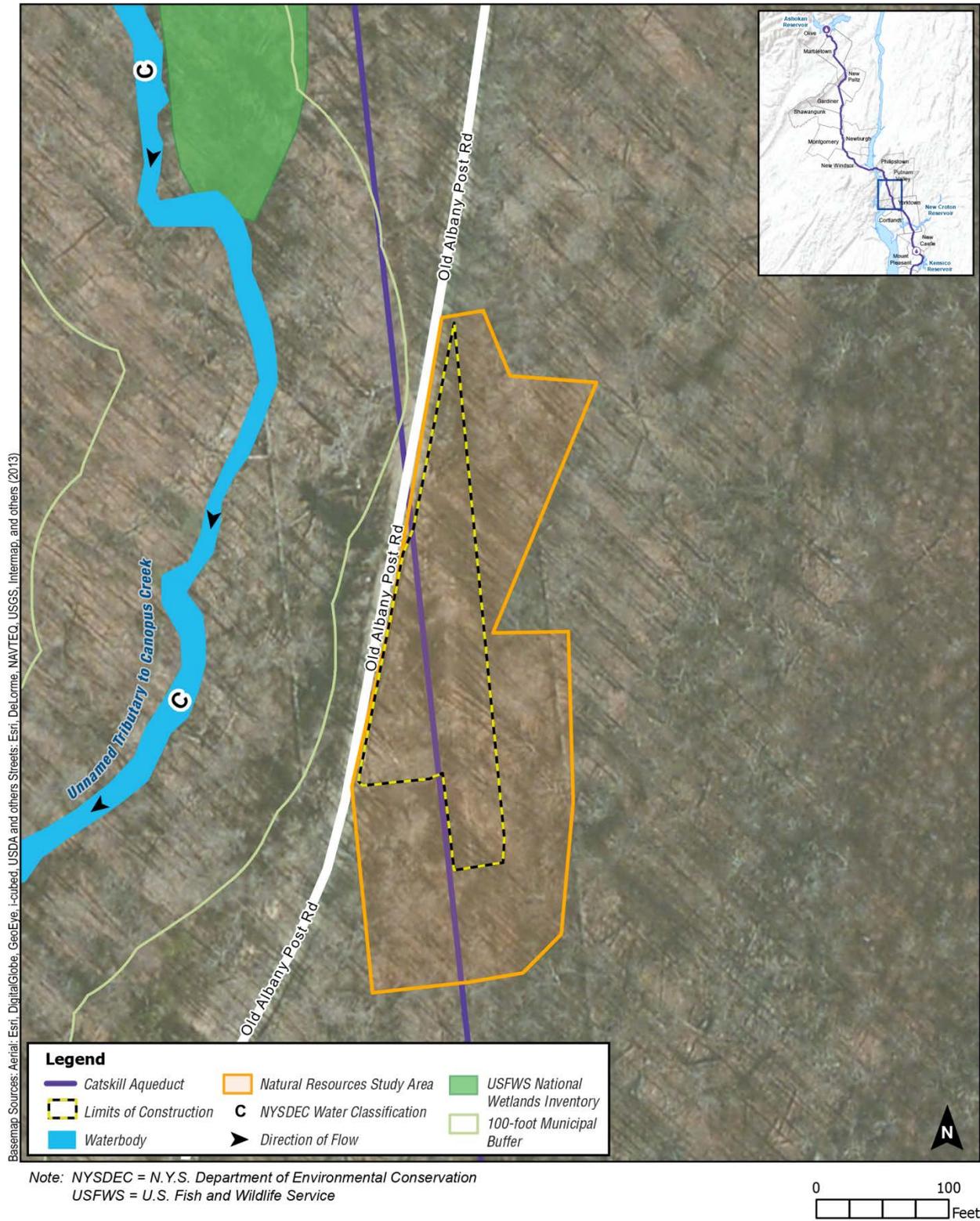


Figure 9.12-18: Natural Resources – Old Albany Post Road Study Area



Table 9.12-9: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Old Albany Post Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visit on August 10, 2015. Work activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, as a highly mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites. Finally, upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Fence Lizard	<i>Sceloporus undulates</i>	Unlisted	Threatened	No individuals were incidentally observed during the field visit on August 10, 2015. According to NYNHP, no records of fence lizards were identified within 1.5 miles of the study area. The open areas with sun exposure within the study area could be used for basking. Temporary effects to basking habitat is possible. However, upon completion of the repair and rehabilitation, the staging areas would be restored to natural conditions and the new boathole is not anticipated to affect basking habitat. Therefore, there are no effects anticipated and no further analysis for fence lizards is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visit on August 10, 2015. Permanent disturbance would be limited to areas previously disturbed. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Upon construction completion, sites would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No
Timber Rattlesnake	<i>Crotalus horridus</i>	Unlisted	Threatened	No individuals were incidentally observed during the field visit on August 10, 2015. According to NYNHP, no records of timber rattlesnakes were identified within 1.5 miles of the study area. The open areas with sun exposure within the study area could be used for basking. Temporary effects to basking habitat is possible. However, upon completion of the repair and rehabilitation, the staging areas would be restored to natural conditions and the new boathole is not anticipated to affect basking habitat. Therefore, there are no effects anticipated and no further analysis for timber rattlesnakes is warranted for this study area.	No

Table 9.12-9: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Old Albany Post Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Wood Turtle	<i>Glyptemys insculpta</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visit on August 10, 2015. Work activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, any wood turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites. Finally, upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for wood turtles is warranted for this study area.	No
Common Wormsnake	<i>Carphophis amoenus</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visit on August 10, 2015. Work activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, any common wormsnakes that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat. Finally, upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for common wormsnakes is warranted for this study area.	No
Mammals					
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	No suitable habitat or evidence of individuals existing in the study area was observed during the presence/absence survey. Therefore, there are no effects anticipated and no further analysis for New England cottontails is warranted for this study area.	No
Plants					
Woodland Agrimony	<i>Agrimonia rostellata</i>	Unlisted	Threatened	No suitable habitat or evidence of individuals existing in the study area was observed during the presence/absence surveys on August 10, 2015. Therefore, there are no effects anticipated and no further analysis for woodland agrimony is warranted for this study area.	No

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*), eastern fence lizards (*Sceloporus undulatus*), eastern hognose snakes (*Heterodon platyrhinos*), timber rattlesnakes (*Crotalus horridus*), wood turtles (*Glyptemys insculpta*), common wormsnares (*Carphophis amoenus*), New England cottontails (*Myotis septentrionalis*), or woodland agrimony (*Agrimonia rostellata*) associated with the repair and rehabilitation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Old Albany Post Road Study Area.

9.12.4.6 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Old Albany Post Road Study Area, a Phase I ESA was conducted in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify RECs. The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a geotechnical investigation and environmental health and safety sampling, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Geotechnical environmental investigations and sampling were undertaken for contaminants of concern including asbestos, lead, volatile and semivolatile organics, PCBs, and total petroleum hydrocarbons along the aqueduct within the study area. Chromium was noted in the soil sampling results. Total chromium was reported in the sample collected at the Sprout Brook North Siphon Chamber. Chromium concentrations, however, were consistent over a widespread sampling area and are more likely associated with background concentrations. Along the Catskill Aqueduct, there are widespread occurrences of chromium, which are attributed to existing geological formations. The legacy data also revealed that lead-containing paint was present on the front door, gate valve, and hoist. Additionally, PCB-containing paint was identified to be present on the front door of the North Siphon Chamber. Materials sampled did not identify asbestos-containing materials or mercury-containing paint. In addition, gasoline range organic compounds and total petroleum hydrocarbons were also detected, but at low concentrations that are not considered to be indicative of contamination that warrants remedial actions.

Based on the results of the environmental investigations completed within the Old Albany Post Road Study Area, no other hazardous materials are known to exist. The soil results support the reuse of excavated materials associated with the boathole installation as backfill and do not suggest the need for special management, handling or health and safety measures at this time.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the

environment are anticipated within the Old Albany Post Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Old Albany Post Road Study Area would be the same as baseline conditions.

Repair and rehabilitation work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. DEP would handle all materials in accordance with applicable federal, State, and local regulations and guidelines. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, excavation associated with the work activities for staging and access improvements and the installation of a new boathole would occur on previously disturbed soils. Following repair and rehabilitation, all equipment and chemical storage would be removed from the Old Albany Post Road Study Area. The staging areas would be restored to baseline conditions. Operation of the repaired and rehabilitated Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Old Albany Post Road Study Area.

9.12.4.7 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Old Albany Post Road Study Area.

Access to the repair and rehabilitation limits of construction for the work sites within the Old Albany Post Road Study Area would be via Old Albany Post Road (see **Figure 9.12-11**). Old Albany Post Road is a two-lane, two-way major collector roadway south of Old West Point Road East, and a two-lane, two-way minor collector roadway north of Old West Point Road East. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Old Albany Post Road Study Area. There is no public transportation and little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the sites; however, there are no DEP employees who work at or visit the study area on a daily basis, and the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Old Albany Post Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Old Albany Post Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and, therefore, be the basis of this transportation analysis. Of these activities, biofilm removal and condition assessment would generate the most vehicle trips. Biofilm removal and condition assessment would occur in fall ~~2020~~2019 between the hours of 7 AM and 7 PM, 7 days a week for approximately 3 weeks during the third 10-week shutdown.

In the future with the repair and rehabilitation, construction vehicles would travel along Old Albany Post Road. The estimated number of peak-day one-way vehicle trips associated with the biofilm removal and condition assessment is 33 vehicles, or approximately 66 peak-day vehicle round trips that would travel to and from the study area. The majority of the peak daily vehicle round trips, approximately 42 vehicle round trips or 42 PCEs, would be workers traveling directly to and from the staging area, with an additional 8 daily shuttle trips between the study area and the staging area. The remaining approximately 16 peak-day vehicle round trips (21 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with biofilm removal and condition assessment is approximately 33 peak-hour vehicle trip ends (36 PCEs). This includes approximately 21 vehicle trip ends (21 PCEs) from workers traveling directly to and from the staging area, approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 8 vehicle trip ends (11 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 12-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 36 peak-hour PCEs along Old Albany Post Road, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, "Transportation." The work activities at the Old Albany Post Road Study Area would be short-term (totaling 10 weeks over 1.5 years; see **Table 9.12-8**) and would not generate public parking or transportation demands or pedestrian activity within the Old Albany Post Road Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Old Albany Post Road Study Area.

9.12.4.8 Noise

As described in Section 9.3.15, "Noise," mobile noise associated with the repair and rehabilitation within the Old Albany Post Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation activities shown on **Figure 9.12-19**.

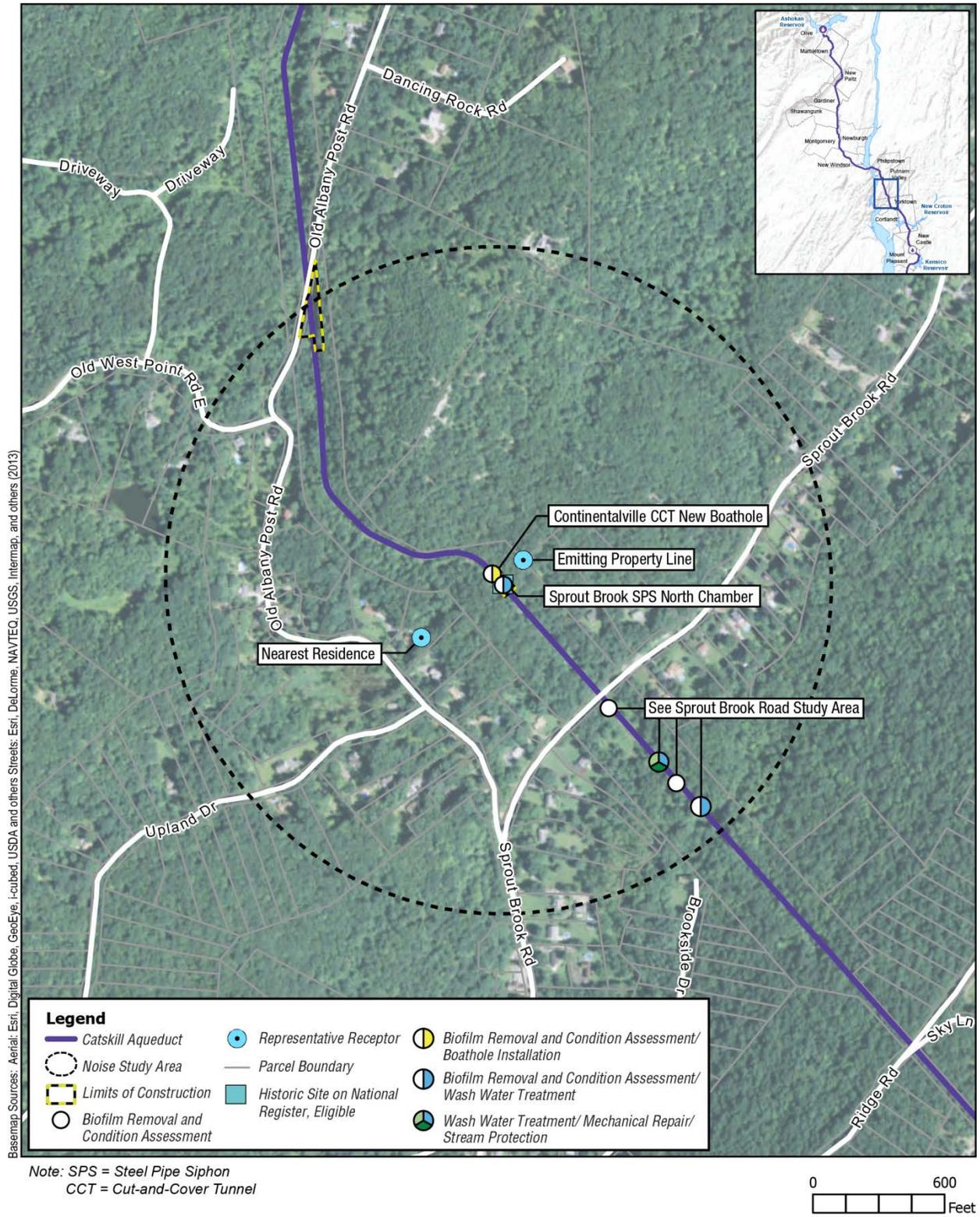


Figure 9.12-19: Noise – Old Albany Post Road Study Area



The Old Albany Post Road Noise Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise code. The study areas are subject to the Town of Philipstown Noise Control Law §175-40(C) which states noise levels at the emitting property line shall not exceed 50 dBA between 7 AM and 8 PM, 40 dBA between 8 PM and 7 AM, or 5 decibels above the ambient noise at the point on the boundary of the lot where measured, whichever is greater. However construction noise between 8 AM and sunset, Monday through Friday is exempt.

Existing ambient noise levels within the Old Albany Post Road Study Area are influenced by vehicular traffic traveling on Old Albany Post Road, Sprout Brook Road, and other nearby local roads. The existing noise levels within the study area are comparable to a quiet suburban residential environment, based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Old Albany Post Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Old Albany Post Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Old Albany Post Road Study Area would occur at one site. The stationary noise-generating equipment that would be used within the Old Albany Post Road Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with boathole installation would emit the most noise. Boathole installation would occur in fall ~~2019~~2018 between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the second 10-week shutdown (see **Table 9.12-8**).

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for boathole installation. Associated equipment reference noise levels are shown in **Table 9.12-10**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.12-10: Stationary Source Construction Equipment Modeled at the Old Albany Post Road Study Area – Noise Analysis and Reference Noise Levels (L_{eq})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA)
Concrete Mixer Truck	81
Crane	77
Generator	82
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	

Table 9.12-11 shows the results of the stationary construction noise analysis. The Town of Philipstown limits daytime and nighttime noise at the emitting property line. Therefore, noise levels at the emitting property line were calculated for comparison with the applicable noise limit. However, the nearest noise-sensitive receptor is a residence approximately 435 feet away from the work activities. Boathole installation within the Old Albany Post Road Study Area during the repair and rehabilitation would produce a noise level (L_{eq}) of approximately 66 dBA at the nearest residence. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities. However, this equipment would not be expected to be louder than those associated with boathole installation. Since the repair and rehabilitation within the Old Albany Post Road Study Area would emit noise levels greater than allowed by the Town of Philipstown noise code, DEP would work with the Town of Philipstown as appropriate.

Table 9.12-11: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors within the Old Albany Post Road Study Area

Location	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)	Town of Philipstown Noise Limit (dBA)	Potential for Exceedance (Yes or No)
Emitting Property Line	149	76	50 ^{1,2}	Yes
Nearest Residence	435	66	NA	NA
Notes: NA = Not Applicable ¹ Daytime noise limit is applicable between the hours of 7 AM and 8 PM. ² The Town of Philipstown has a separate nighttime noise limit that is applicable between the hours of 8 PM and 7 AM. Activity is not anticipated during these hours.				

Following completion of the repair and rehabilitation work activities, the construction equipment and vehicles would be removed from the Old Albany Post Road Study Area. The repair and rehabilitation work activities would be temporary in nature with peak work activities that would occur only during daytime hours for boathole installation in fall ~~2019~~2018 for a limited period (e.g., 2 weeks).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Old Albany Post Road Study Area.

9.12.4.9 Neighborhood Character

The character of the Old Albany Post Road Study Area is largely defined by a mix of residential, community facilities, vacant parcels, and public services land uses and its physical setting within a rural location (see **Figure 9.12-13**). The Catskill Aqueduct traverses the study area in a general north to south direction. An unnamed tributary to Canopus Creek intersects the northwest quadrant of the study area and parallels its western boundary flowing south. Old Albany Post Road traverses the length of the study area, and Sprout Brook Road is located just to the south. The limits of construction for the work sites and associated staging areas are located within a public services corridor with grassy cover, which is owned and maintained by DEP and separated from adjacent land by a forested area.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Old Albany Post Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; and open space and recreation, an impact analysis for the Old Albany Post Road Study Area is not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," Section 9.3.4, "Socioeconomic Conditions," and Section 9.3.6, "Open Space and Recreation," respectively. As described in Section 9.12.4.3, "Historic and Cultural Resources," and Section 9.12.4.4, "Visual Resources," the work activities would not affect historic and cultural resources and visual resources in the Old Albany Post Road Study Area. Furthermore, the public policy impact analysis provided in Section 9.12.2, "Town of Philipstown Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.12.4.7, "Transportation," and 9.12.4.8, "Noise," during construction, the repair and rehabilitation work activities in the Old Albany Post Road Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area, and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Old Albany Post Road Study Area.

9.12.5 SPROUT BROOK ROAD STUDY AREA IMPACT ANALYSIS

Within the Sprout Brook Road Study Area, the aqueduct begins as the Sprout Brook Steel Pipe Siphon, transitioning to the Cat Hill Grade Tunnel at the Sprout Brook Steel Pipe Siphon South Chamber (South Siphon Chamber). In the middle portion of the study area, on the south bank of Canopus Creek, the steel pipe siphon includes three under-stream blow-offs and associated valves within the Sprout Brook Steel Pipe Siphon Blow-off Chambers (Blow-off Chambers). Two sets of access manholes are also located within the study area (see **Figure 9.12-20**).

Work activities within the Sprout Brook Road Study Area would include: staging and access improvements; blow-off chamber reconstruction and associated streambank restoration and protection; biofilm removal and condition assessment; and small-scale wash water treatment.

9.12.5.1 Study Area Location and Description

The Sprout Brook Road Study Area is located along the upper Catskill Aqueduct within the Town of Philipstown. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. The study area is bounded by Ridge Road to the south and traversed in its upper portion by Sprout Brook Road. Canopus Creek crosses the study area flowing from northeast to southwest, and an unnamed tributary to the creek enters the study area from the west.

Proposed work sites within the study area include the entrance off Sprout Brook Road, the area surrounding the Blow-off Chambers, and the South Siphon Chamber. Access to the access manholes would be provided directly from Sprout Brook Road. The Blow-off Chambers would be accessed by an access road that passes over an existing box culvert at Canopus Creek. Access to the South Siphon Chamber would be provided by an access road that connects to Ridge Road. **Figure 9.12-20** shows an aerial photograph of the study area, including the path of the aqueduct, the limits of construction for the work site, and the proposed access routes. **Figure 9.12-21** shows photographs of a proposed staging area and blow-off chamber within the study area.

The study area consists largely of residential, public services, and vacant land uses. The limits of construction for the work sites are located in a public services corridor with grassy cover, which is owned and maintained by DEP. **Figure 9.12-22** shows a map of the land uses in the study area and its surroundings.

Zoning in the study area is primarily rural residential (RR) and suburban residential (SR), with the southeast portion containing single-family residential (R80, R10), as designated by the Town of Philipstown Zoning Code (see **Figure 9.12-23**). Rural residential (RR) zoning provides for low-density residential uses in a rural setting, while suburban residential (SR) zoning provides for a limited amount of suburban growth. The Catskill Aqueduct is a permitted use as a public utility facility within the rural residential (RR) and suburban residential (SR) zoning districts.

There are no federal, State, or local designated landmarks, historic districts, or known archaeological resources within the study area.

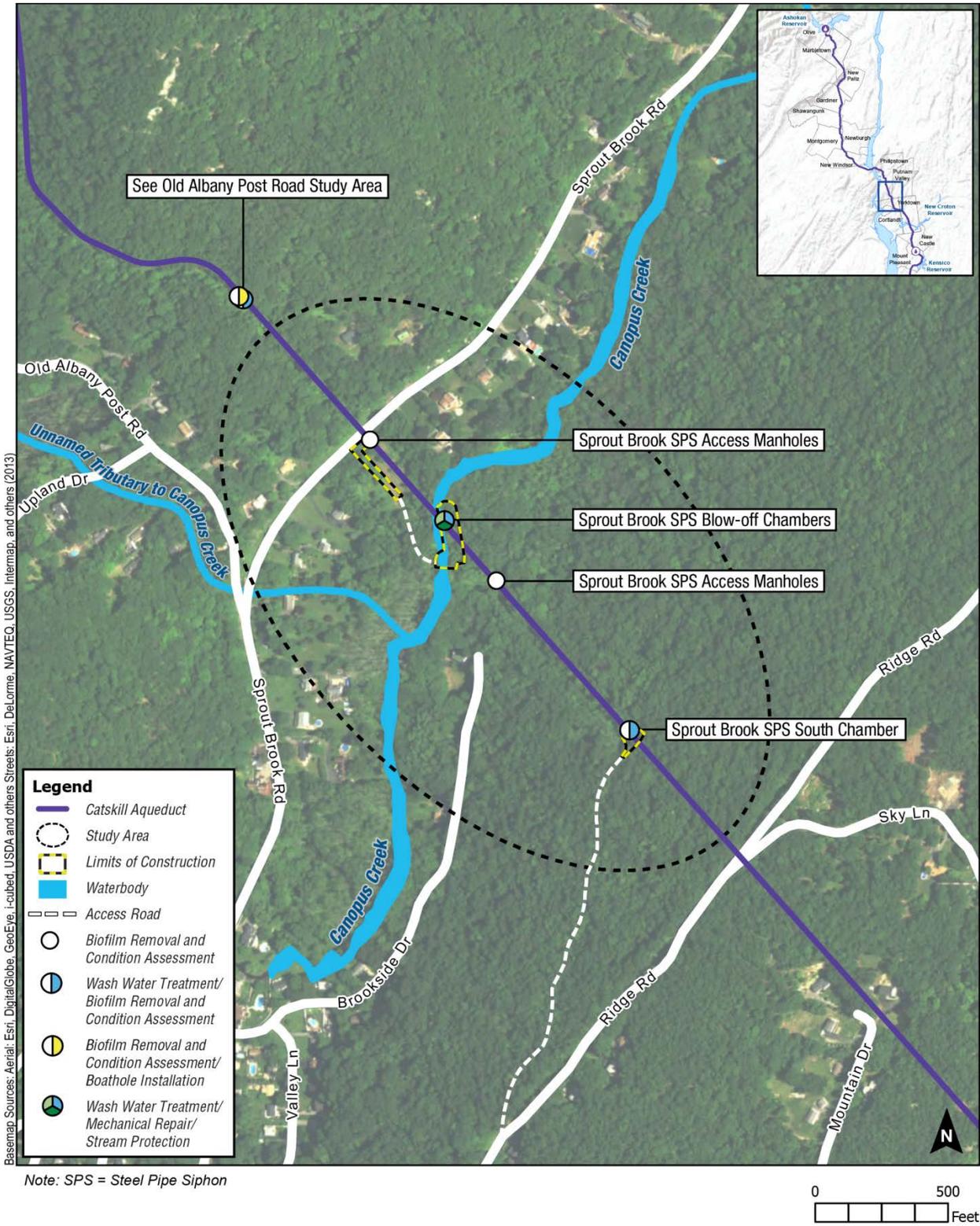


Figure 9.12-20: Study Area – Sprout Brook Road





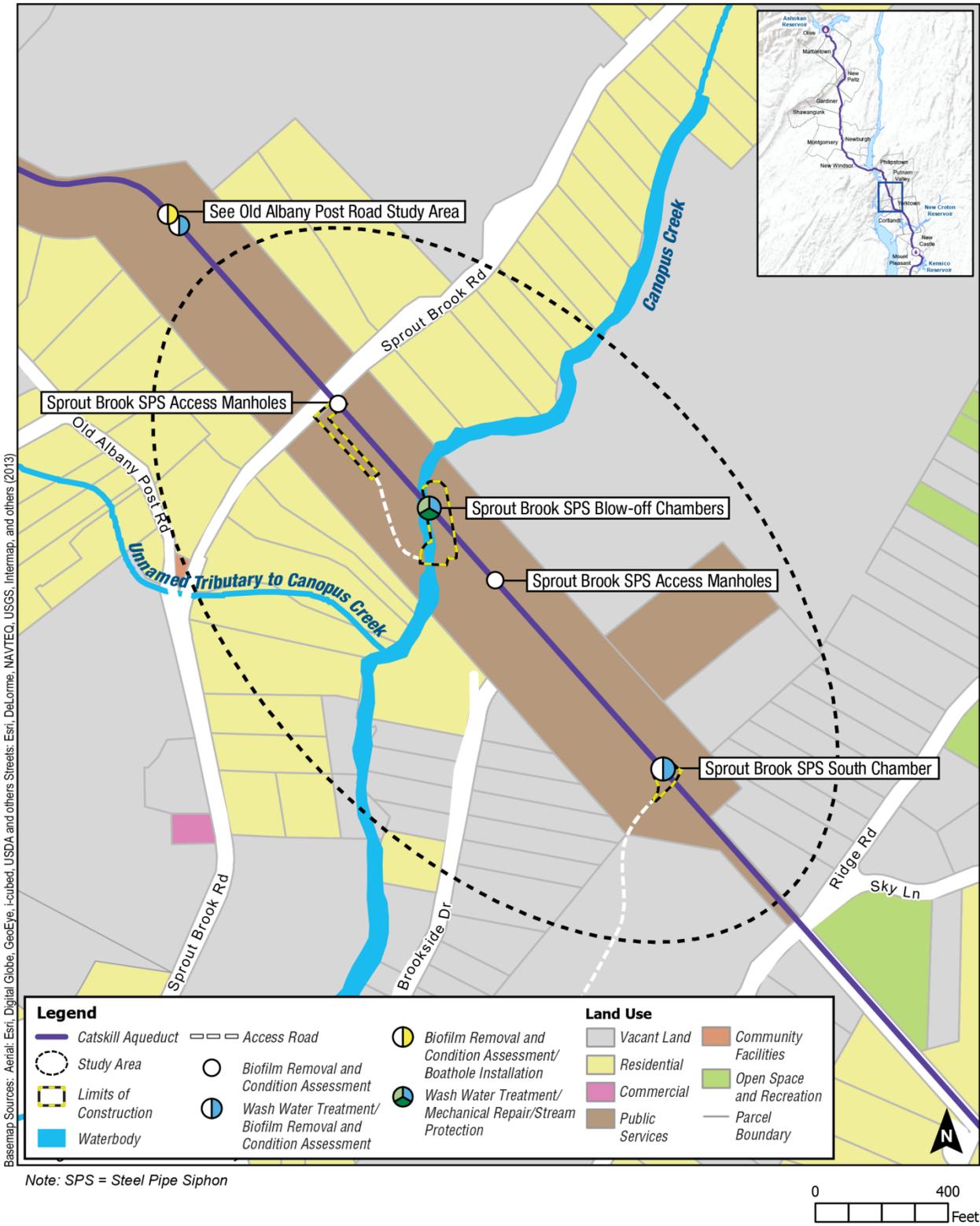
Photograph 1: Looking north across proposed staging area. Canopus Creek is located on the left side of the photograph.



Photograph 2: Sprout Brook Steel Pipe Siphon Blow-Off Chamber. Note the exposed chamber in the channel.

Figure 9.12-21: Photographs – Sprout Brook Road Study Area





Basemap Sources: Aerial, Esri, Digital Globe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.12-22: Land Use – Sprout Brook Road Study Area



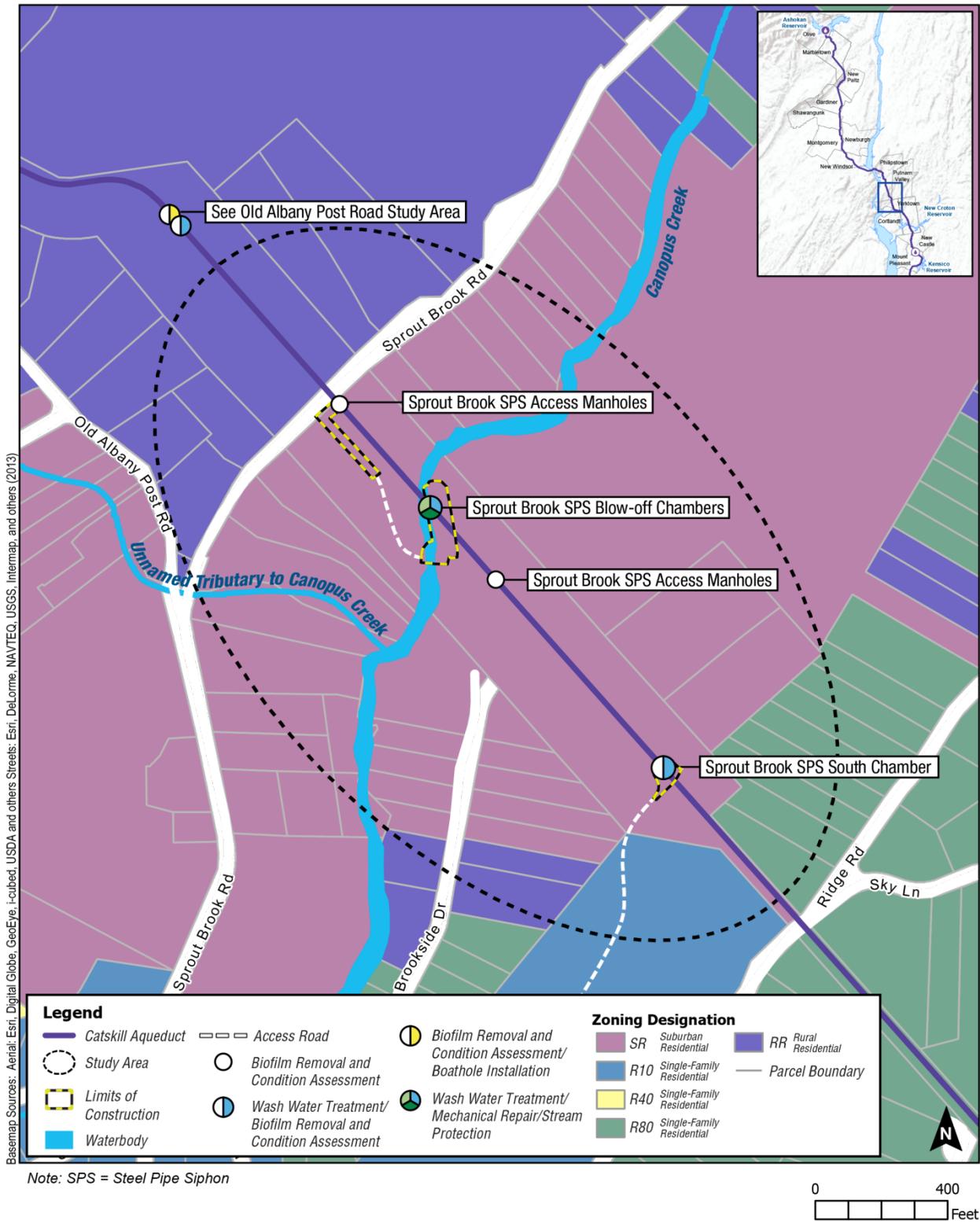


Figure 9.12-23: Zoning – Sprout Brook Road Study Area



9.12.5.2 Proposed Activities within the Sprout Brook Road Study Area

To support activities within the Sprout Brook Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area within the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas, including one along the shoulder of Sprout Brook Road at the access manholes, would provide additional parking. Equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. Site plans showing layouts of the limits of construction for the work sites, which would occupy a total of 0.8 acre, are shown on **Figure 9.12-24** and **Figure 9.12-25**. The schedule for work within the study area is shown in **Table 9.12-12**. The duration of active construction within the Sprout Brook Road Study Area is estimated to total 18 weeks over 1.5 years.

Table 9.12-12: Schedule of Work Activities within the Sprout Brook Road Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Staging and Access Improvements ³	Summer 2019 2018	4 weeks	Monday to Friday, 8 AM to sunset	8
Streambank Restoration and Protection	Summer 2019 2018	3 weeks	Monday to Friday, 8 AM to sunset	10
Blow-off Chamber Reconstruction	Summer 2019 2018	9 weeks	Monday to Friday, 8 AM to sunset	12
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	Fall 2020 2019 (Third 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	21
<p>Notes:</p> <p>¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per the Town of Philipstown Noise Control Law §175-40.</p> <p>² Crew size refers to the number of people anticipated at the work site(s).</p> <p>³ Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>).</p>				

Work in the study area would begin with staging and access improvements in summer ~~2019~~2018. At Canopus Creek, an existing box culvert would be reinforced with steel plates. A new access road would be constructed from the culvert to the Blow-off Chambers, providing permanent access for maintenance and a truck turnaround. Grading and the removal of up to 46 trees may also be required, in addition to underbrush clearing and gravel placement for leveling and erosion control.

Restoration and protection of the portion of Canopus Creek adjacent to the Blow-off Chambers would also occur in summer ~~2019~~2018. The work would include regrading, and installing permanent riprap aprons to repair bank erosion and minimize future bank erosion at this location. To ensure a dry working environment, a temporary stream diversion would be installed, serving to partially

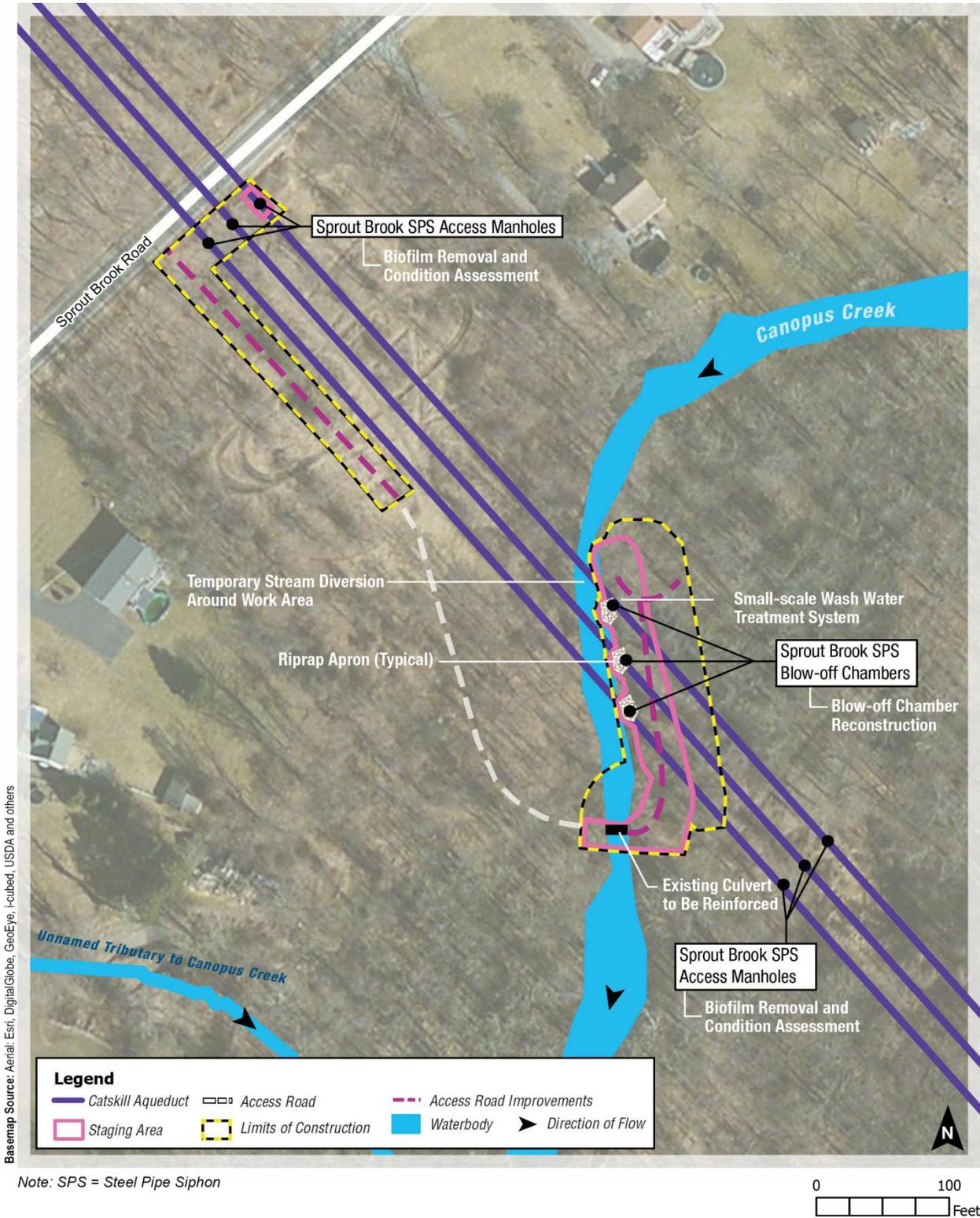


Figure 9.12-24: Site Plan for Sprout Brook SPS Blow-off Chambers – Sprout Brook Road Study Area



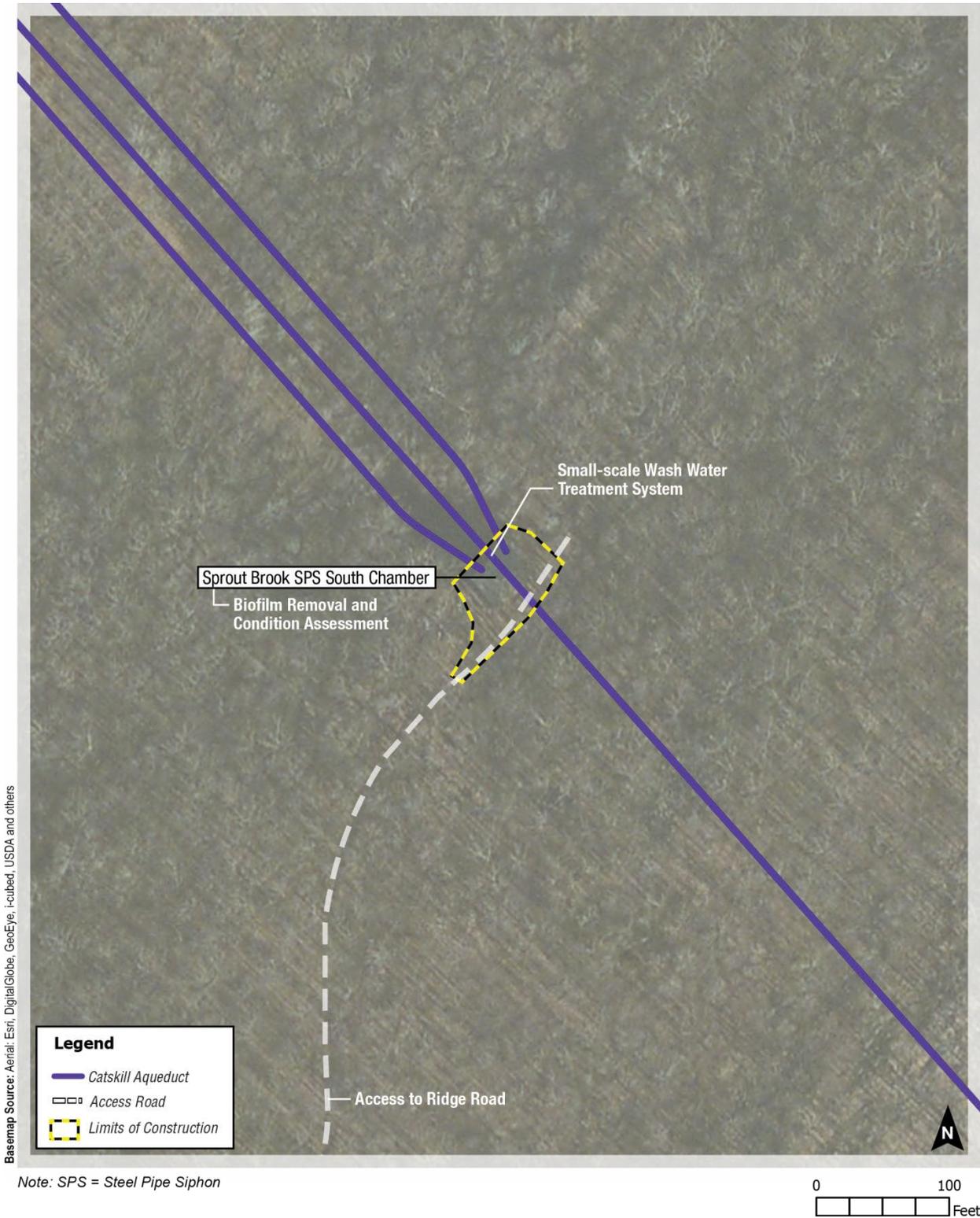


Figure 9.12-25: Site Plan for Sprout Brook SPS South Chamber – Sprout Brook Road Study Area



divert the stream around the work area. A turbidity curtain would be installed to prevent sediment from moving downstream.

Reconstruction of the Blow-off Chambers would also take place in summer ~~2019~~2018. It would include replacement of the blow-off valves, discharge pipes, and chamber covers, repair of the concrete walls, and removal of the access ladders. Small portions of the work that require shutdowns would be performed in spring and fall of that year. In total, the work would require the excavation of 130 cubic yards of soil and 660 cubic yards of soil for fill, resulting in net fill of 530 cubic yards of soil. Temporary in-stream disturbance would cover a total area of approximately 2,610 square feet, and there would be approximately 10 square feet of permanent in-stream disturbance. Temporary wetland disturbance would cover a total area of approximately 2,640 square feet, and there would be approximately 590 square feet of permanent wetland disturbance. Afterwards, the blow-off valves would be used to unwater the aqueduct for future shutdowns during the repair and rehabilitation and future maintenance.

Biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019. Access into the aqueduct would be provided by the two sets of access manholes and the South Siphon Chamber. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Potential treatment locations within the study area include the South Siphon Chamber and the Blow-off Chambers, at which small-scale wash water treatment systems could be established. Upon completion of biofilm removal and condition assessment, all equipment, materials, and the temporary stream crossing would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions. Improvements at the North Siphon Chamber and Blow-off Chambers would remain in place following construction so these areas can continue to be utilized by DEP for future operations and maintenance activities.

Impact categories analyzed for the Sprout Brook Road Study Area are presented in Section 9.12.5.3, “Natural Resources” through Section 9.12.5.7, “Neighborhood Character,” and include natural resources including: water resources, terrestrial resources, and federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.12.2, “Town of Philipstown Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” an impact analysis related to land use and zoning; socioeconomic conditions; community facilities and services; open space and recreation; historic and cultural resources; visual resources; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area is not warranted. Finally, impacts related to project-wide natural resources, water and

sewer infrastructure, and public health were analyzed within Section 9.18, “Project-wide Impact Analysis.”

9.12.5.3 Natural Resources

The study area for the natural resources analysis is the area surrounding limits of construction, including the entrance off Sprout Brook Road and the Blow-offs Chambers (see **Figure 9.12-26**). A second section of the natural resources study area located at the South Siphon Chamber corresponds to the limits of construction (see **Figure 9.12-25**). These two areas are collectively referred to as the natural resources study area.

Based on the tree survey and wetland and watercourse delineation conducted on August 10, and September 17 and 18, 2015, the natural resources study area contains a diverse array of ecological communities ranging from a young successional northern hardwoods forest and red maple (*Acer rubrum*) swamp (i.e., wetlands), to a perennial stream named Canopus Creek. Based on a desktop analysis, the South Siphon Chamber appears to be surrounded by deciduous trees that may be similar to a rich mesophytic forest.

These habitats have the potential to support protected water resources, terrestrial resources, and wildlife species, and an analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

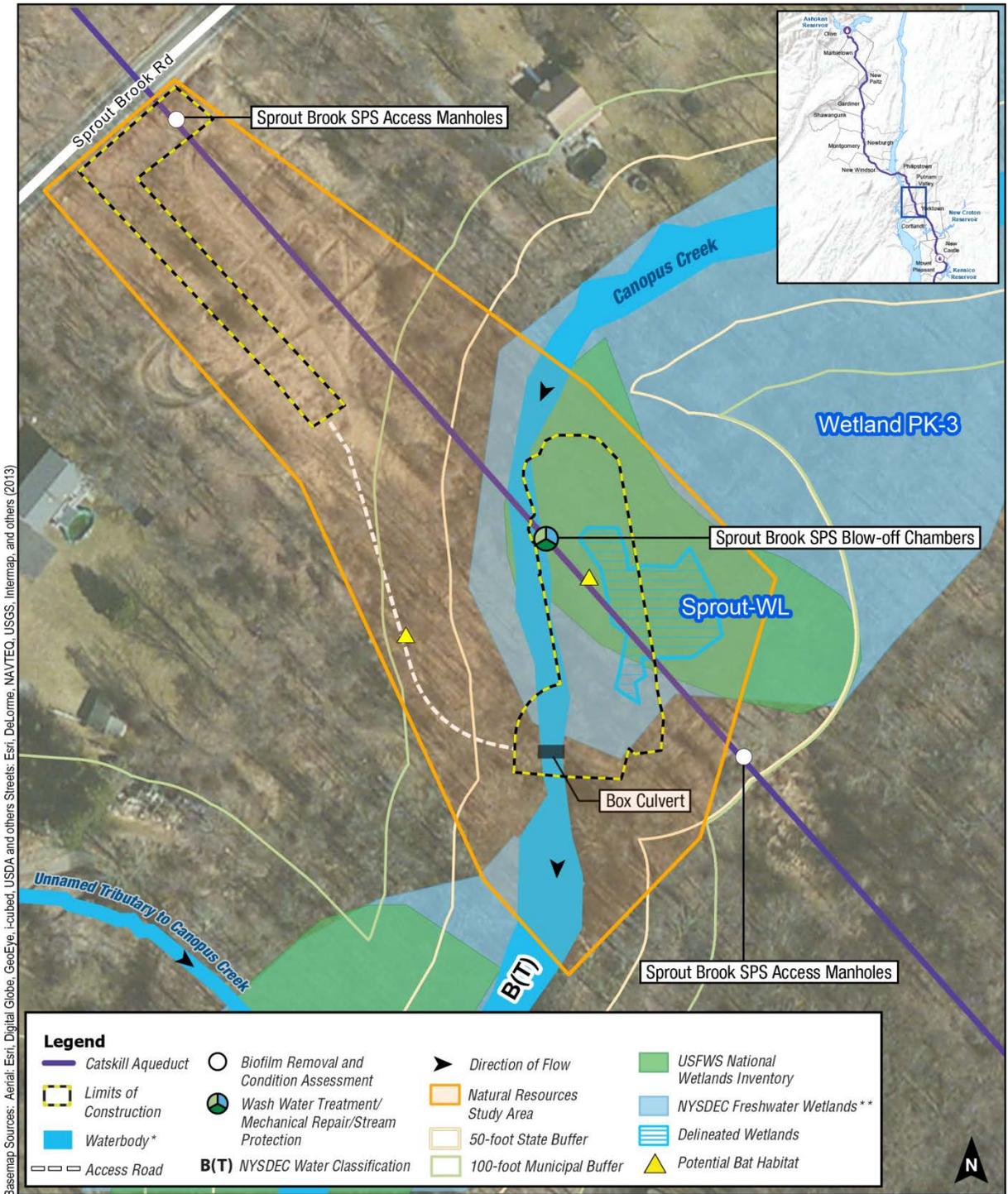
Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the lower Hudson watershed (HUC 02030101) and the Annsville Creek subwatershed (HUC 020301010102).

Canopus Creek, NYSDEC wetlands, and USFWS National Wetlands Inventory (NWI) wetlands in the natural resources study area are subject to jurisdiction under Sections 401 and 404 of the Clean Water Act for work activities. As a Class B(T) stream within the natural resources study area, Canopus Creek may support a trout population and is subject to State Protection of Waters regulations with a regulated 50-foot buffer to protect the streambed and banks. Wetlands in the natural resources study area are associated with a NYSDEC Class I freshwater wetland and would be regulated with a protective 100-foot buffer. In addition, the Town of Philipstown regulates activities within surface water and wetlands, both with a protective 100-foot buffer (Philipstown Town Code Chapter 93: Freshwater Wetlands and Watercourses), and has jurisdiction over activities within floodplains (Philipstown Town Code Chapter 90: Flood Damage Prevention). This municipal buffer encompasses work activities at the Blow-off Chambers. Work activities within water resources, the 100-foot buffer, and floodplain are anticipated to require town review and approval.

Surface Water

The water resources delineation in the natural resources study area occurred on September 18, 2015. The water resource name, length, area, and classifications are shown in **Table 9.12-13**.



Basemap Sources: Aerial, Esri, Digital Globe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

*The actual alignment of Canopus Creek is different than as mapped by NYSDEC.
 **Wetland boundary for Sprout-WL (NYSDEC Wetland PK-3) based on field visit.
 The delineated boundary is different than as mapped by NYSDEC.
 Note: SPS = Steel Pipe Siphon
 NYSDEC = N.Y.S. Department of Environmental Conservation
 USFWS = U.S. Fish and Wildlife Service

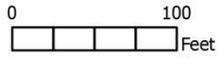


Figure 9.12-26: Natural Resources – Sprout Brook Road Study Area



Canopus Creek

Canopus Creek is mapped in the center of the Sprout Brook Road Study Area (see **Figure 9.12-26**). Canopus Creek flows northeast to southeast. Beyond the study area, it flows into Cortlandt Lake, which flows into Sprout Brook and eventually into the Hudson River. The Blow-off Chambers are located at Canopus Creek.

Canopus Creek features low gradient riffle-pool habitat with a sand and cobble substrate. Some scouring is evident along the banks. No in-stream aquatic vegetation was observed. Some scouring along the streambanks and on the southern side of the existing box culvert was noted. Watermarks on the tree trunks, indicative of standing water, are about 2 feet above the ground surface in the wetland. The stream depth averages approximately 1 foot, with depths of 2 to 3 feet in the vicinity of the existing box culvert. Flow in the stream was clear; observed fish species included white sucker (*Catostomus commersonii*), largemouth bass (*Micropterus salmoides*), fallfish (*Semotilus corporalis*), and creek chub (*Semotilus atromaculatus*). As shown in **Table 9.12-13**, the watercourse is best classified as a “Riverine, Lower Perennial, Unconsolidated Bottom, Sand” based on Cowardin et al. (Cowardin et al. 1979).

Table 9.12-13: Water Resources and Classifications within the Sprout Brook Road Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Canopus Creek	9,270	480	Riverine, Lower Perennial, Unconsolidated Bottom, Sand (R2UB2)
Sprout-WL	6,230	NA	Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded (PFO1E)
Note: NA = Not Applicable			

Wetlands

The Sprout Brook Road Study Area contains wetlands mapped by both the NWI and NYSDEC (see **Figure 9.12-26**). A portion of NYSDEC Wetland PK-3, which the State identifies as a Class I wetland totaling 180.2 acres in size, is located within the natural resources study area east of Canopus Creek at the Blow-off Chambers.

Wetland Sprout-WL

A palustrine forested wetland was delineated within a depressional floodplain terrain east of Canopus Creek. Dominant vegetation consisted of red maple, green ash (*Fraxinus pennsylvanica*), multiflora rose (*Rosa multiflora*), sensitive fern (*Onoclea sensibilis*), tussock sedge (*Carex stricta*), and smartweed (*Polygonum* spp.).

The upper 20 inches of soil is composed of coarse materials, with approximately 40 percent gravel and cobbles. Redoxomorphic features, which are indicative of wetland soils, were concentrated approximately 2 to 5 feet below the ground surface. Hydric soil indicators include

the presence of histol soils and a depleted matrix below a dark, organic layer typically found along riverine systems in areas subject to flooding or ponding.

Wetland hydrology is provided by contributions from Canopus Creek and potentially groundwater flow from the surrounding forested area. Normal conditions were not present due to below average seasonal precipitation for July and August 2015. Therefore, no indicators of wetland hydrology were observed.

The delineated wetland boundary is different than as mapped by NYSDEC and NWI, and was approximately 6,230 square feet (0.14 acre) within the natural resources study area. Wetland Sprout-WL would be best classified as a “Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded” system based on the Cowardin System (Cowardin et al. 1979) (see **Table 9.12-13**).

Floodplains

FEMA Flood Insurance Rate map number 36079C0184E, effective March 4, 2013, was reviewed. As shown on **Figure 9.12-27**, the floodway of Canopus Creek runs through the center of the natural resources study area. The floodway is flanked by a FEMA designated 100-year floodplain (Zone AE), which depicts areas subject to inundation by the one percent Annual Chance Flood, with base flood elevation ranges from 155 to 160 feet. Areas within Zone AE are within the Special Flood Hazard Area and are subject to floodplain management regulations.

The Blow-off Chambers lie within a FEMA regulatory floodway for Canopus Creek. The access manholes southeast of the Blow-off Chambers are located within the 100-year floodplain, and are beyond the mapped floodway.

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP’s understanding that no projects or developments are anticipated to occur within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the Sprout Brook Road Study Area would be the same as baseline conditions.

Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Sprout Brook Road Study Area.

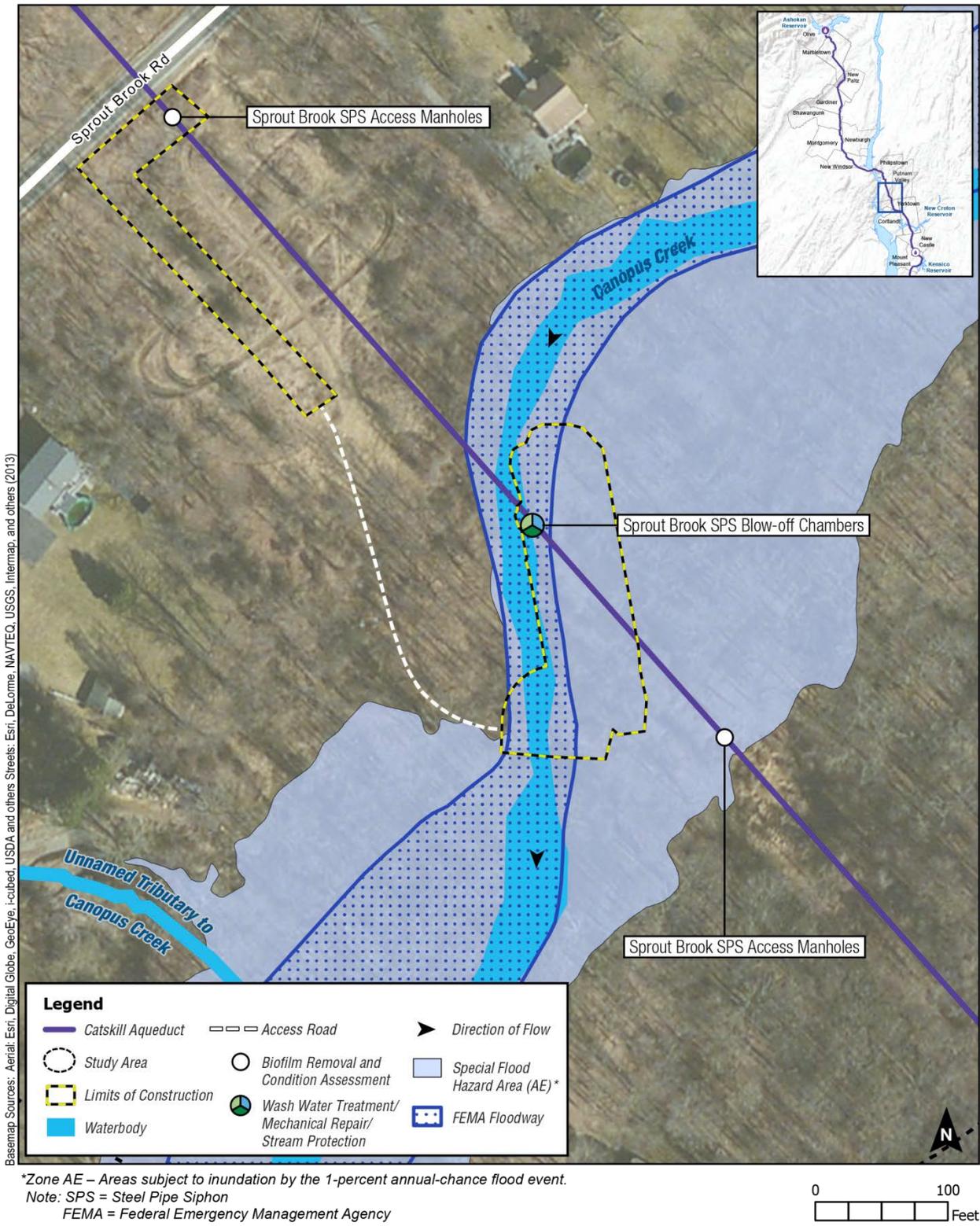


Figure 9.12-27: Floodplains – Sprout Brook Road Study Area



Construction

Work activities related to the repair and rehabilitation would disturb surface water and wetlands with temporary and permanent fill, restore the streambank, and have the potential to temporarily alter flows in Canopus Creek.

The Blow-off Chambers may be accessed multiple times during construction. As the Canopus Creek supports trout and can be designated as a coldwater fishery, in-water construction activities are generally prohibited from October 1 to April 30, unless otherwise authorized. While DEP anticipates that the majority of in-water construction would occur during the summer months and outside of the October 1 to April 30 prohibition, construction activities may need to occur within the restricted period. If this is required, as presented within Section 9.18, “Project-wide Impact Analysis,” DEP would implement additional measures to limit potential adverse impacts to trout.

To access the Blow-off Chambers, temporary steel plates would be placed for reinforcement over an existing culvert in the floodway of Canopus Creek. The steel plates would not affect the base flood elevations and would be secured to ensure they would not be carried downstream during a flood event. A new access road would be constructed from the culvert to the blow-off chambers, providing permanent access for maintenance and a truck turnaround for safe access on the return trip over the culvert.

Prior to commencing the repair and rehabilitation, temporary sediment and erosion control measures, such as silt fences and haybales, would be installed at the perimeter of land-based construction. Within the limits of construction, localized construction dewatering (e.g., installing a barrier and pump to keep the work area dry) may be necessary to facilitate excavation for blow-off chambers and discharge pipe replacement. Blow-off chamber reconstruction would also require in-stream access and temporary stream protection. A temporary stream diversion and a downstream turbidity curtain would be installed. To protect the stream and its banks, aquatic life movement, and prevent sediment and other pollutants from entering the waterway, temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements.

Alternative designs were considered to minimize disturbance to water resources. The discharge pipes for the blow-off chambers would be shorter lengths than at other steel pipe siphon sites, and would be the minimum length needed to reach the discharge point. With this design, the buried discharge pipes would avoid the Sprout-WL and only minor regrading to match existing contours in the wetland would be needed. Additionally, the layout for the new access road between Canopus Creek and Sprout-WL needed for future maintenance would be the minimum width needed for pick-up truck access to each blow-off chamber cover. It would be located along the streambank to minimize wetland encroachment. Streambank restoration and protection would require permanent riprap aprons, approximately 20 to 30 feet long, to be placed along Canopus Creek in the floodway, which would also avoid Sprout-WL. Anticipated temporary and permanent disturbance to water resources and regulated buffers were quantified based on the limits of construction and proposed work activities (see **Table 9.12-14**).

Table 9.12-14: Estimated Disturbance to Water Resources within the Sprout Brook Road Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Canopus Creek	9,270	2,610 <i>Partial stream diversion, temporary steel plates at existing culvert</i>	10 <i>Riprap apron</i>
50-foot State Protection of Waters Buffer	39,980	450 <i>Clearing and grading for construction access and staging, construction equipment use, temporary steel plates at existing culvert</i>	8,010 <i>Access road, riprap apron, and regrading following blow-off chamber reconstruction</i>
Sprout-WL	6,230	2,640 <i>Clearing and grading for construction access and staging and construction equipment use</i>	590 <i>Regrading following access road construction and blow-off chamber reconstruction</i>
NYSDEC 100-foot Wetland Buffer	49,250	8,500 <i>Clearing and grading for construction access and staging and construction equipment use</i>	8,260 <i>Access road, riprap apron, and regrading following blow-off chamber reconstruction</i>
Water Resource Municipal Buffer	77,100	8,500 <i>Clearing and grading for construction access and staging and construction equipment use</i>	8,260 <i>Access road, riprap apron, and regrading following blow-off chamber reconstruction</i>

Construction staging would occur on top of the aqueduct and temporary stream diversion would extend into the stream resulting in approximately 2,640 square feet of temporary disturbance to Sprout-WL and approximately 2,610 square feet of temporary disturbance within Canopus Creek (see **Table 9.12-14**). Approximately 8,500 square feet associated with both the State wetland buffer and municipal water resources buffer and approximately 450 square feet associated with the State Protection of Waters buffer would be temporarily affected due to staging. The new access road needed for future maintenance and upgrades to the Blow-off Chambers require approximately 590 square feet of permanent disturbance to Sprout-WL. Approximately 10 square feet of permanent disturbance to Canopus Creek, approximately 8,010 square feet within the State Protection of Waters buffer, approximately 8,260 square feet within the State wetland buffer, and approximately 8,260 square feet within the municipal water resources buffer would occur to upgrade and maintain the Blow-off Chambers to protect against future bank erosion at this location (see **Table 9.12-14**). Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native, riparian vegetation. Permanent disturbance has been minimized to the greatest extent possible and is further analyzed in Section 9.18, “Project-wide Impact Analysis.”

The South Siphon Chamber and Blow-off Chambers have been identified as potential discharge points for treated wash water. Any wash water generated from the siphons would be treated to meet applicable discharge limits, water quality standards and/or other requirements for reuse in the removal operation, or for discharge back to the Catskill Aqueduct or to Canopus Creek. No

biofilm would be discharged to surface water. Treated wash water would be discharged at low flows that would not result in scour or other physical changes to the stream. In the event alum is added as part of the treatment process, flocculated particles would primarily settle prior to treated wash water being discharged to the stream. Given the short-term, temporary nature of the discharges (approximately 2 weeks), discharges to Canopus Creek are not anticipated to cause scouring, inundate the receiving stream, or affect stream substrate.

This study area has also been identified as a location for discharging raw aqueduct water while unwatering the tunnel, and as a potential discharge point for treated wash water. Reconstructing the blow-off chambers requires the siphons to be unwatered. This initial unwatering would occur with temporary measures in place to protect the stream. Unwatering events to surface water would also occur at any time after stream protection measures are in place during and following construction and therefore are described in “Operation” below.

Operation

Upon completion of blow-off chamber repairs and streambank restoration and protection, the function of the Blow-off Chambers would be restored. Discharges of raw water to Canopus Creek could occur in the future during DEP’s typical operations. The aqueduct could be unwatered via the Blow-off Chambers to conduct maintenance or inspection. This is expected to be an infrequent event.

During unwatering events, the new blow-off valves would be operated to moderate discharge flows from the Sprout Brook Steel Pipe Siphon. This would result in discharges from each chamber of approximately 9,000 gpm at initial valve opening to a maximum flow of approximately 31,900 gpm. It would take approximately 6 hours to unwater the Sprout Brook Steel Pipe Siphon, assuming each siphon pipe is unwatered separately.

An analysis was conducted to determine if the discharge associated with an unwatering event would be greater than the bankfull stream flow. Bankfull flow is the flow that just fills the channel to the top of its banks (i.e., stream capacity) and at the point in which water begins to flow onto the floodplain. Bankfull flow was predicted for Canopus Creek using the USGS StreamStats Program. If the discharge associated with an unwatering event is greater than the bankfull flow, indirect downstream effects, such as an increase in erosion and scouring over the baseline could be reasonably expected. The maximum discharge flows to Canopus Creek would be approximately 203,400 gpm when the blow-offs discharge during a 1.5-year storm event. This is less than the calculated bankfull flow of Canopus Creek of approximately 218,100 gpm. Therefore, indirect downstream impacts such as increases in erosion and scouring would be minimal.

Additionally, flows would be moderated by throttling the valves and would be monitored by an on-site crew to prevent the receiving stream from becoming inundated by discharges of raw water. In the event that inundation begins to occur during unwatering, the on-site crew would have the ability to cease unwatering at any time to allow streamflows to subside to baseline flows. Therefore, the proposed raw water discharges would be short-term and temporary (approximately 6 hours total), are not anticipated to cause scouring, and would not result in a bankfull event or alter stream capacity of Canopus Creek.

The access road and riprap aprons would have minor encroachment on the floodway. Access road improvements would require minor soil excavation, subsurface work, and the placement of new impervious surface, which would have minor encroachment on the Special Flood Hazard Area and would not change base flood elevations. The riprap aprons would be keyed into the existing streambank and would not displace a significant portion of the cross-sectional area of the stream. DEP would coordinate with the Town of Philipstown and FEMA, as necessary, to comply with applicable floodplain management requirements. In addition, DEP would conduct hydrologic and hydraulics calculations as part of the design, as needed, to ensure that work activities would have no effect on existing base flood elevations or floodway elevations.

Water Resources Conclusions

Water resources in the natural resources study area are limited to Canopus Creek and Wetland Sprout-WL near the Blow-off Chambers. While the majority of work activities would result in temporary disturbance, minor permanent disturbance would occur as part of the blow-off chamber reconstruction and associated streambank restoration and protection. Treated biofilm wash water would be discharged over the course of 2 weeks during the third 10-week shutdown. Permanent fill (i.e., riprap aprons, new access road) would be the minimal amount needed for future maintenance and would repair historic bank erosion and minimize future scouring. The streambank restoration measures would be keyed into the existing streambank and are not anticipated to result in an alteration of elevations or flood capacity in the mapped floodplain.

DEP would coordinate with the Town of Philipstown and FEMA, as necessary, to ensure all local and federal requirements pertaining to floodplain management are satisfied.

Discharges to conduct maintenance and inspection would be limited to raw aqueduct unwatering events. These would be infrequent and last several hours in duration. Restoring the historic function of the blow-offs to discharge raw aqueduct water would be a change in baseline conditions. However, based on the above analysis, there would be minimal indirect effects to water resources.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Sprout Brook Road Study Area.

Terrestrial Resources

Terrestrial resources within the natural resources study area consist of a successional northern hardwoods forest, a red maple swamp, and deciduous trees that may be similar to a rich mesophytic forest. The tree species at the study area predominantly consist of green ash, red maple, and black cherry (*Prunus serotina*), as well as Norway maple (~~*A. platanoides*~~) and shagbark hickory (*Carya ovata*). Multiflora rose is the dominant shrub in both the wetland and upland areas. Herbaceous vegetation within the wetland consists of skunk cabbage (*Symplocarpus foetidus*), sensitive fern, and tussock sedge. Although the Town of Philipstown regulates tree removal (Philipstown Town Code Chapter 159: Timber Harvesting and Forest Management), areas of 40,000 square feet or less in size on any lot, or from a contiguous area of 2 acres or less in size on adjacent lots, are exempt. While tree removal may be an exempt activity, terrestrial resources in the study area warrant an analysis.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Sprout Brook Road Study Area within the timeframe of the impact analysis. Natural processes such as changes in habitat due to natural vegetative succession are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would include tree clearing and shrub removal for the purpose of improving site access and staging areas. Approximately 46 trees consisting of five species with a range of average dbh of between 6 and 12.5 inches may be removed to establish staging and access areas. The most common species of trees to be removed include 14 green ash, 14 red maple, and 5 black cherry. To the extent possible, the number of trees proposed for removal has been minimized by limiting tree removal to the immediate vicinity of the work areas. By limiting the disturbance area at the Blow-off Chambers, approximately 16 additional trees would not need to be removed during construction. Trees that not are proposed for removal would be conspicuously marked and protected prior to construction to prevent any tree damage.

Tree removal would occur in discrete locations along the densely forested areas north and south of the aqueduct, and would not dramatically change the character of the area or affect surrounding trees. All tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Additionally, tree removal would be conducted in accordance with applicable requirements set forth by the Town of Philipstown.

Following construction, all equipment would be removed and staging areas would be restored to natural conditions. To enhance the streambanks, DEP would plant riparian vegetation to provide additional streambank stabilization within the floodplain and restore streambank habitat along Canopus Creek. While the species composition and quantity has not yet been determined, replacement plantings would be native species adapted to floodplain habitat, consistent with the species commonly found in a red maple swamp ecological community (i.e., consistent with the on-site community), and planted at recommended densities within DEP property. Vegetated areas temporarily cleared during construction are anticipated to grow back with similar communities.

Operation of the Catskill Aqueduct would be consistent with baseline conditions. Natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Sprout Brook Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, "Natural Resources," as having the potential to be affected by activities within the natural resources study

area. To identify those species that could be affected within the study area, species that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” 16 species were identified as having the potential to occur in the study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these 16 species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.12-15**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and observations from field visits, as applicable.

Table 9.12-15: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Sprout Brook Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Blue-spotted Salamander	<i>Ambystoma laterale</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17, and 18, 2015. Construction may result in permanent disturbance to small areas of wetland habitat. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Bog Turtle	<i>Clemmys</i> [= <i>Glyptemys</i>] <i>muhlenbergii</i>	Threatened	Endangered	The wetland was deemed not to be suitable bog turtle habitat during the wetland and watercourse delineation conducted on September 18, 2015. Therefore, there are no effects anticipated and no further analysis for bog turtles is warranted for this study area.	No
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17 and 18, 2015. Potential habitat (streams, wetlands, and adjacent uplands) was observed within the study area. Work activities would be largely confined to previously disturbed areas. As a highly mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions and the new boathole, access road, and streambank restoration measures that remain would not affect breeding, nesting, or foraging habitat. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Fence Lizard	<i>Sceloporus undulates</i>	Unlisted	Threatened	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17 and 18, 2015. According to NYNHP, no records of fence lizards were identified within 1.5 miles of the study area. The steel pipe siphon provides open areas with sun exposure that could be used for basking. Temporary effects to basking habitat is possible; however, upon construction completion, the staging areas would be restored to natural conditions and the new boathole and streambank restoration measures that remain would not affect habitat. Permanent disturbance from blow-off chamber reconstruction and streambank restoration and protection would be limited in area. Therefore, there are no effects anticipated and no further analysis for eastern fence lizards is warranted for this study area.	No

Table 9.12-15: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Sprout Brook Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17 and 18, 2015. Potential habitat exists within the forested and open areas with sun exposure along the steel pipe siphon berm. However, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Perimeter silt fencing would also help prevent individuals from entering work sites during construction. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No
Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17 and 18, 2015. Construction may result in permanent disturbance to small areas of wetland habitat. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Jefferson Salamander Complex	<i>Ambystoma jeffersonianum x laterale</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17 and 18, 2015. Construction may result in permanent disturbance to small areas of wetland habitat. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Marbled Salamander	<i>Ambystoma opacum</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17, and 18, 2015. Construction may result in permanent disturbance to small areas of wetland habitat. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Southern Leopard Frog	<i>Lithobates sphenoccephalus utricularius</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17, and 18, 2015. Construction may result in permanent disturbance to small areas of wetland habitat. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Spotted Turtle	<i>Clemmys guttata</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17, and 18, 2015. Construction may result in permanent disturbance to small areas of wetland habitat and upland areas that could be used as basking and nesting habitat. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.

Table 9.12-15: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Sprout Brook Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Timber Rattlesnake	<i>Crotalus horridus</i>	Unlisted	Threatened	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17 and 18, 2015. According to NYNHP, no records of timber rattlesnakes were identified within 1.5 miles of the study area. The steel pipe siphon provides open areas with sun exposure that could be used for basking. Temporary effects to basking habitat is possible. However, upon construction completion, the staging areas would be restored to natural conditions and the new boathole and streambank restoration measures that remain would not affect habitat. Permanent disturbance from blow-off chamber reconstruction and streambank restoration and protection would be limited in area. Therefore, there are no effects anticipated and no further analysis for timber rattlesnakes is warranted for this study area.	No
Wood Turtle	<i>Glyptemys insculpta</i>	Unlisted	Special Concern	No individuals were incidentally during the field visits on August 10, 2015 and September 17 and 18, 2015. Potential habitat for wood turtles exists within the Canopus Creek corridor and surrounding habitat in the study area that could be permanently affected by the repair and rehabilitation. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Common Wormsnake	<i>Carphophis amoenus</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17 and 18, 2015. Potential habitat exists within the adjacent forested and open areas along the steel pipe siphon berm. However, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species use in the vicinity during construction. Perimeter silt fencing would also help prevent individuals from entering work sites during construction. Therefore, there are no effects anticipated and no further analysis for common wormsnares is warranted for this study area.	No
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17 and 18, 2015. Removal of two potential roosting trees, a red maple and shagbark hickory, may be required. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Unlisted <u>Threatened</u>	No individuals were incidentally observed during the field visits on August 10, 2015 and September 17 and 18, 2015. Removal of two potential roosting trees, a red maple and shagbark hickory, may be required. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.

Table 9.12-15: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Sprout Brook Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	No suitable habitat and no individuals were incidentally observed on September 17, 2015. Therefore, no further analysis for New England cottontails is warranted for this study area.	No

Blue-spotted Salamander (Ambystoma laterale)

The Blow-off Chambers are located in a forested wetland with adjacent forested habitat that provides suitable habitat for this species. However, a number of protective measures would be in place that would further limit the potential for effects. Work activities would largely be confined to previously disturbed areas along the steel pipe siphon berm. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual salamanders from entering the work sites during construction. At the Blow-off Chambers, the excavation and regrading necessary to replace blow-off chambers and discharge pipes would not greatly increase the extent of impervious surface and would not alter runoff or wetland hydrology. Given that permanent disturbance would be due to upgrades and maintenance of the existing structures, and be limited to a small portion of wetland and forested habitat, there would be minimal effects to potential habitat.

It is expected that salamanders would readily relocate to alternative suitable habitats that are available nearby during construction, and would continue to utilize the study area following construction. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, blue-spotted salamanders (*Ambystoma laterale*) in this study area.

Jefferson Salamander (Ambystoma jeffersonianum) and Jefferson Salamander Complex (Ambystoma jeffersonianum x laterale)

The Blow-off Chambers are located in a forested wetland with adjacent forested habitat that provides suitable habitat for Jefferson salamander (*Ambystoma jeffersonianum*). However, protective measures would be in place that would further limit the potential for effects. Work activities would be confined to previously disturbed areas along the steel pipe siphon berm. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual salamanders from entering the work sites during construction. At the Blow-off Chambers, the excavation and regrading necessary to replace blow-off chambers and discharge pipes would result in a negligible increase in the extent of impervious surface and would not alter runoff or wetland hydrology. Given that permanent disturbance would be due to upgrades and maintenance of the existing structures, and be limited to a small portion of wetland and forested habitat, there would be minimal effects to potential habitat.

It is expected that salamanders would readily relocate to alternative suitable habitats that are available nearby during construction, and would continue to utilize the study area following construction. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, Jefferson salamanders and Jefferson salamander complex (*Ambystoma jeffersonianum x laterale*) in this study area.

Marbled Salamander (Ambystoma opacum)

The Blow-off Chambers are located in a forested wetland with adjacent forested habitat that provides suitable autumn breeding habitat for this species. Because this is a nocturnal species, it is not expected to be active during daytime construction. Protective measures would be in place that would limit the potential for effects. Work activities would largely be confined to previously disturbed areas along the steel pipe siphon berm. Furthermore, perimeter silt fencing would limit

disturbance to adjacent habitat and prevent individual salamanders from entering the work sites during construction. At the Blow-off Chambers, the excavation and regrading necessary to replace blow-off chambers and discharge pipes would result in a negligible increase in the extent of impervious surface and would not alter runoff or wetland hydrology. Given that permanent disturbance would be due to upgrades and maintenance of the existing structures, and be limited to a small portion of wetland and forested habitat, there would be minimal effects to potential habitat.

It is expected that salamanders would readily relocate to alternative suitable habitats that are available nearby during construction, and would continue to utilize the study area following construction. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, marbled salamanders (*Ambystoma opacum*) in this study area.

Southern Leopard Frog (Lithobates sphenoccephalus utricularius)

The Blow-off Chambers are located in a forested wetland with adjacent forested habitat that provides suitable habitat for this species. However, protective measures would be in place that would limit the potential for effects. Work activities would be confined to previously disturbed areas along the steel pipe siphon berm. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual frogs from entering the work sites during construction. At the Blow-off Chambers, the excavation and regrading necessary to replace blow-off chambers and discharge pipes would result in a negligible increase in the extent of impervious surface and would not alter runoff or wetland hydrology. Given that permanent disturbance would be due to upgrades and maintenance of the existing structures, and be limited to a small portion of wetland and forested habitat, there would be minimal effects to potential habitat.

It is expected that frogs would readily relocate to alternative suitable habitats that are available nearby during construction, and would continue to utilize the study area following construction. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, southern leopard frogs in this study area.

Spotted Turtle (Clemmys guttata)

The steel pipe siphon berm provides open areas with sun exposure that could be used for spotted turtle (*Clemmys guttata*) basking and nesting. Additionally, the Blow-off Chambers are located in a forested wetland with adjacent forested habitat that provides suitable foraging and overwinter habitat. However, protective measures would be in place that would limit the potential for effects. Work activities would largely be confined to previously disturbed areas. For the isolated areas of potential habitat at the sites, as a highly mobile species, any spotted turtles are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. At the Blow-off Chambers, the excavation and regrading necessary to replace blow-off chambers and discharge pipes would result in a negligible increase in the extent of impervious surface and would not alter runoff. Given that permanent disturbance would be due to upgrades and maintenance of the existing structures, and

be limited to a small portion of wetland, streambank, and forested habitat, there would be negligible effects to potential habitat.

Potential effects would be negligible due to surrounding basking and nesting opportunities of nearby habitats and short-term construction duration (intermittently over 1.5 years). Upon construction completion, the staging areas and other temporarily disturbed areas would be restored to natural conditions, and the operation of the Catskill Aqueduct would not affect breeding, nesting, or foraging habitat. Since spotted turtle populations are stable within the Hudson River Valley region, the permanent disturbance to potential habitat or to some individuals, if present, would not result in significant adverse impacts to regional populations of spotted turtles or their habitat.

In summary, given the schedule and temporary duration of the proposed activities and limited footprint of disturbance to potential basking areas, no significant effects are anticipated to the spotted turtles and their habitat. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect spotted turtles in this study area.

Wood Turtle (*Glyptemys insculpta*)

Work activities would predominantly occur on previously disturbed areas. Minor disturbance to Canopus Creek, its adjacent forested wetland, and floodplain are unavoidable and would be minimized to the extent practical. A number of protective measures would be in place that would further limit the potential for effects. Specifically, perimeter silt fencing would be erected, as required, for erosion and sediment control prior to commencing work. This would help minimize disturbance to potential habitat and prevent individual wood turtles (*Glyptemys insculpta*) from entering the work sites adjacent to the stream during construction. The temporary stream diversion, riprap aprons, and discharges would be limited to a short reach of the streambank within a short reach. This reach of Canopus Creek is shallow and may freeze during winter. Therefore, it is not suitable to be used for hibernation. The in-stream work associated with streambank restoration is anticipated to minimize temporary disturbance to wood turtles and their habitat. As a highly mobile species, they are anticipated to utilize adjacent habitat while these temporary work activities take place. Moreover, the proposed streambank restoration (including installation of riprap aprons) is scheduled to be completed prior to aqueduct unwatering. Also, treated wash water discharge to prevent scour and streambank erosion, and work activities at the blow-offs would be limited to a short duration (intermittently over 1.5 years).

While no wood turtle individuals were identified during the August and September 2015 field visits, a mating pair was observed in Canopus Creek during a separate visit on October 12, 2015. The perimeter fencing is anticipated to prevent wood turtles from entering the work areas, and any wood turtles encountered within the limits of construction would be moved to adjacent suitable habitat.

Upon construction completion, the staging areas would be restored to natural conditions and the new boathole and streambank restoration measures that remain would not affect breeding, nesting, or foraging habitat.

In summary, given the range of protective measures that would be in place for the duration of construction, as well as the schedule and temporary duration of the proposed activities, no significant effects are anticipated to wood turtles and their habitat. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, wood turtles in this study area.

Indiana Bat (*Myotis sodalis*)

A tree survey was conducted on August 10, 2015 at the Sprout Brook Road Study Area. Two trees, a multi-trunked red maple (6 trunks, ranging from 5 to 22 inches in diameter) and a shagbark hickory (one, 12-inch diameter trunk), were identified as potential bat roosting habitat. The red maple contained crevices and the shagbark hickory exhibited the typical exfoliating bark that could be used by bats.

In the future with the repair and rehabilitation, activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct and would be localized and confined to the limits of construction of the work sites. While tree removal and brush clearing is necessary for access and construction staging, the repair and rehabilitation work activities would not result in significant loss or modification of roosting or foraging habitat for Indiana bats. Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats. Potential effects to streams and wetlands would be avoided to the extent possible and foraging habitat would continue to be available in the canopy within the study area and in adjacent forested areas. There could be temporary noise that discourages Indiana bats from roosting in the immediate vicinity of the work sites. However, there is abundant suitable habitat within which the surrounding areas that Indiana bats could roost. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, Indiana bats in this study area.

Northern Long-eared Bat (*Myotis septentrionalis*)

A tree survey was conducted on August 10, 2015 at the Sprout Brook Road Study Area. There are no man-made structures within the study area that could be used by roosting bats. While northern long-eared bats have been documented to roost in man-made structures, they are more commonly known to roost in trees (see the potential roosting habitat results for Indiana bats, above).

In the future with the repair and rehabilitation, activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct and would be localized and confined to the limits of construction of the work sites. While tree removal and brush clearing is necessary for access and construction staging, the repair and rehabilitation work activities would not result in significant loss or modification of roosting or foraging habitat for northern long-eared bats. Removal of trees would be conducted from November 1 through March 31 to avoid impacts to northern long-eared bats. Disturbance to streams and wetlands would be avoided to the extent possible and foraging habitat would continue to be available in the canopy within the study area and in adjacent forested areas. There could be temporary noise that discourages northern long-eared bats from roosting in the immediate vicinity of the work sites. However, there is abundant suitable habitat within the surrounding areas where northern long-eared bats could roost. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, northern long-eared bats in this study area.

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to bog turtles (*Clemmys [=Glyptemys] muhlenbergii*), eastern box turtles (*Terrapene carolina*), eastern fence lizards (*Sceloporus undulatus*), eastern hognose snakes (*Heterodon platyrhinos*), timber rattlesnakes (*Crotalus horridus*), common wormsnakes (*Carphophis amoenus*), or New England cottontails (*Sylvilagus transitionalis*) associated with the repair and rehabilitation. The repair and rehabilitation may affect, but is not likely to adversely affect blue-spotted salamanders, Jefferson salamanders (and Jefferson salamander complex), marbled salamanders, southern leopard frogs, spotted turtles, wood turtles, Indiana bats, and northern long-eared bats.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Sprout Brook Road Study Area.

9.12.5.4 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Sprout Brook Road Study Area, a Phase I ESA was conducted in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify RECs. The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard.

Based on the Phase I ESA investigation within this study area, there was no indication of an environmental impact that would constitute a REC as defined by the ASTM standard that would affect activities in the study area. Additionally, there is no history of contamination at or in the vicinity of the Sprout Brook Road Study Area. However, the Phase I ESA site visits identified illegal dumping on DEP property of several abandoned pieces of furniture, a car tire, appliances, and various smaller items (e.g., batteries, scrap metal, cans/bottles). These items were found within and outside the work area within the vicinity of the Access Manhole and Blow-off Chambers.

Based on the results of the environmental investigations completed within the Sprout Brook Road Study Area, no other hazardous materials are known to exist. The soil results support the reuse of excavated materials associated with the blow-off chamber reconstruction as backfill and do not suggest the need for special management, handling or health and safety measures at this time.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Sprout Brook Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Sprout Brook Road Study Area would be the same as baseline conditions.

In the future with repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. DEP would handle all materials in accordance with applicable federal, State, and local regulations and guidelines. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Following repair and rehabilitation, all equipment and chemical storage would be removed from the Sprout Brook Road Study Area. The staging areas would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Sprout Brook Road Study Area.

9.12.5.5 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Sprout Brook Road Study Area.

Access to the repair and rehabilitation limits of construction for the work sites within the Sprout Brook Road Study Area would be via Sprout Brook Road and Ridge Road to existing DEP access roads (see **Figure 9.12-20**). Sprout Brook Road (County Route 15) is a two-way, two-lane urban major collector roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Sprout Brook Road Study Area. There is no public transportation and little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site. However, there are no DEP employees who work at or visit the study area on a daily basis, and the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Sprout Brook Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Sprout Brook Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be the basis of this transportation analysis. Of these activities, blow-off chamber reconstruction would generate the most vehicle trips. Blow-off chamber reconstruction would occur in summer ~~2019~~2018 between the hours of 8 AM and sunset, Monday through Friday for approximately 9 weeks, with work that requires shutdowns being performed in spring or fall of that year.

In the future with the repair and rehabilitation, construction vehicles would travel along Sprout Brook Road to the DEP access road. The estimated number of peak-day one-way vehicle trips

associated with the blow-off chamber reconstruction is 101 vehicles, or approximately 202 peak-day vehicle round trips that would travel to and from the study area. Approximately 24 vehicle round trips or 24 PCEs, would be workers either traveling to and from the study area or traveling directly to and from the staging area (depending on parking capacity), with potentially 4 daily shuttle trips between the study area and the staging area. The remaining approximately 174 peak-day vehicle round trips (423 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with blow-off chamber reconstruction is approximately 37 peak-hour vehicle trip ends (66 PCEs). This includes approximately 12 vehicle trip ends (12 PCEs) from workers traveling directly to and from the staging area, approximately 2 peak-hour shuttle trips between the study area and the staging area, and approximately 23 vehicle trip ends (52 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are assumed to coincide with typical construction hours for employee vehicles entering the site. Assuming one 10-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 66 peak-hour PCEs along Sprout Brook Road which is above the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, "Transportation." The work activities at the Sprout Brook Road Study Area would be short-term (totaling 18 weeks over 1.5 years; see **Table 9.12-12**) and would not generate public parking or transportation demands or pedestrian activity within the Sprout Brook Road Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Sprout Brook Road Study Area.

9.12.5.6 Noise

As described in Section 9.3.15, "Noise," mobile noise associated with the repair and rehabilitation within the Sprout Brook Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation activities as shown on **Figure 9.12-28**.

The Sprout Brook Road Noise Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Town of Philipstown Noise Control Law §175-40(C) which states noise levels at the emitting property line shall not exceed 50 dBA between 7 AM and 8 PM, 40 dBA between 8 PM and 7 AM, or 5 decibels above the ambient noise at the point on the boundary of the lot where measured, whichever is greater. However, construction noise between 8 AM and sunset, Monday through Friday is exempt.

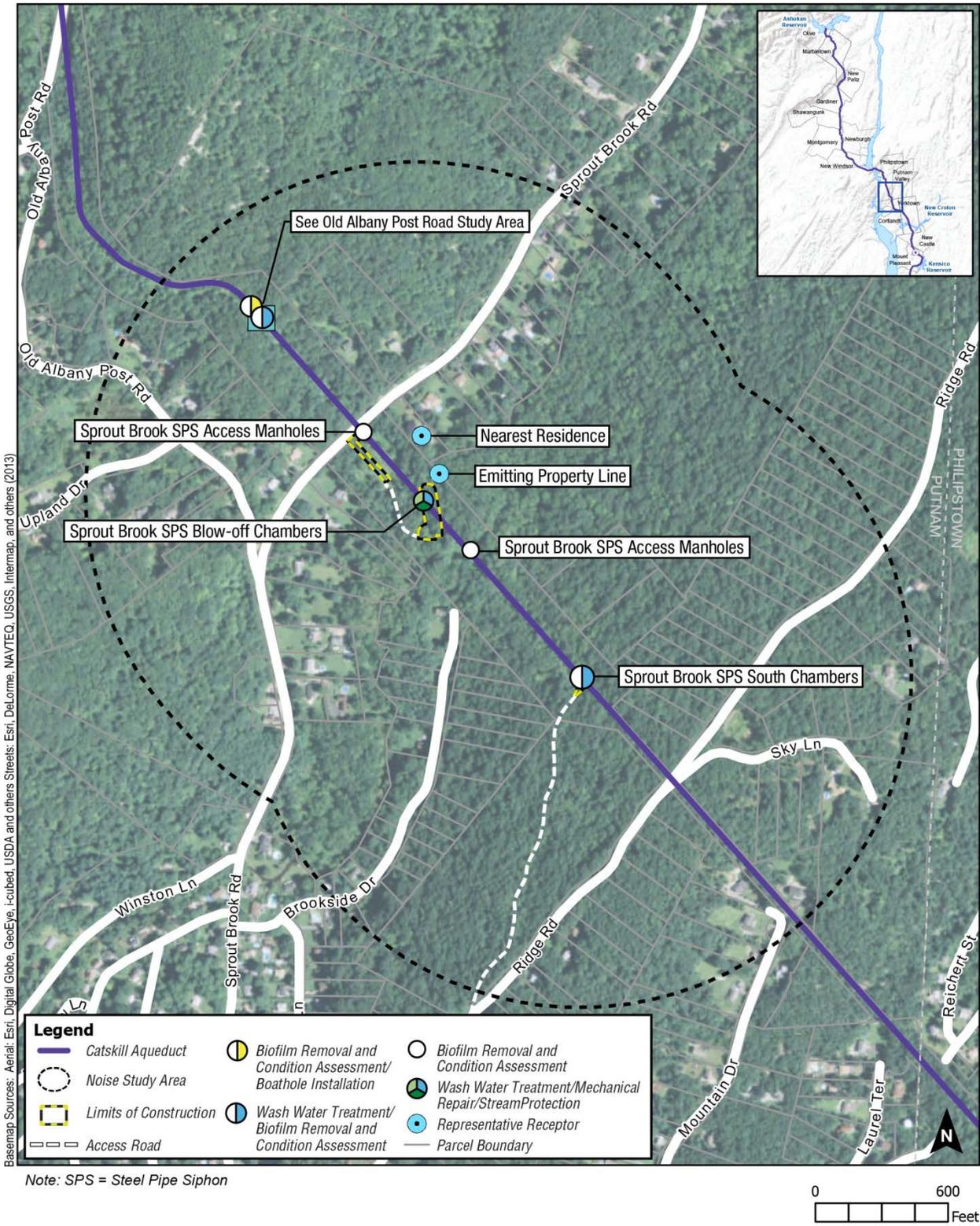


Figure 9.12-28: Noise – Sprout Brook Road Study Area



Existing ambient noise levels within the Sprout Brook Road Study Area are influenced by vehicular traffic traveling on Sprout Brook Road, Ridge Road, and other local roadways. The existing noise levels within the study area are comparable to a quiet suburban and rural residential environment based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels are anticipated within the Sprout Brook Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Sprout Brook Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Sprout Brook Road Study Area would occur at two sites. The stationary noise-generating equipment that would be used within the Sprout Brook Road Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with the blow-off chamber reconstruction would emit the most noise.

Blow-off chamber reconstruction would occur in summer ~~2019~~2018 between the hours of 8 AM and sunset), Monday through Friday for approximately 9 weeks prior to the second 10-week shutdown. Work conducted while the aqueduct is in service would be adjusted to comply with allowable work hours per town noise codes. The next loudest activity, streambank restoration and protection, would also be exempt due to modified hours of work. Small-scale wash water treatment would occur in fall ~~2020~~2019 between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the third 10-week shutdown (see **Table 9.12-12**). These hours cannot be modified because of the limited time to complete work activities during the 10-week shutdown. Therefore, blow-off chamber reconstruction and small-scale wash water treatment are the basis of this stationary noise analysis (see **Table 9.12-12**).

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the blow-off chamber reconstruction and small-scale wash water treatment. Associated equipment reference noise levels are shown in **Table 9.12-16**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.12-16: Stationary Source Construction Equipment Modeled at the Sprout Brook Road Study Area – Noise Analysis and Reference Noise Levels (L_{eq})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA) ¹
Blow-off Chamber Reconstruction	
Ventilation Fan	85
Generator	82
Dozer	81
Small-Scale Wash Water Treatment	
Generator	82
Pump	74
Light Plant	58
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	

Table 9.12-17 shows the results of the stationary construction noise analysis. The Town of Philipstown limits daytime and nighttime noise at the emitting property line. Therefore, noise levels at the emitting property line were calculated for comparison with the applicable noise limits. However, the nearest noise-sensitive receptor is a residence approximately 260 feet away from the work activities. Blow-off chamber reconstruction within the Sprout Brook Road Study Area during the repair and rehabilitation would emit a noise level (L_{eq}) of approximately 73 dBA at the nearest residence. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities, however, this equipment would not be expected to be louder than those associated with blow-off chamber reconstruction. Since the repair and rehabilitation within the Sprout Brook Road Study Area would emit noise levels greater than allowed by the Town of Philipstown noise code, DEP would work with the Town of Philipstown as appropriate.

Table 9.12-17: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors within the Sprout Brook Road Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)	Town of Philipstown Noise Limit (dBA)	Potential for Code Exceedance (Yes or No)
Blow-off Chamber Reconstruction (8 AM to sunset, Monday through Friday)				
Emitting Property Line	134	79	50 ^{1,2}	No ³
Nearest Residence	262	73	NA	NA
Small-Scale Wash Water Treatment (7 AM to 7 PM, 7 days a week)				
Emitting Property Line	134	74	50 ^{1,2}	Yes
Nearest Residence	262	68	NA	NA
Notes: NA = Not Applicable ¹ Daytime noise limit is applicable between the hours of 7 AM and 8 PM. ² The Town of Philipstown has a separate nighttime noise limit that is applicable between the hours of 8 PM and 7 AM. Activity is not anticipated during these hours. ³ Construction noise between 8 AM and sunset, Monday through Friday is exempt.				

Following completion of the repair and rehabilitation work activities, the construction equipment and vehicles would be removed from the Sprout Brook Road Study Area. The repair and rehabilitation work activities would be temporary in nature with peak work activities that would occur during blow-off chamber reconstruction in summer ~~2019~~2018 and small-scale wash water treatment in fall ~~2020~~2019 for limited periods (e.g., up to 9 weeks, per activity).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Sprout Brook Road Study Area.

9.12.5.7 Neighborhood Character

The character of the Sprout Brook Road Study Area is largely defined by a mix of residential, public services, and vacant land uses and its physical setting within a rural location (see **Figure 9.12-22**). The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. The study area is bounded by Ridge Road to the south and traversed in its upper portion by Sprout Brook Road. Canopus Creek crosses the study area flowing from northeast to southwest, and an unnamed tributary to the creek enters the study area from the west. The limits of construction for the work sites are located in a public services corridor with grassy cover, which is owned and maintained by DEP.

DEP has consulted with the Town of Philipstown and Putnam County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Sprout Brook Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; open space and recreation; historic and cultural resources; and visual resources, an impact analysis for the Sprout Brook Road Study Area is not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," Section 9.3.4, "Socioeconomic Conditions," Section 9.3.6, "Open Space and Recreation," Section 9.3.7, "Historic and Cultural Resources," and Section 9.3.8, "Visual Resources," respectively. Furthermore, the public policy impact analysis provided in Section 9.12.2, "Town of Philipstown Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.12.5.5, "Transportation," and 9.12.5.6, "Noise," during construction, the work activities in the Sprout Brook Road Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Sprout Brook Road Study Area.

9.13 TOWN OF CORTLANDT

9.13.1 TOWN OF CORTLANDT PROJECT DESCRIPTION

The Town of Cortlandt is located in Westchester County, New York, on the eastern side of the Hudson River. It is bounded by the Towns of Philipstown to the north and Putnam Valley to the northeast in Putnam County, New York; Town of Yorktown to the east, Towns of New Castle and Ossining to the southeast, and City of Peekskill to the west in Westchester County; and the Hudson River to the west. The Town of Cortlandt encompasses approximately 50 square miles and includes the Villages of Buchanan and Croton-on-Hudson.

The Catskill Aqueduct stretches for approximately 4.4 miles in a northwest to southeast direction through the Town of Cortlandt where activities associated with the repair and rehabilitation would occur are shown on **Figure 9.13-1**. Notable sites along the aqueduct within the Town of Cortlandt include the Peekskill Steel Pipe Siphon North Chamber and the Peekskill Steel Pipe Siphon South Chamber. The repair and rehabilitation work activities within the Town of Cortlandt are shown in **Table 9.13-1**.

Table 9.13-1: Schedule of Work Activities within the Town of Cortlandt

Work Activity	Aqueduct Road Study Area
Staging and Access Improvements	✓
Streambank Restoration and Protection	✓
Blow-off Chamber Reconstruction	✓
Boathole Preparation	✓
Boathole Installation	✓
Biofilm Removal and Condition Assessment/ and Small-scale Wash Water Treatment	✓
Note: ✓ = Work activity proposed.	

The Aqueduct Road Study Area in the Town of Cortlandt encompasses the majority of work that would occur as part of the repair and rehabilitation in this municipality. Additional work activities in the town did not warrant further assessment. Work sites located outside the study area include activities that would primarily be conducted within the aqueduct interior (see Section 9.3, “Screening Assessment and Impact Analysis Methodology”). In the Town of Cortlandt, they include biofilm removal and condition assessment at access manholes not located in the study area and the permanent sealing of four culvert drain sluice gates. See Section 9.2, “Project Description,” for a description of the repair and rehabilitation. Section 9.13.2, “Town of Cortlandt Impact Analysis,” provides a discussion of local regulations in the Town of Cortlandt jurisdictional limits. Section 9.13.3, “Aqueduct Road Study Area Impact Analysis,” provides a description of the study area, proposed activities, and impact analysis for the Aqueduct Road Study Area.

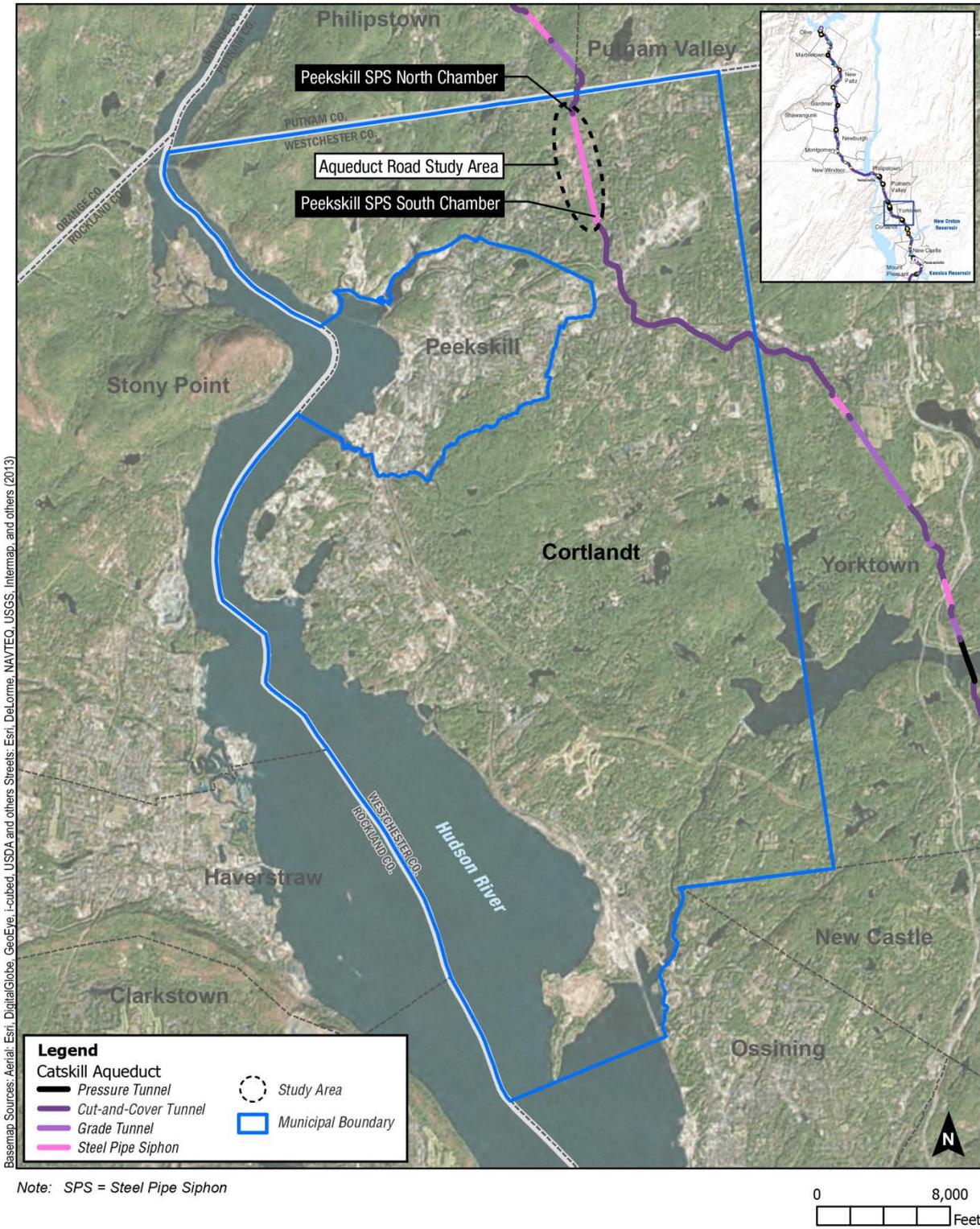


Figure 9.13-1: Town of Cortlandt Study Area



9.13.2 TOWN OF CORTLANDT IMPACT ANALYSIS

9.13.2.1 Public Policy

Because local public policies would not vary for study areas in the same town, public policies are evaluated on a town-wide basis. As discussed in Section 9.3.3, “Land Use, Zoning, and Public Policy,” the repair and rehabilitation’s consistency with the applicable policies of the Westchester County’s Westchester 2025 Plan (Westchester County 2008) within the Aqueduct Road Study Area was analyzed as follows.

Westchester 2025 Plan (2008)

Westchester County’s Westchester 2025 Plan (Westchester County 2008) is a framework to assist the 45 municipalities within the County to develop comprehensive plans that achieve a balance between economic and environmental concerns, while serving the future needs of the local communities within Westchester County. The recommendations outlined in the Plan include those recommended by the Westchester County Planning Board to municipalities as guidance for their own decision making. Based upon a review of these recommendations, the potential effects of the repair and rehabilitation work activities within the Aqueduct Road Study Area are evaluated relative to compatibility with the following two applicable recommendations:

- (1) *Preserve natural resources: Preserve and protect the county’s natural resources and environment, both physical and biotic. Potential impacts on water resources (water bodies, wetlands, coastal zones and groundwater), significant land resources (unique natural areas, steep slopes, ridgelines and prime agricultural land) and biotic resources (critical habitat, plant communities and biotic corridors) require careful consideration as part of land management and development review and approval.*

Within the Aqueduct Road Study Area, no resources in the form of coastal zones or significant land resources have been identified. Water resources within the study area occur along the Peekskill Hollow Creek (Peekskill Hollow Brook) that flows over the Peekskill Steel Pipe Siphon and temporary clearing for access and staging needed at multiple locations in the study area could affect biotic resources. Natural resources are discussed in detail within Section 9.13.3.7, “Natural Resources.”

Under this recommendation, the Westchester 2025 Plan prioritizes the preservation of natural resources in order to balance this alongside land management and development. This recommendation was analyzed for the repair and rehabilitation as work in the study area would potentially impact existing natural resources directly or indirectly.

As part of the work, unwatering of the aqueduct would be required and this would result in raw water discharges to Peekskill Hollow Creek. Additionally, diversion of Peekskill Hollow Creek around in-stream work would be required in order to complete certain work elements. Finally, the discharge of treated biofilm wash waters with a discharge to surface water may also be required.

The proposed action would not be expected to affect water resources for several reasons. While discharges of raw aqueduct water could take place at any time during construction or future maintenance, this would consist of uncontaminated raw water from the aqueduct. Sediment and erosion control measures would also be put in place for all construction activities. Discharge of treated biofilm wash water that would be temporarily discharged to Peekskill Hollow Creek would be conducted in accordance with applicable regulatory requirements established as part of required discharge permits. As a result, work activities are not anticipated to result in significant increases in turbidity, scouring, or other adverse impacts to water resources.

Select tree removal on DEP property would be needed to establish better access to the proposed work sites. However, this would not permanently affect critical biotic habitat or corridors within the study area. The work sites would be located in previously disturbed areas at existing DEP facilities. Tree removal is required because access to these areas has not been needed for some time, and trees have grown in unmaintained areas along the aqueduct. Furthermore, following construction, areas temporarily disturbed during construction would be restored to baseline conditions.

As such, the repair and rehabilitation within the Aqueduct Road Study Area would not affect water resources or biotic resources of Westchester County and would be consistent with this recommendation.

- (2) *Engage in Regional Initiatives: Work with neighboring jurisdictions in the Hudson Valley, Connecticut, New Jersey, Long Island and New York City in planning initiatives aimed at sound land use, transportation, economic development, housing and environmental policies.*

Repair and rehabilitation of the Catskill Aqueduct supports the long-term goal of supplying clean drinking water to the City's 8 million residents and 1 million upstate residents. The potential for impacts to resources identified in this recommendation are analyzed in detail in the following sections: Section 9.13.3.3, "Land Use and Zoning," Section 9.13.3.4, "Socioeconomic Conditions," and Section 9.13.3.9, "Transportation."

Under this recommendation, the Westchester 2025 Plan prioritizes inter-agency cooperation in order to facilitate regional initiatives. This recommendation was analyzed for the repair and rehabilitation, as work in the study area would potentially impact existing land use, transportation, economic development, housing, and environmental policies directly or indirectly.

On a daily basis, over one billion gallons of water are delivered from large reservoirs spanning several counties and jurisdictions within the State to these water consumers. As part of the repair and rehabilitation, DEP has coordinated with local and State jurisdictions to ensure that current and future water supplies are maintained. Through this coordination, repair and rehabilitation within the Aqueduct Road Study Area would comply with existing land use, transportation, economic development, housing, and environmental policies and would therefore be consistent with this recommendation.

Repair and rehabilitation would therefore be consistent with the Westchester 2025 Plan in the Town of Cortlandt and would not result in significant adverse impacts to public policy within the Aqueduct Road Study Area.

9.13.3 AQUEDUCT ROAD STUDY AREA IMPACT ANALYSIS

Within the upper portion of the Aqueduct Road Study Area, the aqueduct consists of the Cat Hill Cut-and-Cover Tunnel, which transitions to the Peekskill Steel Pipe Siphon at the Peekskill Steel Pipe Siphon North Chamber (North Siphon Chamber). Immediately south of Peekskill Hollow Creek, the steel pipe siphon includes three under-stream blow-offs and associated valves within the Peekskill Steel Pipe Siphon North Blow-off Chambers (North Blow-off Chambers). An additional set of blow-off chambers (the Peekskill Steel Pipe Siphon South Blow-off Chambers, or South Blow-off Chambers) is also located in the study area. In the lower portion of the study area, the Peekskill Steel Pipe Siphon transitions to the Peekskill Cut-and-Cover Tunnel at the Peekskill Steel Pipe Siphon South Chamber (South Siphon Chamber). Eight sets of access manholes along the steel pipe siphon are also located within the study area (see **Figure 9.13-2**).

Work activities within the Aqueduct Road Study Area would include: staging and access improvements; blow-off chamber reconstruction and associated streambank restoration and protection; boathole preparation and installation; biofilm removal and condition assessment; and small-scale wash water treatment.

9.13.3.1 Study Area Location and Description

The Aqueduct Road Study Area is located along the upper Catskill Aqueduct in the Town of Cortlandt. The Catskill Aqueduct traverses the study area in a general north to south direction. Peekskill Hollow Creek traverses the upper portion of the study area, flowing from east to west, and Oregon Road runs perpendicular to the aqueduct in the lower portion of the study area (see **Figure 9.13-2**).

Proposed work sites within the study area include the North Siphon Chamber, the North Blow-off Chambers, the South Blow-off Chambers, and the South Siphon Chamber. Access to the North Siphon Chamber would be provided by driving south over the cut-and-cover tunnel from an entrance off Aqueduct Road. Access to the North Blow-off Chambers would be via Oregon Road to a golf cart path stretching from the Hollowbrook Golf Course parking lot to a location within 200 feet of the work site. The South Blow-off Chambers would be accessed by crossing a field adjacent to Oregon Road. The South Siphon Chamber would be accessed by driving over the cut-and-cover tunnel from an entrance off Locust Avenue. The study area boundary is located approximately 500 feet beyond the outermost areas of disturbance related to the work sites. **Figure 9.13-2** shows an aerial photograph of the study area, including the path of the aqueduct and the limits of construction for each work site. **Figure 9.13-3** shows photographs of the study area.

The North and South Siphon Chambers, structures eligible for listing on the National Register of Historic Places, are located in the study area. There are no other federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

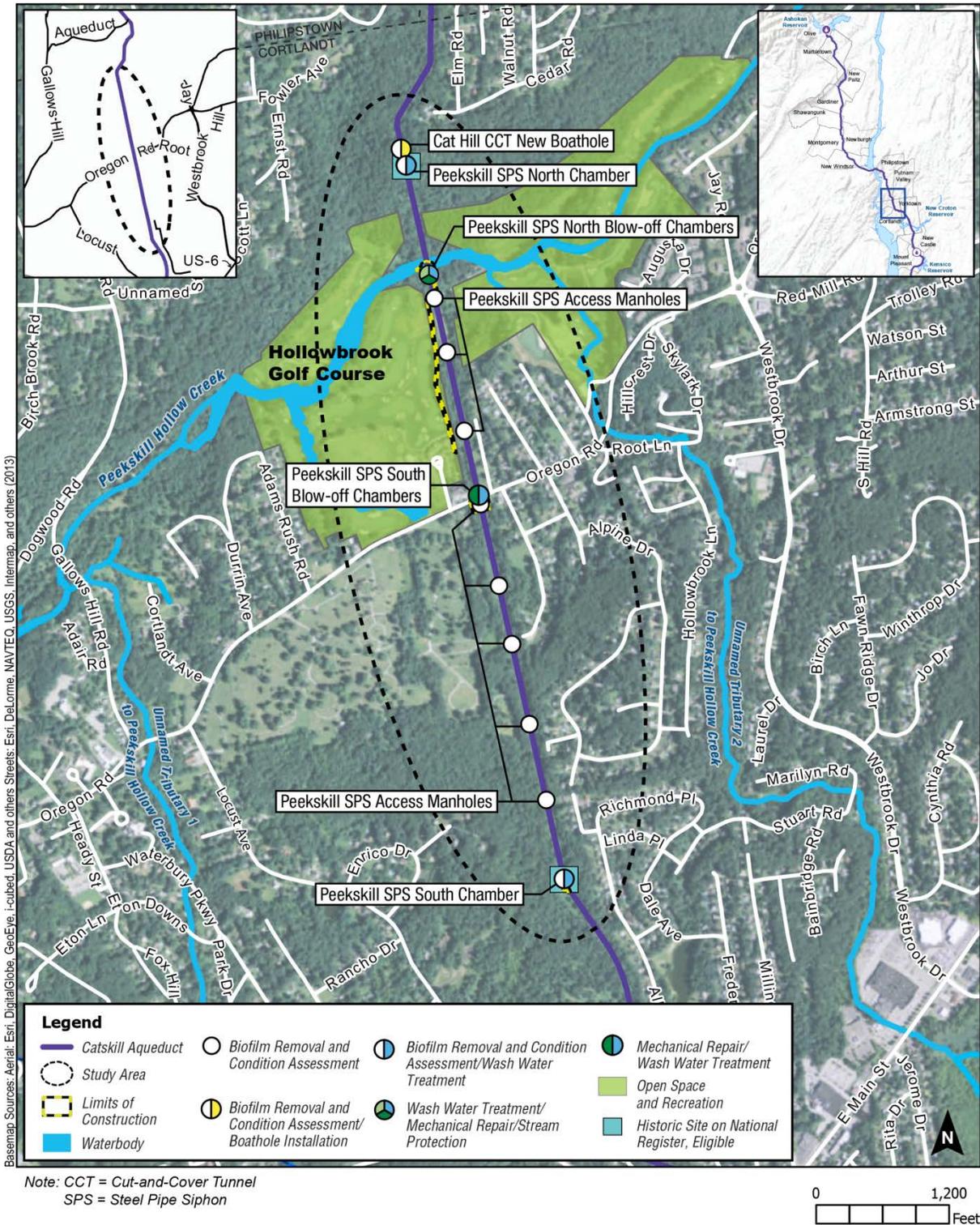


Figure 9.13-2: Study Area – Aqueduct Road





Photograph 1: Peekskill Hollow Creek with exposed blow-off chamber.



Photograph 2: Staging area and south blow-off located south of Oregon Road.

Figure 9.13-3: Photographs – Aqueduct Road Study Area



9.13.3.2 Proposed Activities within the Aqueduct Road Study Area

To support activities within the Aqueduct Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas, including one at the South Blow-off Chambers, would provide additional parking. Equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. Site plans showing layouts of the limits of construction of the work sites, which would occupy a total of 1.9 acres, are shown on **Figure 9.13-4**, **Figure 9.13-5**, **Figure 9.13-6**, and **Figure 9.13-7**. The schedule for work within the study area is shown in **Table 9.13-2**. The duration of active construction within the Aqueduct Road Study Area is estimated to total 37 weeks over 2.5 years.

Table 9.13-2: Schedule of Work Activities within the Aqueduct Road Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Staging and Access Improvements ³	Fall 2018 2017	4 weeks	Monday to Friday, 8 AM to sunset	8
Blow-off Chamber Reconstruction (South)	Summer 2019 2018	9 weeks	Monday to Friday, 8 AM to sunset	12
Boathole Preparation	Summer 2019 2018	3 weeks	Monday to Friday, 7 AM to 5 PM	10
Boathole Installation	Fall 2019 2018 (Second 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	8
Streambank Restoration and Protection	Fall 2019 2018	3 weeks	Monday to Friday, 8 AM to sunset	10
Blow-off Chamber Reconstruction (North)	Fall 2019 2018	9 weeks	Monday to Friday, 8 AM to sunset	12
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	Fall 2020 2019 (Third 10-week shutdown)	7 weeks	7 days a week, 7 AM to 7 PM	21
Notes:				
¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per the Town of Philipstown Noise Control Law §175-40(C).				
² Crew size refers to the number of people anticipated at the work site(s)				
³ Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>).				

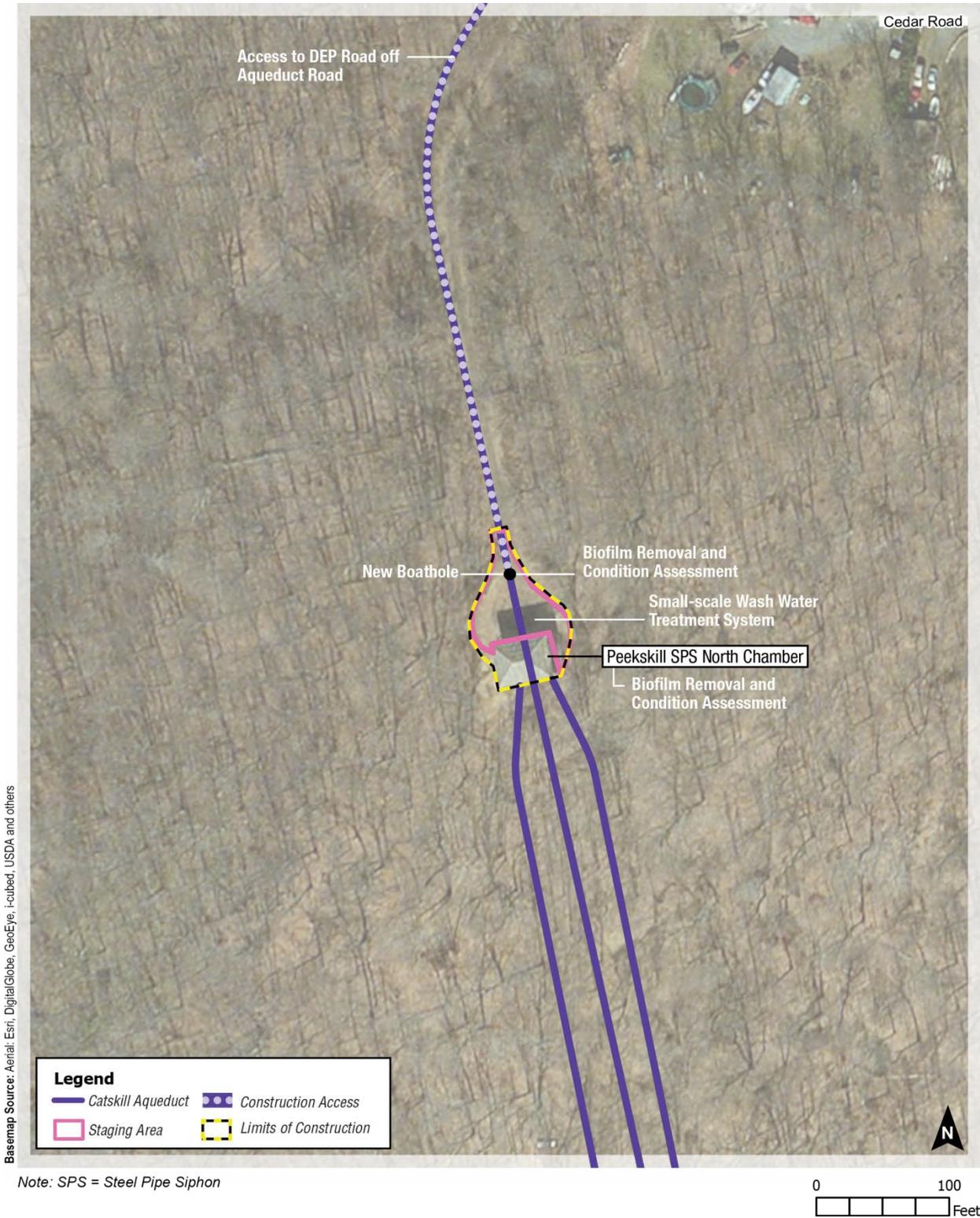


Figure 9.13-4: Site Plan for Peekskill SPS North Siphon Chamber – Aqueduct Road Study Area



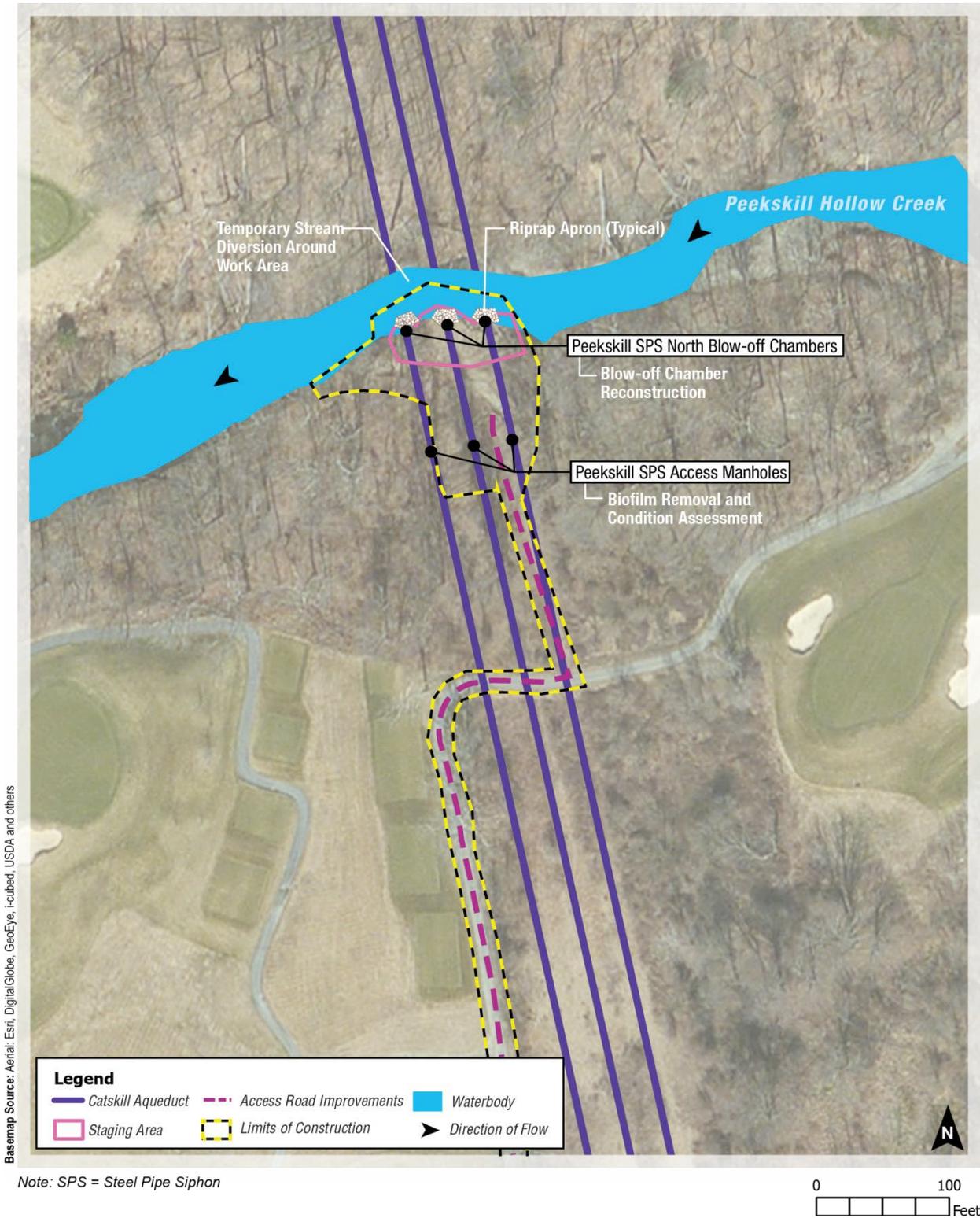


Figure 9.13-5: Site Plan for Peekskill SPS North Blow-off Chambers – Aqueduct Road Study Area



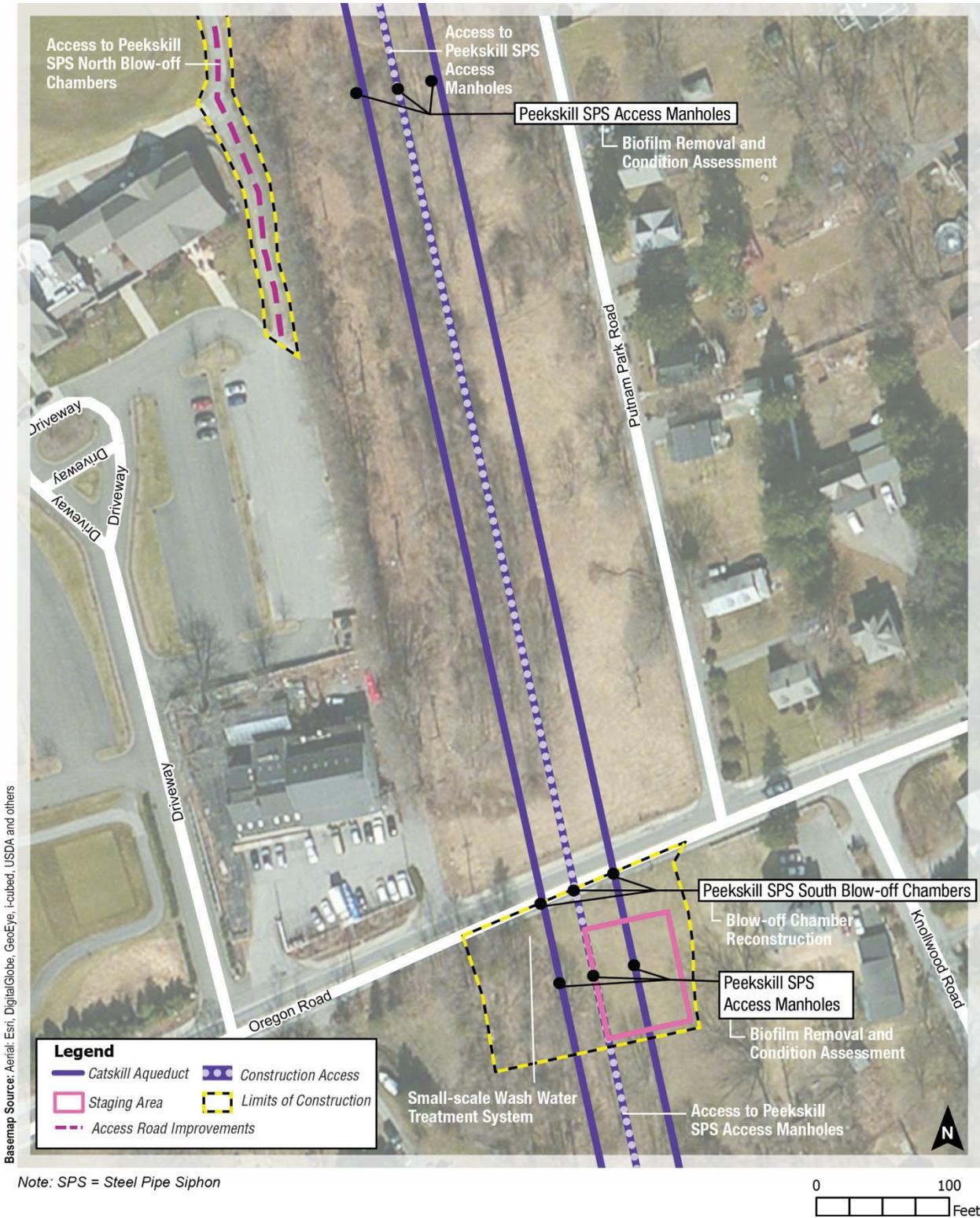
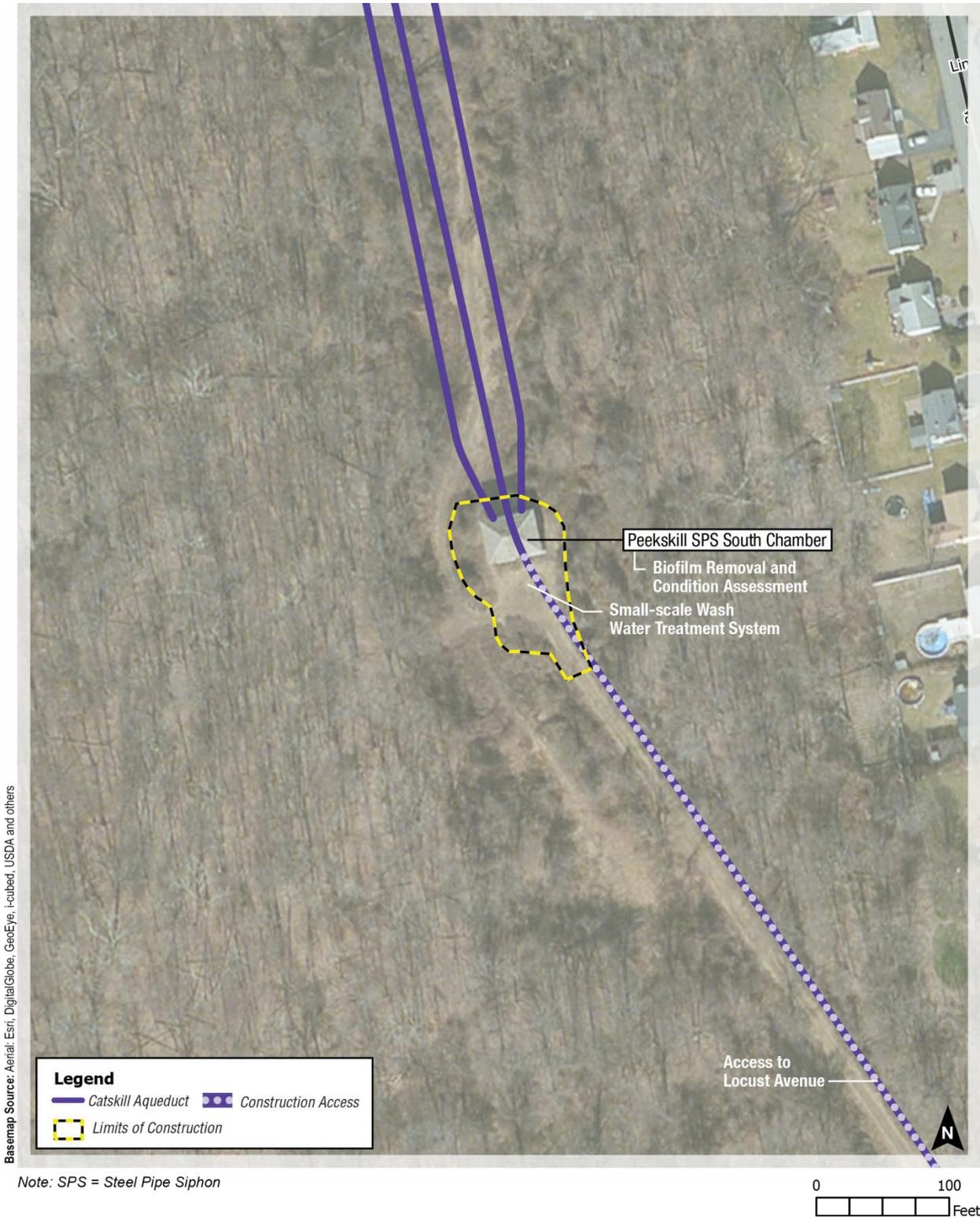


Figure 9.13-6: Site Plan for Peekskill SPS South Blow-off Chambers – Aqueduct Road Study Area





Basemap Source: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others

Note: SPS = Steel Pipe Siphon

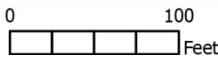


Figure 9.13-7: Site Plan for Peekskill SPS South Siphon Chamber – Aqueduct Road Study Area



Work in the study area would begin with staging and access improvements in fall ~~2018~~2017. The removal of up to 73 trees could be required to establish the staging areas and limits of construction, in addition to underbrush clearing and gravel placement for leveling and erosion control. Road stabilization would also be required along the golf cart path and the grassy stretch between the end of the golf cart path and the North Blow-off Chambers. Work at the North Blow-off Chambers would primarily occur outside the peak golf season, from November to March.

Reconstruction of the South Blow-off Chambers would occur in summer ~~2019~~2018, with small portions of the work that require aqueduct shutdowns performed in the spring and fall of that year. Work activities would include replacement of the blow-off valves, discharge pipes and chamber covers, repair of concrete walls, and removal of the access ladders. The work would require the excavation of approximately 110 cubic yards of soil and approximately 280 cubic yards of soil for fill, resulting in a net fill of approximately 170 cubic yards of soil. Preparation of the new boathole upstream of the North Siphon Chamber would also occur in summer ~~2019~~2018. The work would consist of the excavation of approximately 45 cubic yards of soil and construction of a cast-in-place concrete collar. Boathole installation, which requires unwatering of the aqueduct to tie into the crown of the cut-and-cover tunnel, would take place during the second 10-week shutdown in fall ~~2019~~2018.

Restoration and protection of the portion of Peekskill Hollow Creek that is adjacent to the North Blow-off Chambers would also take place in fall ~~2019~~2018, some work may be conducted in the summer of that year so that erosion and sediment control measures can be installed before October 1, the start of the in-water prohibition period for trout. The work would include regrading and seeding, and installing permanent riprap aprons to repair bank erosion and minimize future bank erosion at this location. To ensure a dry working environment, a temporary stream diversion would be installed, serving to partially divert the stream around the work area. A turbidity curtain would be installed to prevent sediment from moving downstream. Reconstruction of the North Blow-off Chambers, including replacement of the blow-off valves, discharge pipes, and chamber covers, repair of the concrete walls, and removal of the access ladders, would take place in fall ~~2019~~2018 as well. The work would require the excavation of approximately 130 cubic yards of soil and of approximately 160 cubic yards of soil for fill, resulting in a net fill of approximately 30 cubic yards of soil. Temporary in-stream disturbance would cover a total area of approximately 2,000 square feet, and permanent in-stream disturbance would cover approximately 310 square feet. Afterwards, the blow-off valves would be used to unwater the aqueduct for future shutdowns during the repair and rehabilitation and future maintenance.

Lastly, biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019. Access into the aqueduct would be provided by the new boathole, the North Siphon Chamber, the South Siphon Chamber, and the eight sets of access manholes. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct

downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Small-scale wash water treatment systems may be established at the North Siphon Chamber, South Blow-off Chambers, and South Siphon Chamber. Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed. Any areas requiring temporary disturbance would be restored to baseline conditions, including the golf cart path, as necessary.

Impact categories analyzed for the Aqueduct Road Study Area are presented in Section 9.13.3.3, “Land Use and Zoning,” through Section 9.13.3.11, “Neighborhood Character,” and include land use and zoning; socioeconomic conditions; open space and recreation; visual resources; natural resources including water resources, terrestrial resources, federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.13.2, “Town of Cortlandt Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” impact analyses related to community facilities and services; historic and cultural resources; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, federal/State Candidate Species, and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area are not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.13.3.3 Land Use and Zoning

The study area is predominately residential, open space and recreation, and public services land uses, in addition to portions of commercial, community facilities, and vacant land (see **Figure 9.13-8**). Land cover is a combination of forested areas in the north and residential, developed areas in the south.

Zoning in the study area includes single-family residential (R-10, R-20, and R-40), conservation, recreation and open space (CROS), and community commercial (CC) zoning districts as designated by the Town of Cortlandt Zoning Code (see **Figure 9.13-9**). The Catskill Aqueduct is located within the single-family residential (R-40) zoning district, which provides for detached single-family homes. The Catskill Aqueduct is a permitted use as a public utility facility within the single-family residential (R-40) zoning district.

DEP has consulted with the Town of Cortlandt and Westchester County, and it is DEP’s understanding that no major projects or programs are planned that would change land use or zoning within the Aqueduct Road Study Area within the timeframe of the repair and rehabilitation impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that land use and zoning within the Aqueduct Road Study Area would be similar to baseline conditions.

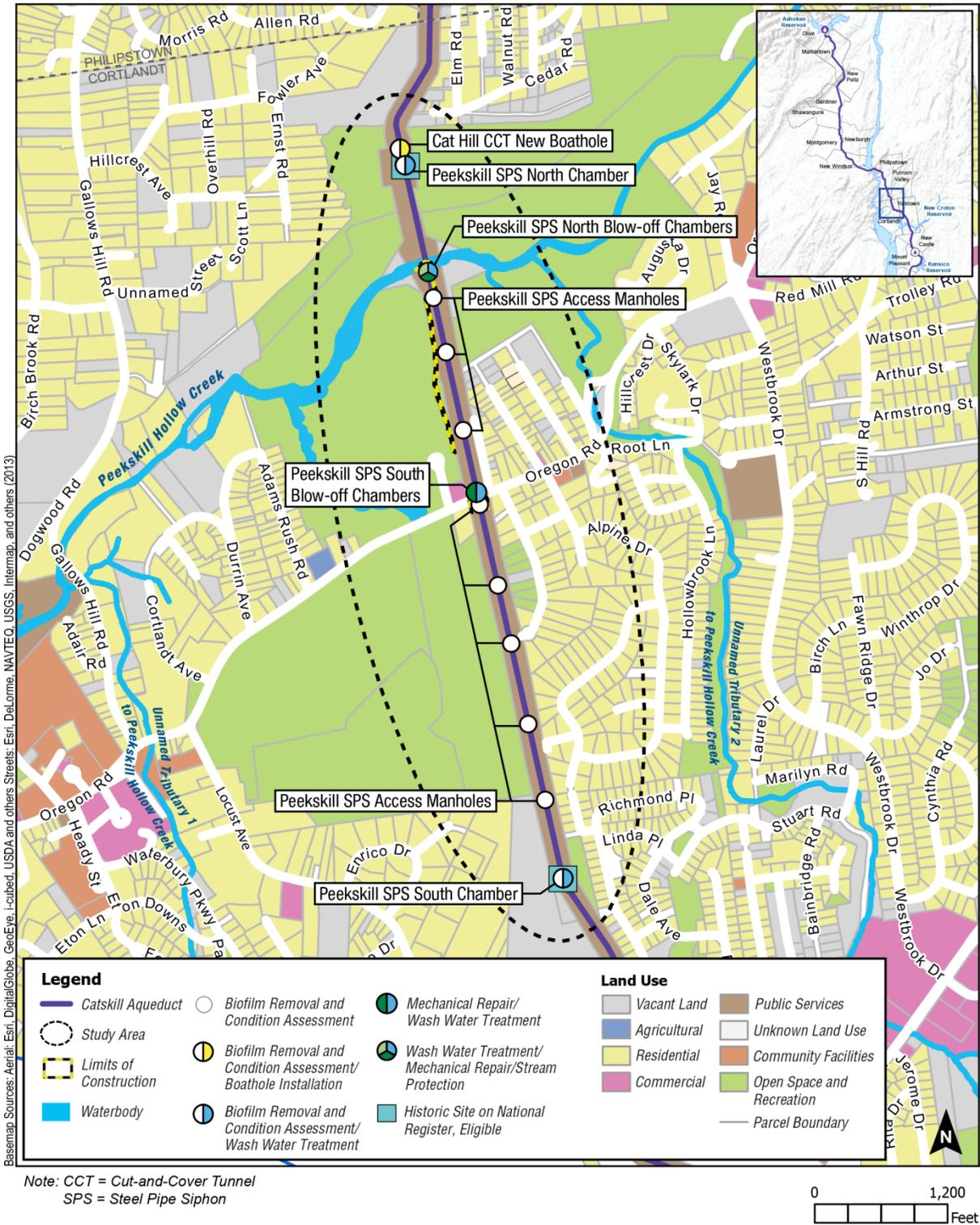


Figure 9.13-8: Land Use – Aqueduct Road Study Area



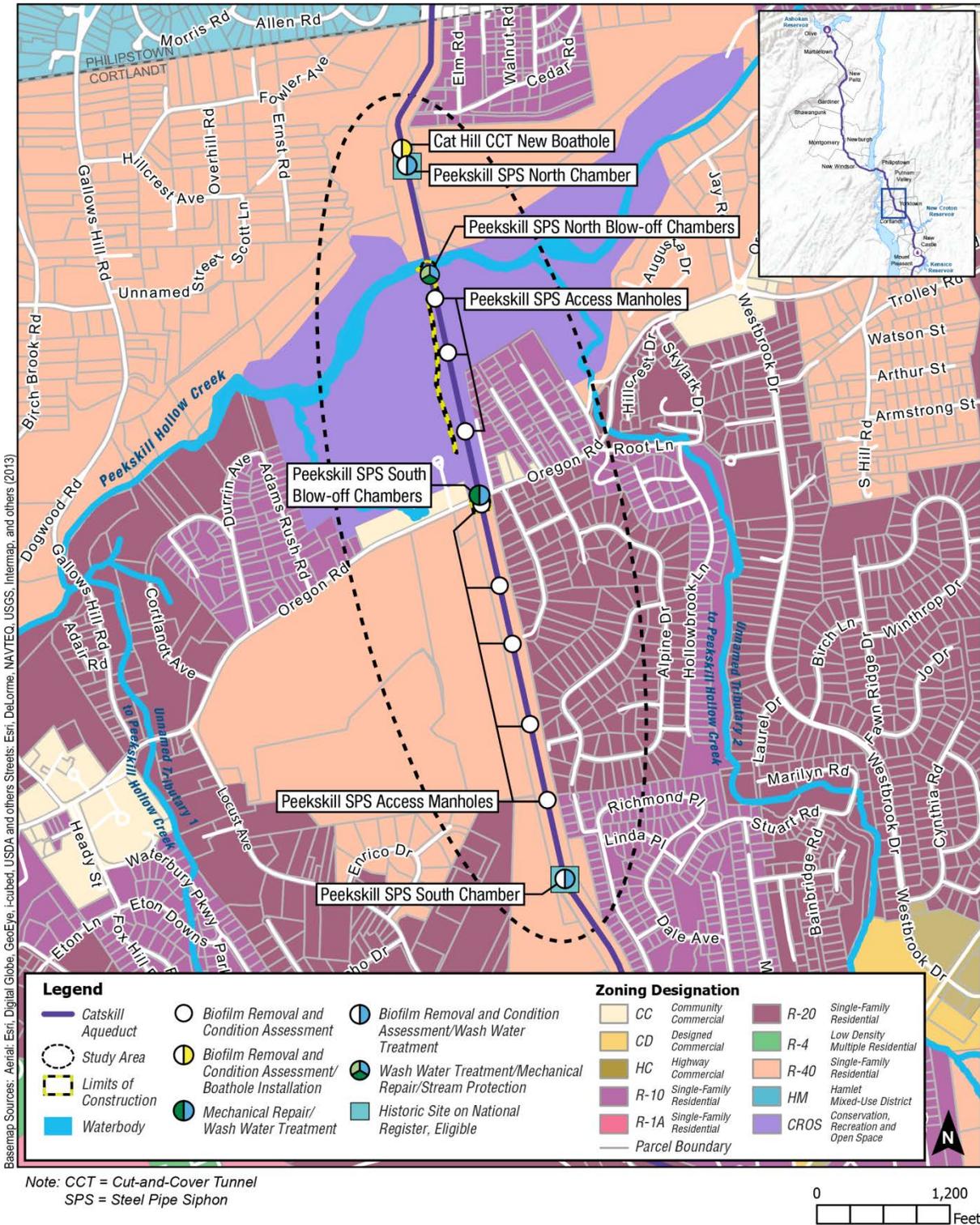


Figure 9.13-9: Zoning – Aqueduct Road Study Area



Access to the North Blow-off Chambers would require crossing the Hollowbrook Golf Course, a private property. Access necessitates the acquisition of an easement of approximately 2.77 acres within portions of a 168-acre parcel in the Town of Cortlandt, identified on the Westchester County Tax Map as Tax ID 12.16-2-1. The land use within the proposed easement area is zoned conservation, recreation and open space (CROS). Under this zoning designation, the minimum lot size required for a dwelling is 15 acres (653,400 square feet) so further subdivision of the lot is allowable under the zoning regulations. The property is currently improved with a clubhouse, several outbuildings, and a golf course. The portion of the property affected by the easement would not include any existing buildings.

The easement would preclude the landowner from any activity that would interfere with or is inconsistent with the rights conveyed to the City, but would not impose any other restrictions on the landowner's use of the existing driveway, parking area, or golf cart path. The landowner would retain the right to relocate the golf cart path if DEP's access to its adjoining lands is preserved. Given the location of the easement along the eastern bounds of the parcel, there would be no deterrent to future subdivision. Acquisition of the easement is consistent with existing land uses, conforms to the existing zoning regulations and would not result in residential or business displacement.

Following construction, all equipment would be removed from the Aqueduct Road Study Area and staging areas would be restored to baseline conditions. Operation of the Catskill Aqueduct would be consistent with baseline conditions and would conform with adjacent land uses and zoning. In addition, the access requirements are not anticipated to result in a significant adverse land use impact to the owner. As such, the property affected by the easement is expected to be able to continue its existing uses after repair and rehabilitation. The permanent easement would not result in any displacement and overall, there would be no change to land use and zoning.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to land use or zoning within the Aqueduct Road Study Area.

9.13.3.4 Socioeconomic Conditions

The study area is predominately residential, open space and recreation (golf course and cemetery), and public services (Catskill Aqueduct) land uses, along with small portions of commercial areas, community facilities, and vacant land (see **Figure 9.13-10**). It is a combination of forested areas in the north and residential, developed areas in the south.

DEP has consulted with the Town of Cortlandt and Westchester County, and it is DEP's understanding that no major developments or programs planned within the Aqueduct Road Study Area within the timeframe of the impact analysis. Therefore, in the future without repair and rehabilitation, it is assumed that land use, population, housing and economic activity within the Aqueduct Road Study Area would be similar to baseline conditions.

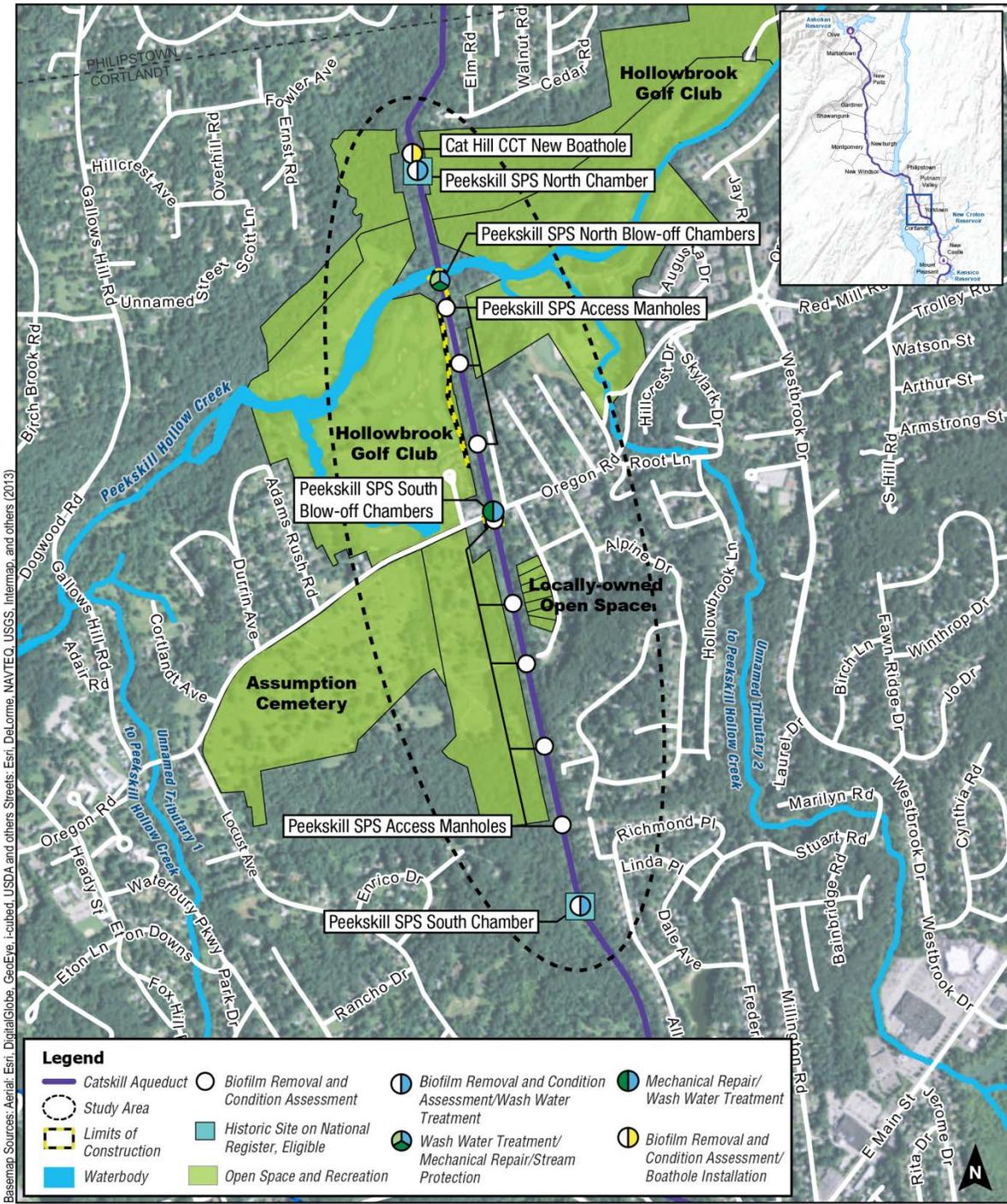


Figure 9.13-10: Open Space and Visual Resources – Aqueduct Road Study Area



As described in Section 9.13.3.3, “Land Use and Zoning,” access to the North Blow-off Chambers would require crossing the Hollowbrook Golf Course, a private property. Repair and rehabilitation would require the acquisition of an approximately 2.77-acre easement within this 168-acre parcel (Tax ID 12.16-2-1). The easement acquisition would not alter the obligation for payment of property taxes on the parcel. The landowner would continue to pay taxes on the full-assessed value of the property, and there should be no significant impact to the tax base. This would not result in a significant incremental difference to the property owner. Use of the parcel would continue as a golf course, and the easement acquisition would not inhibit the golf course uses of the property. Therefore, it is not anticipated that displacement to businesses or residences would occur as a result of this acquisition.

Construction would occur on DEP-owned property and access would partially occur on a small portion of private property. Timing and use of the access road would be coordinated with Hollowbrook Golf Course management to reduce impacts to golf course patrons and operations. Following construction, all equipment would be removed and staging areas would be restored to baseline conditions. For the 2.77-acre easement, the private landowner is expected to be able to continue their existing uses after the repair and rehabilitation. As a result, the repair and rehabilitation would not result in directly displace businesses (or employees) or residences.

Therefore, repair and rehabilitation would not result in significant adverse impacts to socioeconomic conditions within the Aqueduct Road Study Area.

9.13.3.5 Open Space and Recreation

As shown on **Figure 9.13-10**, three open space resources exist within the Aqueduct Road Study Area: the Hollowbrook Golf Course, Assumption Cemetery, and locally owned open space (Common Land Homeowners Association-owned open space). Approximately 110 acres of the approximately 165-acre privately owned Hollowbrook Golf Course is located in the Aqueduct Road Study Area. The golf course is located on both sides of the Catskill Aqueduct, and encompasses much of the study area. The Assumption Cemetery is an approximately 125-acre parcel located south of Oregon Road, on the west side the Catskill Aqueduct. Approximately 50 acres of Assumption Cemetery are located within the study area. Common Land Homeowners Association-owned open space is a privately owned open space that accounts for seven 0.5-acre parcels. The southern parcels are forested, while the northern parcels contain a manicured field, play area, and seating area with benches. The entire Common Land Homeowners Association-owned open space is located within the study area.

DEP has consulted with the Town of Cortlandt and Westchester County, and it is DEP’s understanding that no plans to expand or create new open spaces or recreation resources are anticipated within the Aqueduct Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open spaces are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Aqueduct Road Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities within the Aqueduct Road Study Area would be short-term (intermittently over 2.5 years; see **Table 9.13-2**). In addition, the site preparation activities at the construction staging area near the North Siphon Chamber would not include clearing of trees and shrubs. The North Siphon Chamber boathole installation and the construction staging area for repair and rehabilitation work activities (e.g., biofilm removal and condition assessment) are located in the northern portion of the study area. This area is not visible from the golf course. Activities associated with the North Blow-off Chamber may require removal of trees and shrubs within the construction limits, although the work area is hidden from the view of golf patrons by a buffer of trees and vegetation. Access to the limits of construction for the work site for the North Blow-off Chambers would be provided by way of a Hollowbrook Golf Course road, which DEP uses for maintenance. Use of this road would be coordinated with Hollowbrook Golf Course management to reduce impacts to golf course patrons. Construction vehicles would proceed with caution while driving on the golf course path and obey guidelines established by the Hollowbrook Golf Course management. Assumption Cemetery and Common Land Homeowners Association-owned open space would not be impacted by any work activities within the Aqueduct Road Study Area. Therefore, repair and rehabilitation work activities would not disrupt any recreational uses within the Hollowbrook Golf Course, Assumption Cemetery, or Common Land Homeowners Association-owned open space.

As discussed in Section 9.13.3.10, “Noise,” for the Aqueduct Road Study Area, there could be temporary increases in noise levels due to the work activities within the study area that may discourage recreational uses of the Hollowbrook Golf Course. However, upon completion of the repair and rehabilitation work activities, the recreational uses within the Hollowbrook Golf Course would be unaffected. Assumption Cemetery and Common Land Homeowners Association-owned open space would not be located near any work activities within the Aqueduct Road Study Area.

Following construction, all equipment would be removed from the Aqueduct Road Study Area and staging areas would be restored to baseline conditions. The new boathole and streambank restoration measures would include permanent structures that would remain following construction. Following the repair and rehabilitation within the Aqueduct Road Study Area, operation of the repaired and rehabilitated Catskill Aqueduct would be consistent with baseline conditions and would not disrupt recreational use of adjacent open spaces. As such, the repair and rehabilitation would not encroach upon, cause a loss of, affect the use or physical character of, or disrupt views from the open space and recreation of the Hollowbrook Golf Course, Assumption Cemetery, or Common Land Homeowners Association-owned open space.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Aqueduct Road Study Area.

9.13.3.6 Visual Resources

The study area for the visual resources analysis is the area within the Aqueduct Road Study Area. It also includes view corridors that extend beyond the study area based on the locations that are publicly accessible.

As described in Section 9.13.3.5, “Open Space and Recreation,” and shown on **Figure 9.13-10**, three locally significant resources, Hollowbrook Golf Course, Assumption Cemetery and locally owned open space (Common Land Homeowners Association-owned open space), were identified within the Aqueduct Road Study Area.

In addition, as shown on **Figure 9.13-2**, two additional visual resources, consisting of two structures eligible for listing on the National Register of Historic Places, are located within the study area. The North Siphon Chamber is located in the northern portion of the study area and the South Siphon Chamber is located in the southern portion of the study area. Both chambers are DEP-owned structures associated with the Catskill Aqueduct. The siphon chambers are not visible from surrounding roadways, and are located in a forested area with no public access.

DEP has consulted with the Town of Cortlandt and Westchester County, and it is DEP’s understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Aqueduct Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Aqueduct Road Study Area would be the same as baseline conditions.

Construction access and staging requires removing an estimated 73 trees along Peekskill Hollow Creek and along Oregon Road. All tree removal would be conducted on DEP property and in accordance with applicable requirements set forth by the Town of Cortlandt. To the extent possible, the number of trees proposed for removal would be minimized by limiting tree removal to the immediate vicinity of the work areas. The tree removal at the North Blow-off Chambers would be conducted on DEP property which is surrounded by forested areas, and the work site would continue to be screened from the viewshed of golf patrons. Tree removal for the South Blow-off Chambers at Oregon Road would be visible from the road, but would not affect views from visual resources because this would be an expansion of an existing cleared area associated with the steel pipe siphon. By removing trees in discrete locations along the densely forested areas east of the aqueduct, there would be no change to the character of the area or effect on surrounding trees.

In the future with the repair and rehabilitation, temporary work activities would be visible from local resources, but would be short-term (intermittently over 2.5 years; see **Table 9.13-2**). As noted in the Section 9.3.7, “Historic and Cultural Resources,” there would be no changes to the siphon chamber structures, since the facilities would be used for internal access to the aqueduct and no changes (interior or exterior) to the structures are proposed. The North Siphon Chamber boathole installation and the construction staging area to the North Siphon Chamber (i.e., biofilm removal and condition assessment) are located in the northern portion of the study area. This area is hidden from the viewshed of golf patrons by a buffer of trees and vegetation, and is used for regular maintenance. The North Siphon Chamber boathole installation is not visible from the cemetery, as it is located on the north of Hollowbrook Golf Course, approximately 3,000 feet from the cemetery. Additionally, the boathole installation is not visible from the play area owned by the Common Land Homeowners Association, as it is located on the other side of Hollowbrook Golf Course.

The South Siphon Chamber is not visible from the cemetery, as it is located approximately 900 feet from the cemetery. Additionally, the South Siphon Chamber is not visible from the play area owned by the Common Land Homeowners Association, as it is located approximately 0.5 mile from the South Siphon Chamber and views are blocked by forested areas. Following construction, all equipment would be removed from the Aqueduct Road Study Area and staging areas would be restored to baseline conditions. The new boathole and blow-off chamber reconstructions would include permanent structures that would remain following construction. The structures would not be dramatically altered and views from the golf course, the cemetery, or the homeowners' open space would not change significantly. Following the repair and rehabilitation within the Aqueduct Road Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not disrupt views of identified visual resources. As such, the repair and rehabilitation would not disrupt views from the visual resources of the North Siphon Chamber, Hollowbrook Golf Course, Assumption Cemetery, or Common Land Homeowners Association-owned open space.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Aqueduct Road Study Area.

9.13.3.7 Natural Resources

As shown on **Figure 9.13-11**, the study area for the natural resources analysis is comprised of three sections in the immediate area surrounding the limits of construction: at the North Blow-off Chambers, access manholes, and access road (see **Figure 9.13-11**); at the South Blow-off Chambers (see **Figure 9.13-12**); and at the North and South Siphon Chambers. See **Figure 9.13-11** and **Figure 9.13-12** for more detail on the North and South Siphon Chambers, respectively. These areas are collectively referred to as the natural resources study area.

During a field visit to the North Siphon Chamber on October 7, 2015, the area surrounding this superstructure was characterized as mowed lawn with trees. Peekskill Hollow Creek flows through the natural resources study area at the North Blow-off Chambers. Based on field visits conducted on August 11, 2015 and September 18, 2015, the natural resources study area at the North Blow-off Chambers is best characterized as a rich mesophytic forest community. The natural resources study area at the South Blow-off Chambers is best characterized as mowed lawn with trees based on a field visit on August 11, 2015. Based on a desktop assessment, the area surrounding the South Siphon Chambers is deciduous forest to the west of the aqueduct that may be similar to a rich mesophytic forest, and is mowed lawn to the east.

These habitats have the potential to support protected water resources, terrestrial resources, and wildlife species, and an analysis of the potential effects to natural resources that could result from the repair and rehabilitation work activities is presented below.

Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the Peekskill Hollow Creek subwatershed (hydrologic unit code [HUC] 020301010101) of the lower Hudson watershed (HUC 02030101).

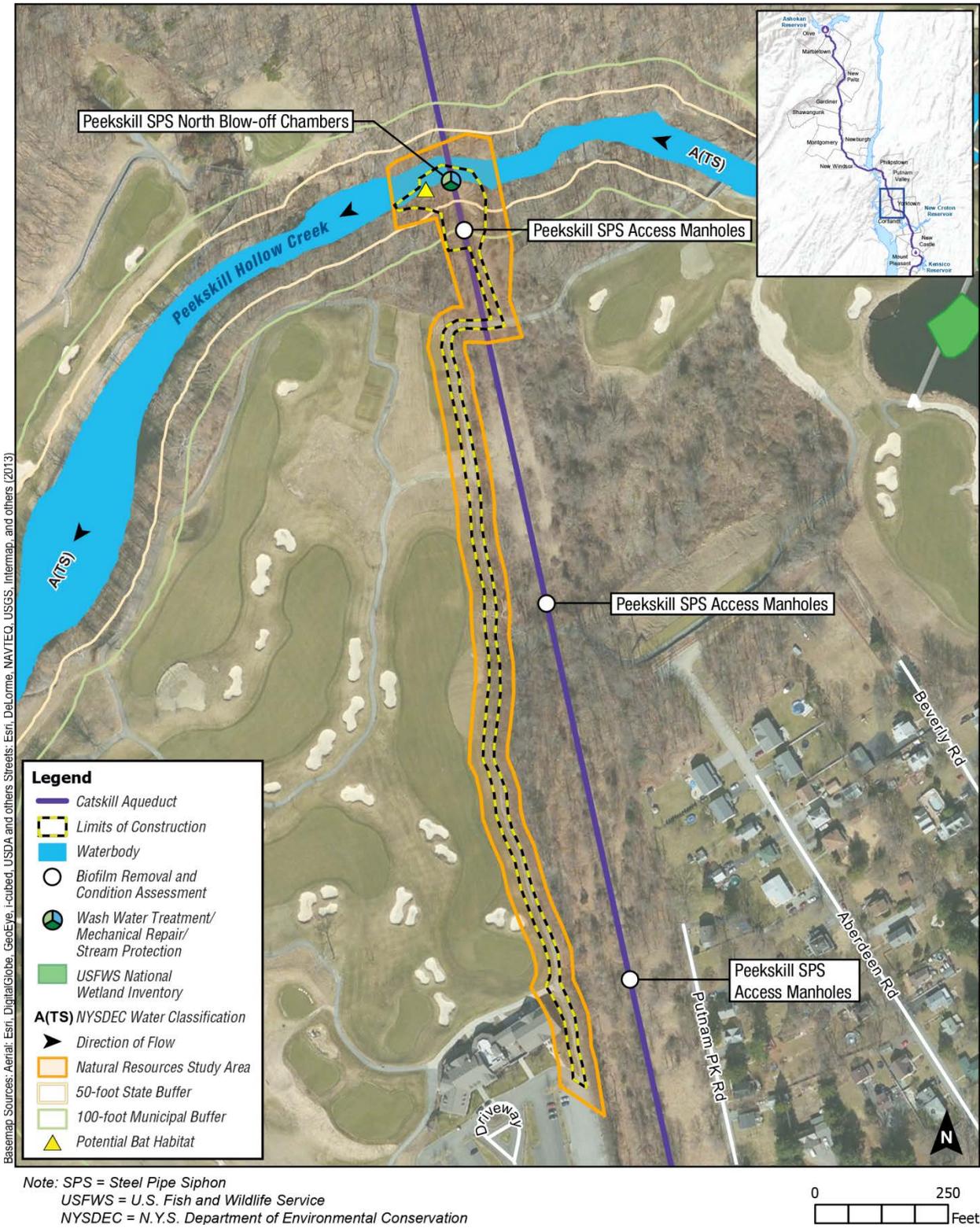


Figure 9.13-11: Natural Resources for Peekskill SPS North Blow-off Chambers – Aqueduct Road Study Area



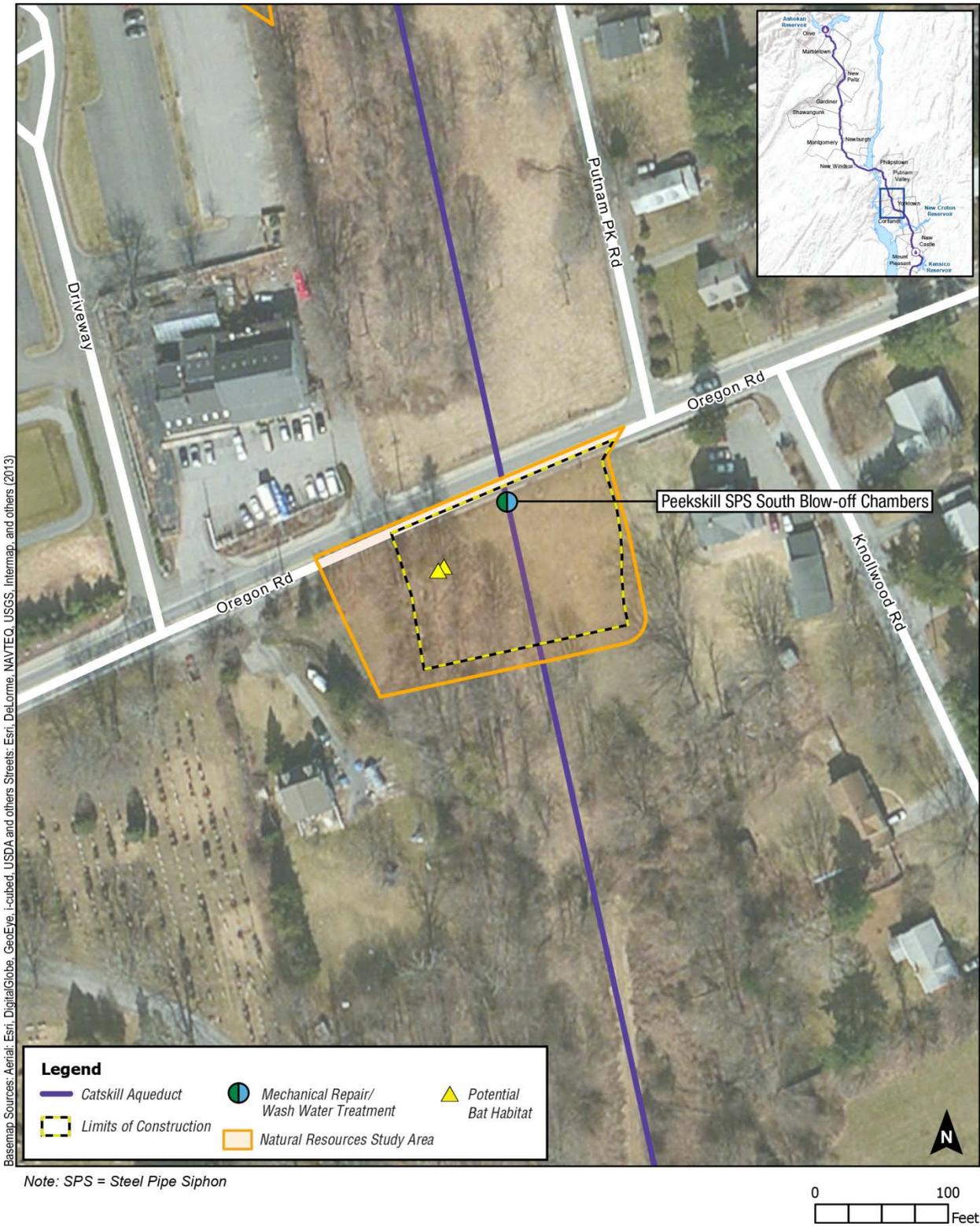


Figure 9.13-12: Natural Resources for Peekskill SPS South Blow-off Chambers – Aqueduct Road Study Area



Peekskill Hollow Creek originates at Tibet Lake in Putnam County and flows approximately 17 miles southwest before it joins Sprout Brook and then Annsville Creek before its confluence with the Hudson River. Peekskill Hollow Creek flows east to west through the natural resources study area and crosses over the Peekskill Steel Pipe Siphon segment of the Catskill Aqueduct located near the North Blow-off Chambers (see **Figure 9.13-11**). No surface water is located at the South Blow-off Chambers along the Peekskill Steel Pipe Siphon at Oregon Road. There is no other surface water identified within the natural resources study area.

Work activities within surface water, including construction staging and blow-off chamber reconstruction, are subject to federal, State, and municipal regulations. Peekskill Hollow Creek, located in the natural resources study area, is subject to jurisdiction under Sections 401 and 404 of the Clean Water Act. As a Class A(TS) stream, Peekskill Hollow Creek may support trout spawning and would be subject to State Protection of Waters regulations with a 50-foot buffer to protect streambanks. In addition, the Town of Cortlandt regulates activities within watercourses with any identifiable channel through which water flows continuously or intermittently with a regulated 100-foot buffer (Cortlandt Town Code Chapter 179: Freshwater Wetlands, Water Bodies, and Watercourses and Chapter 301: Diversion of Watercourses) and also has jurisdiction over activities within floodplains (Cortlandt Town Code Chapter 175: Flood Damage Prevention). Town review and approval may be needed.

Surface Water

The surface water delineations in the natural resources study area occurred on September 18, 2015. One surface water, the Peekskill Hollow Creek, was identified within the natural resources study area. The water resource name, length, area, and classifications are shown in **Table 9.13-3**.

Table 9.13-3: Water Resources and Classifications within the Aqueduct Road Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Peekskill Hollow Creek	7,830	260	Riverine, Upper Perennial, Unconsolidated Bottom, Cobble-Gravel, Permanently Flooded (R3UB1H)

Peekskill Hollow Creek

Peekskill Hollow Creek is fed by the Wiccopee Reservoir and a local watershed of 48 square miles (Hollowbrook Water Watch 2014). Peekskill Hollow Creek supplies water to the City of Peekskill through a pump house which is downstream of the North Blow-off Chambers, outside the study area. See Section 9.19, “Project-wide Impact Analysis,” for additional detail on the Peekskill Water Supply. The substrate of Peekskill Hollow Creek features low gradient riffle-pool habitat and consists of sand, silt, and cobbles. There were many fallen logs and log jams in the stream, and stream flow was clear with no rooted aquatic vegetation. No fish were observed. During the field visit, it was confirmed that there are no wetlands in the natural resources study area. The stream is best classified as a “Riverine, Upper Perennial,

Unconsolidated Bottom, Cobble-Gravel, Permanently Flooded” system based on the Cowardin System (Cowardin et al. 1979).

Floodplains

FEMA Federal Insurance Rate Map (FIRM) number 36119C0009F, effective September 28, 2007, was reviewed. As shown on **Figure 9.13-13**, the study area is within the detailed FEMA flood zone, Zone AE. Zone AE is determined by detailed hydraulic methods and base flood elevations are defined as flood elevations due to the one percent-annual-chance flood event. In addition, floodway extents within the study area determined by FEMA are shown on this figure. The floodway of Peekskill Hollow Creek runs through the center of the natural resources study area near the North Blow-off Chambers; the associated staging area is located within the floodway. The floodway is flanked by a FEMA-designated 100-year floodplain (Zone AE). Areas within Zone AE, including the floodway, are subject to local floodplain management regulations.

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of Cortlandt and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated to occur within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the Aqueduct Study Area would be the same as baseline conditions.

Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Aqueduct Road Study Area.

Construction

Work activities related to the repair and rehabilitation would be restricted to the limits of construction for the work sites. These activities would disturb surface water and vegetated riparian areas, and have the potential to temporarily alter flows in Peekskill Hollow Creek.

The North Blow-off Chambers may be accessed multiple times during construction. As the Peekskill Hollow Creek supports wild trout and can be designated a coldwater fishery, in-water construction activities are generally prohibited from October 1 to May 31 unless otherwise authorized. While DEP anticipates that the majority of in-water construction would occur during the summer and outside of the October 1 to May 31 prohibition, construction activities may need to occur within the restricted period. If this is required as presented within Section 9.19, “Project-wide Impact Analysis,” DEP would implement additional measures to limit potential adverse impacts to trout.

Prior to commencing the repair and rehabilitation, temporary sediment and erosion control measures, such as silt fences and haybales, would be installed at the perimeter of land-based construction. Within the limit of construction, localized construction dewatering (e.g., by installing a barrier and pump to keep the work area dry) may be necessary to facilitate the

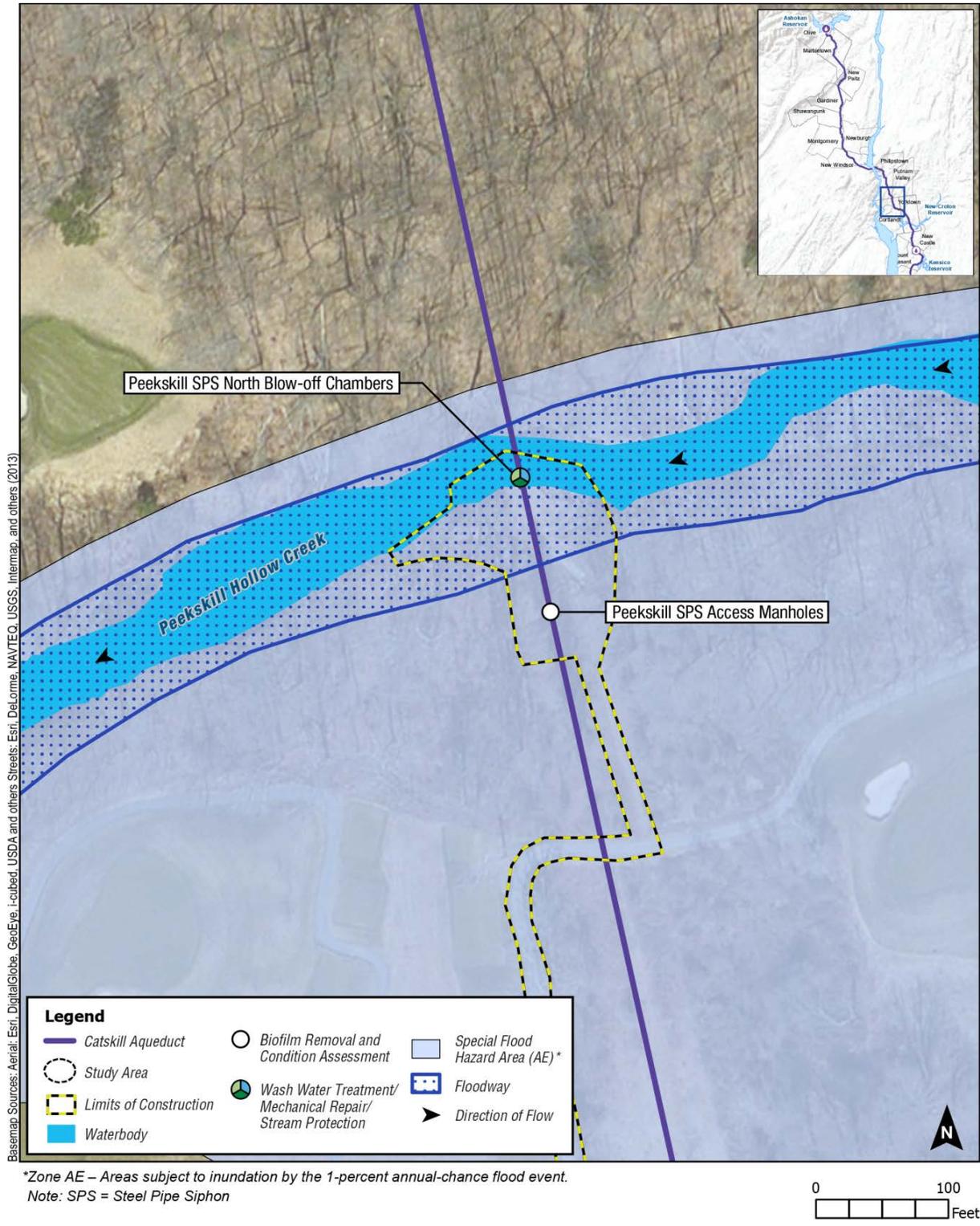


Figure 9.13-13: Floodplains – Aqueduct Road Study Area



excavation of blow-off chambers and discharge pipe replacement. Blow-off chamber reconstruction would also require in-stream access and temporary stream protection. A temporary stream diversion and a downstream turbidity curtain would be installed. These temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements to ensure that the brook creek and its streambanks are protected, aquatic life movement is uninhibited, and sediment and other pollutants are prevented from entering the waterway. Therefore, downstream resources would not be affected. Access and staging activities would primarily occur in upland areas (see **Figure 9.13-11** and **Figure 9.13-12**).

Reconstruction of the Blow-off Chambers and adjacent streambank restoration and protection would require regrading of the streambank and installing permanent riprap aprons approximately 20 to 30 feet long. The re-contoured streambank would have a marginal increase in the extent of impervious surface, but this would not alter runoff to the stream. The riprap aprons would be placed to repair historic bank erosion and minimize future bank erosion in the study area (see Photograph 1, **Figure 9.13-3**). The riprap would also protect the stream while the blow-offs are operated and prevent or limit scour and turbidity.

Anticipated temporary and permanent disturbances to water resources and regulated buffers were quantified based on the limits of construction and proposed work activities (see **Table 9.13-4**). Construction staging would occur on top of the aqueduct and the temporary stream diversion would extend into the stream, resulting in approximately 2,000 square feet of temporary disturbance and approximately 310 square feet of permanent disturbance within Peekskill Hollow Creek. Temporary disturbance to State and municipal watercourse buffers would include approximately 2,590 square feet associated within the State Protection of Waters buffer and approximately 4,770 square feet within the municipal water resource buffer. Permanent disturbance would include approximately 4,770 within the State Protection of Waters buffer and 6,870 square feet within the municipal water resource buffer. Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native riparian vegetation. Permanent disturbance is further analyzed in Section 9.19, "Project-wide Impact Analysis."

The North and South Siphon Chambers and Blow-off Chambers have been identified as potential discharge points for treated wash water. Any wash water would be treated to meet acceptable water quality standards for reuse in the removal operation or for discharge back into the Catskill Aqueduct or to Peekskill Hollow Creek at the North Blow-off Chambers. No biofilm would be discharged to surface water. Treated wash water would be discharged at low flows that would not result in scour or other physical changes to the stream. In the event alum is added as part of the treatment process, flocculated particles would primarily settle prior to the discharge of treated wash water to Peekskill Hollow Creek, and water quality standards for the discharge would be met. Given the low concentrations and short-term, temporary nature of the discharges (approximately 7 weeks), discharges to Peekskill Hollow Creek are not anticipated to cause turbidity, or scouring, inundate the receiving stream, or affect stream substrate. This study area has also been identified as a location for discharging raw aqueduct water while unwatering the aqueduct. Reconstructing the blow-offs requires the siphons to be unwatered, and this initial

Table 9.13-4: Estimated Disturbance to Water Resources within the Aqueduct Road Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Peekskill Hollow Creek	7,830	2,000 <i>Temporary stream diversion and temporary downstream turbidity curtain</i>	310 <i>Riprap</i>
50-foot State Protection of Waters Buffer	18,140	2,590 <i>Construction staging area and construction equipment use</i>	4,770 <i>Riprap apron and regrading following blow-off chamber reconstruction</i>
Water Resource Municipal Buffer	25,370	4,770 <i>Construction staging area and construction equipment use</i>	6,870 <i>Riprap apron and regrading following blow-off chamber reconstruction</i>

unwatering of the siphons would occur with temporary measures in place to protect the stream from erosion. Unwatering events to surface water would also occur at any time after stream protection measures are in place during and following construction and therefore are described in “Operation” below.

Operation

Upon completion of the blow-off chamber repairs and streambank restoration and protection, discharges of raw water to Peekskill Hollow Creek could occur in the future during DEP’s typical operations, when the aqueduct is unwatered for maintenance or inspection. This is expected to be an infrequent event.

The Peekskill Steel Pipe Siphon would primarily be drained from the North Blow-off Chambers into Peekskill Hollow Creek. New streambank protection would be in place at the North Blow-off Chambers to prevent scour during an unwatering event, with discharges of approximately 11,200 gpm at initial valve opening and a maximum flow of approximately 38,200 gpm. The South Blow-off Chambers would be used to drain the remaining volume and would result in minimal discharges to an unnamed and unmapped creek outside of the study area. Discharges from each south chamber would be approximately 1,300 gpm at initial valve opening to a maximum flow of approximately 5,400 gpm. It would take approximately 18 hours to unwater the Peekskill Steel Pipe Siphon. Each siphon pipe would be unwatered separately and the north blow-offs would be unwatered before the south blow-offs.

An analysis was conducted to determine if the discharge associated with an unwatering event is greater than the bankfull stream flow. Bankfull flow is the flow that just fills the channel to the top of its banks (i.e., stream capacity) and at the point in which water begins to flow onto the floodplain. Bankfull flow was predicted for Peekskill Hollow Creek using the USGS StreamStats Program. If the discharge associated with an unwatering event is greater than the bankfull flow, indirect downstream effects, such as an increase in erosion and scouring over the baseline could

be reasonably expected. The maximum discharge flows to Peekskill Hollow Creek would be 421,100 gpm when the blow-offs are operated during a 1.5-year storm event. This is less than the calculated bankfull flow of Peekskill Hollow Creek of approximately 498,200 gpm, making it similar to baseline conditions.

The secondary location used to unwater these siphon pipes would be from the South Blow-off Chambers to the drainage ditch off Oregon Road. The maximum discharge flows would be approximately 13,000 gpm when the South Blow-off Chambers are operated during a 1.5-year storm event. Similarly, this would not exceed the calculated bankfull flow of approximately 14,800 gpm. Therefore, indirect downstream impacts such as increases in erosion and scouring would be minimal.

Additionally, flows would be moderated by throttling the valves. They would be monitored by an on-site crew to prevent the receiving stream from becoming inundated by discharges of raw water. In the event that inundation begins to occur during unwatering, the on-site crew would have the ability to cease unwatering at any time to allow streamflows to subside to baseline flows. Discharges would be limited to raw aqueduct unwatering events, which would be infrequent and last several hours in duration. They are not anticipated to cause scouring or result in a bankfull event, or otherwise alter stream capacity of the receiving waters.

The streambank restoration measures would have minor encroachment on the floodway, would be keyed into the existing streambank, and would not displace a significant portion of the cross-sectional area of the stream. DEP would coordinate with the Town of Cortlandt and FEMA, as necessary, to comply with applicable floodplain management requirements. In addition, DEP would conduct hydrologic and hydraulics calculations as part of the design, as applicable, to ensure that placement of the streambank restoration measures would have no effect on the existing base flood elevations or floodway elevations.

Water Resources Conclusions

Water resources in the natural resources study area are limited to Peekskill Hollow Creek at the North Blow-off Chambers. While the majority of the work activities would result in temporary disturbance, minor permanent disturbance would occur as part of the blow-off chamber reconstruction and associated streambank restoration and protection. A temporary stream diversion may be needed to construct the streambank restoration measures. Permanent fill (i.e., riprap aprons and a retaining wall) would be minimal and would be beneficial in that it would repair historic bank erosion and minimize future scouring. Following construction, the site would be restored to natural conditions. Permanent disturbance would entail upgrades to existing infrastructure and be limited to a small portion of the streambank that would be revegetated. Therefore, there would be no long-term impacts to water resources.

DEP would coordinate with the Town of Cortlandt and FEMA, as necessary, to ensure all local and federal requirements pertaining to floodplain management are satisfied. The minor encroachment on the floodplain would not displace a significant portion of the cross-sectional area of the waterbody, and would not result in greater than a 1-foot rise in base flood elevations.

Treated biofilm wash water would be discharged over the course of 7 weeks during the third 10-week shutdown in accordance with applicable regulatory requirements. Restoring the historic function of the blow-offs to discharge raw aqueduct water would be a change in baseline conditions; however, based on the above assessment, there would be minimal indirect effects to water resources.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Aqueduct Road Study Area.

Terrestrial Resources

Terrestrial resources within the natural resources study area consist of a rich mesophytic forest, mowed lawn, and mowed lawn with trees. However, this site is a poor representation of a mesophytic forest community due to the numbers of non-native species. Trees include black locust (*Robinia pseudoacacia*), tree-of-heaven (*Ailanthus altissima*), red maple (*Acer rubrum*), and tuliptree (*Liriodendron tulipifera*) that are heavily overgrown with Oriental bittersweet (*Celastrus orbiculatus*). The understory is composed of a variety of non-native species including multiflora rose (*Rosa multiflora*), smartweed (*Polygonum* spp.), Japanese knotweed (*Polygonum cuspidatum*), common mugwort (*Artemisia vulgaris*), and privet (*Ligustrum* spp.).

The Town of Cortlandt regulates removal of more than five trees with a diameter greater than 4 inches and any single tree exceeding 18 inches in diameter on publicly held property (Cortlandt Town Code Chapter 283: Trees), and Town review and approval may be needed.

DEP has consulted with the Town of Cortlandt and Westchester County, and it is DEP's understanding that no new projects or programs that would affect terrestrial resources are anticipated within the Aqueduct Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be similar to baseline conditions.

In the future with the repair and rehabilitation, work activities would include tree clearing and shrub removal to create staging areas. An estimated 73 trees consisting of 11 species with a dbh range between 5 and 14 inches may be removed to establish staging areas within the natural resources study area. The most common species of trees to be removed include 24 red maple, 15 black locust, and 10 tree-of-heaven. Tree removal would occur along Peekskill Hollow Creek and for staging and blow-off repairs along Oregon Road. All tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Additionally, tree removal would be conducted on DEP property and in accordance with applicable requirements set forth by the Town of Cortlandt. To the extent possible, the number of trees proposed for removal would be minimized by limiting tree removal to the immediate vicinity of the work areas. Tree removal would occur in discrete locations along the densely forested areas east and west of the aqueduct, and would not dramatically change the character of the area or affect surrounding trees. Following construction, staging areas would be restored to natural conditions.

To offset disturbance within the riparian habitat of Peekskill Hollow Creek, riparian vegetation would be planted following the repair and rehabilitation to provide additional streambank

stabilization within the regulated floodway. While the species composition and quantity have not yet been determined, replacement plantings would be native species adapted to floodplain habitat and planted at recommended densities within DEP property.

Following construction, all equipment would be removed from the natural resources study area and staging areas would be restored to natural conditions. Riparian vegetation would be planted to restore the floodplain community along Peekskill Hollow Creek, and other vegetated areas temporarily cleared during construction would be restored with similar communities via reseeded. Operation of the repaired and rehabilitated Catskill Aqueduct would be consistent with baseline conditions and natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Aqueduct Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. Species that could be affected within the study area and that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as County and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” eight species were identified to have the potential to be affected by the repair and rehabilitation within natural resources in the study areas. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these eight species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.13-5**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and field visits, as applicable.

Table 9.13-5: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitats within the Aqueduct Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 11, 2015, September 18, 2015, and October 7, 2015. Permanent disturbance to forested habitat and a small area of watercourse and streambank habitat would occur as part of the repair and rehabilitation. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Eastern Fence Lizard	<i>Sceloporus undulates</i>	Unlisted	Threatened	No individuals were incidentally observed during the field visits on August 11, 2015, September 18, 2015, and October 7, 2015. According to NYNHP, no records of eastern fence lizards were identified within 1.5 miles of the study area. Potential habitat exists within the forested and open areas with sun exposure along the steel pipe siphon berm. Permanent disturbance to forested habitat and a small area of watercourse and streambank habitat would occur as part of the repair and rehabilitation. Temporary effects to basking habitat are possible; however, upon completion of the repair and rehabilitation, the staging areas would be restored to natural conditions and blow-off chamber reconstruction and streambank restoration are not anticipated to affect basking habitat. Therefore, there are no effects anticipated, and no further analysis for eastern fence lizards is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 11, 2015, September 18, 2015, and October 7, 2015. Potential habitat exists within the forested and open areas with sun exposure along the steel pipe siphon berm; however, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species use in the vicinity during construction. Perimeter silt fencing would also help prevent individuals from entering work sites during construction. Therefore, there are no effects anticipated, and no further analysis for eastern hognose snakes is warranted for this study area.	No

Table 9.13-5: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitats within the Aqueduct Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Timber Rattlesnake	<i>Crotalus horridus</i>	Unlisted	Threatened	No individuals were incidentally observed during the field visits on August 11, 2015, September 18, 2015, and October 7, 2015. According to NYNHP, no records of timber rattlesnakes were identified within 1.5 miles of the study area. Potential habitat exists within the forested and open areas with sun exposure along the steel pipe siphon berm. Temporary effects to basking habitat are possible; however, upon completion of the repair and rehabilitation, the staging areas would be restored to natural conditions, and blow-off chamber reconstruction and streambank restoration are not anticipated to affect basking habitat. Therefore, there are no effects anticipated, and no further analysis for timber rattlesnakes is warranted for this study area.	No
Wood Turtle	<i>Glyptemys insculpta</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 11, 2015, September 18, 2015, and October 7, 2015. Potential habitat for wood turtles exists along Peekskill Hollow Creek in the study area, which would be affected by the repair and rehabilitation. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Common Wormsnake	<i>Carphophis amoenus</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 11, 2015, September 18, 2015, and October 7, 2015. Potential habitat exists within the forested and open areas with sun exposure along the steel pipe siphon berm; however, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species use in the vicinity during construction. Perimeter silt fencing would also help prevent individuals from entering work sites during construction. Therefore, there are no effects anticipated, and no further analysis for common wormsnares is warranted for this study area.	No
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	Tree surveys were conducted on August 11, 2015 and September 18, 2015. Three trees were identified as potential bat roosting habitat. Additionally, there could be temporary noise that discourages bats from roosting in the immediate vicinity of the work sites. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened None	Tree surveys were conducted on August 11, 2015 and September 18, 2015. Three trees were identified as potential bat roosting habitat. Additionally, there could be temporary noise that discourages bats from roosting in the immediate vicinity of the work sites. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.

Eastern Box Turtle (*Terrapene carolina*)

The steel pipe siphon provides open areas with sun exposure that could be used for basking and nesting. Additionally, the North Blow-off Chambers are located in a deciduous forest with well-drained soils that provide suitable foraging and overwinter habitat for eastern box turtles. During construction, a number of protective measures would be in place that would limit the potential for effects. Work activities would largely be confined to previously disturbed areas. In instances where potential habitat would be temporarily disturbed during construction, it is anticipated that eastern box turtles would move to adjacent similar habitats. Perimeter silt fencing would also limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. At the North and South Blow-off Chambers, the excavation and regrading necessary to replace blow-off chambers and discharge pipes would not greatly increase the extent of impervious surface and would not alter runoff. No eastern box turtles were identified during the field visits, and the perimeter fencing is anticipated to prevent individual turtles from entering the work areas. Any eastern box turtles encountered within the limits of construction would be moved by a DEP Wildlife Specialist to adjacent suitable habitat. Potential effects would be negligible due to the surrounding basking, foraging, and overwintering opportunities of nearby habitats and the short-term construction duration (totaling 37 weeks over 2.5 years).

Upon construction completion, the staging areas and other temporarily disturbed areas would be restored to natural conditions and the operation of the Catskill Aqueduct would not affect breeding, nesting, or foraging habitat. Since eastern box turtle populations are stable within the Hudson River Valley region, the permanent disturbance to potential habitat or to some individuals, if present, as a result of the repair and rehabilitation in the natural resources study area would not result in significant adverse impacts to regional populations of eastern box turtles or their habitat.

In summary, given the temporary duration of the proposed activities, and limited footprint of disturbance to potential basking areas, no significant effects are anticipated to eastern box turtles and their habitat. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, eastern box turtles in this natural resources study area.

Wood Turtle (*Glyptemys insculpta*)

Work activities would predominantly occur on previously disturbed areas; however, minor disturbance to the ~~brook creek~~ and its adjacent floodplain and forested habitat are unavoidable and would be minimized to the extent practical. A number of protective measures would be in place that would further limit the potential for effects. Specifically, perimeter silt fencing would be erected, as required, for erosion and sediment control prior to commencement of work, which would help minimize impacts to adjacent habitat and prevent individual wood turtles (*Glyptemys insculpta*) from entering the work sites adjacent to the stream during construction. The temporary stream diversion, riprap aprons, and discharges would be limited to a portion of the streambank within a short reach. At the North and South Blow-off Chambers, the excavation and regrading necessary to replace the blow-off chambers and discharge pipes would not greatly increase the extent of impervious surface and would not alter runoff. In instances where potential habitat would be temporarily disturbed during construction, it is anticipated that wood turtles would

move to adjacent similar habitats. Potential effects would be negligible due to the surrounding basking, foraging, and overwintering opportunities of nearby habitats and the short-term construction duration (totaling 37 weeks over 2.5 years).

Once completed, the streambank restoration measures would dissipate flows during future unwatering events to protect downstream shorelines and riparian habitat. While a small amount of habitat would be permanently altered, the restored riprap would provide an overall benefit to potential wood turtle habitat along Peekskill Hollow Creek. In addition, unwatering flows would be moderated to ensure that the streambanks are not overtopped as a result of the repair and rehabilitation. Furthermore, all wash water would be treated to meet water quality standards for discharge to waterbodies and, therefore, no change in water quality is anticipated as a result of the repair and rehabilitation.

While no wood turtle individuals were identified during the field visits, and the perimeter fencing is anticipated to prevent wood turtles from entering the work areas, any wood turtles encountered within the limits of construction would be moved by a DEP Wildlife Specialist to adjacent suitable habitat. Upon construction completion, the staging areas would be restored to natural conditions and the new boathole and streambank restoration measures that remain would not affect breeding, nesting, or foraging habitat. In summary, given the range of protective measures that would be in place for the duration of construction, the schedule, and the temporary duration of the proposed activities, as well as permanent stream protection that would benefit wood turtle habitat during future aqueduct unwatering, no effects are anticipated to wood turtles and their habitat. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, wood turtles in this natural resources study area.

Indiana Bat (*Myotis sodalis*)

Field visits were conducted on August 11, 2015 to identify trees to be removed for site access. Each tree was inspected for the potential to serve as bat roosting habitat. Trees tagged for removal included predominantly black locust, tree-of-heaven, and tuliptree. One tree was identified as potential bat roosting habitat at the North Blow-off Chambers near Peekskill Hollow Creek, and two more trees were identified as potential roosting habitat near the South Blow-off Chambers, for a total of three potential roosting trees (see **Figure 9.13-11** and **Figure 9.13-12**).

Repair and rehabilitation work activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct and would be localized and confined to the immediate vicinity of the Peekskill Steel Pipe Siphon. Based on the tree survey, select clearing of brush and trees would not result in significant loss or modification of foraging or roosting habitat for Indiana bats. Three trees with potential bat roosting habitat may be removed during construction. Potential effects to streams and wetlands would be avoided to the furthest extent possible, and foraging habitat would continue to be available in the canopy within the natural resources study area and in adjacent forested areas. There could be temporary noise that discourages Indiana bats from roosting in the immediate vicinity of the work sites. However, there is abundant suitable habitat in the surrounding areas in which Indiana bats could roost. Any tree removal that is required would be limited to a few select trees, and would be conducted from November 1 through March 31 to avoid impacts to potential roosting trees of Indiana bats. Therefore, the

repair and rehabilitation may affect, but is unlikely to adversely affect, Indiana bats in the natural resources study area.

Northern Long-eared Bat (*Myotis septentrionalis*)

Three trees were identified as potential roosting habitat during the August 11, 2015 field visit. The North Siphon Chamber and South Siphon Chamber are structures located at the northern and southern extents of the natural resources study area, respectively, and could be used as roosting sites by northern long-eared bats. Northern long-eared bats are more commonly known to roost in trees. See the potential roosting habitat results above for Indiana bats.

Repair and rehabilitation work activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct and would be localized and confined to the immediate vicinity of the Peekskill Steel Pipe Siphon. Based on the tree survey, select clearing of brush and trees and would not result in significant loss or modification of foraging or roosting habitat for northern long-eared bats. Three trees with potential bat roosting habitat may be removed during construction. Potential effects to streams and wetlands would be avoided to the furthest extent possible, and foraging habitat would continue to be available in the canopy within the natural resources study area and in adjacent forested areas.

During the field visit on October 7, 2015, there was no access to the North Siphon Chamber building interior to investigate for signs of roosting bats at the structure. Potential roosting habitat at the South Siphon Chamber was based on a desktop assessment. The buildings would be used for access to the aqueduct during 10-week shutdowns, similar to baseline conditions, and would not be permanently altered. Should any bats or their guano be observed within these structures during work activities, USFWS and NYSDEC would be contacted immediately to determine the best course of action.

There could also be temporary noise that discourages northern long-eared bats from roosting in the immediate vicinity of the work sites; however, there is abundant suitable habitat in the surrounding areas within which northern long-eared bats could roost. Any tree removal that is required would be limited to a few select trees, and would be conducted from November 1 through March 31 to avoid impacts to potential roosting trees of northern long-eared bats. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect northern long-eared bats in this study area.

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern fence lizards (*Sceloporus undulatus*), eastern hognose snakes (*Heterodon platyrhinos*), timber rattlesnakes (*Crotalus horridus*), or common wormsnares (*Carphophis amoenus*) associated with the repair and rehabilitation. The repair and rehabilitation may affect, but is not likely to adversely affect, eastern box turtles, wood turtles, Indiana bats, or northern long-eared bats.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Aqueduct Road Study Area.

9.13.3.8 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Aqueduct Road Study Area, a Phase I Environmental Site Assessment (ESA) was conducted in general conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Practice E 1527-13 and City Environmental Quality Review (CEQR) requirements to identify Recognized Environmental Conditions (RECs). The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a geotechnical investigation and environmental health and safety sampling, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Geotechnical environmental investigations and sampling were undertaken for contaminants of concern including asbestos, lead, volatile and semivolatile organics, polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons along the aqueduct within the study area. Chromium and zinc were noted in the soil sampling results. Total chromium was reported in the sample collected at the North Siphon Chamber. Chromium concentrations, however, were consistent over a widespread sampling area and are likely associated with background concentrations. Along the Catskill Aqueduct, there are widespread occurrences of chromium, which are attributed to existing geological formations. Likewise, zinc was detected in one sample but is also naturally occurring in soils and is therefore also likely to be the result of background concentrations. The legacy data also revealed that asbestos-containing materials are presumed to be present on the ceiling beams of the North Siphon Chamber building. Additionally, lead-containing paint was found to be present on the steel door, gate valve, and hoist in the siphon chamber. Materials sampled did not identify PCB-containing paint or mercury-containing paint. In addition, although gasoline range organics were not detected in the samples, total petroleum hydrocarbons were detected, but at low concentrations that are not considered indicative of contamination that warrants remedial actions.

Based on the results of the environmental investigations completed within the Aqueduct Road Study Area, no other hazardous materials are known to exist. The soil results support the reuse of excavated materials associated with the boathole installation and blow-off chamber reconstruction as backfill and do not suggest the need for special management, handling, or health and safety measures at this time.

DEP has consulted with the Town of Cortlandt and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Aqueduct Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Aqueduct Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for backup power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. DEP would handle all materials in accordance with applicable federal, State, and local regulations and guidelines. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines, including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage, and spill reporting requirements. Furthermore, excavation associated with the work activities for the installation of a new boathole and blow-off chamber reconstruction would occur on previously disturbed and undisturbed soils. Following construction, all equipment and chemical storage would be removed from the Aqueduct Road Study Area. The staging areas would be restored, and operation of the repaired and rehabilitated Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Aqueduct Road Study Area.

9.13.3.9 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Aqueduct Road Study Area.

Access to the majority of repair and rehabilitation limits of construction for the work sites within the Aqueduct Road Study Area would be via Aqueduct Road and Oregon Road (see **Figure 9.13-2**). The South Siphon Chamber would be accessed by driving over the cut-and-cover tunnel from an entrance off Locust Avenue. Aqueduct Road is a two-way local roadway. Oregon Road is a two-lane, two-way minor arterial roadway. Locust Avenue is a two-lane, two-way minor arterial roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Aqueduct Road Study Area. There is no public transportation and little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site. However, there are no DEP employees who work at or visit the study area on a daily basis, and the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Town of Cortlandt and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Aqueduct Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Aqueduct Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be the basis of this transportation analysis. Of these activities, blow-off chamber reconstruction would generate the most vehicle trips. Blow-off chamber reconstruction would occur in summer and

fall ~~2019~~2018 between the hours of 8 AM and sunset, Monday through Friday, for a total of 18 weeks, with work that requires shutdowns being performed in spring or fall of that year.

In the future with the repair and rehabilitation, construction vehicles would travel along Aqueduct Road, Oregon Road, or Locust Avenue. The estimated number of peak-day one-way vehicle trips associated with the blow-off chamber reconstruction is 101 vehicles, or approximately 202 peak-day vehicle round trips that would travel to and from the study area. Approximately 24 vehicle round trips, or 24 Passenger Car Equivalents (PCEs), would be workers either traveling to and from the study area or traveling directly to and from the staging area (depending on parking capacity), with potentially 4 daily shuttle trips between the study area and the staging area. The remaining approximately 174 peak-day vehicle round trips (423 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with blow-off chamber reconstruction is approximately 37 peak-hour vehicle trip ends (66 PCEs). This includes approximately 12 vehicle trip ends (12 PCEs) from workers traveling directly to and from the staging area, approximately two peak-hour shuttle trips between the study area and the staging area, and approximately 23 vehicle trip ends (52 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 12-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 66 peak-hour PCEs along Oregon Road, which is above the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, "Transportation." The work activities at the Aqueduct Road Study Area would be short-term (totaling 37 weeks over 2.5 years see **Table 9.13-2**) and would not generate public parking or transportation demands or pedestrian activity within the Aqueduct Road Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Aqueduct Road Study Area.

9.13.3.10 Noise

As described in Section 9.3.15, "Noise," mobile noise associated with the repair and rehabilitation within the Aqueduct Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation work sites as shown in **Figure 9.13-14**, which encompasses areas within the Towns of Cortland, Philipstown, and Putnam Valley. The study area is split into two polygons, which together are considered the noise study area. One worst-case receptor was analyzed for each type of receptor.

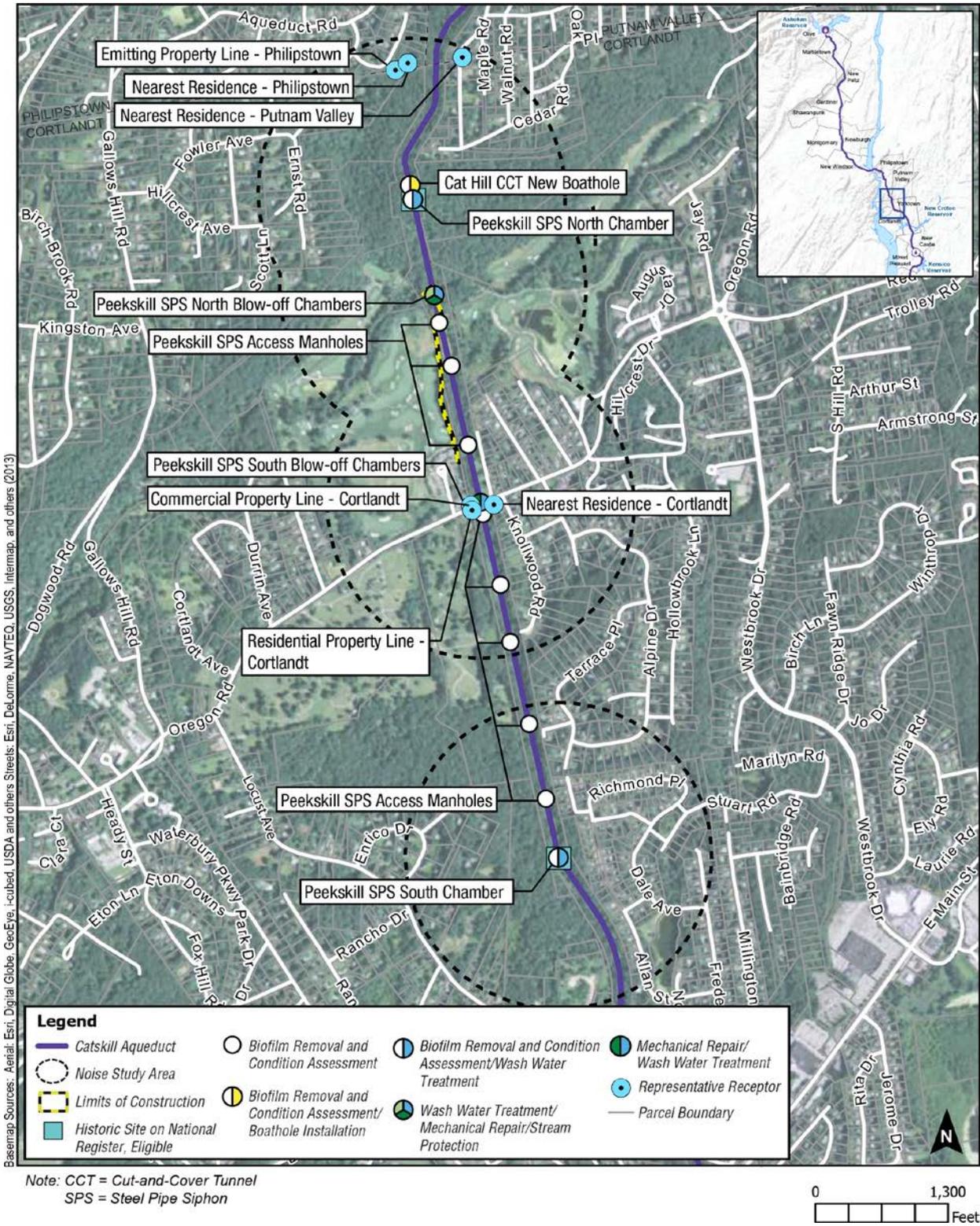


Figure 9.13-14: Noise – Aqueduct Road Study Area



The Aqueduct Road Noise Study Area includes residential parcels and one commercial parcel within 1,500 feet of the repair and rehabilitation work activities that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Town of Cortlandt Noise Control Law §197-14, which prohibits noise levels from exceeding 65 dBA between the hours of 8 AM and 6 PM and 55 dBA between 6 PM and 8 AM in residentially zoned districts. Additionally, the Town of Cortlandt Noise Control Law §197-15 prohibits noise levels from exceeding 65 dBA in commercially zoned districts. The Town of Cortlandt Noise Control Law §197-16 prohibits construction work between the hours of 7 PM and 7 AM, Monday through Saturday, and all day Sunday and on national holidays, that is audible beyond the property line of the property upon which such excavation, filling, demolition, rehabilitation, or construction operations are being undertaken; however, operations of an emergency nature undertaken by governmental entities or public service corporations during these hours are exempt.

Noise-producing activities in the northern portion of the Aqueduct Road Study Area are also subject to the Towns of Philipstown and Putnam Valley Noise Control Laws. The Town of Philipstown Noise Control Law §175-40(C) states that noise levels at the emitting property line shall not exceed 50 dBA between 7 AM and 8 PM, 40 dBA between 8 PM and 7 AM, or 5 decibels above the ambient noise at the point on the boundary of the lot where measured, whichever is greater. However, construction noise between 8 AM and sunset, Monday through Friday, is exempt. The Town of Putnam Valley Noise Control Law §82 does not specify quantitative noise limits, but prohibits the use of noise-producing equipment between the hours of 8 PM and 8 AM on weekdays and 7 PM and 9 AM on weekends.

Existing ambient noise levels within the Aqueduct Road Study Area are influenced by vehicular traffic traveling on Aqueduct Road, Oregon Road, Locust Avenue, and other local roadways. The existing noise levels within the study area are comparable to the levels within a quiet suburban and rural residential environment based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban and rural communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of Cortlandt and Westchester County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels are anticipated within the Aqueduct Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Aqueduct Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Aqueduct Road Study Area would occur at four sites. The stationary noise-generating equipment that would be used within the Aqueduct Road Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with the boathole installation at the North Siphon Chamber and blow-off chamber

reconstruction at the South Blow-off Chambers would emit the most noise. Two activities were evaluated because they are separated by over 3,000 feet, and therefore include unique receptors. Boathole installation would occur in fall ~~2019~~2018 between the hours of 7 AM and 7 PM, 7 days a week, for approximately 2 weeks during the second 10-week shutdown. Reconstruction of the South Blow-off Chambers would occur in summer ~~2019~~2018 between 8 AM and sunset, Monday through Friday, for approximately 9 weeks prior to the second 10-week shutdown (see **Table 9.13-2**). These blow-off chamber reconstruction work hours are proposed to limit the length of time the repair and rehabilitation would operate under a variance.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the boathole installation and blow-off chamber reconstruction. Associated equipment reference noise levels are shown in **Table 9.13-6**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.13-6: Stationary Source Construction Equipment Modeled for Repair and Rehabilitation within the Aqueduct Road Study Area – Noise Analysis and Reference Noise Levels (and L_{eq})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA)
Boathole Installation	
Crane	77
Concrete Mixer Truck	81
Generator	82
Blow-off Chamber Reconstruction	
Ventilation Fan	85
Generator	82
Dozer	81
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	

Table 9.13-7 shows the results of the stationary construction noise analysis.

The Towns of Philipstown and Cortlandt limit daytime and nighttime noise levels at the property line. Philipstown noise limits apply to the property line of the work site, while Cortlandt noise limits apply at the property boundary of receiving land uses (the nearest commercial and residential land uses). Therefore, noise levels at the property line were calculated for comparison with the applicable local noise limits. However, the nearest noise-sensitive receptor within the Town of Philipstown is a residence approximately 1,260 feet away from the work activities and the nearest noise-sensitive receptor within the Town of Cortlandt is a residence approximately 125 feet away from the work activities.

Stationary noise levels associated with the blow-off chamber reconstruction within the Aqueduct Road Study Area during the repair and rehabilitation would emit a noise level (L_{eq}) of approximately 80 dBA at the nearest residence within Cortlandt. The nearest residences in

Table 9.13-7: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors within the Aqueduct Road Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)	Town of Philipstown Noise Limit (dBA)	Town of Putnam Valley Noise Limit (dBA)	Town of Cortlandt Noise Limit (dBA)	Potential for Code Exceedance (Yes or No)
Emitting Property Line - Philipstown	1,200	58	50 ¹ /40 ²	NA	NA	Yes
Nearest Residence - Philipstown	1,257	57	NA	NA	NA	NA
Nearest Residence - Putnam Valley	1,408	56	NA	NA	NA	Yes ³
Commercial Property Line - Cortlandt	94	82	NA	NA	65 ⁴	Yes
Residential Property Line - Cortlandt	99	82	NA	NA	65 ⁵ /55 ⁶	Yes
Nearest Residence - Cortlandt	127	80	NA	NA	NA	NA

Notes:
NA = Not Applicable
¹ Daytime noise limit is applicable between the hours of 7 AM and 8 PM.
² Nighttime noise limit is applicable between the hours of 8 PM and 7 AM.
³ The Town of Putnam Valley prohibits the use of noise-producing equipment between the hours of 8 PM and 8 AM on weekdays and 7 PM and 9 AM on weekends.
⁴ Noise limit is applicable for commercial districts.
⁵ Noise limit is applicable between the hours of 8 AM and 6 PM in residential district.
⁶ Noise limit is applicable between the hours of 6 PM and 8 AM in residential district.

Philipstown and Putnam Valley are predicted to experience noise levels (L_{eq}) of 57 dBA and 56 BA, respectively, from boathole installation. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities. However, this equipment would not be expected to be louder than equipment associated with boathole installation and blow-off chamber reconstruction.

Since the repair and rehabilitation within the Aqueduct Road Study Area would emit noise levels greater than allowed by the Towns of Cortlandt and Philipstown noise codes, and repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Town of Putnam Valley, DEP would work with the Towns of Cortlandt, Philipstown, and Putnam Valley, as appropriate.

Following completion of the repair and rehabilitation work activities, the construction equipment and vehicles would be removed from the Aqueduct Road Study Area. The repair and rehabilitation work activities would be temporary with peak work activities occurring during boathole installation in fall ~~2019~~2018 and blow-off chamber reconstruction in summer ~~2019~~2018 for limited periods (e.g., up to 9 weeks, per activity).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Aqueduct Road Study Area.

9.13.3.11 Neighborhood Character

The character of the Aqueduct Road Study Area is largely defined by a mix of residential, commercial, recreation and entertainment, open space and recreation, community facilities, and public services land uses and its physical setting within a suburban location (see **Figure 9.13-8**). The Catskill Aqueduct traverses the study area in a general north to south direction. Peekskill Hollow Creek traverses the upper portion of the study area flowing from east to west, and Oregon Road runs perpendicular to the aqueduct in the lower portion of the study area. The limits of construction for the work sites are located in a public services corridor with grassy cover, which is owned and maintained by DEP. Access to the North Siphon Chamber would be provided by driving over the cut-and-cover tunnel from an entrance off Aqueduct Road to the north. Access to the North Blow-off Chambers would be via Oregon Road to a golf cart path stretching from the Hollowbrook Golf Course parking lot to a location within 200 feet of the work site. The South Blow-off Chambers would be accessed by crossing a field adjacent to Oregon Road. The South Siphon Chamber would be accessed by driving over the cut-and-cover tunnel from an entrance off Locust Avenue.

DEP has consulted with the Town of Cortlandt and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Aqueduct Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for historic and cultural resources, an impact analysis for the Aqueduct Road Study Area was not warranted, as discussed in Section 9.3.7, "Historic and Cultural Resources." As described in Section 9.13.3.3, "Land Use and Zoning," Section 9.13.3.4, "Socioeconomic Conditions," Section 9.13.3.5, "Open Space and Recreation," and Section 9.13.3.6, "Visual Resources," the work activities would not affect land use and zoning, socioeconomic conditions, open space and recreation, and visual resources in the Aqueduct Road Study Area. Furthermore, the public policy impact analysis provided in Section 9.13.2, "Town of Cortlandt Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.13.3.9, "Transportation," and 9.13.3.10, "Noise," during construction, the work activities in the Aqueduct Road Study Area would be short-term (intermittently over 2.5 years) and would result in a temporary increase in traffic and noise. Following completion of

the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Aqueduct Road Study Area.

9.14 TOWN OF YORKTOWN

9.14.1 TOWN OF YORKTOWN PROJECT DESCRIPTION

The Town of Yorktown is located in Westchester County, New York on the eastern side of the Hudson River. It is bounded by the Towns of Putnam Valley to the north and Carmel to the northeast in Putnam County, New York; and the Towns of Somers to the east, New Castle to the south, and Cortlandt to the west in Westchester County, New York. The Town of Yorktown is approximately 51.5 square miles. General boundaries of locations where activities associated with the repair and rehabilitation would occur within the Town of Yorktown are shown on **Figure 9.14-1**.

The Catskill Aqueduct, which stretches for approximately 7 miles in a southeastern direction through the Town of Yorktown. Notable sites along the aqueduct within the Town of Yorktown include the Hunters Brook Steel Pipe Siphon North Chamber, Hunters Brook Steel Pipe Siphon South Chamber, Turkey Mountain Steel Pipe Siphon North Chamber, Turkey Mountain Steel Pipe Siphon South Chamber, Croton Lake Pressure Tunnel Downtake Chamber, Croton Lake Pressure Tunnel Blow-off and Waste Gate Chamber, and Croton Lake Pressure Tunnel Uptake Chamber. The repair and rehabilitation in the Town of Yorktown would occur within ~~four~~ five study areas as shown in **Table 9.14-1**.

Table 9.14-1: Schedule of Work Activities within the Town of Yorktown

Work Activity	Study Area				
	Jacob Road	Chapman Road	Croton Dam Road	Kitchawan Road	<u>Pines Bridge Road</u>
Staging and Access Improvements	✓	✓	✓	✓	✓
Primary Staging Area	-	✓	-	-	-
Internal Leak Repair	-	-	✓	-	-
Dechlorination Installation (if necessary)	-	-	✓	-	-
Blow-off Chamber Reconstruction	✓	✓	-	-	-
Boathole Preparation	✓	✓	-	-	-
Boathole Installation	✓	✓	-	-	-
Blow-off Valve and Waste Gate Replacement	-	✓	-	-	-
Air Vent Installation	-	-	✓	-	-
Biofilm Removal and Condition Assessment	✓	✓	✓	✓	✓
Small-scale Wash Water Treatment	✓	✓	-	-	-
Large-scale Wash Water Treatment	-	✓	-	-	-
Sluice Gate Replacement	-	-	-	✓	-
Streambank Restoration and Protection	✓	✓	-	✓	-
Dechlorination Demobilization/ Site Restoration (if necessary)	-	-	✓	-	-

Notes:
 - = Work activity not proposed.
 ✓ = Work activity proposed.

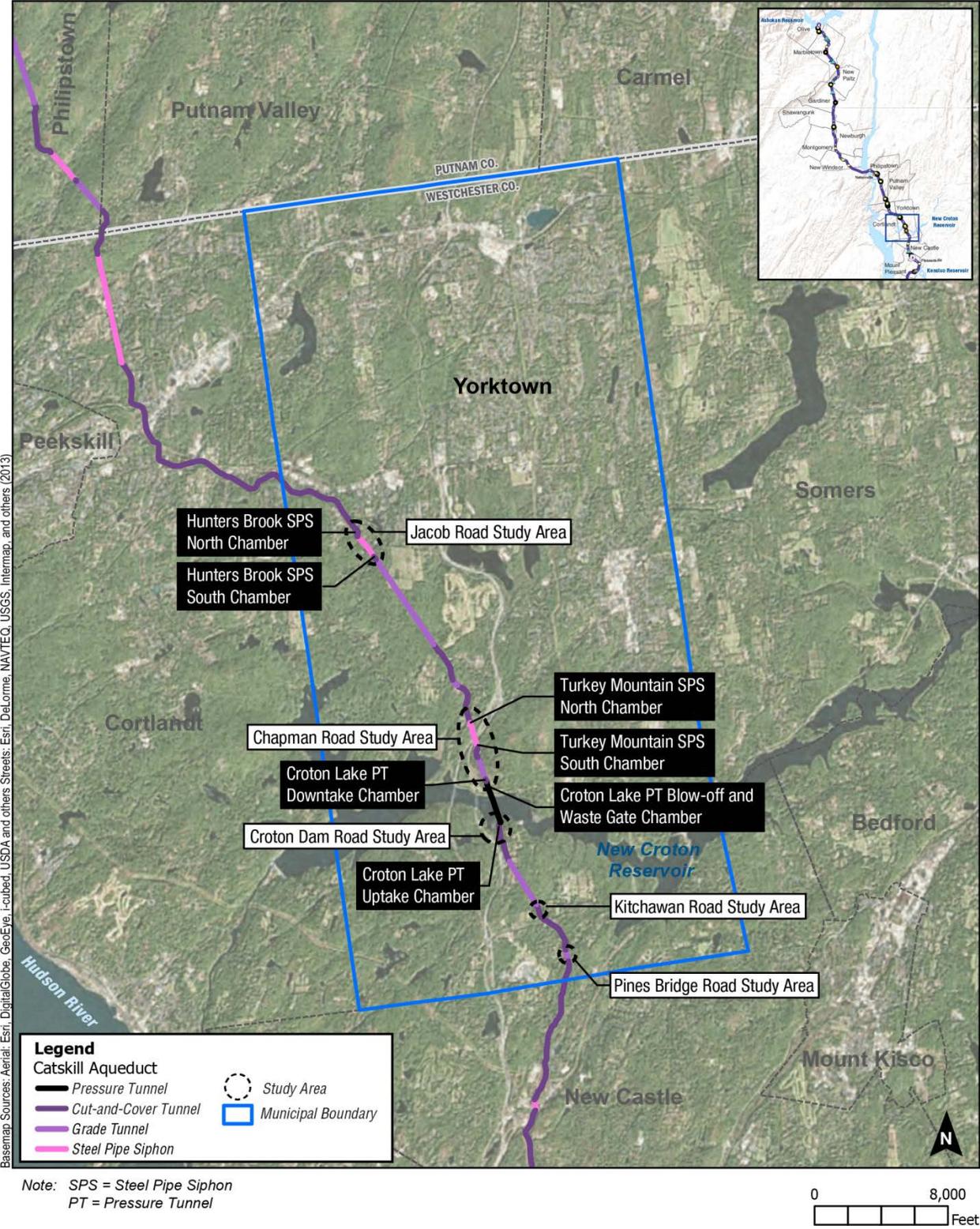


Figure 9.14-1: Town of Yorktown Study Areas



These ~~four~~ five study areas in the Town of Yorktown encompass the work analyzed as part of the repair and rehabilitation in this municipality. Additional work activities in the town do not warrant further analysis. Work sites located outside the study area include activities that would primarily be conducted within the aqueduct interior (see Section 9.3, “Screening Assessment and Impact Analysis Methodology”). In the Town of Yorktown, they include biofilm removal and condition assessment at access manholes, and permanently sealing three culvert drain sluice gates not located in these study areas. See Section 9.2, “Project Description,” for an overall project description of the repair and rehabilitation. Section 9.14.2, “Town of Yorktown Impact Analysis,” provides a discussion of local regulations in the Town of Yorktown jurisdictional limits. The following sections provide a description of the study area, proposed activities, and impact analysis for the four study areas:

- Section 9.14.3 – Jacob Road Study Area Impact Analysis
- Section 9.14.4 – Chapman Road Study Area Impact Analysis
- Section 9.14.5 – Croton Dam Road Study Area Impact Analysis
- Section 9.14.6 – Kitchawan Road Study Area Impact Analysis
- Section 9.14.7 – Pines Bridge Road Study Area Impact Analysis

9.14.2 TOWN OF YORKTOWN IMPACT ANALYSIS

9.14.2.1 Public Policy

Because local public policies would not vary for study areas in the same town, public policies were evaluated on a town-wide basis. As discussed in Section 9.3.3, “Land Use, Zoning, and Public Policy,” the repair and rehabilitation’s consistency with the applicable policies of Westchester County’s Westchester 2025 Plan (Westchester County 2008) in the Jacob Road, Chapman Road, Croton Dam Road, ~~and~~ Kitchawan Road, and Pines Bridge Road study areas are analyzed as follows.

Westchester 2025 Plan (2008)

Westchester County’s Westchester 2025 Plan is a framework to assist the 45 municipalities within the County to develop comprehensive plans that achieve a balance between economic and environmental concerns, while serving the future needs of the local communities within Westchester County. The recommendations outlined in the Plan include those recommended by the Westchester County Planning Board to municipalities as guidance for their own decision making. Based upon a review of these recommendations, the potential effects of the repair and rehabilitation work activities within the Jacob Road, Chapman Road, Croton Dam Road, ~~and~~ Kitchawan Road, and Pines Bridge Road study areas are evaluated relative to compatibility with two applicable recommendations:

- (1) *Preserve natural resources: Preserve and protect the county’s natural resources and environment, both physical and biotic. Potential impacts on water resources (water bodies, wetlands, coastal zones and groundwater), significant land resources (unique natural areas, steep slopes, ridgelines and prime agricultural land) and biotic*

resources (critical habitat, plant communities and biotic corridors) require careful consideration as part of land management and development review and approval.

There are no significant land resources within the study areas in the Town of Yorktown. Water resources and biotic resources within the Jacob Road, Chapman Road, Croton Dam Road, ~~and~~ Kitchawan Road, and Pines Bridge Road study areas are discussed in detail within the respective “Natural Resources” sections. Water resources in these study areas consist of New Croton Reservoir (a body of water maintained by DEP as part of its water supply system and described further in Section 3.1.3, “The Croton Water Supply System Overview,”) Hunter Brook, Turkey Mountain Brook, two unnamed tributaries to New Croton Reservoir, and a wetland.

Under this recommendation, the Westchester 2025 Plan recommends the preservation of natural resources in order to balance this alongside land management and development. This recommendation was analyzed for repair and rehabilitation as work in the study areas would potentially impact existing natural resources directly or indirectly, depending on the study area.

As part of the work at Jacob Road, Chapman Road, and Kitchawan Road study areas, riprap aprons would be installed at blow-off chambers and culvert drain sluice gates, restoring the historic stream protection measures at these sites. A retaining wall would also be installed at the Jacob Road and Chapman Road study areas. Unwatering of the aqueduct would be required. This may result in raw water discharges to Hunter Brook in the Jacob Road Study Area, Turkey Mountain Brook in the Chapman Road Study Area, and unnamed tributary 3 to New Croton Reservoir in the Kitchawan Road Study Area. During construction, diversion of these waters around in-stream work would be required in order to complete certain work elements. Additionally, the discharge of treated biofilm wash waters with a discharge to surface water may also be required at the Jacob Road and Chapman Road study areas. Finally, a leak in the Croton Dam Road Study Area would be repaired. If leak repair is not feasible, a local dechlorination system would be installed and operated during temporary chlorination of the aqueduct.

The proposed action would not be expected to affect water resources for several reasons. While discharges of raw aqueduct water could take place at any time during construction or future maintenance, this would consist of uncontaminated raw water from the aqueduct. Sediment and erosion control measures would also be put in place for all construction activities. Restoring the riprap aprons to their original condition would result in minimal fill and would be beneficial in that these would minimize future scouring when the blow-off chambers and culvert drain sluice gates are operated. Leak repairs in the Croton Dam Road Study Area would restore pre-leak flows within the receiving unnamed tributary to New Croton Reservoir. New Croton Reservoir would be unaffected by the repair and rehabilitation. Discharge of treated biofilm wash water or dechlorinated aqueduct water that would be temporarily discharged to the unnamed tributary to New Croton Reservoir would be conducted in accordance with applicable regulatory requirements established as part of required discharge permits. As a result, work activities are not anticipated to result in significant increases in turbidity, scouring, or other adverse impacts to water resources.

Select tree removal on DEP property may be needed at each study area in the Town of Yorktown to establish better access to the proposed work sites. However, this would not permanently affect critical biotic habitat or corridors within the study area. The work sites occur in previously

disturbed areas at existing DEP facilities. Tree removal is required because access to these areas has not been needed for some time, and trees have grown in unmaintained areas along the aqueduct. Furthermore, following construction, areas temporarily disturbed during construction would be restored to baseline conditions.

As such, the repair and rehabilitation within the Jacob Road, Chapman Road, Croton Dam Road, ~~and~~ Kitchawan Road, and Pines Bridge Road study areas would not affect natural resources or biotic resources and would be consistent with this recommendation.

- (2) *Engage in Regional Initiatives: Work with neighboring jurisdictions in the Hudson Valley, Connecticut, New Jersey, Long Island and New York City in planning initiatives aimed at sound land use, transportation, economic development, housing and environmental policies.*

Repair and rehabilitation supports the goal of supplying clean drinking water to the City's 8 million residents and 1 million upstate residents. As described in Section 9.3, "Screening Assessment and Impact Analysis Methodology," land use and zoning and socioeconomic conditions would not be affected by the repair and rehabilitation within study areas in the Town of Yorktown. The potential for impacts to transportation within the Jacob Road, Chapman Road, Croton Dam Road, ~~and~~ Kitchawan Road, and Pines Bridge Road study areas are discussed in detail within the respective "Transportation" sections.

Under this recommendation, the Westchester 2025 Plan prioritizes inter-agency cooperation to facilitate regional initiatives. This recommendation was analyzed for repair and rehabilitation as work within the study areas would potentially impact existing land use, transportation, economic development, housing, and environmental policies, directly or indirectly, depending on the study area.

On a daily basis, over 1 billion gallons of water are delivered from large reservoirs spanning several counties and jurisdictions within the State to these water consumers. As part of the repair and rehabilitation, DEP has coordinated with State and local jurisdictions to ensure that current and future water supplies are maintained. Through this coordination, repair and rehabilitation within the Jacob Road, Chapman Road, Croton Dam Road, ~~and~~ Kitchawan Road, and Pines Bridge Road study areas would comply with existing land use, transportation, economic development, housing, and environmental policies and would therefore be consistent with this recommendation.

Repair and rehabilitation would therefore be consistent with the Westchester 2025 Plan in the Town of Yorktown and would not result in significant adverse impacts to public policy within the Jacob Road, Chapman Road, Croton Dam Road, ~~and~~ Kitchawan Road, and Pines Bridge Road study areas.

9.14.3 JACOB ROAD STUDY AREA IMPACT ANALYSIS

Within the upper portion of the Jacob Road Study Area, the aqueduct consists of the Peekskill Cut-and-Cover Tunnel, which transitions to the Hunters Brook Steel Pipe Siphon at the Hunters Brook Steel Pipe Siphon North Chamber (North Siphon Chamber). Just north of Hunter Brook,

the steel pipe siphon includes three under-stream blow-off chambers and associated valves referred to as the Hunters Brook Steel Pipe Siphon Blow-off Chambers (Blow-off Chambers). Within the lower portion of the study area, the Hunters Brook Steel Pipe Siphon transitions to the Yorktown Cut-and-Cover Tunnel at the Hunters Brook Steel Pipe Siphon South Chamber (South Siphon Chamber). A set of access manholes along the steel pipe siphon is also located in the study area (see **Figure 9.14-2**).

Work activities within the Jacob Road Study Area would include: staging and access improvements; blow-off chamber reconstruction and associated streambank restoration and protection; boathole preparation and installation; biofilm removal and condition assessment; and small-scale wash water treatment.

9.14.3.1 Study Area Location and Description

The Jacob Road Study Area is located along the upper Catskill Aqueduct in the Town of Yorktown. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. Hunter Brook flows from east to west across the lower portion of the study area. Hunterbrook Road traverses the study area from north to south, intersecting White Hill Road to the south and Jacob Road to the north. Proposed work sites within the study area include the North Siphon Chamber, the Blow-off Chambers, and the South Siphon Chamber. Access to the North Siphon Chamber would be provided by driving over the cut-and-cover tunnel from an entrance off Jacob Road. The Blow-off Chambers would be accessed directly from the shoulder of White Hill Road, and the South Siphon Chamber would be accessed by an access road from Hunterbrook Road. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work sites. **Figure 9.14-2** shows an aerial photograph of the study area, including the path of the aqueduct, the locations of the limits of construction for the work sites, and the proposed access routes. **Figure 9.14-3** shows two photographs of a blow-off chamber and the staging area in the study area.

The study area consists of residential, commercial, public services, agricultural, and vacant land. Land cover is forested with scattered residential development. The limits of construction for all three work sites and associated access routes are located in a public services corridor with grassy cover, which is owned and maintained by DEP. **Figure 9.14-4** shows a map of the land uses in the study area and its surroundings.

Zoning in the study area is single-family residential (R1-40 and R1-160), as designated by the Town of Yorktown Zoning Code (see **Figure 9.14-5**). The Catskill Aqueduct and limits of construction are located within both single-family residential (R1-40 and R1-160) zoning districts, which provide for low-density, single-family housing. The Catskill Aqueduct is a permitted use as a water supply facility within the single-family residential (R1-40 and R1-160) zoning districts.

There are no federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

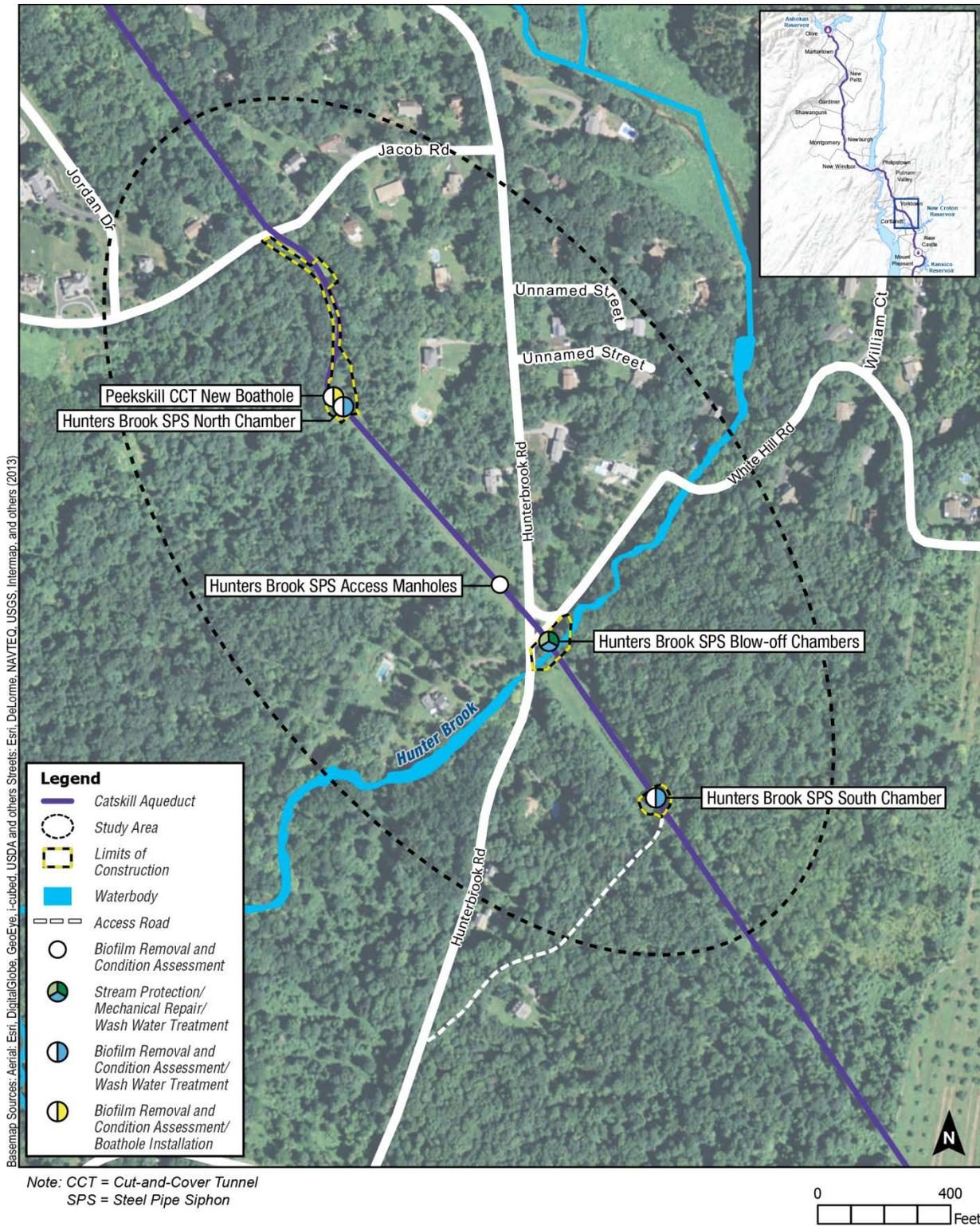


Figure 9.14-2: Study Area – Jacob Road





Photograph 1: Hunters Brook Steel Pipe Siphon east blow-off chamber at Hunter Brook.



Photograph 2: Hunterbrook Road at White Hill Road intersection. The Blow-off Chambers would be accessed from the pull-off on the right.

Figure 9.14-3: Photographs – Jacob Road Study Area



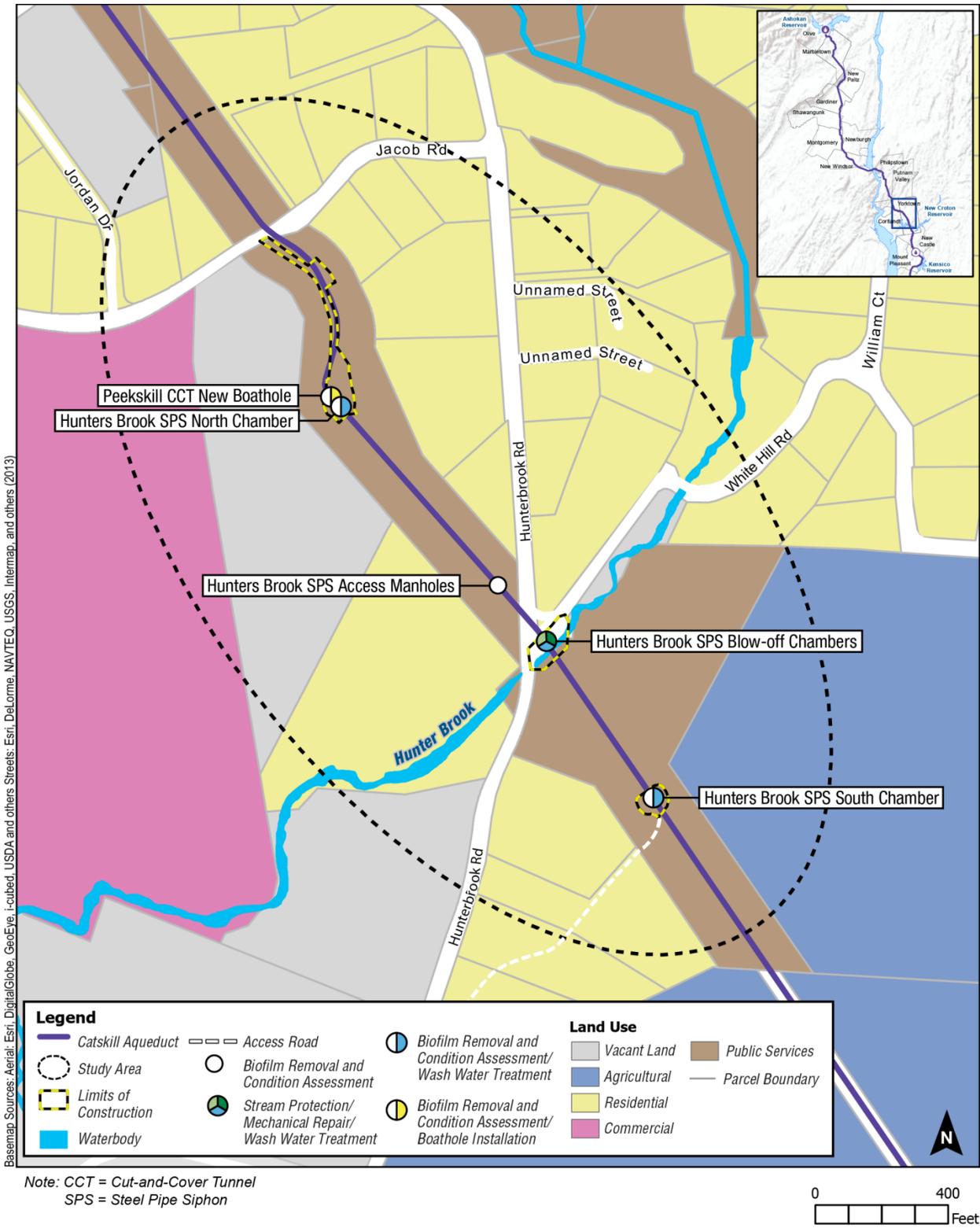


Figure 9.14-4: Land Use – Jacob Road Study Area



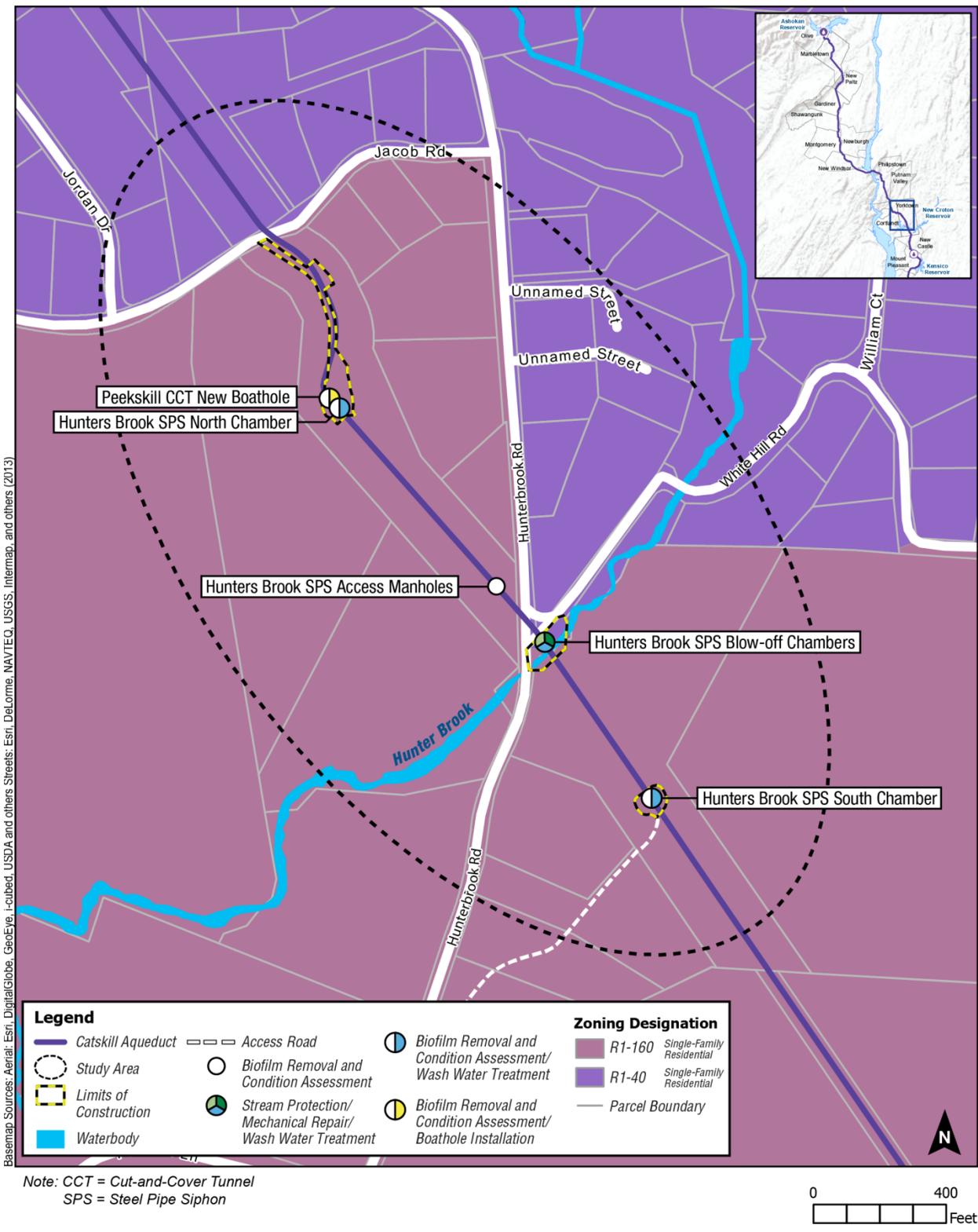


Figure 9.14-5: Zoning – Jacob Road Study Area



9.14.3.2 Proposed Activities within the Jacob Road Study Area

To support activities within the Jacob Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas, including one at the Blow-off Chambers, would provide additional parking. Equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. Site plans showing layouts of the limits of construction for the work sites, which would occupy a total of 1 acre, are shown on **Figure 9.14-6** and **Figure 9.14-7**. The schedule for work within the study area is shown in **Table 9.14-2**. The duration of active construction within the Jacob Road Study Area is estimated to total 27 weeks over 1.5 years.

Table 9.14-2: Schedule of Work Activities within the Jacob Road Study Area

Work Activity	Dates	Duration	Work Hours	Crew Size ¹
Staging and Access Improvements ²	Summer 2019 2018	2 weeks	Monday to Friday, 7 AM to 5 PM	8
Streambank Restoration and Protection	Summer 2019 2018	3 weeks	Monday to Friday, 7 AM to 5 PM	10
Blow-off Chamber Reconstruction	Summer 2019 2018	9 weeks	Monday to Friday, 7 AM to 5 PM	12
Boathole Preparation	Summer 2019 2018	3 weeks	Monday to Friday, 7 AM to 5 PM	10
Boathole Installation	Fall 2019 2018 (Second 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	8
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	Fall 2020 2019 (Third 10-week shutdown)	8 weeks	7 days a week, 7 AM to 7 PM	21
Notes:				
¹ Crew size refers to the number of people anticipated at the work site(s).				
² Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>).				

Work in the study area would begin with staging and access improvements in summer ~~2019~~2018. At the entrance off Jacob Road, grading of approximately 7,100 square feet would be required to facilitate loading and unloading of heavy equipment restricted from traveling over the cut-and-cover tunnel. To the north of Hunterbrook Road, all-terrain vehicle access to the set of existing access manholes would be provided. Improvements would also involve gravel placement for leveling and erosion control on the shoulder of White Hill Road. The removal of approximately 25 trees may be required within the Jacob Road Study Area.

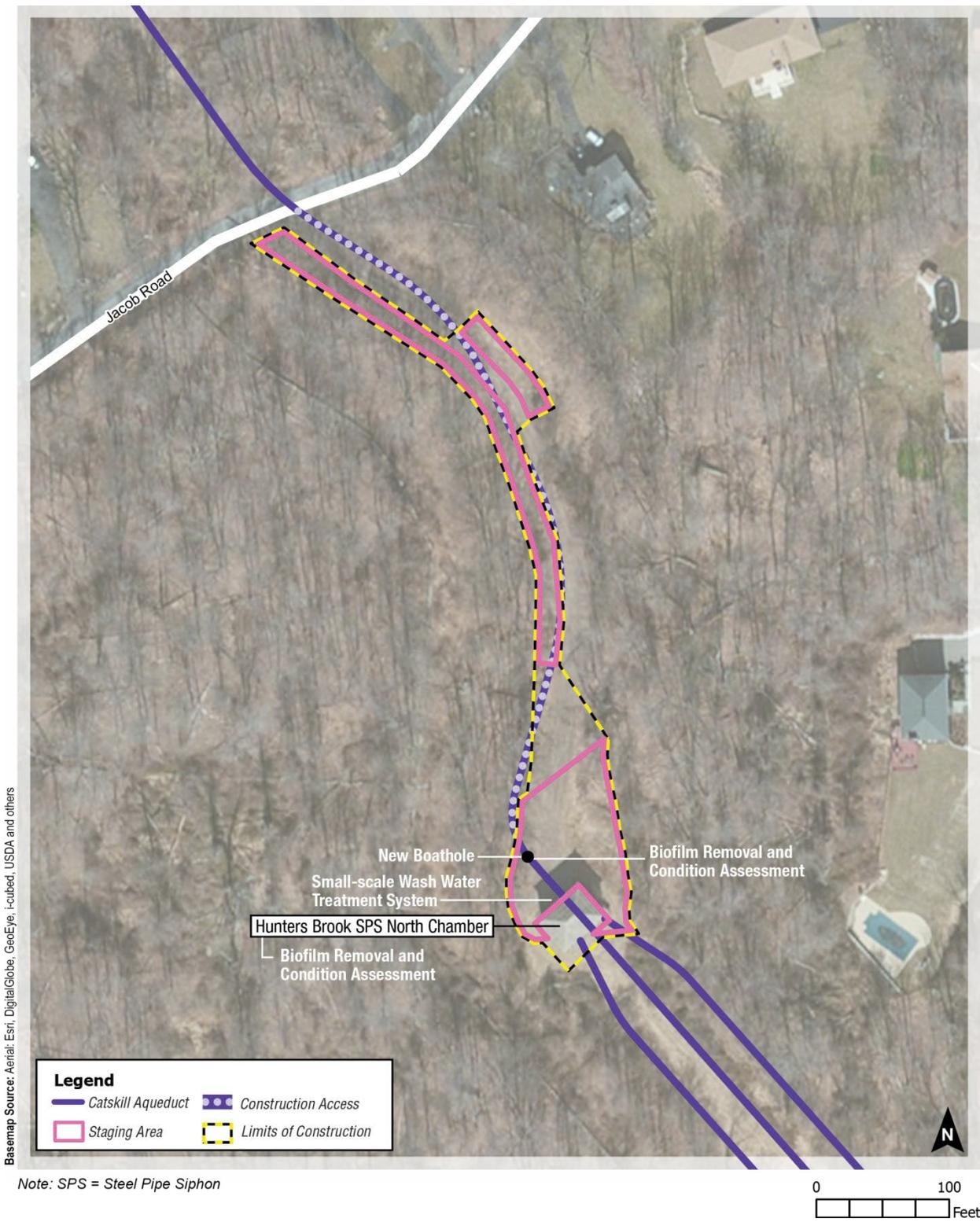


Figure 9.14-6: Site Plan for Hunters Brook SPS North Chamber – Jacob Road Study Area



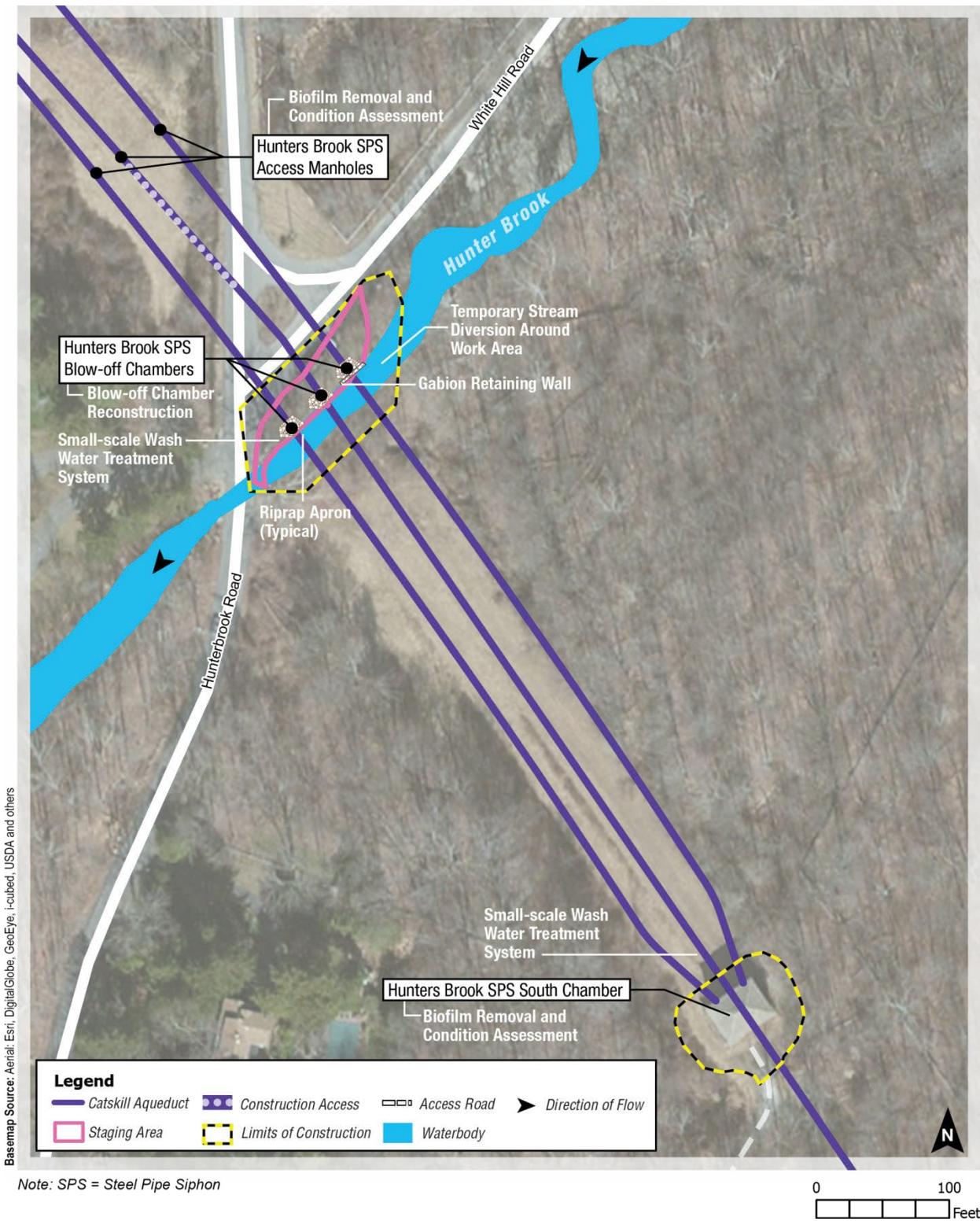


Figure 9.14-7: Site Plan for Hunters Brook SPS Blow-off Chambers and Hunter Brook SPS South Chamber – Jacob Road Study Area



Following the staging and access improvements, restoration and protection of the portion of Hunter Brook adjacent to the Blow-off Chambers would take place. The work would include regrading and installing a gabion retaining wall and permanent riprap aprons to repair bank erosion and minimize future bank erosion at this location. To ensure a dry working environment, a temporary stream diversion would be installed, serving to partially divert the stream around the work area. A turbidity curtain would be installed to prevent sediment from moving downstream. Blow-off chamber reconstruction would include replacement of the blow-off valves, discharge pipes, and chamber covers, repair of the concrete walls, and removal of the access ladders, would also take place in summer 2019~~2018~~. Small portions of the work that require shutdowns would be performed in spring and fall of that year. In total, the work would require the excavation of approximately 90 cubic yards of soil and approximately 120 cubic yards of soil for fill, resulting in a net fill of approximately 30 cubic yards of soil. Temporary in-stream disturbance would cover a total area of approximately 1,530 square feet, and permanent in-stream disturbance would cover approximately 1,110 square feet. Afterwards, the blow-off valves would be used to unwater the aqueduct for future shutdowns during the repair and rehabilitation and future maintenance.

Preparation of the new boathole upstream of the North Siphon Chamber would also occur in summer 2019~~2018~~. The work would consist of the excavation of approximately 45 cubic yards of soil and construction of a cast-in-place concrete collar. Boathole installation, which requires unwatering of the aqueduct to tie into the crown of the cut-and-cover tunnel, would take place during the second 10-week shutdown in fall 2019~~2018~~.

Lastly, biofilm removal and condition assessment would occur during the third 10-week shutdown in fall 2020~~2019~~. Access into the aqueduct would be provided by the new boathole, the North Siphon Chamber, the South Siphon Chamber, and the set of access manholes. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Potential treatment locations within the study area include the North Siphon Chamber, the South Siphon Chamber, and the Blow-off Chambers, at which small-scale wash water treatment facilities could be established. Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Jacob Road Study Area are presented in Sections 9.14.3.3, “Natural Resources” through 9.14.3.7, “Neighborhood Character” and include: natural resources including water resources, terrestrial resources, federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public

policies was analyzed on a town-wide basis in Section 9.14.2, “Town of Yorktown Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” impact analyses related to land use and zoning; socioeconomic conditions; community facilities and services; open space and recreation; historic and cultural resources; visual resources; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area are not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.14.3.3 Natural Resources

The study area for the natural resources analysis is represented by the immediate areas surrounding the limits of construction, including the North Siphon Chamber (see **Figure 9.14-8**), as well as the Blow-off Chambers and South Siphon Chamber (see **Figure 9.14-9**). These three sections are collectively referred to as the natural resources study area.

The general ecology of the natural resources study area was analyzed based on field visits conducted on August 11, 2015 and September 17, 2015. The natural resources study area is an Allegheny oak forest near the North Siphon Chamber, and a beech-maple mesic forest community near the Blow-off Chambers. Near the Blow-off Chambers, the natural resources study area has a perennial stream (Hunter Brook) flowing through it. Based on a desktop analysis, the South Siphon Chamber area is successional old field, surrounded by deciduous forest. These habitats have the potential to support protected water resources, terrestrial resources, and wildlife species, and an analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the Bailey Brook-Croton River subwatershed (hydrologic unit code [HUC] 020301010307) of the lower Hudson watershed (HUC 02030101).

Hunter Brook is subject to federal jurisdiction under Sections 401 and 404 of the Clean Water Act for proposed work activities. No wetlands were delineated in the natural resources study area.

As a Class B(TS) stream within the natural resources study area, Hunter Brook may support trout spawning and is subject to State Protection of Waters regulations with a regulated 50-foot buffer to protect the streambed and banks. The repair and rehabilitation would be conducted in accordance with applicable local regulations. The Town of Yorktown regulates activities in natural watercourses with a 100-foot regulated buffer (Yorktown Town Code Chapter 178: Freshwater Wetlands) and has jurisdiction over activities within floodplains (Yorktown Town Code Chapter 175: Flood Damage Prevention). Work activities occurring in and along the stream and its floodplain may be subject to Town review and approval.

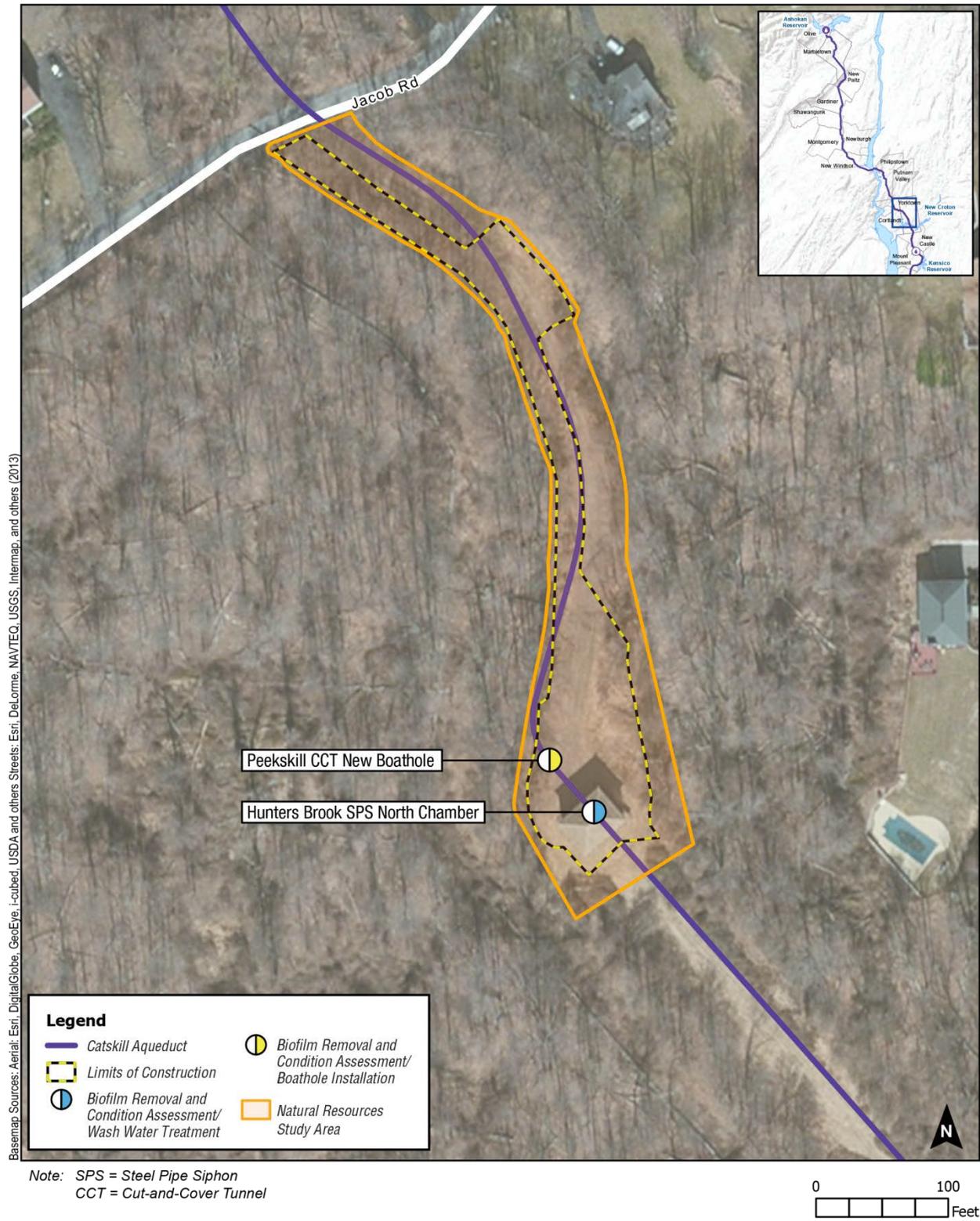


Figure 9.14-8: Natural Resources – Hunters Brook SPS North Chamber – Jacob Road Study Area



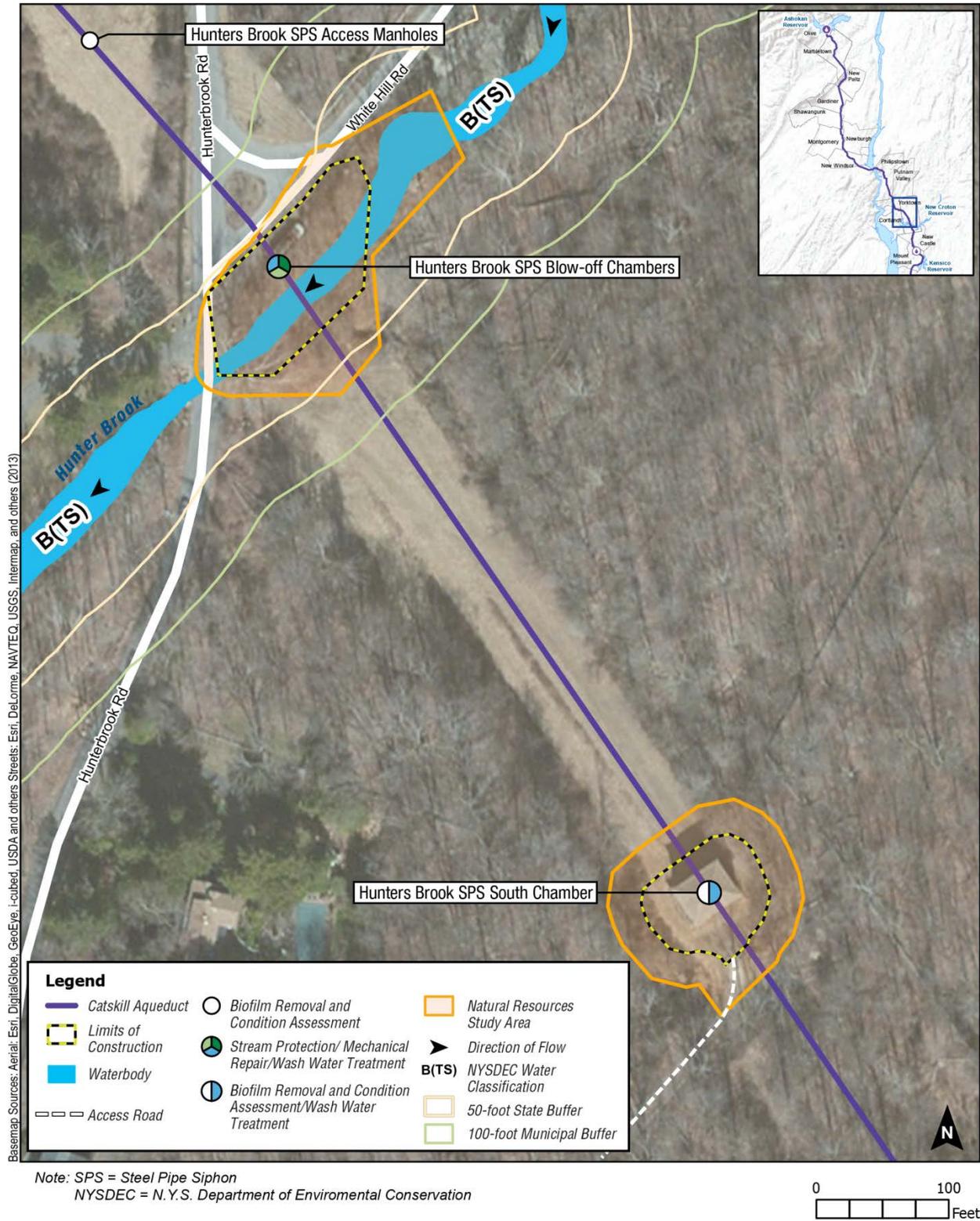


Figure 9.14-9: Natural Resources – Hunters Brook SPS Blow-off Chambers and Hunter Brook SPS South Chamber – Jacob Road Study Area



Surface Water

Surface water within the natural resources study area was assessed and a delineation was conducted on September 17, 2015. Hunter Brook was the only surface water identified. The water resource name, area, and length are shown in **Table 9.14-3**.

Table 9.14-3: Water Resources and Classifications within the Jacob Road Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Hunter Brook	5,570	300	Riverine, Lower Perennial, Unconsolidated Bottom, Sand (R2UB2)

Hunter Brook

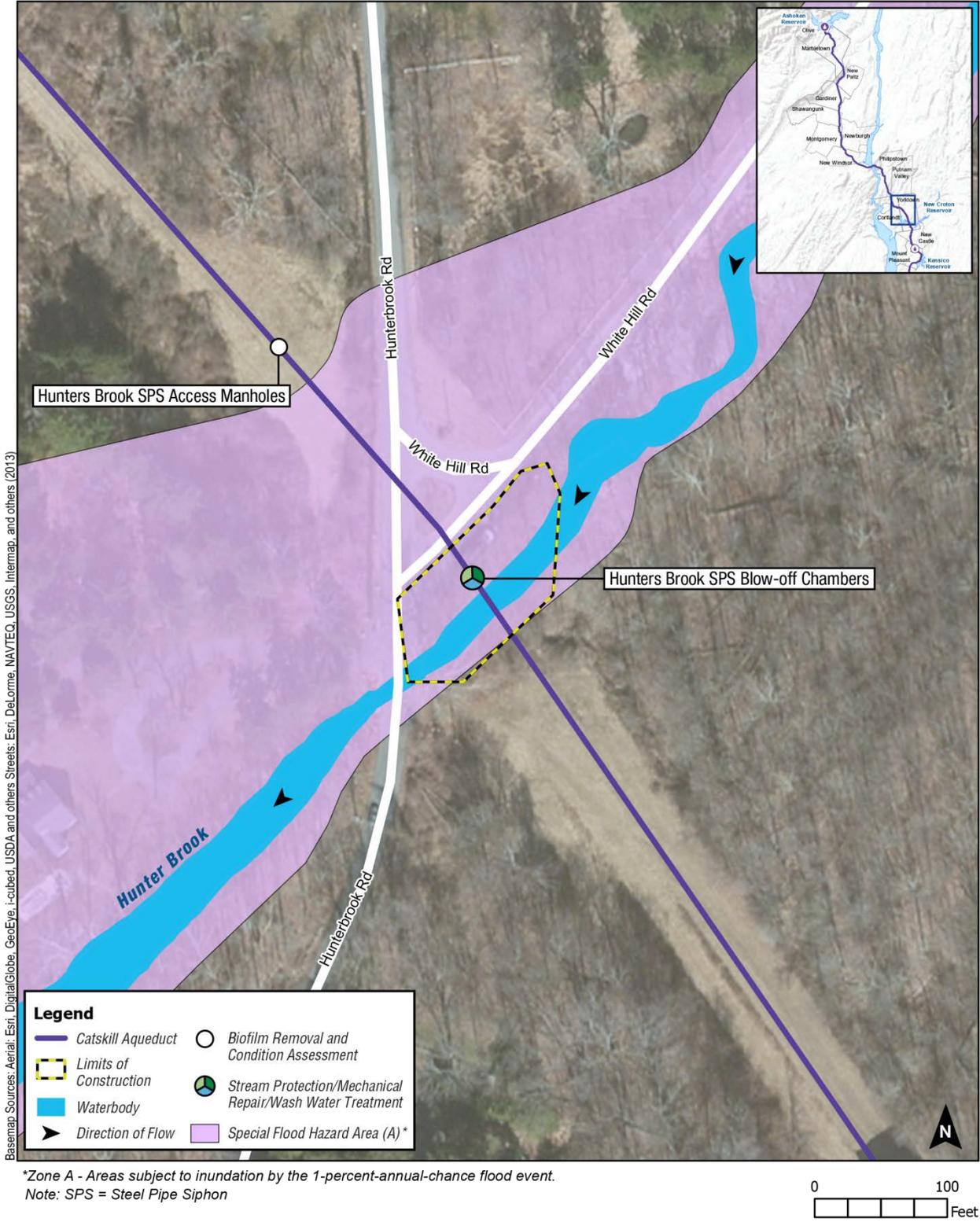
Hunter Brook flows parallel to White Hill Road, in a northeast to southwest direction through the natural resources study area (see **Figure 9.14-9**). It continues to flow approximately 1.5 miles where it enters New Croton Reservoir, which is part of the Croton Water Supply System. Hunter Brook has a moderate gradient with riffle and pool habitat, and a sand and cobble substrate. The Hunters Brook Steel Pipe Siphon travels perpendicular under the stream with three blow-off chambers spaced equidistant along the northwestern bank of Hunter Brook. Scouring and exposed tree roots were observed along the steep banks, which are conditions unrelated to the aqueduct. The entrenched stream channel was approximately 10 feet below the bottom of the most upstream blow-off pipe. During the field visit, creek chub (*Semotilus atromaculatus*), tessellated darter (*Etheostoma olmstedi*), and white sucker (*Catostomus commersoni*) were observed. As shown in **Table 9.14-3**, the watercourse is best classified as a “Riverine, Lower Perennial, Unconsolidated Bottom, Sand” system based on the Cowardin System (Cowardin et al. 1979).

Floodplains

Flood Insurance Rate map number 36119C0039F, effective September 28, 2007, was reviewed. As shown on **Figure 9.14-10**, a FEMA-designated 100-year floodplain (Zone A), which depicts areas subject to inundation by the one percent Annual Chance Flood, runs through the center of the study area. Zone A Special Flood Hazard Areas are generally determined using approximate methods. Areas within Zone A are within the Special Flood Hazard Area and are subject to local floodplain management regulations. There are no FEMA-designated floodways in this study area.

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated to occur within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the Jacob Road Study Area would be the same as baseline conditions.



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.14-10: Floodplain – Jacob Road Study Area



Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Jacob Road Study Area.

Construction

Work activities related to the repair and rehabilitation at the Blow-off Chambers would temporarily disturb surface water and vegetated riparian areas, and have the potential to temporarily alter flows in Hunter Brook.

The Blow-off Chambers may be accessed multiple times during construction. As Hunter Brook supports wild trout and can be designated as a coldwater fishery, in-water construction activities are generally prohibited from October 1 to April 30 unless otherwise authorized. While DEP anticipates that the majority of in-water construction would occur during the summer months, and outside of the October 1 to April 30 prohibition, construction activities may need to occur within the restricted period. If this is required, as presented within Section 9.19, “Project-wide Impact Analysis,” DEP would implement additional measures to limit potential adverse impacts to trout.

Prior to commencing the repair and rehabilitation, temporary sediment and erosion control measures, such as silt fences and haybales, would be installed at the perimeter of land-based construction. Within the limits of construction, localized construction unwatering (i.e., installing a barrier and pump to keep the work area dry) may be necessary to facilitate excavation for blow-off chambers and discharge pipe replacement. Blow-off chamber reconstruction would also require in-stream access and temporary stream protection. A temporary stream diversion and a downstream turbidity curtain would be installed. To protect the stream and its banks, aquatic life movement, and prevent sediment and other pollutants from entering the waterway, temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements.

Blow-off chamber reconstruction and adjacent streambank restoration and protection would require regrading of the northern streambank and installing permanent riprap aprons approximately 20 to 30 feet long. The re-contoured streambank would not increase the extent of impervious surface and would not alter runoff to the stream. The riprap aprons would be placed to repair historical bank erosion and minimize future bank erosion in the study area. The riprap would also protect the stream while the Blow-off Chambers are operated and prevent or limit scour and turbidity. To further protect the streambank, a gabion retaining wall would be installed in an area vulnerable to scour. The retaining wall would be a semi-circular arch aligned to the natural streambank, and would be approximately 40-feet in length. This permanent structure represents a new, hardened shoreline that would be a minor encroachment necessary to attenuate flows during unwatering events to protect the stream’s bed and banks. Anticipated temporary and permanent disturbance to water resources and regulated buffers were quantified based on the limits of construction and proposed work activities (see **Table 9.14-4**). Construction staging would occur on top of the aqueduct and the temporary stream diversion would extend into the

Table 9.14-4: Estimated Disturbance to Water Resources within the Jacob Road Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Hunter Brook	5,570	1,530 <i>Temporary stream diversion and temporary downstream turbidity curtain</i>	1,110 <i>Riprap apron, gabion retaining wall</i>
50-foot State Protection of Waters Buffer	17,560	5,900 <i>Construction staging area and construction equipment use</i>	3,280 <i>Riprap apron, gabion retaining wall, and regrading following blow-off chamber reconstruction</i>
100-foot Water Resource Municipal Buffer	18,610	5,900 <i>Construction staging area and construction equipment use</i>	3,280 <i>Riprap apron, gabion retaining wall, and regrading following blow-off chamber reconstruction</i>

stream, resulting in approximately 1,530 square feet of temporary disturbance within Hunter Brook. Approximately 5,900 square feet associated with both the State Protection of Waters buffer and the municipal water resource buffer would also be temporarily affected due to staging. Upgrades and maintenance at the Blow-off Chambers would protect against future bank erosion, and require approximately 1,110 square feet of permanent disturbance to Hunter Brook, as well as approximately 3,280 square feet within both the State Protection of Waters buffer and the municipal water resource buffer. Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native riparian vegetation. Permanent disturbance is further analyzed in Section 9.19, “Project-wide Impact Analysis.”

The North and South Siphon Chambers and Blow-off Chambers have been identified as potential discharge points for treated wash water. Any wash water generated from the siphons would be treated to meet applicable discharge limits, water quality standards and/or other requirements for reuse in the removal operation, or for discharge back to the Catskill Aqueduct or to Hunter Brook. No biofilm would be discharged to surface water. Treated wash water would be discharged at low flows that would not result in scour or other physical changes to the stream.

In the event alum is added as part of the treatment process, flocculated particles would primarily settle prior to treated wash water being discharged to the stream. Given the short-term, temporary nature of the discharges (approximately 8 weeks), discharges to Hunter Brook are not anticipated to cause scouring, inundate the receiving stream, or affect stream substrate.

This study area has also been identified as a location for discharging raw aqueduct water while unwatering the tunnel during construction and future maintenance. Blow-off chamber reconstruction requires the siphons to be unwatered. This initial unwatering of the siphons would occur with temporary measures in place to protect the stream from erosion. Unwatering events to surface water would also occur at any time after stream protection measures are in place during and following construction and, therefore, are described in “Operation” below.

Operation

Upon completion of the blow-off chamber repairs and streambank restoration and protection, the function of the Blow-off Chambers would be restored. Discharges of raw water to Hunter Brook could occur in the future during DEP's typical operations. The aqueduct could be unwatered via the Blow-off Chambers to conduct maintenance or inspection. This is expected to be an infrequent event.

During unwatering events, new blow-off valves and chambers would be operated to moderate discharge flows, this would result in lower discharges from each chamber of approximately 5,800 gpm at initial valve opening to a maximum flow of approximately 21,100 gpm. It would take approximately 4 hours to unwater the Hunters Brook Steel Pipe Siphon, as each siphon pipe would be unwatered separately.

An analysis was conducted to determine if the discharge associated with an unwatering event would be greater than the bankfull stream flow. Bankfull stream flow is the flow that just fills the channel to the top of its banks (i.e., stream capacity) and at the point in which water begins to flow onto the floodplain. Bankfull flow was predicted for Hunter Brook using the USGS StreamStats Program. If the discharge associated with an unwatering event would be greater than the bankfull flow, indirect downstream effects, such as an increase in erosion and scouring over the baseline could occur. The maximum discharge flows to Hunter Brook would be approximately 121,200 gpm when the Blow-off Chambers discharge during a 1.5-year storm event. This is less than the calculated bankfull flow of Hunter Brook of approximately 131,500 gpm, making it similar to baseline conditions. Therefore, indirect downstream impacts from unwatering, such as increases in erosion and scouring would be minimal.

Additionally, flows would be moderated by throttling the valves. They would be monitored by an on-site crew to prevent the receiving stream from becoming inundated by discharges of raw water. In the event that inundation begins to occur during unwatering, the on-site crew would have the ability to cease unwatering at any time to allow streamflows to subside to baseline flows. Therefore, the proposed raw water discharges would be short-term and temporary in nature (up to 4 hours total), are not anticipated to cause scouring, and would not result in a bankfull event or alter stream capacity of Hunter Brook.

Due to the fixed location of the needed repair, activities within the designated Special Flood Hazard Area could not be avoided. While the streambank restoration measures would have minor encroachment on the Special Flood Hazard Area, they would be keyed into the existing streambank and would not displace a significant portion of the cross-sectional area of the stream. These activities are not anticipated to result in an alteration of elevations or flood capacity in the mapped floodplain. DEP would coordinate with the Town of Yorktown and FEMA, as necessary, to comply with all applicable floodplain management requirements.

Water Resources Conclusion

Water resources in the natural resources study area are limited to Hunter Brook. While the majority of work activities would result in temporary disturbance, minor permanent disturbance would occur as part of the blow-off chamber reconstruction and associated streambank

restoration and protection. Discharges would be limited to raw aqueduct unwatering events, which would be infrequent and last several hours in duration, and biofilm wash waters that would be discharged over the course of 8 weeks during the third 10-week shutdown. Permanent fill (i.e., riprap aprons and a gabion retaining wall) would be minimal and would be beneficial in that it would repair historic bank erosion and minimize future scouring. The streambank restoration measures would be keyed into the existing streambank and are not anticipated to result in an alteration of elevations or flood capacity in the mapped floodplain. DEP would coordinate with the Town of Yorktown and FEMA, as necessary, to ensure all local and federal requirements pertaining to floodplain management are satisfied. Restoring the historic function of the Blow-off Chambers to discharge raw aqueduct water would be a change in baseline conditions. However, based on the above analysis, there would be minimal indirect effects to water resources.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Jacob Road Study Area.

Terrestrial Resources

Terrestrial resources within the natural resources study area consist of an Allegheny oak forest near the North Siphon Chamber and a beech-maple mesic forest community near the Blow-off Chambers. Species near the North Siphon Chamber and Blow-off Chambers include red maple (*Acer rubrum*), black oak (*Quercus velutina*), sweet birch (*Betula lenta*), black locust (*Robinia pseudoacacia*), pignut hickory (*Carya glabra*) and an understory of royal paulownia (*Paulownia* spp.), flowering dogwood (*Cornus florida*), and sassafras (*Sassafras albidum*). Near the Blow-off Chambers, dominant tree species consist of Norway maple (*Acer platanoides*), red maple, and slippery elm (*Ulmus rubra*). The shrub layer is predominantly Japanese barberry (*Berberis thunbergii*) and the sparse groundcover consists of Japanese stiltgrass (*Microstegium vimineum*), spotted touch-me-not (*Impatiens capensis*), tickseed sunflower (*Bidens frondosa*), and clearweed (*Pilea pumila*). Based on a desktop analysis, the South Siphon Chamber area is successional old field, surrounded by deciduous forest.

During construction, tree removal is proposed. The Town of Yorktown regulates tree removal (Yorktown Town Code Chapter 270: Trees). Exemptions include tree removal that is necessary to maintain public or private rights-of-way held under New York City permits or under easements. While the limits of construction are located on City-owned land and may qualify for this exemption, terrestrial resources within the study area warrant analysis.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Jacob Road Study Area within the timeframe of the impact analysis. Natural processes such as changes in habitat due to natural vegetative succession are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be the same as baseline conditions.

Work activities associated with the repair and rehabilitation would include tree clearing and shrub removal for the purpose of improving site access and staging areas, particularly along Hunter Brook (see **Figure 9.14-9**). Along the staging area, 25 trees consisting of four species

with a range of average diameter at breast height (dbh) of between 6.3 and 14.3 inches may be removed to establish staging areas north and south of the bridge. The most common species of trees to be removed include 13 Norway maple and six slippery elm. These trees are located on DEP property in the immediate vicinity of the work areas adjacent to the existing Catskill Aqueduct. Tree removal would occur in discrete locations along the densely forested areas northeast and southwest of the aqueduct, and would not dramatically change the character of the area or affect surrounding trees. Any removal of trees and would be conducted from November 1 through March 31 to avoid impacts to potential roosting trees for Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Additionally, tree removal would be conducted on DEP property and in accordance with applicable requirements set forth by the Town of Yorktown. No tree removal is anticipated at the North Siphon Chamber or South Siphon Chamber (see **Figure 9.14-8** and **Figure 9.14-9**).

While tree removal associated with the repair and rehabilitation may be exempt from Town of Yorktown tree removal regulations, DEP would plant riparian vegetation following construction to provide additional streambank stabilization within the floodplain and restore shoreline habitat along Hunter Brook at the Blow-off Chambers. While the species composition and quantity have not yet been determined, replacement plantings would be native species adapted to floodplain habitat and planted at recommended densities within DEP property.

Following construction, all equipment would be removed from the study area, and staging areas would be restored to natural conditions. Riparian vegetation would be planted to restore the floodplain community along Hunter Brook. Other areas temporarily disturbed would be restored to natural conditions, and vegetated areas temporarily cleared during construction would be restored with similar communities via reseeded. Following the repair and rehabilitation within the study area, operation of the Catskill Aqueduct would be consistent with baseline conditions, and natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Jacob Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected, species that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” four species were identified as having the potential to occur in the natural resources study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these four species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area for these species are shown in **Table 9.14-5**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and field visits, as applicable.

Table 9.14-5: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Jacob Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on August 11, 2015 and September 17, 2015. Potential habitat (streams, wetlands, and adjacent uplands) was observed within the study area. Work activities would be largely confined to previously disturbed areas, and as a mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions and the new boathole and streambank restoration measures that remain would not affect breeding, nesting, or foraging habitat. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	A tree survey was conducted on August 11, 2015. There were no trees identified as potential bat roosting habitat. Any removal of trees and would be conducted from November 1 through March 31 to avoid impacts to potential roosting bats. Repair activities would result in minor, permanent fill within Hunter Brook. Given that these upgrades would be limited to a portion of the streambank, it would not adversely affect bat foraging within the study area. Therefore, there are no effects anticipated and no further analysis for Indiana bats is warranted for this study area.	No
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened Unlisted	A tree survey was conducted on August 11, 2015. There were no trees identified as potential bat roosting habitat. Any removal of trees and would be conducted from November 1 through March 31 to avoid impacts to potential roosting bats. Repair activities would result in minor, permanent fill within Hunter Brook. Given that these upgrades would be limited to a portion of the streambank, it would not adversely affect bat foraging within the study area. Therefore, there are no effects anticipated and no further analysis for northern long-eared bats is warranted for this study area.	No
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	No suitable habitat or individuals were observed during field visits on August 11, 2015 and September 17, 2015. Therefore, no further analysis for New England cottontails is warranted for this study area.	No

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*), Indiana bats, northern long-eared bats, or New England cottontails (*Sylvilagus transitionalis*) associated with the repair and rehabilitation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Jacob Road Study Area.

9.14.3.4 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Jacob Road Study Area, a Phase I Environmental Site Assessment (ESA) was conducted in general conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Practice E 1527-13 and City Environmental Quality Review (CEQR) requirements to identify Recognized Environmental Conditions (RECs). The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a geotechnical investigation and environmental health and safety sampling, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Geotechnical environmental investigations and sampling were undertaken for contaminants of concern including asbestos, lead, volatile and semivolatile organics, polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons along the aqueduct within the study area. Chromium was noted in the soil sampling results. Total chromium was reported in the sample collected at the Hunters Brook Steel Pipe North Siphon Chamber. Chromium concentrations however were consistent over a widespread sampling area and are more likely associated with background concentrations. Along the Catskill Aqueduct, there are widespread occurrences of chromium, which are attributed to the existing geological formations. The legacy data also revealed that lead-containing paint is present on steel door, steel gate, and wood stop shutters and presumed to be present on the hoist of the North Siphon Chamber building. Materials sampled did not identify asbestos-containing materials, PCB-containing paint or mercury-containing paint. In addition, gasoline range organics were not detected in the samples, total petroleum hydrocarbons were detected, but at low concentrations that are not considered to be indicative of contamination that warrants remedial actions.

Based on the results of the environmental investigations completed within the Jacob Road Study Area, no other hazardous materials are known to exist. The soil results support the reuse of excavated materials associated with the boathole installation and blow-off chamber reconstruction as backfill and do not suggest the need for special management, handling or health and safety measures at this time.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Jacob Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Jacob Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. DEP would handle all materials in accordance with applicable federal, State, and local regulations and guidelines. The use and storage of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, excavation associated with the work activities for the installation of a new boathole and blow-off chamber reconstruction would occur on previously disturbed soils and access road improvements would occur on both previously disturbed and undisturbed soils. Following the repair and rehabilitation, all equipment would be removed from the Jacob Road Study Area. The staging areas would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Jacob Road Study Area.

9.14.3.5 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Jacob Road Study Area.

Access to the repair and rehabilitation limits of construction for the work sites within the Jacob Road Study Area would be via Jacob Road, Hunterbrook Road, and White Hill Road (see **Figure 9.14-2**). Jacob Road, Hunterbrook Road (north of White Hill Road), and White Hill Road are two-lane, two-way urban minor arterial roadways. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Jacob Road Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area. There is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site. However, there are no DEP employees who work at or visit the study area on a daily basis, and the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Jacob Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Jacob Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be the basis of this transportation analysis. Of these activities, biofilm removal and condition assessment (see **Figure 9.14-6** and **Figure 9.14-7**) would generate the most vehicle trips. Biofilm removal and condition assessment would occur in fall ~~2020~~2019 between the hours of 7 AM and 7 PM, 7 days a week for approximately 8 weeks during the third 10-week shutdown.

In the future with the repair and rehabilitation, construction vehicles would travel along Jacob Road, Hunterbrook Road, or White Hill Road to a DEP access road. The estimated number of peak-day one-way vehicle trips associated with biofilm removal and condition assessment is 33 vehicles, or approximately 66 peak-day vehicle round trips that would travel to and from the study area. The majority of the peak daily vehicle round trips, approximately 42 vehicle round trips or 42 Passenger Car Equivalents (PCEs), would be workers either traveling to and from the study area, or traveling directly to and from the staging area (depending on parking capacity), with potentially 8 daily shuttle trips between the study area and the staging area. The remaining approximately 16 peak-day vehicle round trips (21 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with biofilm removal and condition assessment is approximately 33 peak-hour vehicle trip ends (36 PCEs). This includes approximately 21 vehicle trip ends (21 PCEs) from workers traveling directly to and from the staging area, approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 8 vehicle trip ends (11 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 12-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 36 peak-hour PCEs along Jacob Road, Hunterbrook Road, or White Hill Road, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, “Transportation.” The work activities at the Jacob Road Study Area would be short-term (totaling 27 weeks over 1.5 years; see **Figure 9.14-2**) and would not generate public parking or transportation demands or pedestrian activity within the Jacob Road Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Jacob Road Study Area.

9.14.3.6 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation work activities within the Jacob Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation work activities as shown on **Figure 9.14-11**. The Jacob Road Noise Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Town of Yorktown Noise Control Ordinance §216-2, which prohibits excessive noise between 11 PM and 7 AM, Sunday evening through Friday morning and 10 PM and 8 AM, Friday evening through Sunday morning. The Town of Yorktown Ordinance §300-67 also prohibits adverse noise impacts from watershed and water supply facilities.

Existing ambient noise levels within the Jacob Road Study Area are influenced by vehicular traffic traveling on Jacob Road, Hunterbrook Road, and other local roads. The existing noise levels within the study area are comparable to a quiet suburban residential environment, based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements (e.g., commercial uses). Typical noise levels (measured as L_{eq}) for quiet suburban residential communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Jacob Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Jacob Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Jacob Road Study Area would occur on three sites. The stationary noise-generating equipment that would be used within the Jacob Road Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with the blow-off chamber reconstruction would emit the most noise. Blow-off chamber reconstruction would occur in summer ~~2019~~2018 between the hours of 7 AM and 5 PM, Monday through Friday for approximately 9 weeks prior to the second 10-week shutdown. Blow-off chamber reconstruction would occur during hours that comply with the Town of Yorktown code, so the next loudest activity, boathole installation, was also included in this stationary noise analysis. Boathole installation would occur in fall ~~2019~~2018 between the hours of 7 M and 7 PM, 7 days a week for approximately 2 weeks during the second 10-week shutdown (see **Table 9.14-2**). Other noise-producing equipment would also be utilized within the study area for a limited period during work activities; however, this equipment would not be expected to be louder than those associated with blow-off chamber reconstruction and boathole installation.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the blow-off chamber reconstruction and boathole installation. Associated equipment reference noise levels are shown in **Table 9.14-6**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

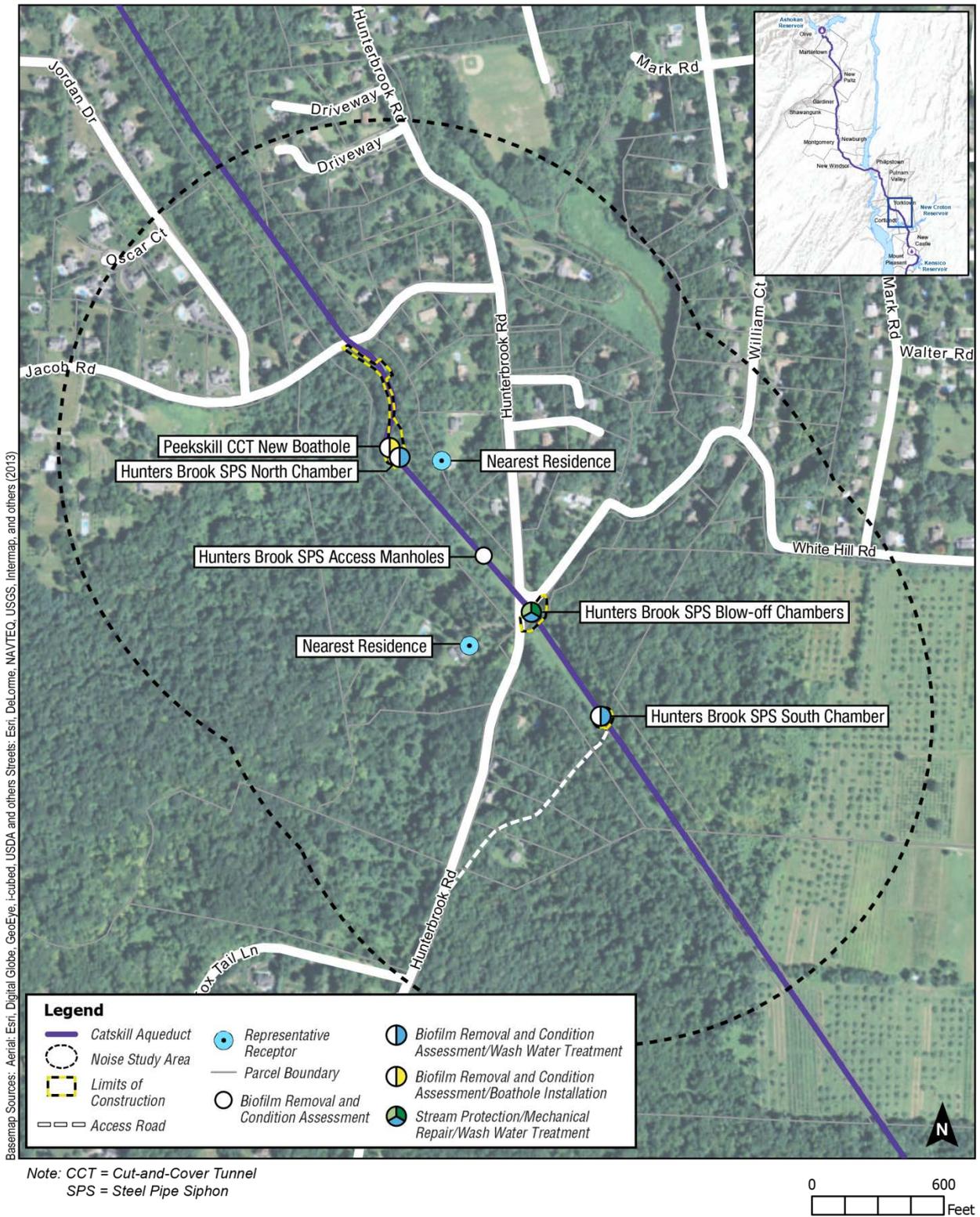


Figure 9.14-11: Noise – Jacob Road Study Area



Table 9.14-6: Stationary Source Construction Equipment Modeled at the Jacob Road Study Area - Noise Analysis and Reference Noise Levels (L_{eq})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA) ¹
Blow-off Chamber Reconstruction (7 AM to 5 PM, Monday to Friday)	
Ventilation Fan	85
Generator	82
Dozer	81
Boathole Installation (7 AM to 7 PM, 7 days a week)	
Crane	77
Generator	82
Concrete Mixer Truck	81
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	

Table 9.14-7 shows the results of the stationary construction noise analysis. Blow-off chamber reconstruction within the Jacob Road Study Area during the repair and rehabilitation could produce a noise level (L_{eq}) of approximately 72 dBA at the nearest residence approximately 320 feet away from the blow-off chamber reconstruction activities. Boathole installation could produce a noise level (L_{eq}) of approximately 71 dBA at the nearest residence approximately 250 feet away from the boathole installation activities. Repair and rehabilitation work activities have the potential to occur during hours when excessive noise is prohibited, as defined by the Town of Yorktown. DEP would work with the Town of Yorktown, as appropriate.

Table 9.14-7: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors within the Jacob Road Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)	Town of Yorktown Noise Limit (dBA)	Potential for Exceedance (Yes or No)
Blow-off Chamber Reconstruction (7 AM to 5 PM, Monday to Friday)				
Nearest Residence	320	72	NA	No
Boathole Installation (7 AM to 7 PM, 7 days a week)				
Nearest Residence	248	71	NA	Yes ¹
Notes: NA = Not Applicable ¹ Repair and rehabilitation work activities have the potential to occur during hours when excessive noise is prohibited, as defined by the Town of Yorktown.				

Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Jacob Road Study Area. The repair and rehabilitation would be temporary in nature, with the peak work activities occurring during blow-off chamber reconstruction in summer ~~2019~~2018 and boathole installation in fall ~~2019~~2018 for limited periods (e.g., up to 9 weeks per activity).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Jacob Road Study Area.

9.14.3.7 Neighborhood Character

The character of the Jacob Road Study Area is largely defined by a mix of residential, commercial, public services, agricultural, and vacant land uses and its physical setting within a rural location (see **Figure 9.14-4**). The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. Hunter Brook flows from east to west across the lower portion of the study area. Hunterbrook Road traverses the study area from north to south, intersecting White Hill Road to the south and Jacob Road to the north. The limits of construction for the work sites and associated access routes are located in a public services corridor with grassy cover, which is owned and maintained by DEP.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Jacob Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; open space and recreation; historic and cultural resources; and visual resources, an impact analysis for the Jacob Road Study Area is not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," Section 9.3.4, "Socioeconomic Conditions," Section 9.3.6, "Open Space and Recreation," Section 9.3.7, "Historic and Cultural Resources," and Section 9.3.8, "Visual Resources," respectively. Furthermore, the public policy impact analysis provided in Section 9.14.2, "Town of Yorktown Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.14.3.5, "Transportation," and 9.14.3.6, "Noise," during construction, the work activities in the Jacob Road Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Jacob Road Study Area.

9.14.4 CHAPMAN ROAD STUDY AREA IMPACT ANALYSIS

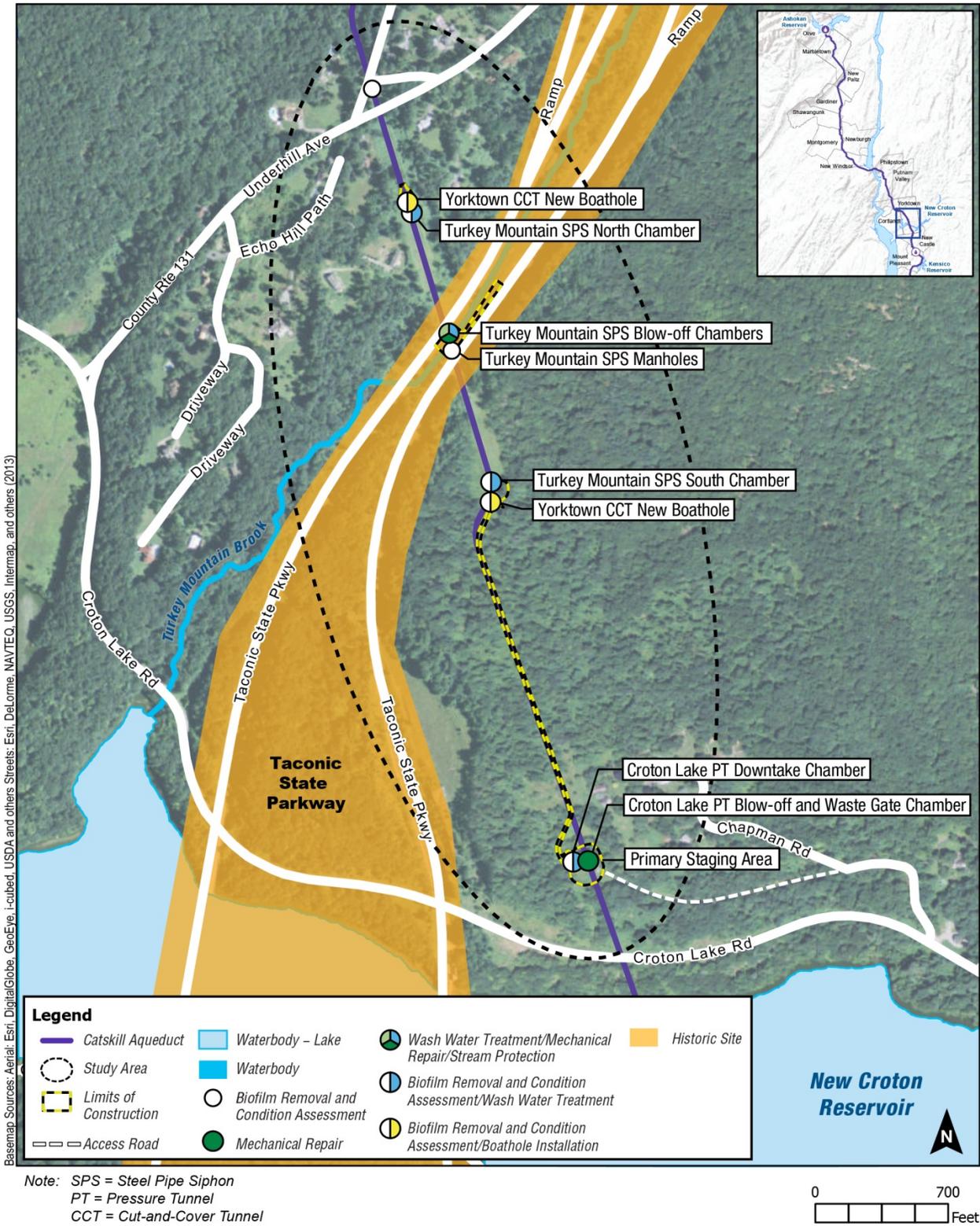
Within the upper portion of the Chapman Road Study Area, the aqueduct consists of the Yorktown Cut-and-Cover Tunnel, which transitions to the Turkey Mountain Steel Pipe Siphon at the Turkey Mountain Steel Pipe Siphon North Chamber (North Siphon Chamber). Adjacent to Turkey Mountain Brook, the steel pipe siphon includes a set of access manholes and three under-stream blow-off chambers and associated valves within the Turkey Mountain Steel Pipe Siphon Blow-off Chambers (Blow-off Chambers). Approximately 700 feet south of the Blow-off Chambers, the steel pipe siphon transitions to another segment of the Yorktown Cut-and-Cover Tunnel at the Turkey Mountain Steel Pipe Siphon South Chamber (South Siphon Chamber). South of the cut-and-cover tunnel is the Turkey Mountain Grade Tunnel, which transitions to the Croton Lake Pressure Tunnel via a deep vertical shaft at the Croton Lake Pressure Tunnel Downtake Chamber (Croton Lake Downtake Chamber). The Croton Lake Downtake Chamber includes a 5-foot by 5-foot sluice gate (waste gate) and two 60-inch diameter blow-off valves for draining the northern portion of the aqueduct (see **Figure 9.14-12**).

Work activities within the Chapman Road Study Area would include: staging and access improvements; establishment and use of a primary staging area; blow-off chamber reconstruction and associated streambank restoration and protection; boathole preparation and installation; replacement of a 5-foot by 5-foot waste gate and two 60-inch diameter blow-off valves; biofilm removal and condition assessment; small-scale wash water treatment; and large-scale wash water treatment.

9.14.4.1 Study Area Location and Description

The Chapman Road Study Area is located along the upper Catskill Aqueduct in the Town of Yorktown. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. The study area is roughly bounded by New Croton Reservoir to the south and includes a portion of the Taconic State Parkway, which crosses the upper half of the study area in a southwest to northeast direction. Turkey Mountain Brook, a tributary to New Croton Reservoir, parallels the Taconic State Parkway through the study area. Underhill Avenue (County Route 131) traverses the northern portion of the study area from west to east. Croton Lake Road traverses the southern edge of the study area from west to east.

Proposed work sites within the study area include the North Siphon Chamber, the Blow-off Chambers, the South Siphon Chamber, and the Croton Lake Downtake Chamber. Access to the North Siphon Chamber would be provided by driving over the cut-and-cover tunnel from an entrance off Underhill Avenue (County Route 131). The Blow-off Chambers are located within the median of the Taconic State Parkway. The Croton Lake Downtake Chamber work site would be accessed by an access road that connects to Chapman Road. To access the South Siphon



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.14-12: Study Area – Chapman Road



Chamber, vehicles would use the same access road and then proceed to the north along an access road that parallels the aqueduct. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work sites. **Figure 9.14-12** shows an aerial photograph of the study area, including the path of the aqueduct, the locations of the limits of construction for the work sites, and the proposed access routes. **Figure 9.14-13** shows two photographs of the study area.

The study area consists of residential, public services, open space and recreation, and vacant land uses, in addition to an undesignated land use associated with the Taconic State Parkway, owned by the New York State Department of Transportation (NYSDOT). Land cover is forested with scattered residential development. Except for the Blow-off Chambers, which are located on NYSDOT property, the limits of construction for all work sites and associated access routes are located in a public services corridor, which is owned and maintained by DEP. **Figure 9.14-14** shows a map of the land uses in the study area and its surroundings.

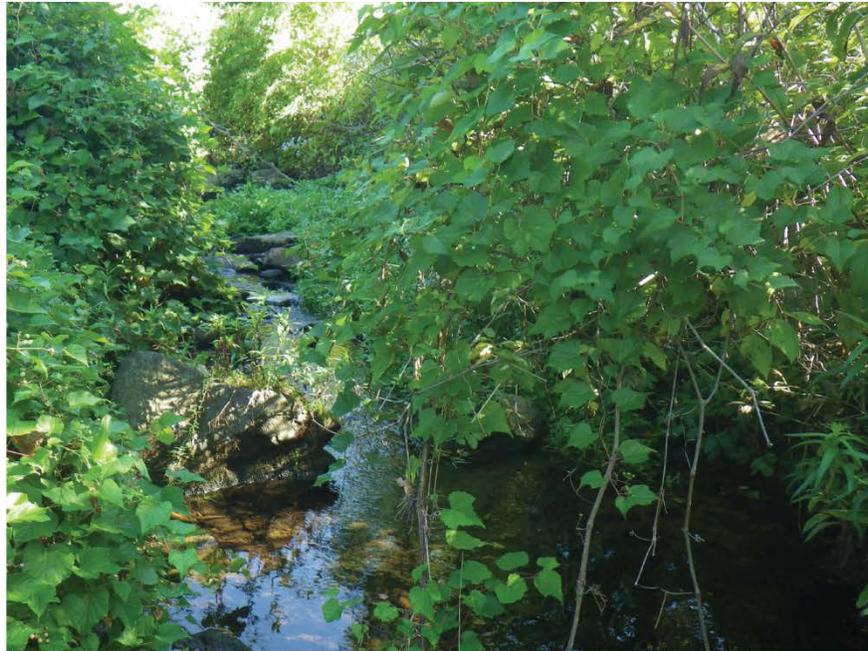
Zoning in the Chapman Road Study Area is primarily single-family residential (R1-160, R1-80, and R1-200), in addition to an unzoned area associated with the Taconic State Parkway, as designated by the Town of Yorktown Zoning Code (see **Figure 9.14-15**). The Catskill Aqueduct is a permitted use as a water supply facility within all three single-family residential (R1-160, R1-80, and R1-200) zoning districts, which provide for single-family housing.

The Taconic State Parkway is listed on the National Register of Historic Places as a historic site. There are no other federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

9.14.4.2 Proposed Activities within the Chapman Road Study Area

To support activities within the Chapman Road Study Area, the staging area at the Croton Lake Downtake Chamber would serve as a primary staging area for contractor trailers and parking to support repair and rehabilitation construction activities along the 25 miles of aqueduct directly east of the Hudson River. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. Site plans showing layouts of limits of construction for the work sites, which would occupy a total of 2.6 acres, are shown on **Figure 9.14-16**, **Figure 9.14-17**, and **Figure 9.14-18**. The schedule for work within the study area is shown in **Table 9.14-8**. The duration of active construction within the Chapman Road Study Area would total 92 weeks over 3 years, with some overlapping activities.

Work in the study area would begin in ~~2018~~2017 with staging and access improvements for the primary staging area. In addition to underbrush clearing and gravel placement for leveling and erosion control, staging and access improvements would involve grading and tree removal. The removal of approximately 29 trees may be required within the Chapman Road Study Area. Approximately 250 cubic yards of fill could also be added along the slope to the south of the Croton Lake Downtake Chamber (see **Figure 9.14-18**). The primary staging area would then be established and would be available for the duration of the repair and rehabilitation. Any fill or associated retaining structures would be temporary and would be removed upon completion of the repair and rehabilitation.



Photograph 1: Turkey Mountain Brook looking upstream (north).



Photograph 2: Croton Lake Downtake Chamber looking east at the existing access road and potential staging area.

Figure 9.14-13: Photographs – Chapman Road Study Area



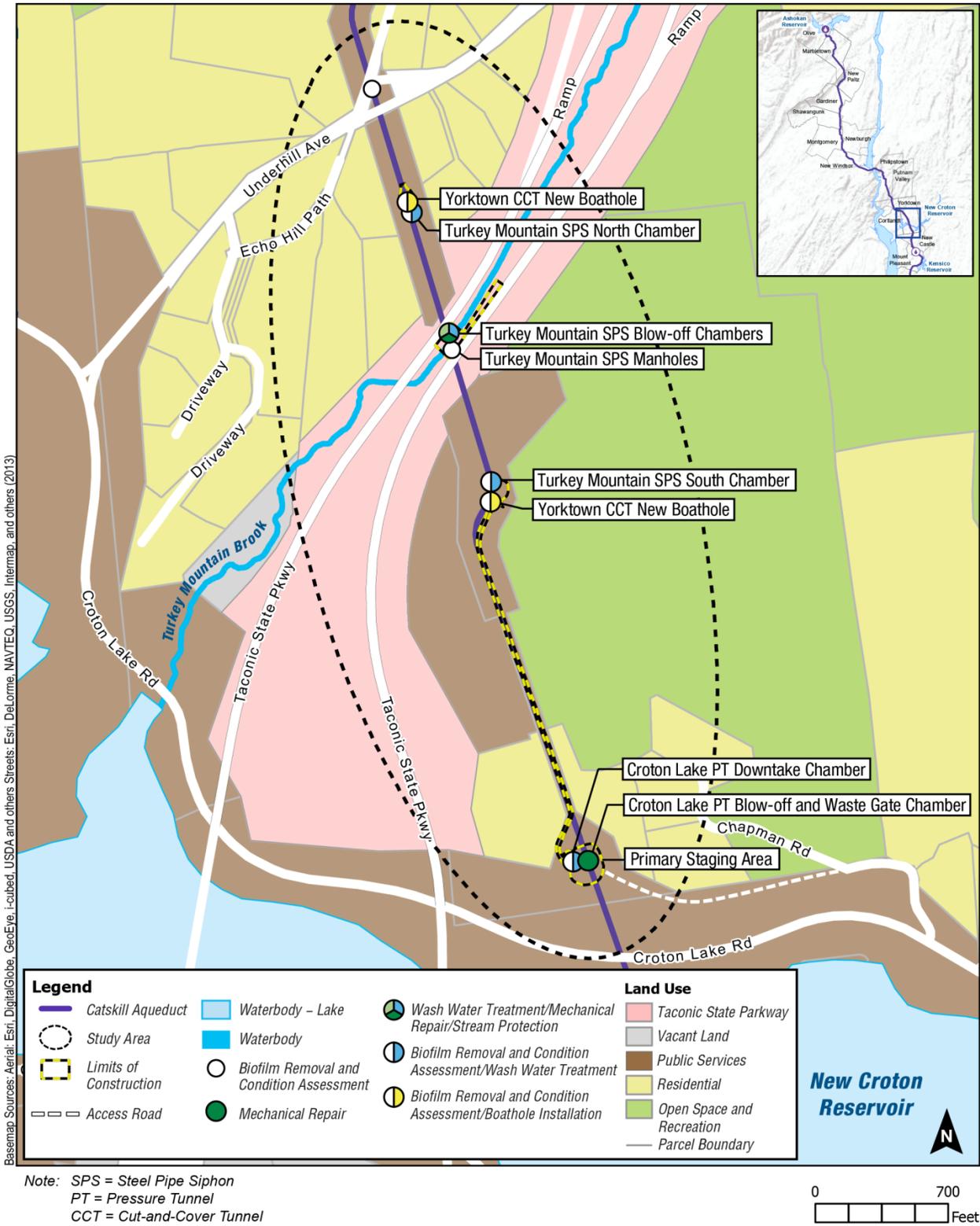


Figure 9.14-14: Land Use – Chapman Road Study Area



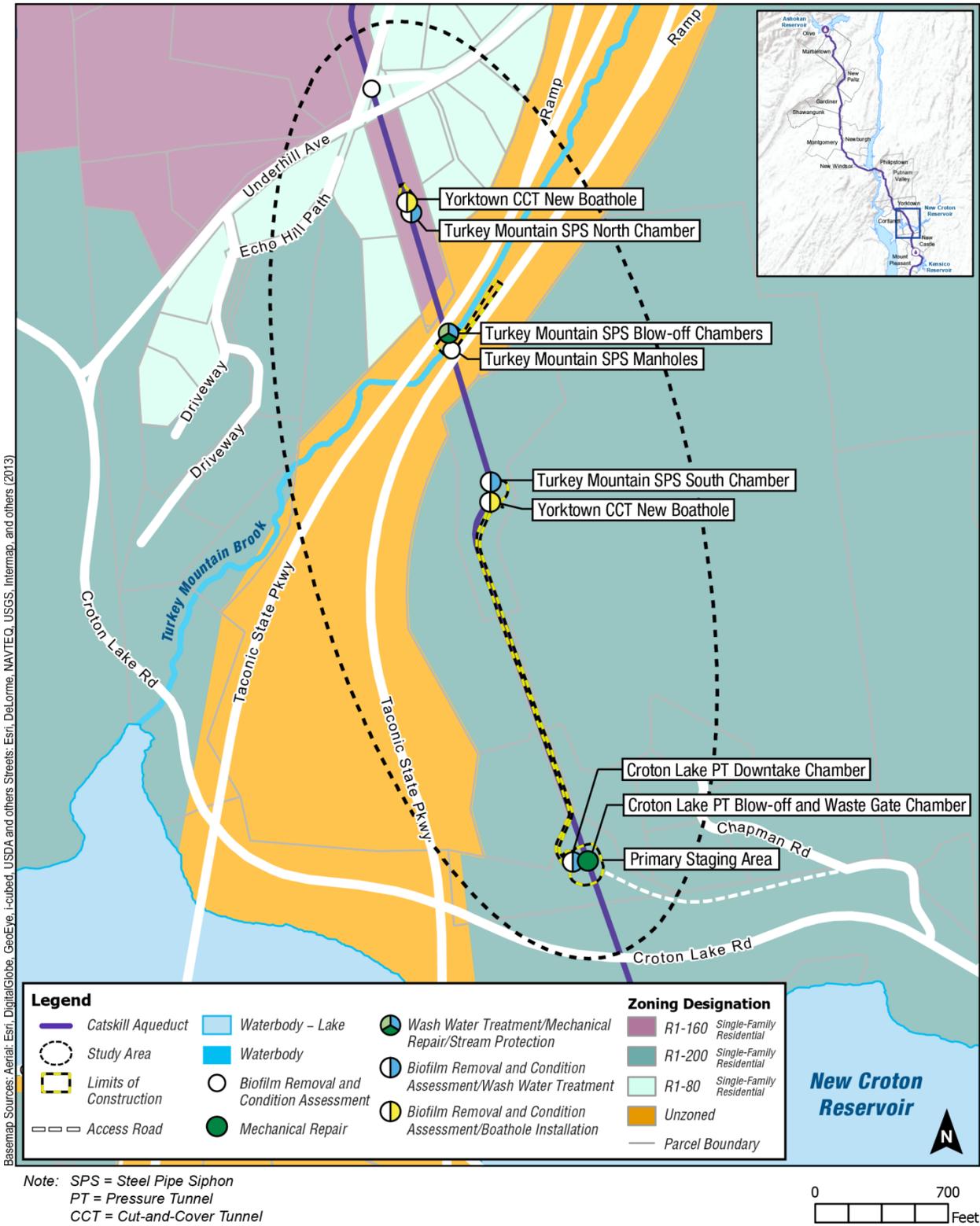


Figure 9.14-15: Zoning – Chapman Road Study Area



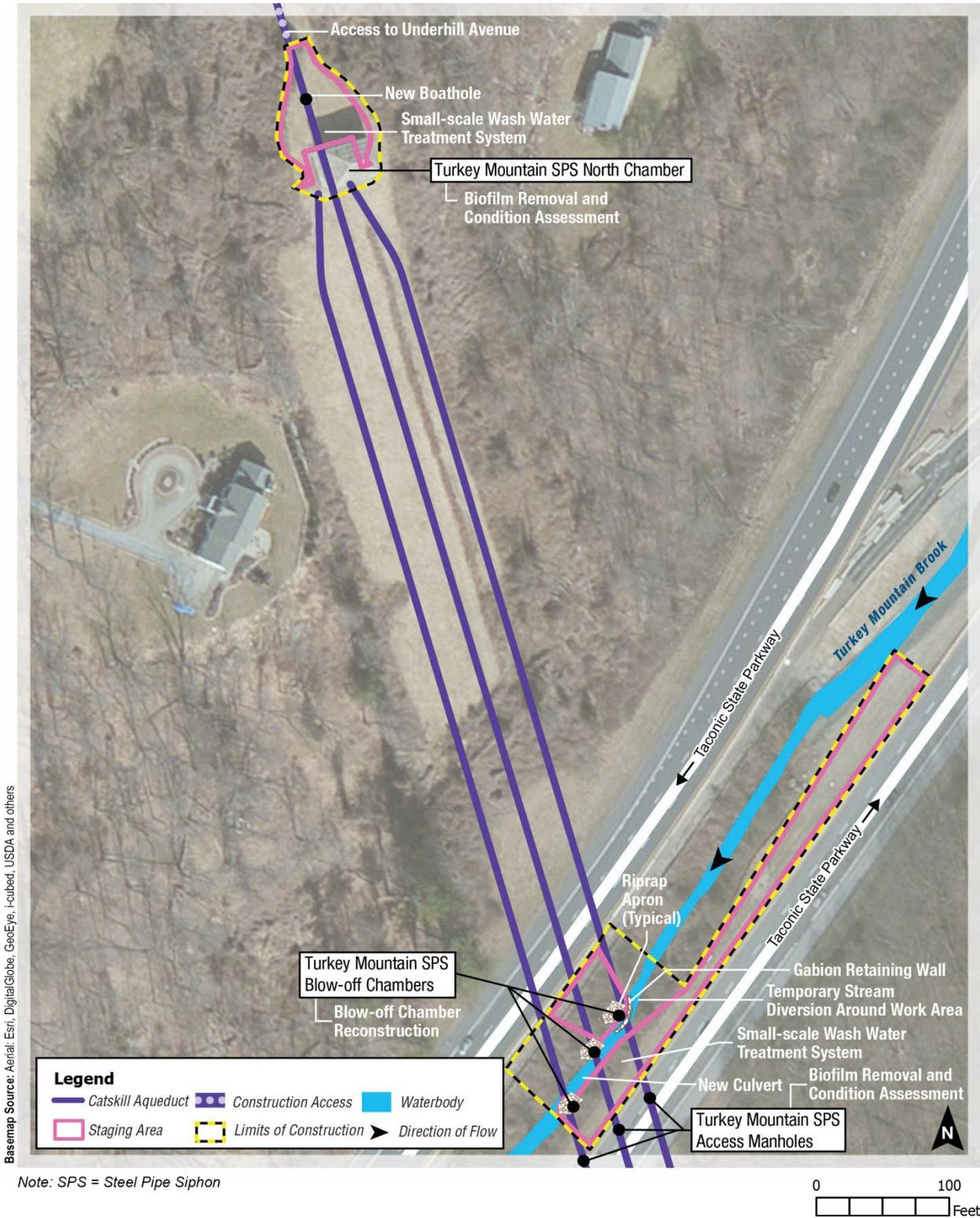


Figure 9.14-16: Site Plan for Turkey Mountain SPS North Chamber and Turkey Mountain SPS Blow-off Chambers – Chapman Road Study Area



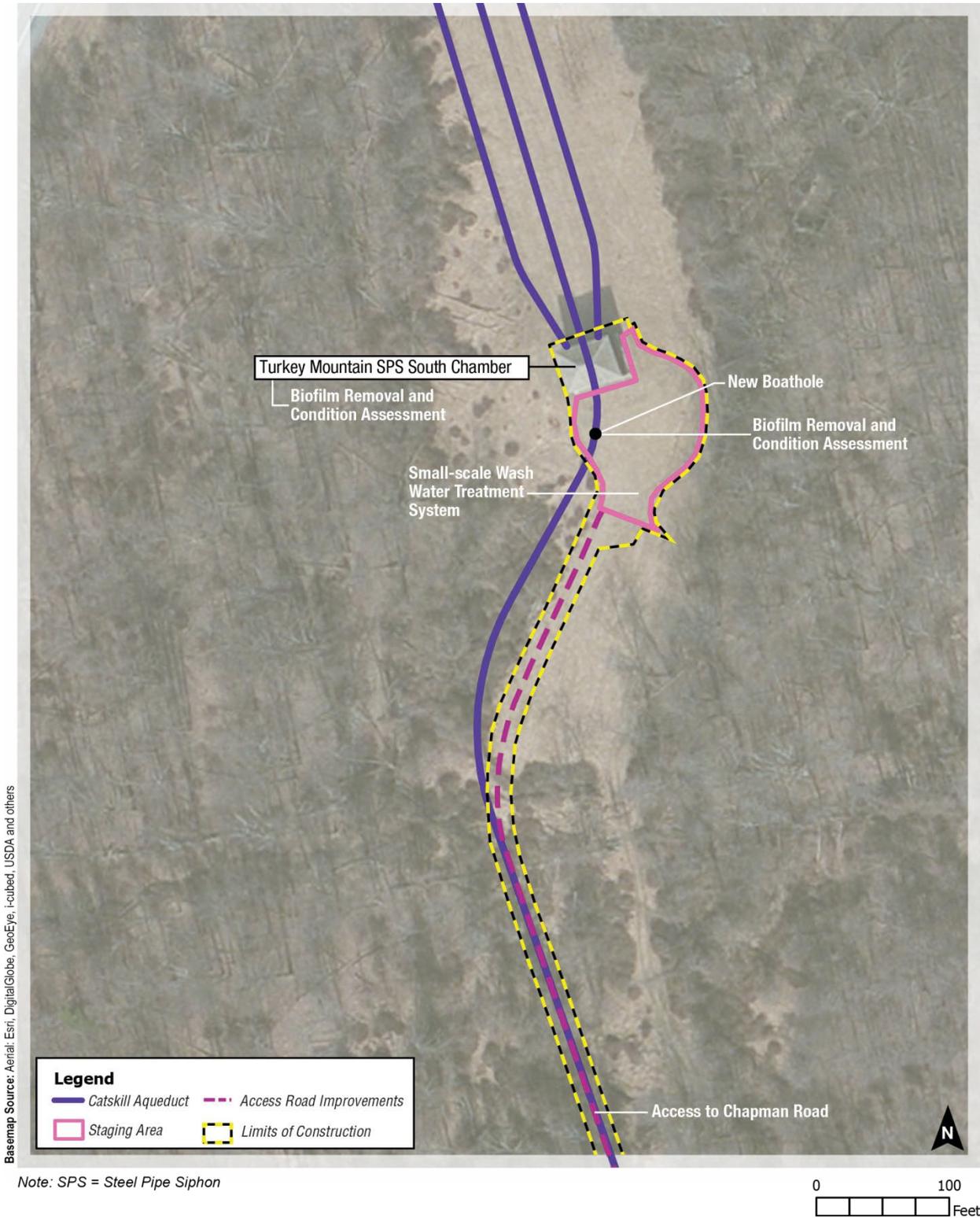


Figure 9.14-17: Site Plan for Turkey Mountain SPS South Chamber – Chapman Road Study Area



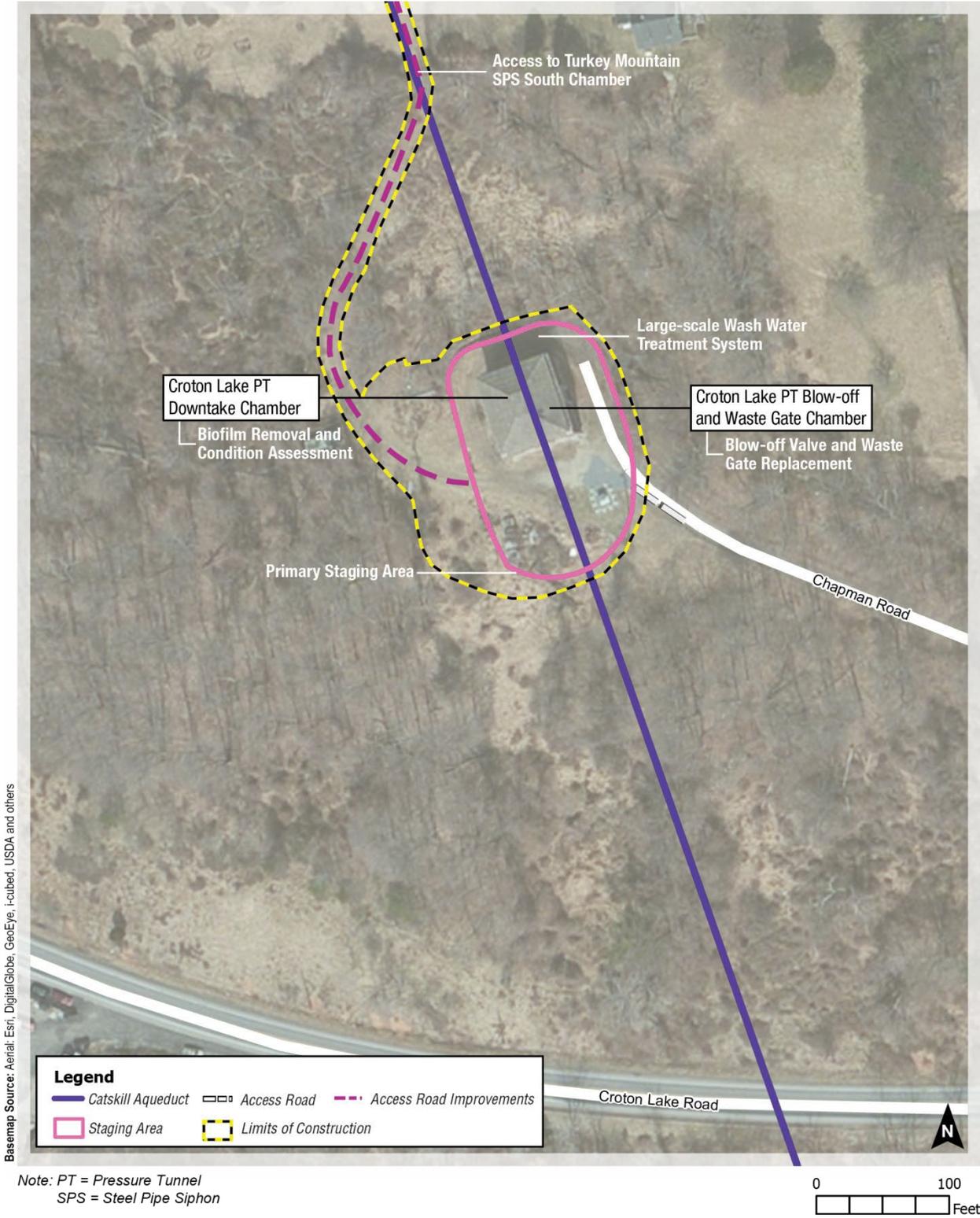


Figure 9.14-18: Site Plan for Croton Lake Pressure Tunnel Downtake Chamber – Chapman Road Study Area



Table 9.14-8: Schedule of Work Activities within the Chapman Road Study Area

Work Activity ¹	Dates	Duration	Work Hours	Crew Size ²
Staging and Access Improvements ³	2018 2017 and Summer 2019 2018	6 weeks (divided)	Monday to Friday, 7 AM to 5 PM	8
Primary Staging Area Management	2018 2017 – 2020	Less than 2 continuous years	7 days a week, 24 hours per day (shutdowns) Monday to Friday, 7 AM to 5 PM (all other times)	12
Streambank Restoration and Protection	Summer 2019 2018	3 weeks	Monday to Friday, 7 AM to 5 PM	10
Blow-off Chamber Reconstruction	Summer 2019 2018	9 weeks	7 days a week, 24 hours per day	12
Boathole Preparation	Summer 2019 2018	3 weeks	Monday to Friday, 7 AM to 5 PM	10
Boathole Installation	Fall 2019 2018 (Second 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	8
Blow-off Valve and Waste Gate Replacement	Fall 2019 2018 (Second 10-week shutdown)	10 weeks	7 days a week, 7 AM to 7 PM	16
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	Fall 2020 2019 (Third 10-week shutdown)	9 weeks	7 days a week, 7 AM to 7 PM	21
Large-scale Wash Water Treatment	Fall 2020 2019 (Third 10-week shutdown)	10 weeks	7 days a week, 24 hours per day	7
Notes:				
¹ Overlapping activities are estimated to total 92 weeks. All work activities overlap with primary staging area management.				
² Crew size refers to the number of people anticipated at the work site(s).				
³ Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>).				

Staging and access improvements for the South Siphon Chamber and Blow-off Chambers would also occur in summer ~~2019~~2018. For work at the South Siphon Chamber, improvements would involve grading and gravel fill along the existing access road to the Croton Lake Downtake Chamber, as well as the protection of existing culverts. Restoration and protection of the portion of Turkey Mountain Brook adjacent to the Blow-off Chambers, which are located in the median of the Taconic State Parkway, would occur in summer ~~2019~~2018 (portions of the work that require shutdowns would be performed in spring and fall of that year). Tree removal and the

installation of a new permanent culvert across Turkey Mountain Brook would be required to provide access for construction and future maintenance. To provide access from the Taconic State Parkway to the median, closure of the left northbound lane of the parkway would be required. Work would be conducted 24 hours per day, or as required by the NYSDOT, to minimize the duration and disruption to traffic.

Following the staging and access improvements, restoration and protection of the portion of Turkey Mountain Brook adjacent to the Blow-off Chambers would take place. Streambank restoration work along Turkey Mountain Brook would include regrading and installing a gabion retaining wall and riprap aprons to repair bank erosion and minimize future bank erosion (see **Figure 9.14-16**). To ensure a dry working environment, a temporary stream diversion would be installed, and a pump would be operated to divert the stream around the work area. A turbidity curtain would be installed to prevent sediment from moving downstream. Reconstruction of the Blow-off Chambers, including replacement of the blow-off valves, discharge pipes, and chamber covers, repair of the concrete walls, and removal of the access ladders, would also take place in summer ~~2019~~2018. Portions of the work that require shutdowns would be performed in spring and fall of that year. In total, the streambank work would require the excavation of approximately 80 cubic yards of soil and approximately 270 cubic yards of soil for a net fill of approximately 190 cubic yards of soil. Temporary in-stream disturbance would cover a total area of approximately 770 square feet, and permanent in-stream disturbance would cover approximately 220 square feet. Afterwards, the blow-off valves would be used to unwater the aqueduct for future shutdowns during the repair and rehabilitation and future maintenance.

Following the staging and access improvements, boatholes would be installed at both the North Siphon Chamber (see **Figure 9.14-16**) and the South Siphon Chamber (see **Figure 9.14-17**). Preparation for each new boathole would consist of the excavation of approximately 45 cubic yards of soil and construction of a cast-in-place concrete collar. Boathole installation, which requires unwatering of the aqueduct to tie into the crown of the cut-and-cover tunnel, would take place during the second 10-week shutdown in fall ~~2019~~2018.

Replacement of the blow-off valves and waste gate at the Croton Lake Downtake Chamber (see **Figure 9.14-18**) would also occur during the second 10-week shutdown in fall ~~2019~~2018. Although the aqueduct would be unwatered during this shutdown, water would remain in the downtake shaft, requiring pumping to permit work in the dry. The 5-foot by 5-foot waste gate would be replaced in-kind, and the two 60-inch cast iron blow-off valves would be replaced with two 48-inch by 60-inch knife gate valves. The hydraulic actuators for the valves would also be replaced with electric actuators and a new access ladder system would be installed, in addition to the replacement of three sluice gates and concrete repair work, as needed. Accessing the blow-off valves would require the removal of two concrete slabs, each estimated at 3,700 pounds, by a gantry crane.

Lastly, biofilm removal and condition assessment (see **Figure 9.14-16** through **Figure 9.14-18**) would occur during the third 10-week shutdown in fall ~~2020~~2019. Access into the aqueduct would be provided by the new boatholes, the North and South Siphon Chambers, the Croton Lake Downtake Chamber, and the existing set of access manholes. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered,

permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a large-scale wash water treatment system that would be established at the Croton Lake Downtake Chamber, where it would be treated to meet water quality standards for discharge back into the aqueduct (see Section 9.2, “Project Description”). The treatment system would require 24-hour operation to process the anticipated volume of wash water. Additional potential treatment locations within the study area include the North Siphon Chamber, the South Siphon Chamber, and the Blow-off Chambers, at which small-scale treatment systems could be established.

Upon completion of repair and rehabilitation in 2020, all trailers, equipment, and materials associated with the primary staging area would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Chapman Road Study Area are presented in Section 9.14.4.3, “Open Space and Recreation” through 9.14.4.10, “Neighborhood Character” and include: open space and recreation; historic and cultural resources; visual resources; natural resources including water resources, terrestrial resources, and federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.14.2, “Town of Yorktown Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” an impact analysis related to land use and zoning; socioeconomic conditions; community facilities and services; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area is not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were assessed within Section 9.19, “Project-wide Impact Analysis.”

9.14.4.3 Open Space and Recreation

As shown on **Figure 9.14-19**, two open space resources are located within the Chapman Road Study Area: New Croton Reservoir Watershed Lands and Turkey Mountain DEP Recreational Land. Approximately 4 acres of New Croton Reservoir Watershed Lands are located within the southern portion of the study area, although the reservoir and adjacent shoreline are not located within the study area. New Croton Reservoir is approximately 2,182 acres in total and is used for recreational shoreline fishing and non-motorized boat fishing to the public with a DEP watershed access permit and fishing license. The DEP- managed New Croton Reservoir Watershed Lands within the Chapman Road Study Area is an area where access to fishing from the shoreline may occur. Use of New Croton Reservoir would not be affected and is outside of the repair and rehabilitation construction staging areas and work sites. Approximately 48 acres of the Turkey Mountain DEP Recreational Land are located within the eastern portion of the Chapman Road Study Area. Turkey Mountain DEP Recreational Land is approximately 185 acres in total and is

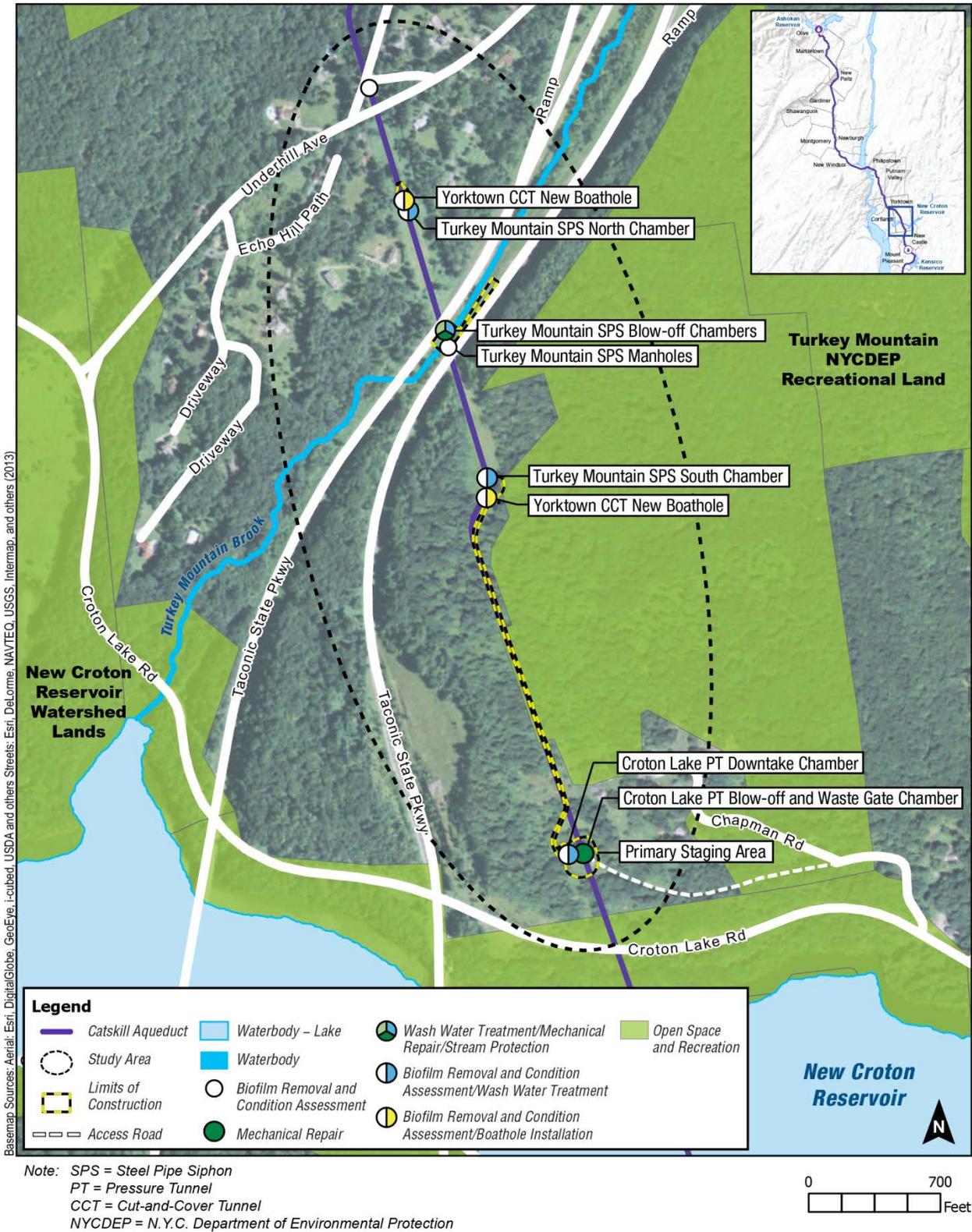


Figure 9.14-19: Open Space and Visual Resources - Chapman Road Study Area



used for outdoor recreation such as hiking and hunting. DEP does not maintain formal hiking trails within Turkey Mountain DEP Recreational Land. There are no fishing access points within the study area.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no plans to expand or create new open space or recreational resources are anticipated within the Chapman Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open spaces is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Chapman Road Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities within the Chapman Road Study Area near these two open space resources would be short-term. Repair and rehabilitation work activities within the Chapman Road Study Area do not occur within and would not be visible from the Turkey Mountain DEP Recreational Land or New Croton Reservoir Watershed Lands due to dense stands of trees that obstruct the views.

As discussed in Section 9.14.4.9, "Noise," the repair and rehabilitation work activities would temporarily increase noise levels within the Chapman Road Study Area that may affect recreational activities within Turkey Mountain DEP Recreational Land. Turkey Mountain DEP Recreational Land does not contain noise-sensitive receptors, as there are no maintained formal trails. During hunting season, hunters with a valid hunting license and DEP access permit would be able to continue hunting within Turkey Mountain DEP Recreational Land, although temporary increases in noise levels within the Chapman Road Study Area may interrupt the hunting experience (e.g., disrupt the quiet forest, game may avoid the area). However, upon completion of the repair and rehabilitation work activities, the recreational uses within the Turkey Mountain DEP Recreational Land would be unaffected. In addition, the repair and rehabilitation work activities would not affect recreational activities on the New Croton Reservoir. Following completion of the repair and rehabilitation work activities, the construction equipment, including the potential water treatment system and vehicles, would be removed from the Chapman Road Study Area. New Croton Reservoir Watershed Lands would continue to be used for fishing and Turkey Mountain DEP Recreational Land would continue to be used for hiking and hunting.

Following the repair and rehabilitation, operation of the Catskill Aqueduct within the Chapman Road Study Area would be consistent with baseline conditions. The two new boatholes at the North Siphon Chamber and the Croton Lake Downtake Chamber would remain, as would the streambank restoration measures and new culvert crossing Turkey Mountain Brook in the median of the Taconic State Parkway. Operation of the Catskill Aqueduct would not affect the physical character of or disrupt views from the Turkey Mountain DEP Recreational Land or New Croton Reservoir.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Chapman Road Study Area.

9.14.4.4 Historic and Cultural Resources

As shown on **Figure 9.14-20**, there is one site listed on the National Register of Historic Places: the Taconic State Parkway (NR Number 02NR05036), which travels north to south through the northern portions of the Chapman Road Study Area.

In the future without the repair and rehabilitation, it is assumed that historic and cultural resources within the Chapman Road Study Area would be the same as baseline conditions.

Areas of previous disturbance associated with construction of the Catskill Aqueduct were identified and compared to the potential for ground disturbance within the Chapman Road Study Area to determine if the repair and rehabilitation could affect archeological resources. The Chapman Road Study Area is not located in an area with the potential to contain archeological resources, and all work activities are located within the areas of previous soil disturbance.

The State Historic Preservation Office reviewed the repair and rehabilitation and concluded in a letter dated July 6, 2015 that there were no concerns regarding potential impacts to historic or archeological resources associated with the repair and rehabilitation work activities within the study area and no additional archeological investigations are necessary. Work activities would be short-term (totaling 92 weeks over 3 years for all work activities, with the primary staging area activities occurring for less than 2 years continuously). As discussed in Section 9.14.4.8, “Transportation,” there is the potential for temporary lane closures of the Taconic State Parkway during repair and rehabilitation work activities.

Following construction, all equipment would be removed from the Chapman Road Study Area, and the staging area would be restored to baseline conditions. The new boatholes, culvert, and streambank restoration measures would be permanent structures and would remain. The new culvert and streambank restoration measures along the highway are low-profile and would not affect the historical nature of the Taconic State Parkway. Following the repair and rehabilitation work activities within the Chapman Road Study Area, operation of the Catskill Aqueduct would be consistent with the baseline conditions and would not affect historic or cultural resources.

Therefore, although there is one site within the Chapman Road Study Area listed on the National Register of Historic Places, the repair and rehabilitation would not result in significant adverse impacts related to historic and cultural resources within the Chapman Road Study Area.

9.14.4.5 Visual Resources

The study area for the visual resources analysis is the area within the Chapman Road Study Area. It also includes view corridors that extend beyond the study area, based on the locations that are publicly accessible.

As discussed in Section 9.14.4.3, “Open Space and Recreation,” and Section 9.14.4.4, “Historic and Cultural Resources,” and shown on **Figure 9.14-19** and **Figure 9.14-20** above, three visual resources, consisting of the Taconic State Parkway, listed on the National Register of Historic Places and also listed as a New York State Scenic Byway, and two locally significant visual

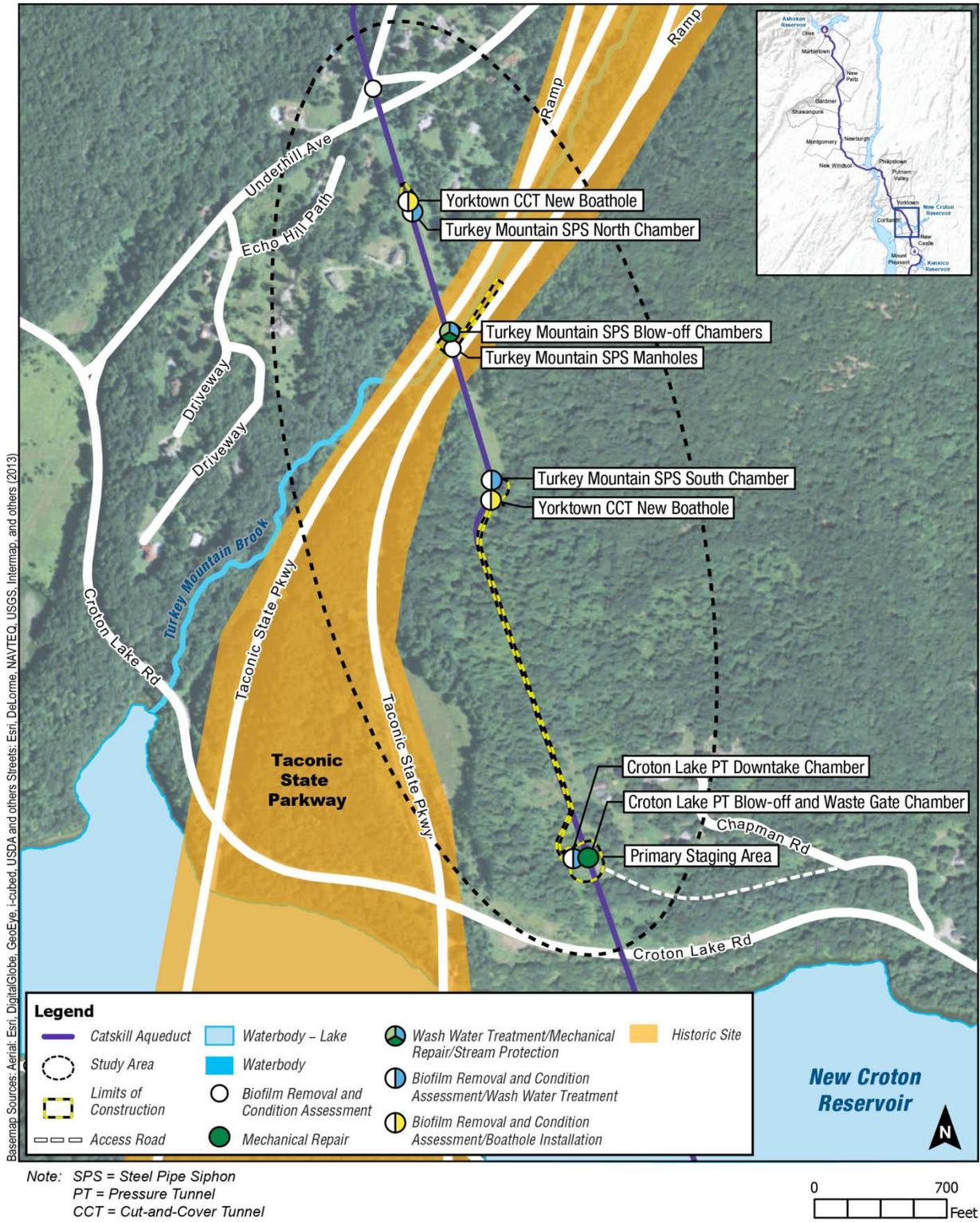


Figure 9.14-20: Historic and Cultural Resources - Chapman Road Study Area



resources, consisting of DEP- managed New Croton Reservoir Watershed Lands and Turkey Mountain DEP Recreational Land, were identified within the Chapman Road Study Area.

Approximately 3,000 feet of the Taconic State Parkway, a 104-mile parkway connecting Kensico Dam Plaza in Westchester County to Chatham in Columbia County, is within the Chapman Road Study Area. The winding, hilly route offers scenic vistas of the Hudson Highlands, Catskill, and Taconic regions of the State, with many areas of dense vegetation along either side of the parkway.

The North Siphon Chamber is located west of the southbound lanes of the Taconic State Parkway. While the chamber is visible from the parkway, it is not within the line of sight while traveling along the road. The Turkey Mountain South Siphon Chamber is located east of the northbound lanes of the parkway in the opposite direction that vehicles are traveling.

Approximately 4 acres of New Croton Reservoir Watershed Lands are located within the southern portion of the study area, although the reservoir and adjacent shoreline is not located within the study area. New Croton Reservoir is used for recreational shoreline fishing and non-motorized boat fishing with a DEP watershed access permit and fishing license. The DEP- managed New Croton Reservoir Watershed Lands within the Chapman Road Study Area are accessible for fishing from the shoreline. Approximately 48 acres of the Turkey Mountain DEP Recreational Land are located within the eastern portion of the Chapman Road Study Area. Turkey Mountain DEP Recreational Land is approximately 185 acres and used for outdoor recreation such as hiking and hunting. DEP does not maintain formal hiking trails within Turkey Mountain DEP Recreational Land. Views from Turkey Mountain DEP Recreational Land are limited with the dense vegetation of the area.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Chapman Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Chapman Road Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities would be short-term (totaling 92 weeks over 3 years for all work activities, with the primary staging area activities occurring for less than 2 years continuously; see **Table 9.14-2**). The proposed boatholes and access roads would be installed on the opposite side of the existing chamber buildings. The buildings would screen views from the Taconic State Parkway. The Croton Lake Downtake Chamber is not visible from the Taconic State Parkway, as it is surrounded by forested lands and a tall rock outcrop. Additionally, views to or from New Croton Reservoir Watershed Lands and other visual resources would not be affected as they are screened by vegetation.

Construction access and staging could require removal of an estimated 29 trees along the Catskill Aqueduct, distributed across more than 0.5 mile from the North Siphon Chamber to the Croton Lake Downtake Chamber. To the extent possible, the number of trees proposed for removal would be minimized by limiting tree removal to the limits of construction. An estimated 13 trees

would be removed at the Blow-off Chambers adjacent to the Taconic State Parkway. While this would be visible to drivers along the Taconic State Parkway, changes to vegetation in the highway median would not affect views to or from visual resources in the study area. The remaining tree removal would be undertaken to prepare staging areas at the South Siphon Chamber and Croton Lake Downtake Chamber, but would not affect views to or from visual resources. By removing trees in discrete locations along the densely forested areas east of the aqueduct, there would be no change to the character of the area or effect on surrounding trees.

Following construction, all equipment would be removed from the Chapman Road Study Area and staging areas would be restored to baseline conditions. The boatholes at the North and South Siphon Chambers as well as streambank restoration measures and new culvert in the median of the Taconic State Parkway would remain. However, they would be low-profile, permanent structures that would not be visible when viewed from a distance. Following the repair and rehabilitation work activities within the Chapman Road Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not result in changes to the future visual and aesthetic resource conditions of the views to the Taconic State Parkway.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Chapman Road Study Area.

9.14.4.6 Natural Resources

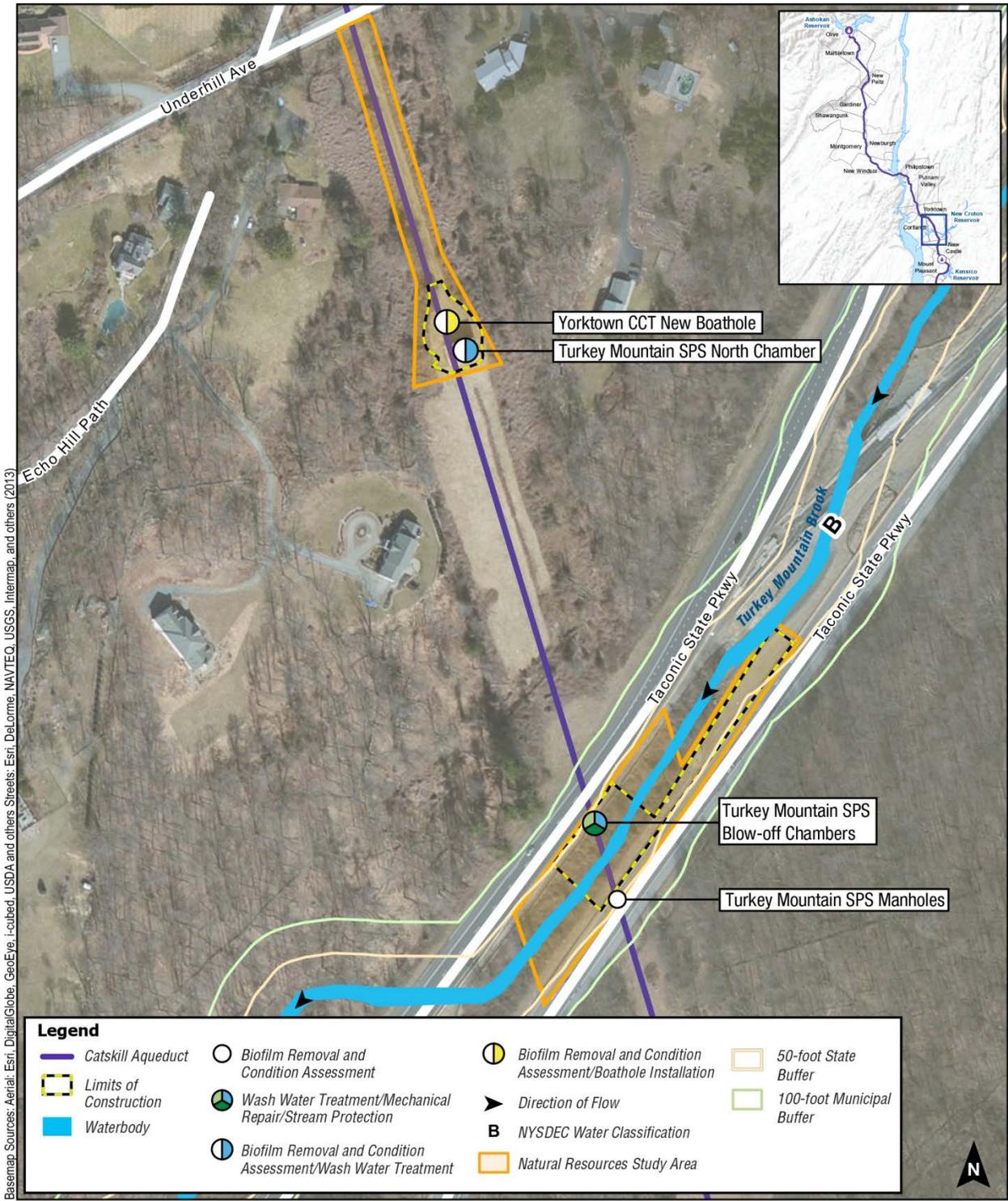
As shown on **Figure 9.14-21**, the study area for the natural resources analysis is represented by the immediate areas surrounding the limits of construction, including the North Siphon Chamber, the Blow-off Chambers in the median of the Taconic State Parkway. The natural resources study area is also shown on **Figure 9.14-22** at the South Siphon Chamber and Croton Lake Downtake Chamber. These three sections are collectively referred to as the natural resources study area.

The natural resources study area was analyzed based on the field visits conducted on November 22, 2013, and August 13 and September 17, 2015. Habitat at the North Siphon Chamber, Blow-off Chambers, and South Siphon Chamber along the Turkey Mountain Steel Pipe Siphon is characteristic of an oak-tuliptree forest community and includes areas of mowed roadside/pathway.

Habitat in the vicinity of the Croton Lake Downtake Chamber includes mowed lawn surrounded by maple-oak forest. Beyond the limits of construction is a drainage ditch with wetland vegetation at the toe-of-slope/forest edge. Turkey Mountain Brook also flows through the natural resources study area. These habitats have the potential to support protected water resources, terrestrial resources, and wildlife species, and an analysis of potential effects to the natural resources resulting from the repair and rehabilitation activities is provided below.

Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the lower Hudson watershed (HUC 02030101) and the Bailey Brook-Croton River subwatershed (HUC 020301010307).



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

*Alignment based on field visit. The actual alignment of these streams is different than as mapped by NYSDEC.
 Note: SPS = Steel Pipe Siphon
 CCT = Cut-and-Cover Tunnel
 NYSDEC = N.Y.S. Department of Environmental Conservation

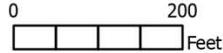


Figure 9.14-21: Natural Resources for Turkey Mountain SPS North Chamber and Turkey Mountain SPS Blow-off Chambers – Chapman Road Study Area



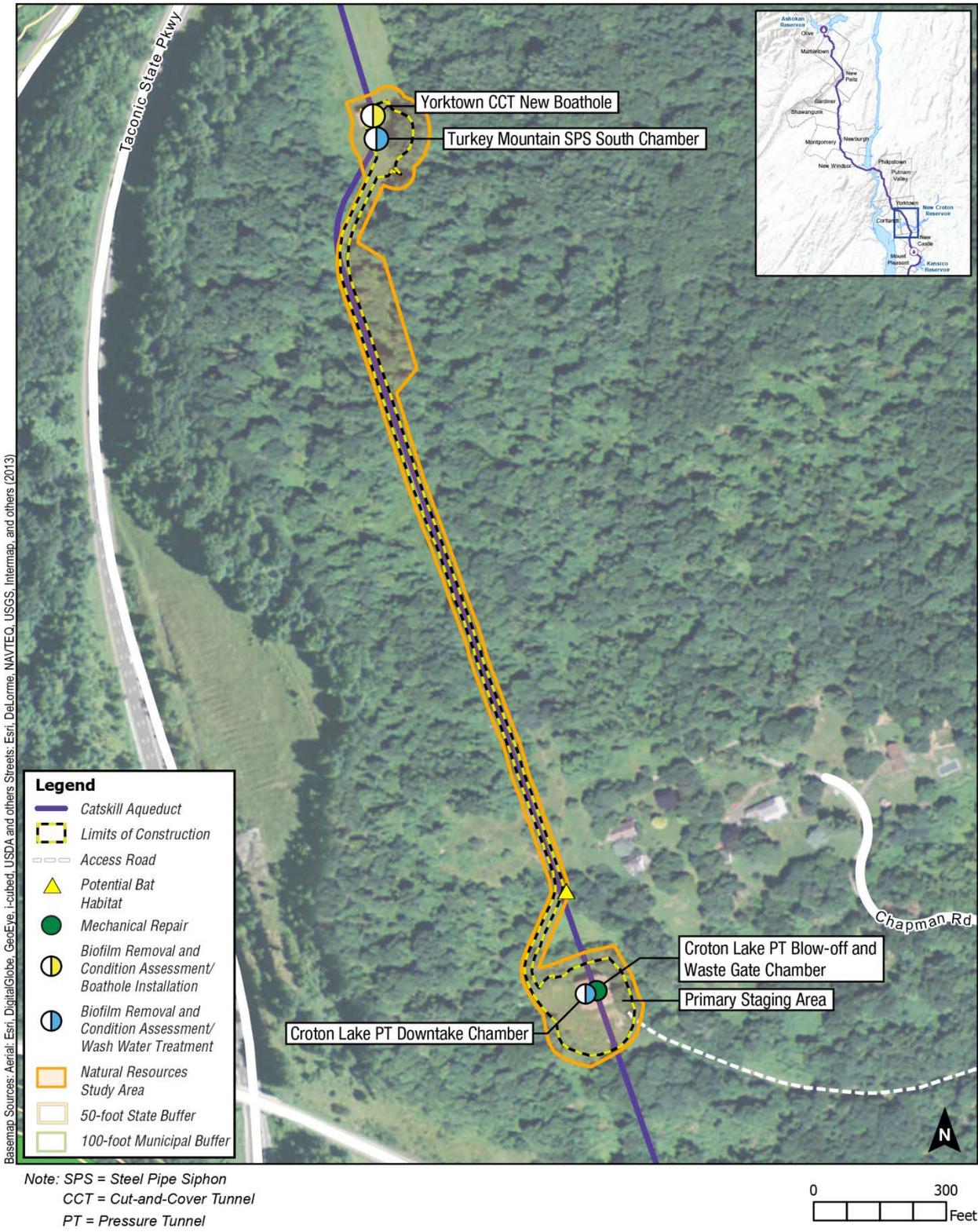


Figure 9.14-22: Natural Resources for Turkey Mountain SPS South Chamber and Croton Lake Pressure Tunnel Downtake Chamber – Chapman Road Study Area



Turkey Mountain Brook is subject to federal jurisdiction under Sections 401 and 404 of the Clean Water Act. As a Class B stream within the natural resources study area, Turkey Mountain Brook is also subject to State Protection of Waters regulations with a regulated 50-foot buffer to protect the streambed and banks. The repair and rehabilitation would be conducted in accordance with applicable local regulations. The Town of Yorktown regulates activities in natural watercourses with a 100-foot regulated buffer (Yorktown Town Code Chapter 178: Freshwater Wetlands) and has jurisdiction over activities within floodplains (Yorktown Town Code Chapter 175: Flood Damage Prevention). Therefore, work activities occurring in and along Turkey Mountain Brook and its floodplain may be subject to Town review and approval.

Surface Water

Surface water within the Chapman Road natural resources study area was assessed and a delineation was conducted on September 17, 2015. Turkey Mountain Brook was the only surface water identified. The water resource name, area, and length are shown in **Table 9.14-9**.

Table 9.14-9: Water Resources and Classifications within the Chapman Road Natural Resources Study Area

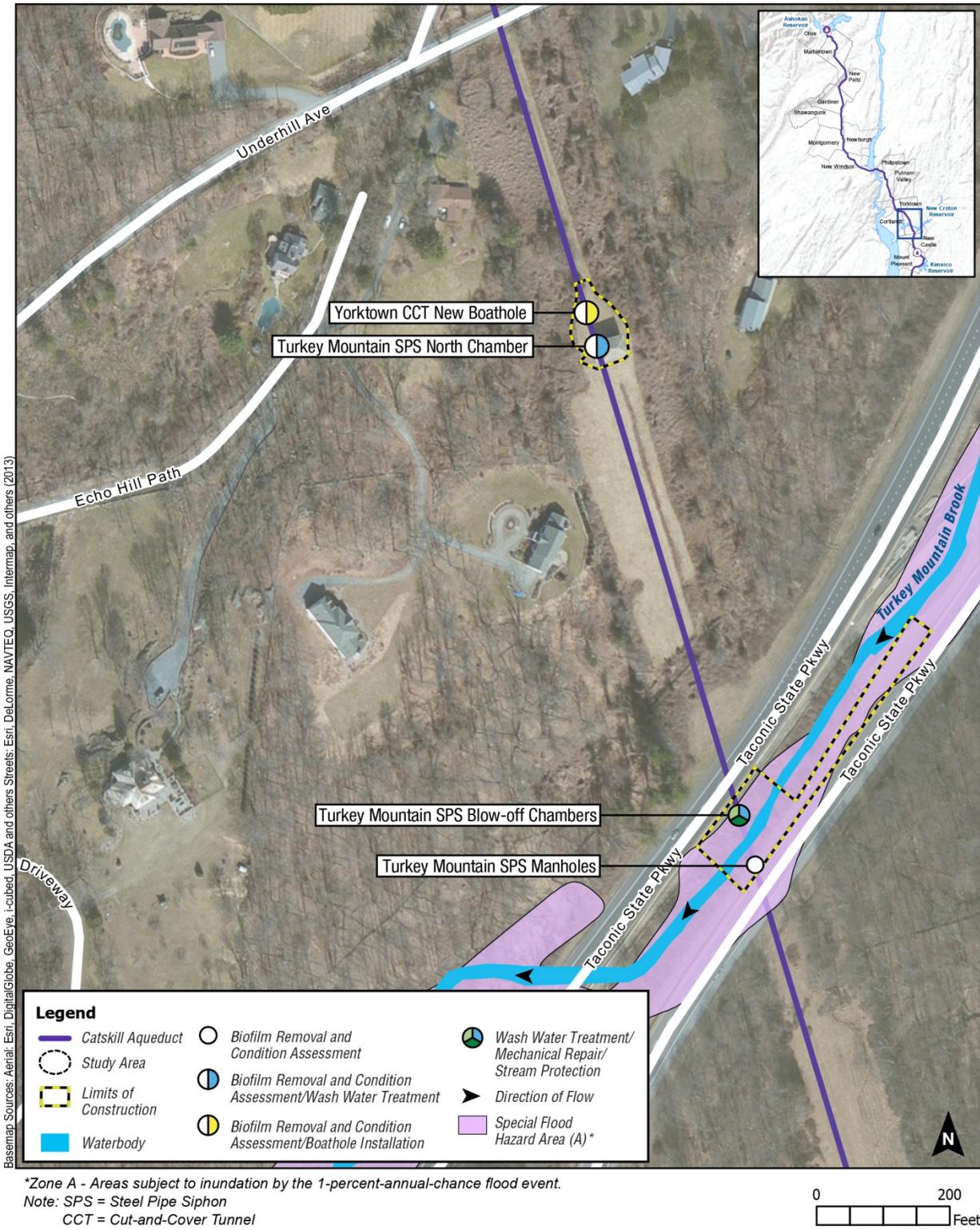
Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Turkey Mountain Brook	2,770	430	Riverine, Upper Perennial, Unconsolidated Bottom, Sand, Seasonally Flooded (R3UB2C)

Turkey Mountain Brook

Turkey Mountain Brook flows south between the northbound and southbound lanes of the Taconic State Parkway adjacent to the Turkey Mountain Steel Pipe Siphon Blow-off Chambers (see **Figure 9.14-21**). The stream is perennial and features a shallow (less than 1 foot deep) riffle-pool habitat with steep banks that appear to have been channelized. No in-stream aquatic vegetation was observed and substrate was noted to be sand, gravel, and cobbles. The trees along the streambank were heavily overgrown with Oriental bittersweet and porcelain berry. Crayfish and eastern blacknose dace (*Rhinichthys atratulus*) were observed in the stream. As shown in **Table 9.14-9**, the watercourse is best classified as a “Riverine, Upper Perennial, Unconsolidated Bottom, Sand, Seasonally Flooded” based on the Cowardin System (Cowardin et al. 1979).

Floodplains

FEMA’s Flood Insurance Rate maps number 36119C0127F and number 36119C0039F, effective September 28, 2007, were reviewed. As shown on **Figure 9.14-23**, a FEMA-designated 100-year floodplain (Zone A) runs through the center of the natural resources study area near the Blow-off Chambers, which depicts areas subject to inundation by the one percent Annual Chance Flood. Areas within Zone A are within the Special Flood Hazard Area and are subject to local floodplain management regulations. The Blow-off Chambers and access manholes are within the 100-year floodplain. There are no FEMA-designated floodways in this study area.



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.14-23: Floodplain - Chapman Road Study Area



Future Without the Repair and Rehabilitation

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no projects or developments are anticipated to occur within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the Chapman Road Study Area would be the same as baseline conditions.

Analysis of Potential Effect

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Jacob Road Study Area.

Construction

Work activities related to the repair and rehabilitation at the Blow-off Chambers in the Taconic State Parkway median have the potential to temporarily alter flows in Turkey Mountain Brook and result in minor, permanent disturbance to water resources. The Blow-off Chambers may be accessed multiple times during construction.

Prior to commencing the repair and rehabilitation, temporary sediment and erosion control measures would be installed, such as silt fences, hay bales and catch basin protection for water draining from the Taconic State Parkway to Turkey Mountain Brook. A temporary stream diversion would be installed for in-stream work. All stream flow would be diverted around the work site (i.e., a full diversion) so the new culvert can be properly secured. A turbidity curtain would be installed to prevent sediment from moving downstream. To protect the stream and its banks, and prevent sediment and other pollutants from entering the waterway, these temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements.

Access to this on-site staging area would be provided directly from the northbound Taconic State Parkway lanes to the stream. Temporary clearing and grubbing would be conducted within the stream buffer to remove trees and brush in the median, and gravel or stone would be placed to prepare the access road. In addition, a new permanent culvert would be installed in the channel to provide for vehicle and construction equipment crossing of Turkey Mountain Brook during construction and future maintenance needs.

Blow-off chamber reconstruction and adjacent streambank restoration and protection would require regrading of the southern streambank and installation of permanent riprap aprons approximately 20 to 30 feet long. The re-contoured streambank would not increase the extent of impervious surface and would not alter runoff to the stream. The riprap aprons would be placed to repair historical bank erosion and minimize future bank erosion in the study area. The riprap would also protect the stream while the Blow-off Chambers are operated, and prevent or limit scour and turbidity. To further protect the southern streambank, a gabion retaining wall would be installed in an area vulnerable to scour. The retaining wall would be a semi-circular arch aligned to the natural streambank, and would be approximately 40-feet in length. This permanent

structure represents a new, hardened shoreline that would be a minor encroachment necessary to attenuate flows during unwatering events to protect the stream’s bed and banks. Anticipated temporary and permanent disturbances to water resources and regulated buffers were quantified based on the limits of construction and proposed work activities (see **Table 9.14-10**).

Construction staging would occur on top of the aqueduct and the work activities would extend into the stream, resulting in approximately 770 square feet of temporary disturbance within Turkey Mountain Brook associated with the stream diversion. Approximately 17,420 square feet associated with the State Protection of Waters buffer and approximately 18,130 square feet associated with the municipal water resource buffer would also be temporarily affected due to staging. Permanent disturbance associated with work activities and staging would include approximately 220 square feet to Turkey Mountain Brook related to the new culvert and streambank restoration measures, and approximately 4,010 square feet within both the State Protection of Waters buffer and the municipal water resource buffer. Following construction, temporarily disturbed areas would be restored to natural conditions. Permanent disturbance is further analyzed in Section 9.19, “Project-wide Impact Analysis.”

Table 9.14-10: Estimated Disturbance to Water Resources within the Chapman Road Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Turkey Mountain Brook	2,770	770 <i>Temporary stream diversion and temporary downstream turbidity curtain</i>	220 <i>Riprap apron, gabion retaining wall, concrete culvert</i>
50-foot State Protection of Waters Buffer	45,250	17,420 <i>Clearing and grubbing to prepare access road, construction equipment use</i>	4,010 <i>Riprap apron, gabion retaining wall, concrete culvert, regrading following blow-off chamber reconstruction</i>
100-foot Water Resource Municipal Buffer	50,970	18,130 <i>Clearing and grubbing to prepare access road, construction equipment use</i>	4,010 <i>Riprap apron, gabion retaining wall, concrete culvert, regrading following blow-off chamber reconstruction</i>

The North and South Siphon Chambers, Blow-off Chambers, and the Croton Lake Downtake Chamber have been identified as potential discharge points for treated wash water. Any wash water would be treated to meet acceptable water quality standards for reuse in the removal operation or for discharge back into the Catskill Aqueduct or to Turkey Mountain Brook. No biofilm would be discharged to surface water. Treated wash water would be discharged at lower flows than during a typical raw aqueduct water unwatering event. Treated wash water discharges would be discharged at low flows that would not result in scour or other physical changes to the stream.

In the event alum is added as part of the treatment process, flocculated particles would primarily settle prior to treated wash water being discharged to Turkey Mountain Brook and testing would

ensure water quality standards for discharge are met. Given the low concentrations and the short-term, temporary nature of the discharges (approximately 9 weeks), discharges to Turkey Mountain Brook are not anticipated to cause scouring, inundate the receiving stream, or affect stream substrate.

This study area has also been identified as a location for discharging raw aqueduct water while unwatering the aqueduct. Blow-off chamber reconstruction requires the siphons to be unwatered. This initial unwatering of the siphons would occur with temporary measures in place to protect the stream from erosion. Unwatering events to surface water would also occur at any time after stream protection measures are in place during and following construction and, therefore, are described in “Operation” below.

Operation

Upon completion of the blow-off chamber repairs and streambank restoration and protection, the function of the Blow-off Chambers would be restored and discharges of raw water to Turkey Mountain Brook could occur in the future during DEP’s typical operations. The aqueduct could be unwatered via the Blow-off Chambers to conduct maintenance or inspection. This is expected to be an infrequent event.

During unwatering events, new blow-off valves would be operated to moderate discharge flows. This would decrease flows and result in discharges from each chamber of approximately 5,400 gpm at initial valve opening to a maximum flow of approximately 19,300 gpm. It would take approximately 4 hours to unwater the Turkey Mountain Steel Pipe Siphon, with each tunnel being unwatered separately.

An analysis was conducted to determine if the discharge associated with an unwatering event would be greater than the bankfull stream flow. Bankfull flow is the flow that just fills the channel to the top of its banks (i.e., stream capacity) and at the point in which water begins to flow onto the floodplain. Bankfull flow was predicted for Turkey Mountain Brook using the USGS StreamStats Program. If the discharge associated with an unwatering event is greater than the bankfull flow, indirect downstream effects, such as an increase in erosion and scouring over the baseline could be reasonably expected. The maximum discharge flows would be approximately 40,800 gpm when the Blow-off Chambers are operated during a 1.5-year storm event. This would exceed the calculated bankfull flow of Turkey Mountain Brook of approximately 39,000 gpm. While a bankfull event is possible when unwatering at this location, new blow-off valves would be operated to moderate discharge flows from the Turkey Mountain Steel Pipe Siphon. Flows would be moderated by throttling the valves. They would be monitored by an on-site crew to prevent the receiving stream from becoming inundated by discharges of raw water. Because each siphon would be unwatered one at a time by manually opening the associated blow-off valve, the on-site crew could cease unwatering at any point to allow streamflows to subside to baseline conditions. Moreover, blow-off discharges would be restricted from occurring within 24 hours of predicted rain events, during rain events, and for a period of 48 hours after rain events or after which time streamflow returns to normal. Discharges would be limited to raw aqueduct unwatering events. These would be infrequent and last several hours in duration, are not anticipated to cause scouring and would not result in a bankfull event or alter stream capacity of Hunter Brook. The streambank restoration measures would have minor

encroachment on the 100-year floodplain, as they would be keyed into the existing streambank and would not displace a significant portion of the cross-sectional area of the stream. Work activities related to the repair and rehabilitation would occur within the Special Flood Hazard Area of Turkey Mountain Brook. A hydrologic and hydraulics analysis would be completed as part of the design to adequately size the culvert and to verify there would be no potential changes to base flood elevations from this or the streambank restoration measures. In addition, DEP would coordinate with the Town of Yorktown and FEMA, as necessary, to comply with all floodplain management requirements.

Water Resources Conclusions

Water resources in the natural resources study area are limited to Turkey Mountain Brook, which is adjacent to the Blow-off Chambers. While the majority of work activities would result in temporary disturbance, minor permanent disturbance would occur as part of the blow-off chamber reconstruction and associated streambank restoration and protection. Treated biofilm wash waters would be discharged to Turkey Mountain Brook over the course of 9 weeks during the third 10-week shutdown. The streambank restoration measures would be keyed into the existing streambank and the culvert would be sized accordingly so as not to alter elevations or flood capacity in the mapped floodplain. DEP would coordinate with the Town of Yorktown and FEMA, as necessary, to ensure all local and federal requirements pertaining to floodplain management are satisfied. Following construction, the site would be restored to natural conditions.

Discharges would be limited to raw aqueduct unwatering events, which would be infrequent and last several hours in duration. Restoring the historic function of the Blow-off Chambers to discharge raw aqueduct water would be a change in baseline conditions. However, based on the above analysis, there would be minimal indirect effects to water resources. Permanent fill would be minimized to the greatest extent practical. The culvert and streambank restoration measures would be designed to ensure that Turkey Mountain Brook and its streambanks are protected and aquatic life movement is uninhibited. The streambank restoration measures would be beneficial in that these would repair historic bank erosion and minimize future scouring.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Chapman Road Study Area.

Terrestrial Resources

The natural resources study area is comprised of multiple ecological communities, including oak-tulip tree forest with areas of mowed roadside/pathway at the North Siphon Chamber, Blow-off Chambers, and South Siphon Chamber. Species in these communities include tuliptree (*Liriodendron tulipifera*) and black walnut (*Juglans nigra*). The area is heavily overgrown in areas with Oriental bittersweet (*Celastrus orbiculatus*), fox grape (*Vitis labrusca*), and porcelain berry (*Ampelopsis brevipedunculata*). Other dominant vegetation consists of multiflora rose (*Rosa multiflora*), gray dogwood (*Cornus racemosa*), poison ivy (*Toxicodendron radicans*), privet (*Ligustrum* spp.), and pussy willow (*Salix discolor*). This area is not mapped as a significant natural community by the NYNHP.

Habitat in the vicinity of the Croton Lake Downtake Chamber includes mowed lawn surrounded by maple-oak forest (Edinger et al. 2014). The forest edge is approximately 100 feet from the structure and includes pin oak (*Quercus palustris*), sugar maple (*Acer saccharum*), red oak (*Quercus rubra*), Norway maple (*Acer platanoides*), red maple (*Aver rubrum*), white ash (*Fraxinus americana*), flowering dogwood (*Cornus florida*), and black oak (*Quercus velutina*) tree species in the canopy and multiflora rose, black raspberry (*Rubus occidentalis*), milkweed (*Asclepias syriaca*), bedstraw (*Galium* spp.), Japanese honeysuckle (*Lonicera japonica*), and fox grape in the herbaceous and vine stratum. The mowed area includes crabgrass (*Digitaria* spp.), bergamot (*Monarda didyma*), spiny sowthistle (*Sonchus asper*), Timothy-grass (*Phleum pratense*), and prairie grass (*Koeleria macrantha*). A drainage ditch with wetland vegetation at the toe-of-slope/forest edge was observed outside the natural resources study area. Similarly, this area is also not mapped as a significant natural community by the NYNHP.

The Town of Yorktown regulates removal of trees (Yorktown Town Code Chapter 270: Trees). Exemptions include tree removal that is necessary to maintain public or private rights-of-way held under New York City permits or under easements. While the limits of construction are located on such lands and may qualify for this exemption, terrestrial resources within the study area warrant analysis.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Chapman Road Study Area within the timeframe of the impact analysis. Natural processes such as changes in habitat due to natural vegetative succession are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be the same as baseline conditions.

Work activities associated with the repair and rehabilitation would include minor tree clearing and shrub removal for the purpose of improving site access and staging areas. Twenty-nine trees consisting of 11 species with a range of average dbh of between 5 and 40 inches may be removed along an approximate 4,000-foot stretch near Turkey Mountain Steel Pipe Siphon to establish staging areas east and west of the Taconic Parkway. The most common species of trees to be removed include five red maple, five white ash, and five pussy willow. These trees are located adjacent to the existing Catskill Aqueduct. Removal of trees would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Additionally, tree removal would be conducted on DEP property and in accordance with applicable requirements set forth by the Town of Yorktown. Tree removal would occur in discrete locations along the densely forested areas east and west of the aqueduct. It would not dramatically change the character of area or affect surrounded trees.

Following construction, all equipment would be removed from the natural resources study area, and staging areas would be restored to natural conditions. Following the repair and rehabilitation work activities within the Chapman Road Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions, and natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Chapman Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section include an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected, species that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” five species were identified as having the potential to occur in the natural resources study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these five species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.14-11**. The analysis included an evaluation of the repair and rehabilitation work activities within the natural resources study area and field visits, as applicable.

Table 9.14-11: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Chapman Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on November 22, 2013, and August 13 and September 17, 2015. Potential habitat (streams and adjacent uplands) was observed within the study area. Work activities would be largely confined to previously disturbed areas. As a mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions and the new boathole and streambank restoration measures that remain would not affect breeding, nesting, or foraging habitat. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on November 22, 2013, and August 13 and September 17, 2015. A number of work activities including staging and access improvements; blow-off chamber reconstruction and associated streambank restoration and protection; boathole preparation and installation have the potential to disturb nesting habitat. However, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual snakes from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. The new boathole and streambank restoration measures that remain would not affect nesting habitat. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No
Birds					
Bald Eagle	<i>Haliaeetus leucocephalus</i>	BGPA/MBTA	Threatened	NYNHP identified the nearest nest to be approximately 12,300 feet from the work sites, outside the study area and well beyond the USFWS and DEP recommended buffer restriction of 330 and 660 feet, respectively. The dam on New Croton Reservoir is located approximately 2.5 miles west of the leak and the active nest. The study area is outside the flight path between the dam and the known nests. Therefore, there are no effects anticipated and no further analysis for Bald Eagles is warranted for this study area.	No

Table 9.14-11: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Chapman Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	A summer habitat survey was conducted on August 13, 2015 and potential bat roosting habitat within the study area consisted of one Norway maple. The presence of adjacent forest areas and a potential roost tree within the survey area indicate potential summer habitat for bat species within the forested areas of the study area. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened Unlisted	A summer habitat survey was conducted on August 13, 2015 and potential bat roosting habitat within the study area consisted of one Norway maple. The presence of adjacent forest areas and a potential roost tree within the survey area indicate potential summer habitat for bat species within the forested areas of the study area. Also, the North Siphon Chamber and Croton Lake Downtake Chamber buildings are located in the study area. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
<p>Notes: BGPA: Bald and Golden Eagle Protection Act MBTA: Migratory Bird Treaty Act</p>					

Indiana Bat (*Myotis sodalis*)

Potential bat roosting habitat was observed near the Croton Lake Downtake Chamber on August 13, 2015 (see **Figure 9.14-22**). One Norway maple with a dbh of approximately 27 inches was identified in the vicinity of the proposed staging area. The crown of the tree was broken and contained several cavities. The presence of adjacent forest areas and a potential roost tree within the area indicate potential summer habitat for both bat species within the forested areas of the study area.

Repair and rehabilitation work activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct. They would be localized and confined to the immediate vicinity of the Turkey Mountain Steel Pipe Siphon and Croton Lake Pressure Tunnel. Tree removal could be required for access and staging, which would occur from November 1 through March 31 to avoid impacts to Indiana bats. Repair and rehabilitation would not result in significant loss or modification of forested habitat for roosting Indiana bats. Potential effects to stream habitat would be avoided to the furthest extent possible, and foraging habitat would continue to be available in the canopy within the natural resources study area and in adjacent forested areas.

There may be temporary noise from repair and rehabilitation work activities that discourages Indiana bats from roosting in the immediate vicinity of the work sites. However, there is abundant suitable habitat within the surrounding areas where Indiana bats could roost.

Given the protective measures that would be in place for the duration of construction, no significant effects are anticipated to Indiana bats and their habitat. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect Indiana bats in the natural resources study area.

Northern Long-eared Bat (*Myotis septentrionalis*)

The Croton Lake Downtake Chamber is a man-made structure located at the southern extent of the natural resources study area that could be used by as a roosting site by northern long-eared bats. Northern long-eared bats are more commonly known to roost in trees (see the potential roosting habitat results for Indiana bats, above).

Repair and rehabilitation work activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct. They would be localized and confined to the immediate vicinity of the Turkey Mountain Steel Pipe Siphon and Croton Lake Pressure Tunnel. Tree removal could be required for access and staging, which would occur from November 1 through March 31 to avoid impacts to northern long-eared bats. Repair and rehabilitation would not result in significant loss or modification of forested habitat for roosting northern long-eared bats. Use of the North Siphon Chamber and Croton Lake Downtake Chamber buildings' interior by roosting bats was not formally surveyed. The North Siphon Chamber building and Croton Lake Downtake Chamber building would be used for access to the tunnel interior, similar to baseline conditions, and there would be no structural changes to these buildings. Should any roosting bats or guano be observed in these structures during work activities, USFWS and NYSDEC would be contacted immediately to determine the best course of action.

Potential effects to stream habitat would be avoided to the furthest extent possible and foraging habitat would continue to be available in the canopy within the study area and in adjacent forested areas. There may be temporary noise from repair and rehabilitation work activities that discourages northern long-eared bats from roosting in the immediate vicinity of the work sites. However, there is abundant suitable habitat within the surrounding areas where northern long-eared bats could roost.

Given the protective measures that would be in place for the duration of construction, no significant effects are anticipated to northern long-eared bats and their habitat. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect northern long-eared bats in the natural resources study area.

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), or Bald Eagles (*Haliaeetus leucocephalus*) associated with the repair and rehabilitation. Repair and rehabilitation may affect, but is not likely to adversely affect, Indiana bats and northern long-eared bats.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Chapman Road Study Area.

9.14.4.7 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Chapman Road Study Area, a Phase I ESA was conducted in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify RECs. The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site itself and for its neighboring properties within the appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a geotechnical investigation and environmental health and safety sampling, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Based on the Phase I ESA investigations, there was no indication of an environmental impact that would constitute a REC as defined by the ASTM standard that would affect activities in the study area. Additionally, there is no history of contamination at or in the vicinity of work sites within the Chapman Road Study Area. The proposed activities would occur on previously disturbed soils.

Geotechnical environmental investigations and sampling were undertaken for contaminants of concern including asbestos, lead, volatile and semivolatile organics, PCBs, and total petroleum hydrocarbons along the aqueduct within the study area. Several parameters were noted in the soil sampling results including chromium, copper, lead, and zinc. Total chromium was reported in the samples collected at the North Siphon Chamber and Croton Lake Downtake Chamber. Chromium concentrations however were consistent over a widespread sampling area and are

more likely associated with background concentrations. Along the Catskill Aqueduct, there are widespread occurrences of chromium, which are attributed to the existing geological formations. Copper, lead and zinc, although naturally occurring in soils, are likely to be the result of background concentrations. The legacy data also revealed asbestos-containing materials on the ceiling beam at the South Siphon Chamber. Additionally, lead-containing paint was identified to be present on steel doors, blow-off (gate) valves, ceilings, floor, equipment, stop shutters, and walls of the North Siphon Chamber, South Siphon Chamber and the Croton Lake Downtake Chamber (North Shaft) structures. Materials sampled did not identify PCB-containing paint or mercury-containing paint. In addition, total petroleum hydrocarbons were also detected but at low concentrations that are not considered to be indicative of contamination that warrants remedial actions.

Based on the results of the environmental investigations completed within the Chapman Road Study Area, no other hazardous materials are known to exist. The soil results support the reuse of excavated materials associated with the boathole installation and blow-off chamber reconstruction as backfill and do not suggest the need for special management, handling or health and safety measures at this time.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Chapman Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Chapman Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, excavation associated with the work activities for the installation of a new boathole and blow-off chamber reconstruction would occur on previously disturbed soils. Following the repair and rehabilitation, all equipment would be removed from the Chapman Road Study Area. The staging areas would be restored and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Chapman Road Study Area.

9.14.4.8 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Chapman Road Study Area.

Access to the repair and rehabilitation limits of construction for the North Siphon Chamber would occur via Underhill Avenue (County Route 131) to the Yorktown Cut-and-Cover Tunnel

segment of the aqueduct, as shown in yellow on **Figure 9.14-24** (Construction Route 1). Underhill Avenue is a two-lane urban minor arterial and carries 11,790 vehicles per day, based on 2009 traffic counts (NYSDOT Traffic Data Viewer), with approximately 1,010 vehicles in the morning peak hour and 1,190 vehicles in the afternoon peak hour along this road.

Access to the limits of construction for the Blow-off Chambers, which are located in the median of the Taconic State Parkway, would occur directly from the parkway, as shown in green on **Figure 9.14-24** (Taconic State Parkway Construction Route). The Taconic State Parkway (State Route 987G) is a six-lane, two-way urban principal arterial expressway for passenger cars only and carries 42,820 vehicles per day, based on 2011 traffic counts (NYSDOT Traffic Data Viewer). Under the baseline conditions, there are approximately 4,390 vehicles in the morning peak hour and 4,280 vehicles in the afternoon peak hour along this road.

Limits of construction for the South Siphon Chamber and Croton Lake Downtake Chamber would be accessed via Croton Lake Road (State Route 129) and Chapman Road to a DEP access gate leading to a gravel road, as shown in orange on **Figure 9.14-24** (Construction Route 2). State Route 129 is a two-lane, two-way urban minor arterial and carries 3,820 vehicles per day, based on 2007 traffic counts (NYSDOT Traffic Data Viewer), with approximately 440 vehicles in the morning peak hour and 390 vehicles in the afternoon peak hour along this road. Chapman Road is a two-way local roadway. There are no traffic counts available for Chapman Road.

There are no recent traffic counts conducted in this study area and no known changes in land use since 2011. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Chapman Road Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area and there is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site. However, there are no DEP employees who work at or visit the study area on a daily basis, and the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Chapman Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

In the future with the repair and rehabilitation, the Chapman Road Study Area would be used as a primary staging area to support work activities at the Gatehouse Road, Fishkill Road, Indian Brook Road, Old Albany Post Road, Sprout Brook Road, Aqueduct Road, Jacob Road, Chapman Road, Croton Dam Road, Kitchawan Road, Somerstown Turnpike, Station Place, Campfire Road and Chappaqua Road study areas. The primary staging area would be used for contractor's office trailers and equipment storage. However, it would only be accessed for short periods (i.e., several weeks coinciding with spring/summer construction and the 10-week shutdowns) for parking, deliveries, and other activities. All construction workers for these study areas would drive to the Chapman Road primary staging area and would then be shuttled to the study area work sites.

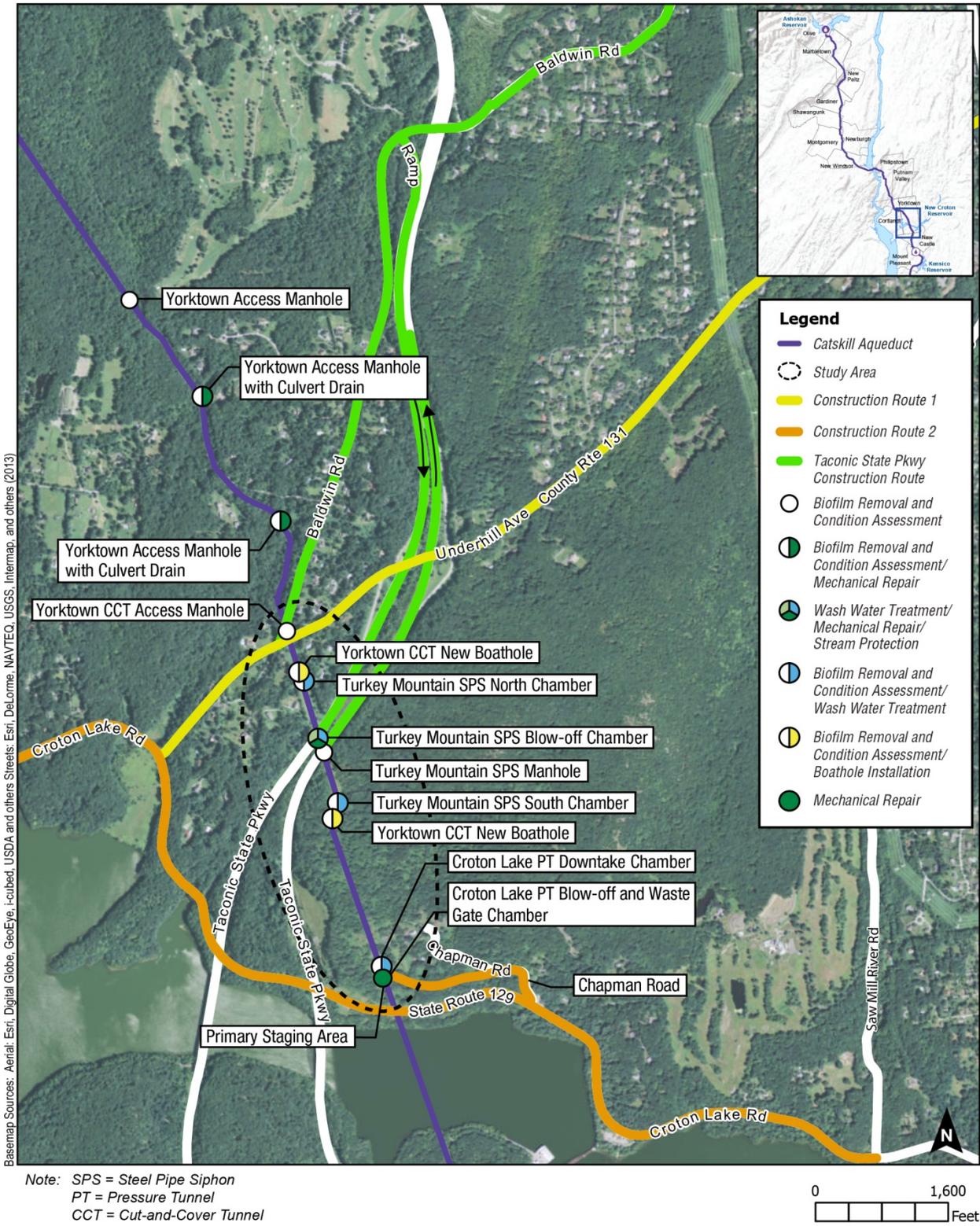


Figure 9.14-24: Transportation – Chapman Road Study Area



Repair and rehabilitation work activities within the Chapman Road Study Area were evaluated to determine which activities would have the potential to generate the most vehicle trips and therefore form the basis of this transportation analysis. Of these activities, use of the primary staging area during the third 10-week shutdown in fall ~~2020~~2019 would generate the most vehicle trips. Therefore, peak-day and peak-hour calculations were conducted for vehicles that would travel to and from the primary staging area during this peak period.

During this time period, there would be shuttle trips between the primary staging area and four study areas. There would be four shuttles operating each peak hour between the primary staging area and the Fishkill Road, Old Albany Post Road, Aqueduct Road and Croton Dam Road study areas (32 shuttles daily, in total). The estimated number of peak-day one-way vehicle trips associated with the Chapman Road Study Area is 118 vehicles, or approximately 236 peak-day vehicle round trips (267 PCEs) that would travel to and from the Chapman Road Study Area. Approximately 90 vehicle round trips or 90 PCEs, would be workers traveling to and from the Chapman Road Study Area. The remaining 146 peak-day vehicle round trips (177 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with the Chapman Road Study Area is approximately 245 peak-hour vehicle trip ends (261 PCEs). This includes approximately 186 vehicle trip ends (186 PCEs) from workers and approximately 59 vehicle trip ends (75 PCEs) for trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming two 12-hour shifts, this would be during the 6 AM to 7 AM and 6 PM to 7 PM hours, and would be unlikely to coincide with the peak hour for non-project-related traffic.

The repair and rehabilitation would result in approximately 261 peak-hour PCEs along the roadways discussed above during the third 10-week shutdown, which is above the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, "Transportation." While use of this study area as a primary staging area would span the duration of construction (~~2018~~2017 through 2020), concentrated activities would occur during the three 10-week shutdowns (see **Table 9.14-8**). Construction would not generate public parking or transportation demands or pedestrian activity within the Chapman Road Study Area.

Work activities at the Blow-off Chambers would require temporarily closing the northbound left lane of the Taconic State Parkway during construction. This temporary lane closure would be coordinated with NYSDOT, and would be performed in accordance with site-specific traffic control plans that would be developed for this location. The duration of the northbound lane closure would be minimized to the extent possible. It would occur in accordance with NYSDOT-issued work stipulations, which specify the allowable non-peak hours of potential lane closures. Additionally, the proposed work within the highway right-of-way would be short in duration (approximately 6 weeks) further minimizing effects on vehicles traveling northbound along the Taconic State Parkway.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Chapman Road Study Area.

9.14.4.9 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation work activities within the Chapman Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation activities as shown on **Figure 9.14-25**.

The Chapman Road Noise Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Town of Yorktown Noise Control Ordinance §216-2, which prohibits excessive noise between 11 PM and 7 AM, Sunday evening through Friday morning, and 10 PM and 8 AM, Friday evening through Sunday morning. The Town of Yorktown Ordinance §300-67 also prohibits adverse noise impacts from watershed and water supply facilities.

Existing ambient noise levels within the Chapman Road Study Area are influenced by vehicular traffic traveling on the Taconic State Parkway and other nearby local roads. The existing noise levels within the study area are comparable to a quiet suburban residential environment, based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban residential communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP’s understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Chapman Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Chapman Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Chapman Road Study Area would occur at four sites. The stationary noise-generating equipment that would be used within the Chapman Road Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with the blow-off valve and waste gate replacement would emit the most noise. Blow-off valve and waste gate replacement would occur in fall ~~2019~~2018 between the hours of 7 AM and 7 PM, 7 days a week for approximately 10 weeks during the second 10-week shutdown. Repair and rehabilitation noise-producing activities also could include 24-hour construction during blow-off chamber reconstruction. Blow-off chamber reconstruction at the Turkey Mountain Steel Pipe Siphon would occur during summer ~~2019~~2018 for up to 24 hours per day, 7 days a week for approximately 9 weeks prior to the second 10-week shutdown. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities. However, this equipment would not be expected to be louder than those associated with blow-off valve and waste gate replacement and blow-off chamber reconstruction.

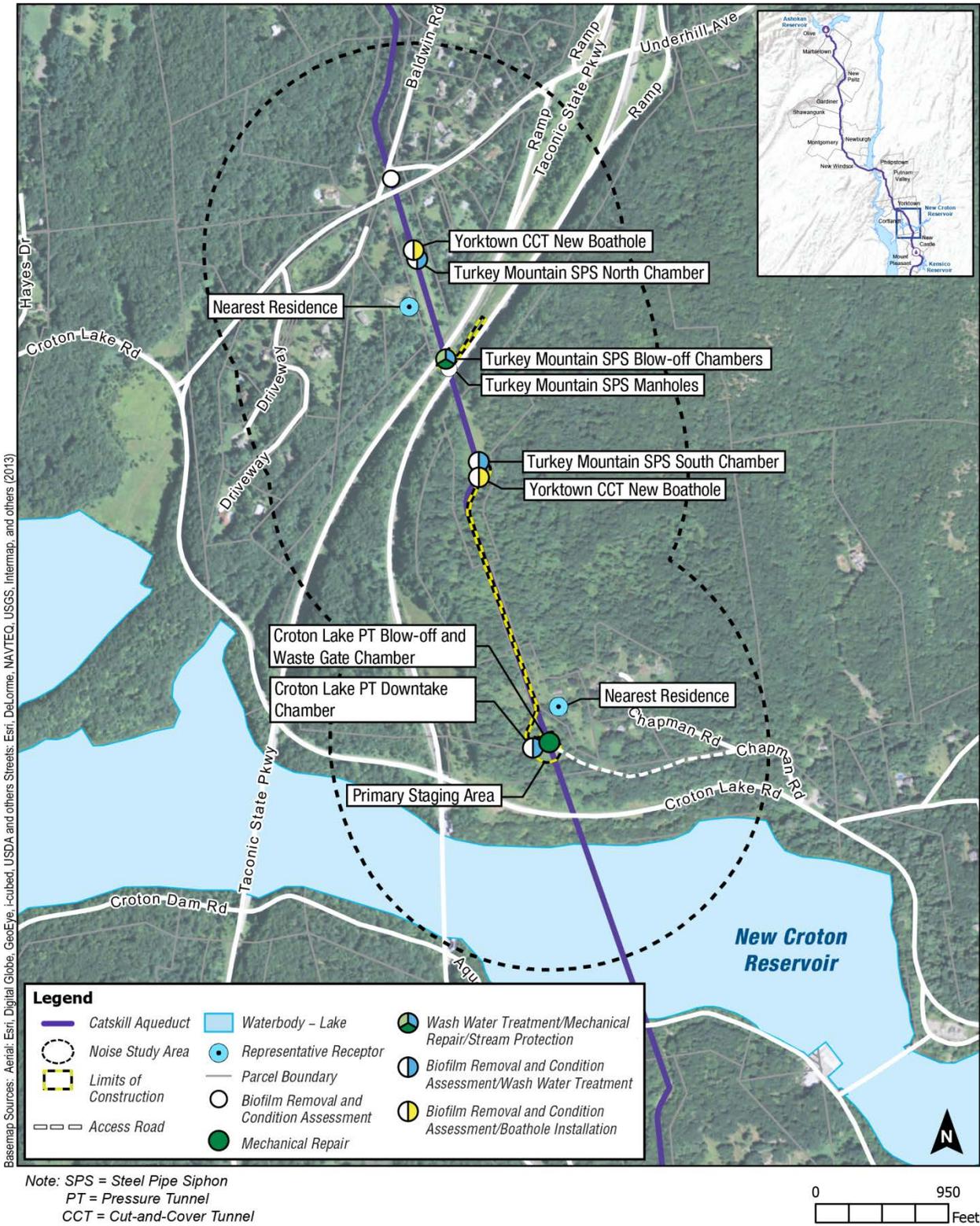


Figure 9.14-25: Noise – Chapman Road Study Area



The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the blow-off valve and waste gate replacement and blow-off chamber reconstruction. Associated equipment reference noise levels are shown in **Table 9.14-12**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.14-12: Stationary Source Construction Equipment Modeled at the Chapman Road Study Area - Noise Analysis and Reference Noise Levels (L_{eq})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA)
Blow-off Valve and Waste Gate Replacement	
Ventilation Fan	85
Generator	82
Dozer	81
Blow-off Chamber Reconstruction²	
Ventilation Fan	85
Dozer	81
Excavator	81
Notes:	
¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	
² The Croton Lake Downtake Chamber has an on-site power source, so generators are not needed at the site.	

Table 9.14-13 shows the results of the stationary construction noise analysis. Daytime blow-off valve and waste gate replacement within the Chapman Road Study Area during the repair and rehabilitation could produce a noise level (L_{eq}) of approximately 73 dBA at the nearest residence approximately 270 feet away from the daytime work. Twenty-four-hour blow-off chamber reconstruction could produce a noise level (L_{eq}) of approximately 69 dBA at the nearest residence approximately 450 feet away from the 24-hour work.

Table 9.14-13: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors within the Chapman Road Study Area

Location	Distance from Site (feet)	Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)	Town of Yorktown Noise Limit (dBA)	Potential for Exceedance (Yes or No)
Blow-off Valve and Waste Gate Replacement (7 AM to 7 PM, 7 days a week)				
Nearest Residence	267	73	NA	Yes ¹
Blow-off Chamber Reconstruction (24 hours per day, 7 days a week)				
Nearest Residence	446	69	NA	Yes ¹
Notes:				
NA = Not Applicable				
¹ Repair and rehabilitation work activities have the potential to occur during hours when excessive noise is prohibited, as defined by the Town of Yorktown.				

Although there would be an increase in stationary noise levels during 24-hour construction, noise levels inside the nearest residence would be reduced to an interior noise level (L_{eq}) of approximately 45 dBA. Repair and rehabilitation work activities have the potential to occur during hours when excessive noise is prohibited, as defined by the Town of Yorktown. DEP would work with the Town of Yorktown, as appropriate.

Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Chapman Road Study Area. The repair and rehabilitation would be temporary in nature with peak work activities occurring during blow-off valve and waste gate replacement in fall ~~2019~~2018 and blow-off chamber reconstruction generally in summer ~~2019~~2018 for limited periods (e.g., up to 10 weeks, per activity).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Chapman Road Study Area.

9.14.4.10 Neighborhood Character

The character of the Chapman Road Study Area is largely defined by a mix of residential, public services, open space and recreation, and vacant land uses and its physical setting within a rural location. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction (see **Figure 9.14-14**). The study area is roughly bounded by New Croton Reservoir to the south and includes a portion of the Taconic State Parkway, which crosses the upper half of the study area in a southwest to northeast direction. Turkey Mountain Brook, a tributary to New Croton Reservoir, parallels the Taconic State Parkway through the study area. Except for the Blow-off Chambers, limits of construction for all work sites and associated access routes are located in a public services corridor which is owned and maintained by DEP. The Blow-off Chambers are located in the median of the Taconic State Parkway and would be accessed from the left travel lane of the northbound side of the parkway.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Chapman Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning and socioeconomic conditions, an impact analysis for the Jacob Road Study Area was not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," and Section 9.3.4, "Socioeconomic Conditions." As described in Section 9.14.4.3, "Open Space and Recreation," Section 9.14.4.4, "Historic and Cultural Resources," and Section 9.14.4.5, "Visual Resources," the work activities would not affect open space and recreation, historic and cultural resources, and visual resources in the Chapman Road Study Area. Furthermore, the public policy impact analysis provided in Section 9.14.2, "Town of Yorktown Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.14.4.8, “Transportation,” and 9.14.4.9, “Noise,” during construction, the work activities in the Chapman Road Study Area would be short-term. While use of this study area as a primary staging area would span the duration of construction (2018~~2017~~ through 2020), concentrated activities would occur during the three 10-week shutdowns, resulting in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, there would be no potential significant adverse impacts related to neighborhood character from the repair and rehabilitation within the Chapman Road Study Area.

9.14.5 CROTON DAM ROAD STUDY AREA IMPACT ANALYSIS

Within the Croton Dam Study Area, the aqueduct transitions from the Croton Lake Pressure Tunnel to the Croton Cut-and-Cover Tunnel. This transition occurs via a deep vertical shaft at the Croton Lake Pressure Tunnel Uptake Chamber (Croton Lake Uptake Chamber), which is equipped with a boathole at its southern end. One toe-of-slope leak (Leak 7) has been identified along this segment of the Croton Cut-and-Cover Tunnel, formed as water flows down-gradient from the base of the cut-and-cover berm before seeping into the surroundings (see **Figure 9.14-26**).

Work activities within the Croton Dam Road Study Area would include: staging and access improvements; internal leak repair; air vent installation; biofilm removal and condition assessment; and, if necessary, the installation and operation of a local dechlorination system, which would also require site restoration following completion of aqueduct chlorination.

9.14.5.1 Study Area Location and Description

The Croton Dam Road Study Area is located along the upper Catskill Aqueduct in the Town of Yorktown. The Catskill Aqueduct traverses the study area in a general north to south direction. In the northwest corner of the study area, two unnamed tributaries flow to an inlet of New Croton Reservoir, next to which is located Aqueduct Road, which branches off to Croton Dam Road bending to the north. The study area also includes a portion of the Taconic State Parkway along its western edge. Proposed work sites within the study area include one at the Croton Lake Uptake Chamber and one at Leak 7. Access to both sites would be provided by a DEP access road that connects to Croton Dam Road. The study area boundary is located approximately 500 feet beyond the outermost areas of disturbance related to the work sites and associated access road. **Figure 9.14-26** shows an aerial photograph of the study area, including the path of the aqueduct, limits of construction for the work sites, and the proposed access route. **Figure 9.14-27** and **Figure 9.14-28** show photographs of the study area.

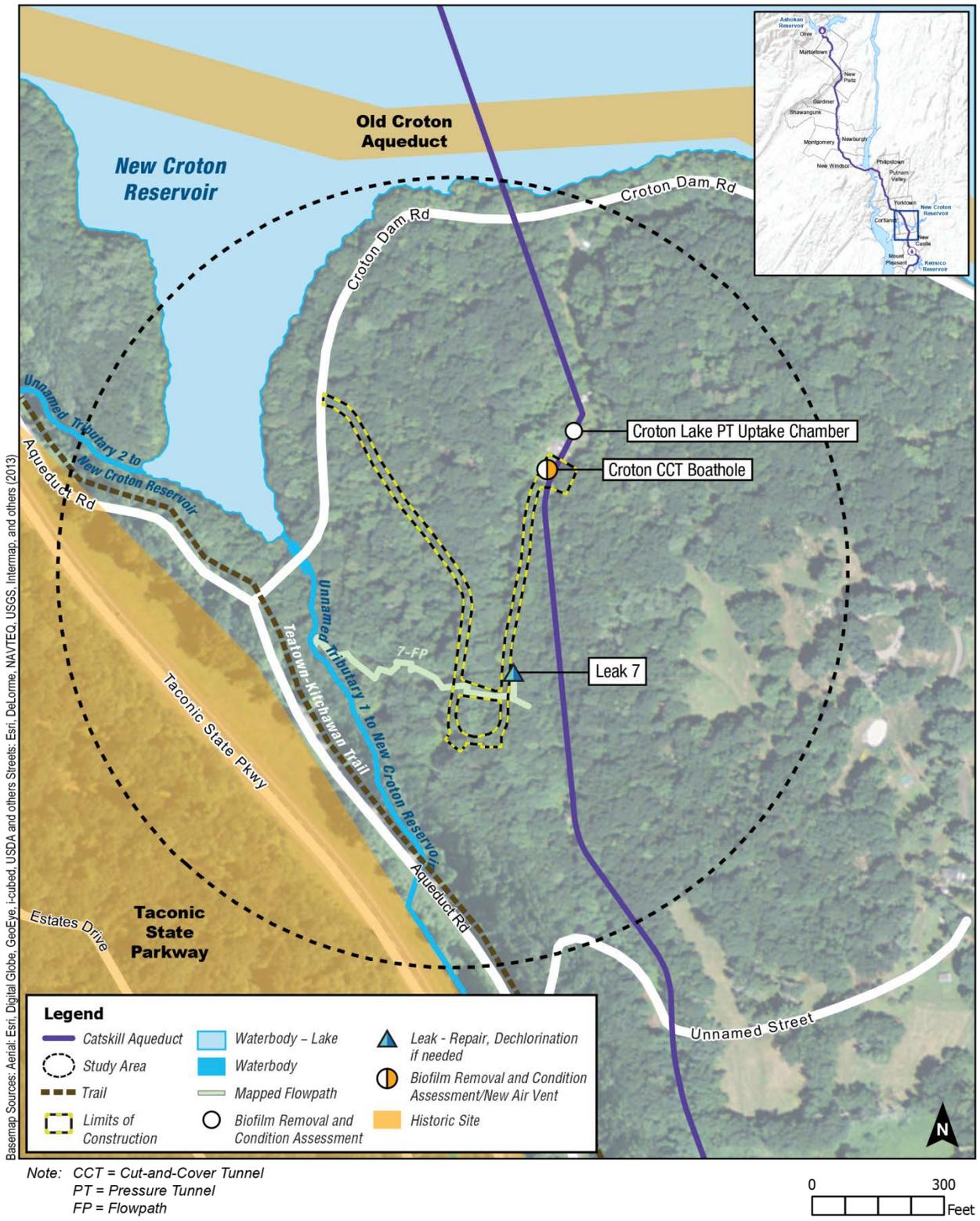


Figure 9.14-26: Study Area – Croton Dam Road



Photograph 1: Flowpath of Leak 7 along DEP Access Road (looking northward).



Photograph 2: Croton Cut-and-Cover Tunnel Boathole (facing northeast).

Figure 9.14-27: Photographs – Croton Dam Road Study Area





Photograph 3: Croton Lake Pressure Tunnel Uptake Chamber (facing northwest).

Figure 9.14-28: Photographs – Croton Dam Road Study Area



The study area consists of residential, public services, undesignated land use associated with the Taconic State Parkway (owned by NYSDOT), and with a narrow portion of vacant land to the southwest. Land cover is generally wooded, with several grassy areas towards the southeast. The limits of construction for each work site and associated access road are located in a public services corridor which is owned and maintained by DEP. **Figure 9.14-29** shows a map of the land uses in the study area and its surroundings.

Zoning in the study area is single-family residential (R1-200), as designated by the Town of Yorktown Zoning Code (see **Figure 9.14-30**). The single-family residential (R1-200) zoning district provides for low-density residential development. The Catskill Aqueduct is a permitted use as a water supply facility within this zoning district.

The Taconic State Parkway is listed on the National Register of Historic Places. There are no other federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

9.14.5.2 Description of Leak 7

Leak 7 is a toe-of-slope leak that is the result of seepage in several areas along the western side of the sidewall at the base of the cut-and-cover berm. As shown on **Figure 9.14-31**, Leak 7 is located approximately 115 feet west of the aqueduct's centerline in a forested area that lies approximately 590 feet south of the Croton Lake Uptake Chamber. The Leak 7 flowpath, 7-FP, originates on the western side of the aqueduct from the multiple hillside seeps that flow into a drainage ditch along the gravel access road (see Photograph 1 on **Figure 9.14-27**). The flowpath continues west into a stream (unnamed tributary 1 to New Croton Reservoir) that then discharges into New Croton Reservoir. While the primary source of flow within 7-FP is from Leak 7, surface water and groundwater in the vicinity of this reach also likely contribute to flowpath 7-FP. The maximum observed flow of the leak is approximately 31.5 gpm (or approximately 45,000 gpd).

9.14.5.3 Proposed Activities within the Croton Dam Road Study Area

To support activities within the Croton Dam Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorkton) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas, including one adjacent to the Croton Lake Gate House, would provide additional parking. Equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. A site plan showing a layout of the limits of construction for the work sites, which would occupy a total of 0.9 acre, is shown on **Figure 9.14-31**. The schedule for work within the study area is shown in **Table 9.14-14**. The duration of active construction within the Croton Dam Road Study Area is estimated to total 15 weeks over 2.5 years, in addition to 2 weeks to demobilize and restore the site following temporary chlorination.

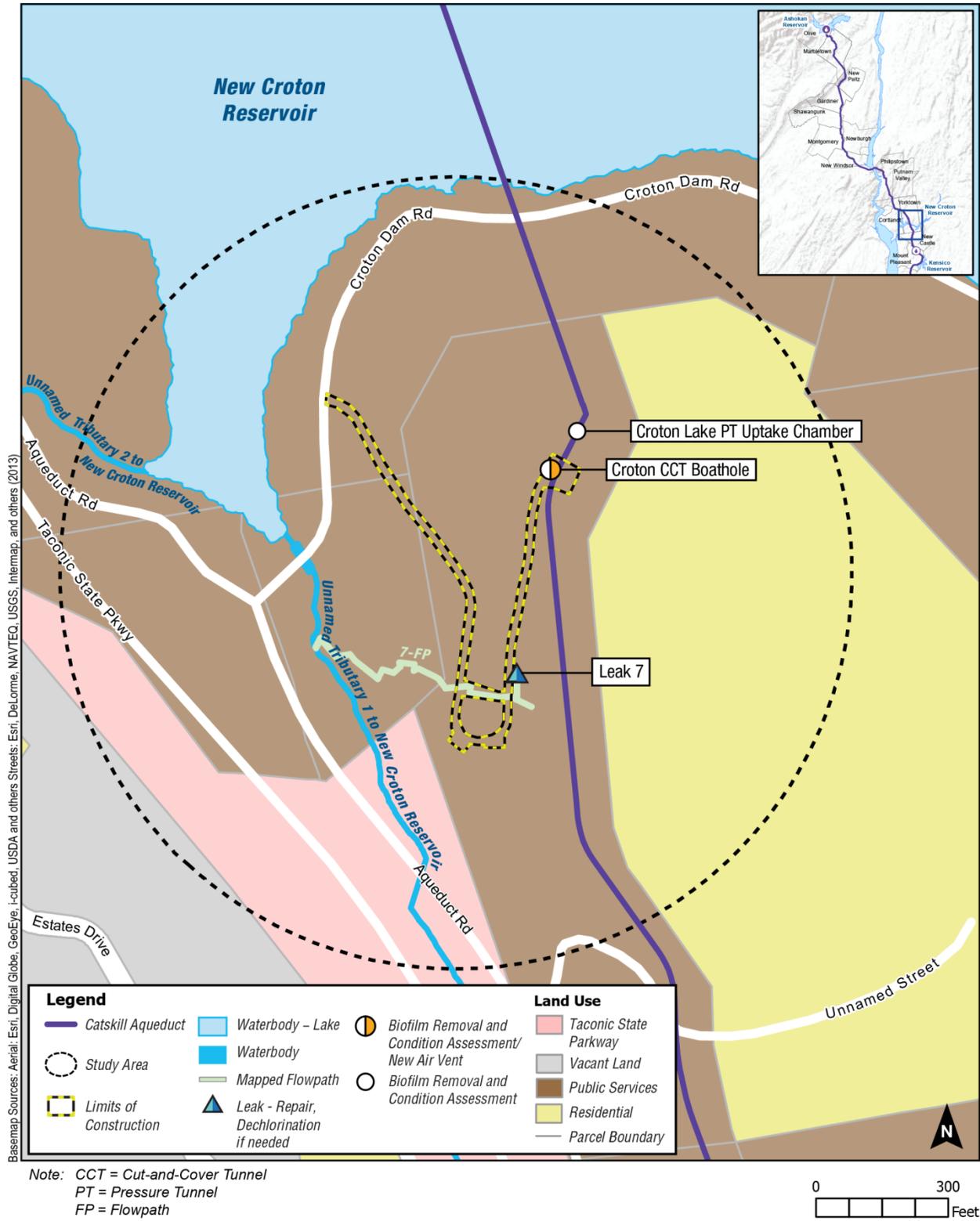


Figure 9.14-29: Land Use – Croton Dam Road Study Area



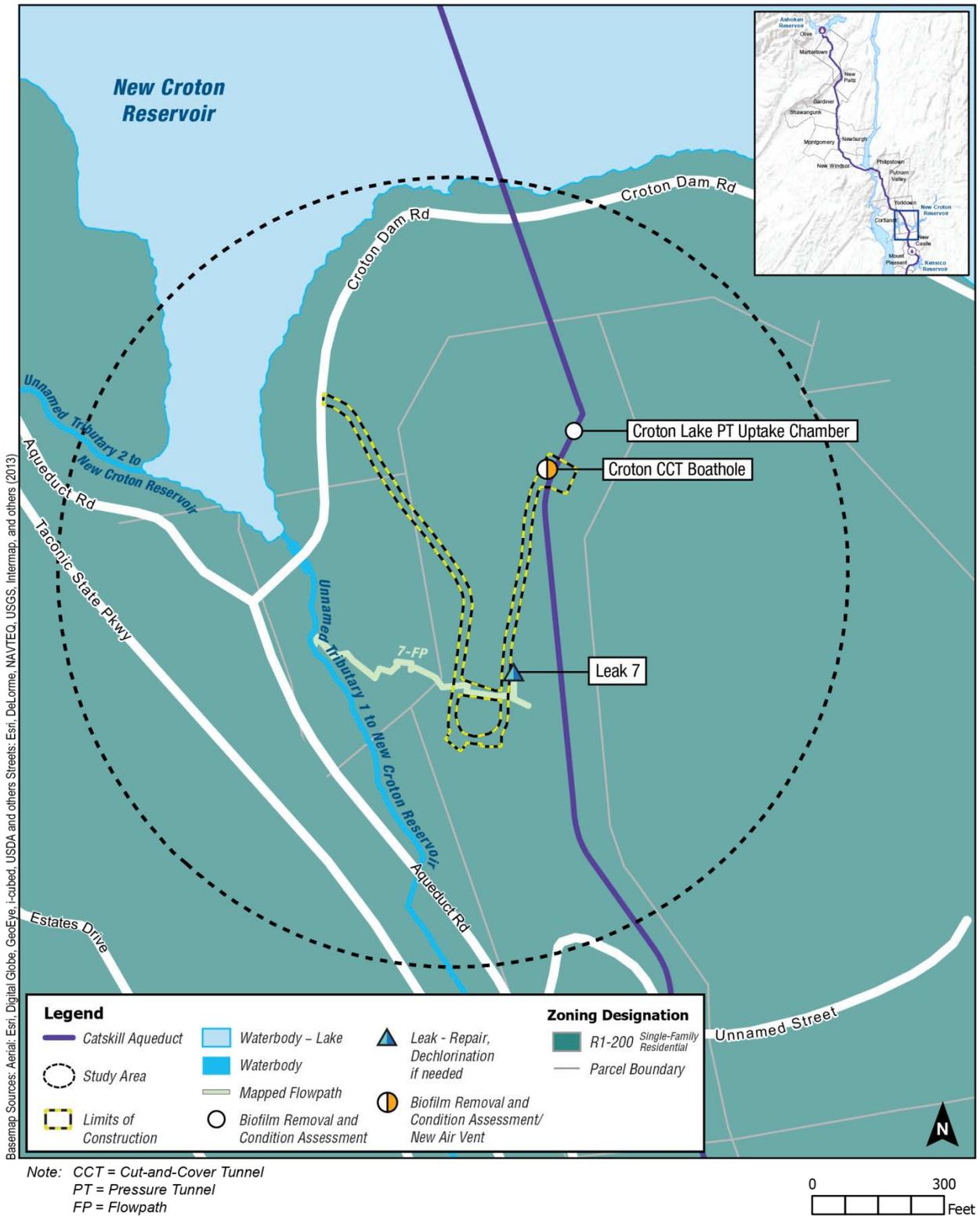


Figure 9.14-30: Zoning – Croton Dam Road Study Area



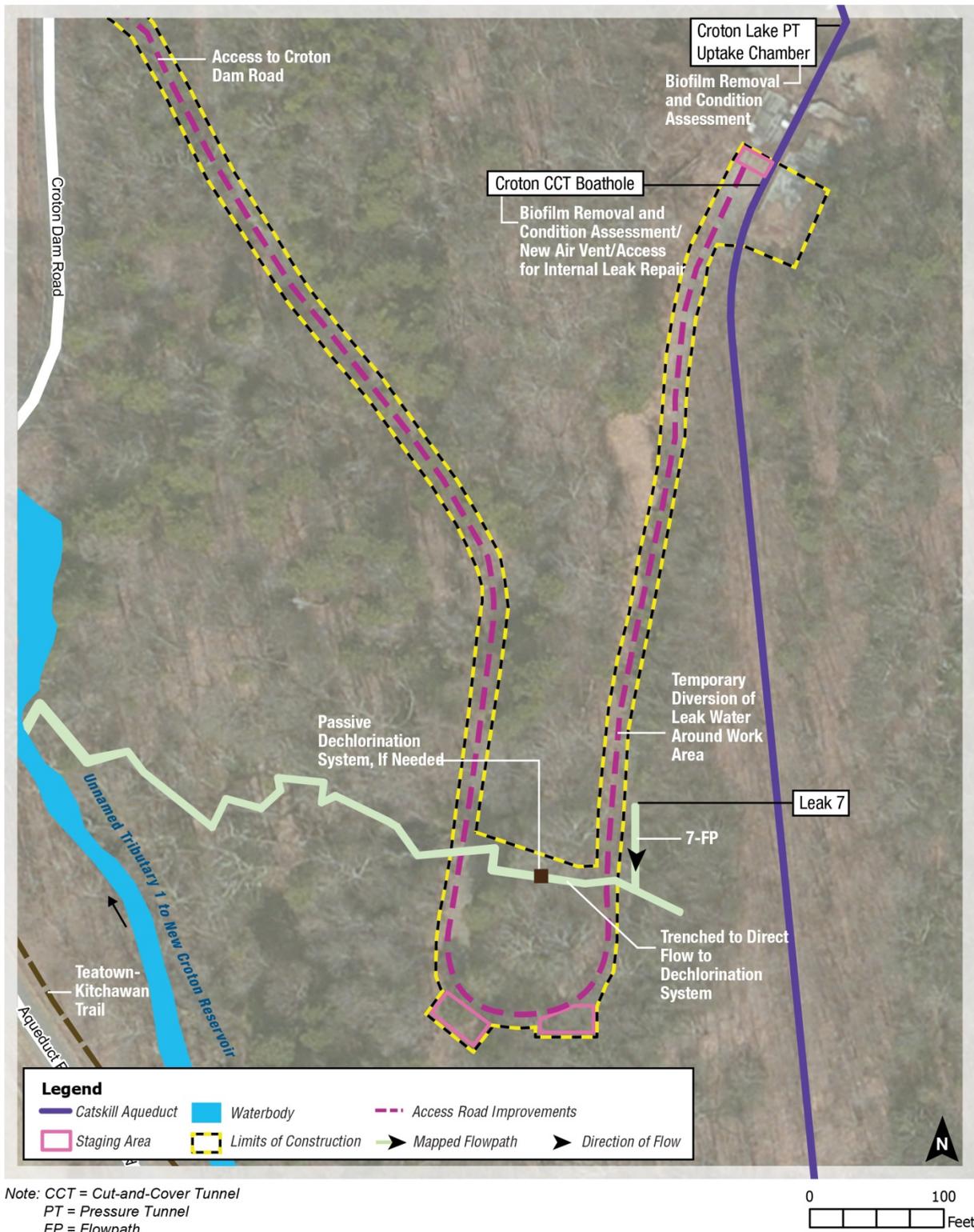


Figure 9.14-31: Site Plan – Croton Dam Road Study Area



Table 9.14-14: Schedule of Work Activities within the Croton Dam Road Study Area

Work Activity	Dates	Duration	Work Hours	Crew Size ¹
Staging and Access Improvements ²	Summer 2018 2017	2 weeks	Monday to Friday, 7 AM to 5 PM	8
Internal Leak Repair	Fall 2018 2017 (First 10-week shutdown)	4 weeks	7 days a week, 24 hours per day	10
Dechlorination Installation (if necessary)	Summer 2019 2018	4 weeks	Monday to Friday, 7 AM to 5 PM	8
Air Vent Installation	Fall 2019 2018 (Second 10-week shutdown)	3 weeks	7 days a week, 7 AM to 7 PM	8
Biofilm Removal and Condition Assessment	Fall 2020 2019 (Third 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	21
Dechlorination Demobilization/ Site Restoration (if necessary) ³	2023	2 weeks	Monday to Friday, 7 AM to 5 PM	8
Notes: ¹ Crew size refers to the number of people anticipated at the work site(s). ² Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>). ³ Dechlorination demobilization and site restoration is not included in estimated duration of active construction.				

Work in the study area would begin with staging and access improvements in summer ~~2018~~2017. In addition to underbrush clearing and gravel placement, improvements would involve the removal of up to nine trees and grading to improve access from Croton Dam Road to Leak 7 and the Croton Lake Uptake Chamber.

Following the staging and access improvements, internal leak repair would take place during the first 10-week shutdown in fall ~~2018~~2017. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. To conduct the leak repair, grout would be applied on the interior portion of the cut-and-cover tunnel following localized biofilm removal and inspection of the tunnel wall for cracks.

Once repaired, the leak contribution to the flowpath is expected to permanently cease. The flowpath would become dry except for contributions from runoff and groundwater. This would result in approximately 2,850 square feet of permanent wetland disturbance. However, if leak repair is unsuccessful, a local dechlorination system would be installed in summer ~~2019~~2018. Specifically, this would be a temporary, passive dechlorination system. An activated carbon trench with a footprint of approximately 34 square feet would be installed west of the aqueduct where the leak daylight, requiring temporary diversion of the leak water around the work area. The excavation of 2 to 4 cubic yards of soil would be required for channelization and trench installation. The system would be sized to treat the leak flow that would occur when the

aqueduct is operated at its maximum capacity and the anticipated flow during temporary chlorination. Upon completion of the installation, all equipment and materials would be removed.

Air vent installation would take place during the second 10-week shutdown in fall ~~2019~~2018. One air vent structure would be mounted on a concrete slab, which, together with an access hatch, would replace the cover of the existing boathole at the Croton Lake Uptake Chamber. Minor excavation of approximately 18 inches of soil may be required to access the existing cover.

Biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019, with the Croton Lake Uptake Chamber and the existing boathole providing access into the aqueduct. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”).

As stated in Section 9.2, “Project Description,” the local dechlorination systems would be in operation when chlorination of the aqueduct begins in ~~2020~~2019. While in operation, the systems would be inspected and maintained on a regular basis, including the monitoring of residual chlorine concentrations, as required. When chlorination of the aqueduct is no longer required in 2023, the passive dechlorination system would be removed from the study area, and any areas temporarily disturbed would be restored to baseline conditions.

Impact categories analyzed for the Croton Dam Road Study Area are presented in Section 9.14.5.4, “Open Space and Recreation,” through Section 9.14.5.11, “Neighborhood Character,” and include: open space and recreation; historic and cultural resources; visual resources; natural resources, including water resources, terrestrial resources and federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.14.2, “Town of Yorktown Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” an impact analysis related to land use and zoning; socioeconomic conditions; community facilities and services; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area are not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.14.5.4 Open Space and Recreation

As shown on **Figure 9.14-32**, two open space resources are located within the Croton Dam Road Study Area: New Croton Reservoir with surrounding DEP watershed lands and Teatown-Kitchawan Trail. Approximately 23 acres of New Croton Reservoir and surrounding watershed lands lies within the northern portion of the study area. New Croton Reservoir is approximately 2,200 acres and is used for recreational fishing from either the shoreline or non-motorized boats, with a DEP watershed access permit and fishing license. There are approximately 23 acres of New Croton Reservoir Watershed Lands within the Croton Dam Road Study Area. Of these, approximately 4 acres are the reservoir and 19 acres are the adjacent New Croton Reservoir Watershed Lands, where shoreline fishing may occur. New Croton Reservoir is outside of the repair and rehabilitation construction staging areas and work sites.

Approximately 0.25 mile of the Teatown-Kitchawan Trail is located in a north to south orientation along Aqueduct Road, between the Taconic State Parkway and New Croton Reservoir. The approximately 6.5-mile Teatown-Kitchawan Trail travels east to west on the south side of New Croton Reservoir, beginning at the North County Trailway in the east, following Aqueduct Road through the Croton Dam Road Study Area, and ending south of New Croton Reservoir in the Teatown Lake Reservation. This trail is open to the public for recreational purposes, although it is separated from the Croton Lake Uptake Chamber by the tributary, existing steep hillside, and dense vegetation.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no plans to expand or create new open space or recreational resources are anticipated within the Croton Dam Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open spaces is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Croton Dam Road Study Area would be the same as baseline conditions.

Work activities within the Croton Dam Road Study Area would be short-term (totaling 15 weeks over 2.5 years; see **Table 9.14-14**). The work activities would not occur within New Croton Reservoir or affect recreational use of the reservoir. Following construction, all construction equipment would be removed from the Croton Dam Road Study Area, and staging areas would be restored to baseline conditions.

Temporary chlorination of Catskill Aqueduct would take place from 2019 through 2023 and include passive dechlorination of Leak 7. It is anticipated uses of the identified open spaces would continue with typical fluctuations in and frequency of use of the open spaces depending on the season.

Once the Catskill Aqueduct returns to typical operations in 2023, the passive dechlorination system would be removed and the site would be restored to baseline conditions. The new air vent at the Croton Cut-and-Cover Tunnel Boathole is a permanent structure that would remain following construction. The repaired leak would result in a loss of artificial flow to downstream resources, returning them to pre-leak conditions. The permanent repairs would not encroach upon, cause a loss of open space, impact the use or physical character of, or disrupt views from New Croton Reservoir or Teatown-Kitchawan Trail.

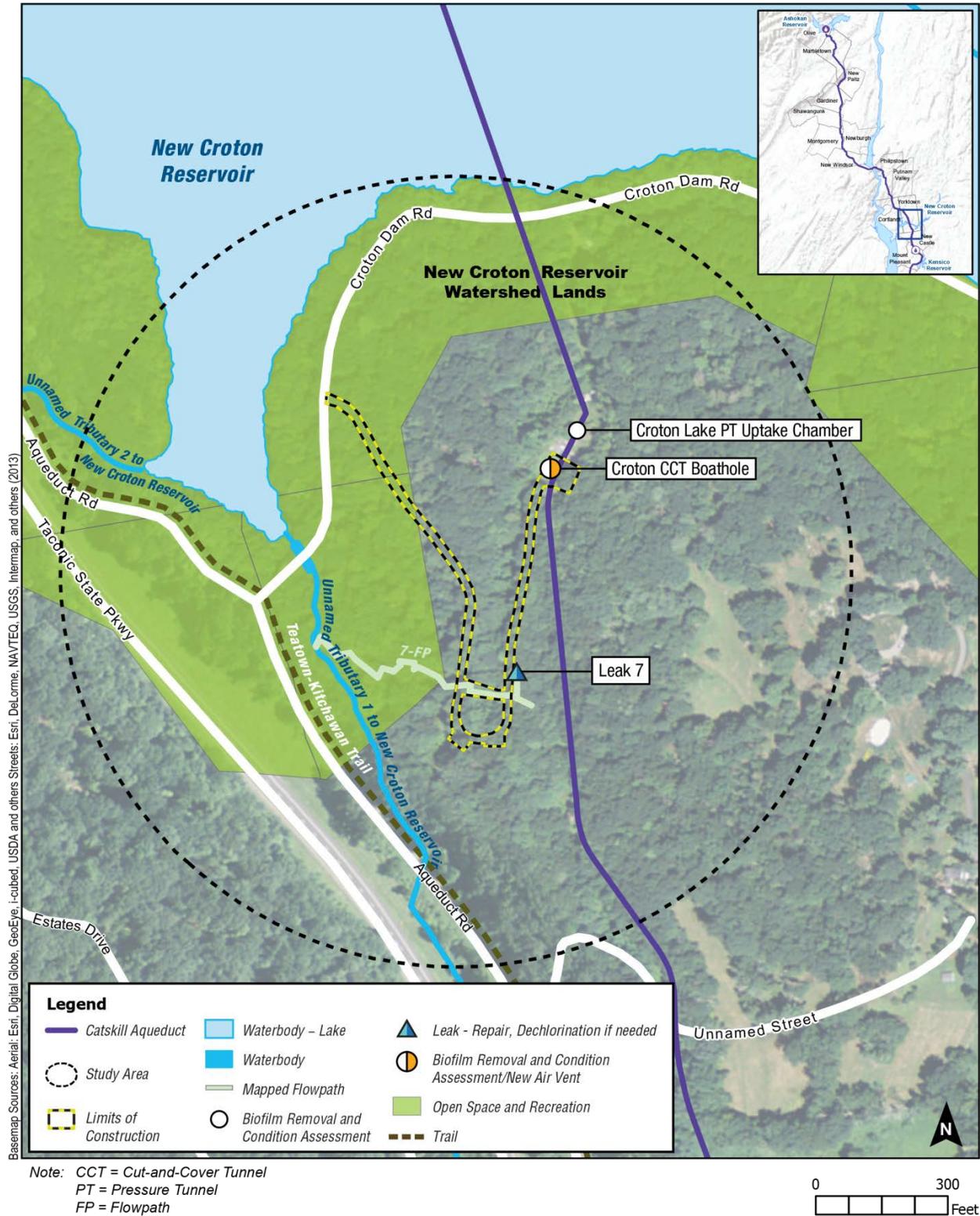


Figure 9.14-32: Open Space and Visual Resources – Croton Dam Road Study Area



Therefore, the repair and rehabilitation would not result in potential significant adverse impacts to open space and recreation within the Croton Dam Road Study Area.

9.14.5.5 Historic and Cultural Resources

As shown on **Figure 9.14-33**, there is one site listed on the National Register of Historic Places, the Taconic State Parkway (NR Number 02NR05036) within the Croton Dam Road Study Area. The Old Croton Aqueduct is outside of the study area.

A review of the SHPO ArcGIS data indicates that the approximately 1,200 feet of the 104-mile long Taconic State Parkway is located within the Croton Dam Road Study Area. The limits of construction are not located within the Taconic State Parkway.

Areas of previous disturbance associated with construction of the Catskill Aqueduct were identified and compared to the potential for ground disturbance within the Croton Dam Road Study Area to determine if the repair and rehabilitation could affect archeological resources. The Croton Dam Road Study Area does have the potential to contain archeological resources.

The Croton Dam Road Study Area was previously disturbed between 1910 and 1912 during initial construction of the Catskill Aqueduct. The sites are located along the Croton Lake Pressure Tunnel and the Croton Cut-and-Cover portion of the Catskill Aqueduct. The Uptake Chamber forms the juncture between the Croton Lake Pressure Tunnel and the Croton Cut-and-Cover Tunnel. To create the Uptake Chamber, a 350-foot vertical shaft was constructed to the invert of the pressure tunnel, to serve both as a junction between the two tunnels and as surface entry. The shaft, cut-and-cover, and boathole shaft required significant construction excavation. The work activities within the Croton Dam Road Study Area would occur only on previously disturbed soils.

In the future without the repair and rehabilitation, it is assumed that historic and cultural resources within the Croton Dam Road Study Area would be the same as baseline conditions.

Following SHPO's review of the repair and rehabilitation, SHPO concluded in a letter dated July 6, 2015 that there were no concerns regarding potential impacts to historic or archeological resources associated with the repair and rehabilitation work activities within the study area, and no additional archeological investigations are necessary.

The work activities would be short-term (totaling 15 weeks over 2.5 years; see **Table 9.14-14**). Following construction, all construction equipment would be removed from the Croton Dam Road Study Area, and staging areas would be restored to baseline conditions.

Temporary chlorination of Catskill Aqueduct would take place from 2019 through 2023 and, if required, would include passive dechlorination of Leak 7. Once the Catskill Aqueduct returns to typical operations in 2023, the passive dechlorination system would be removed and the site would be restored to baseline conditions.

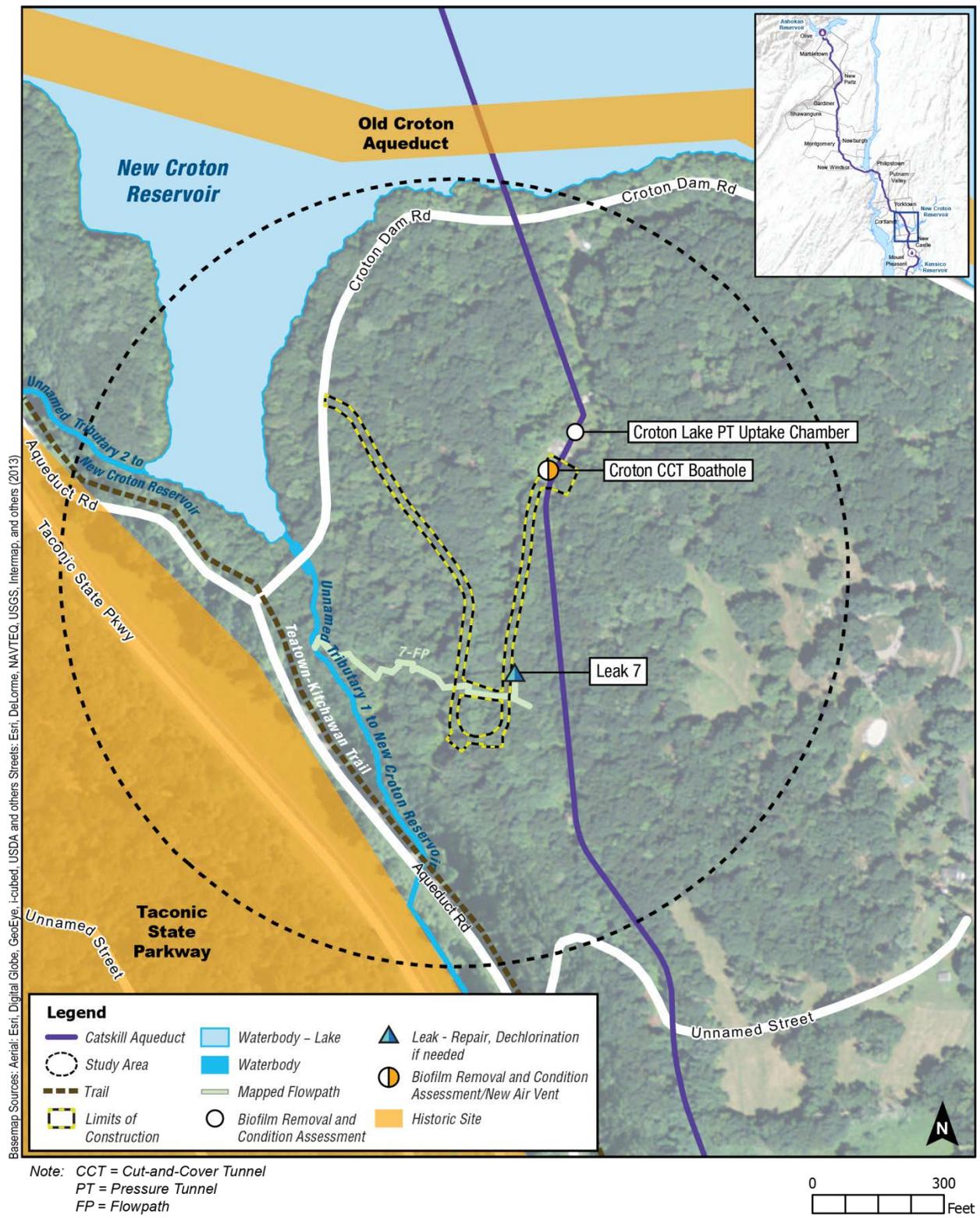


Figure 9.14-33: Historic and Cultural Resources – Croton Dam Road Study Area



The new air vent at the Croton Cut-and-Cover Tunnel Boathole would be a permanent structure that would remain following construction. If successful, leak repair would result in a loss of artificial flow to downstream resources, returning them to pre-leak conditions. Should the leak not be repaired, conditions would remain as they currently are. In the future with the repair and rehabilitation, operation of the Catskill Aqueduct would not disrupt historic or archeological resources.

Therefore, although there is one site within the Croton Dam Road Study Area listed on the National Register of Historic Places, the repair and rehabilitation would not result in significant adverse impacts related to historic and cultural resources within the Croton Dam Road Study Area.

9.14.5.6 Visual Resources

The study area for the visual resources analysis is the area within the Croton Dam Road Study Area. It also includes view corridors that extend beyond based on the locations that are publicly accessible.

As shown in Section 9.14.5.4, “Open Space and Recreation,” and Section 9.14.5.5, “Historic and Cultural Resources,” and on **Figure 9.14-32** and **Figure 9.14-33** above, three visual resources, consisting of one site listed on the National Register of Historic Places, the Taconic State Parkway, and two locally significant resources, New Croton Reservoir with surrounding watershed lands and the Teatown-Kitchawan Trail, were identified within the Croton Dam Road Study Area.

The Taconic State Parkway, an approximately 104-mile parkway connecting Kensico Dam Plaza in Westchester County to Chatham in Columbia County is listed on the National Register of Historic Places. The winding, hilly route offers scenic vistas of the Hudson Highlands, Catskill, and Taconic regions of the State, with many areas of dense vegetation along either side of the parkway. The Croton Lake Uptake Chamber is not visible from the Taconic State Parkway, as it is surrounded by forested lands. Along the parkway, directly west of the Uptake Chamber, dense vegetation limits views to the east.

Approximately 23 acres of New Croton Reservoir and surrounding watershed lands lies within the northern portion of the study area. Of these, approximately 4 acres are the reservoir and 19 acres are the adjacent reservoir watershed area, where shoreline fishing may occur. Views from New Croton Reservoir would not be affected, as it is outside of the repair and rehabilitation construction staging areas and work sites and separated by densely forested areas.

The Teatown-Kitchawan Trail travels east to west on the south side of New Croton Reservoir, following Aqueduct Road through the Croton Dam Road Study Area. This trail is open to the public for recreational purposes, although there are no views of the Croton Lake Uptake Chamber due to the existing steep hillside and existing vegetation.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP’s understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Croton Dam Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative

succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Croton Dam Road Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities would be short-term (totaling 15 weeks over 2.5 years; see **Table 9.14-14**). As stated above, the Croton Dam Road Study Area is not visible from the Taconic State Parkway or the Teatown-Kitchawan Trail. Construction access and staging may require minor tree removal in discrete locations, which would not change the character of the area or affect surrounding trees and would not affect views to or from visual resources.

Following construction, all construction equipment would be removed from the Croton Dam Road Study Area, and staging areas would be restored to baseline conditions. Temporary chlorination of Catskill Aqueduct would take place from 2019 through 2023 and may include passive dechlorination of Leak 7. It is anticipated uses of the identified visual resources would continue with typical fluctuations in and frequency of use of the visual resources depending on the season.

Once the Catskill Aqueduct returns to typical operations in 2023, the passive dechlorination system would be removed and the site would be restored to baseline conditions. The new air vent at the boathole would be a permanent structure that would remain following construction, and the repaired leak would result in a loss of artificial flow to downstream resources, returning them to pre-leak conditions. The reduction of flow would be not visibly alter the surrounding waterways within the Croton Dam Road Study Area.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Croton Dam Road Study Area.

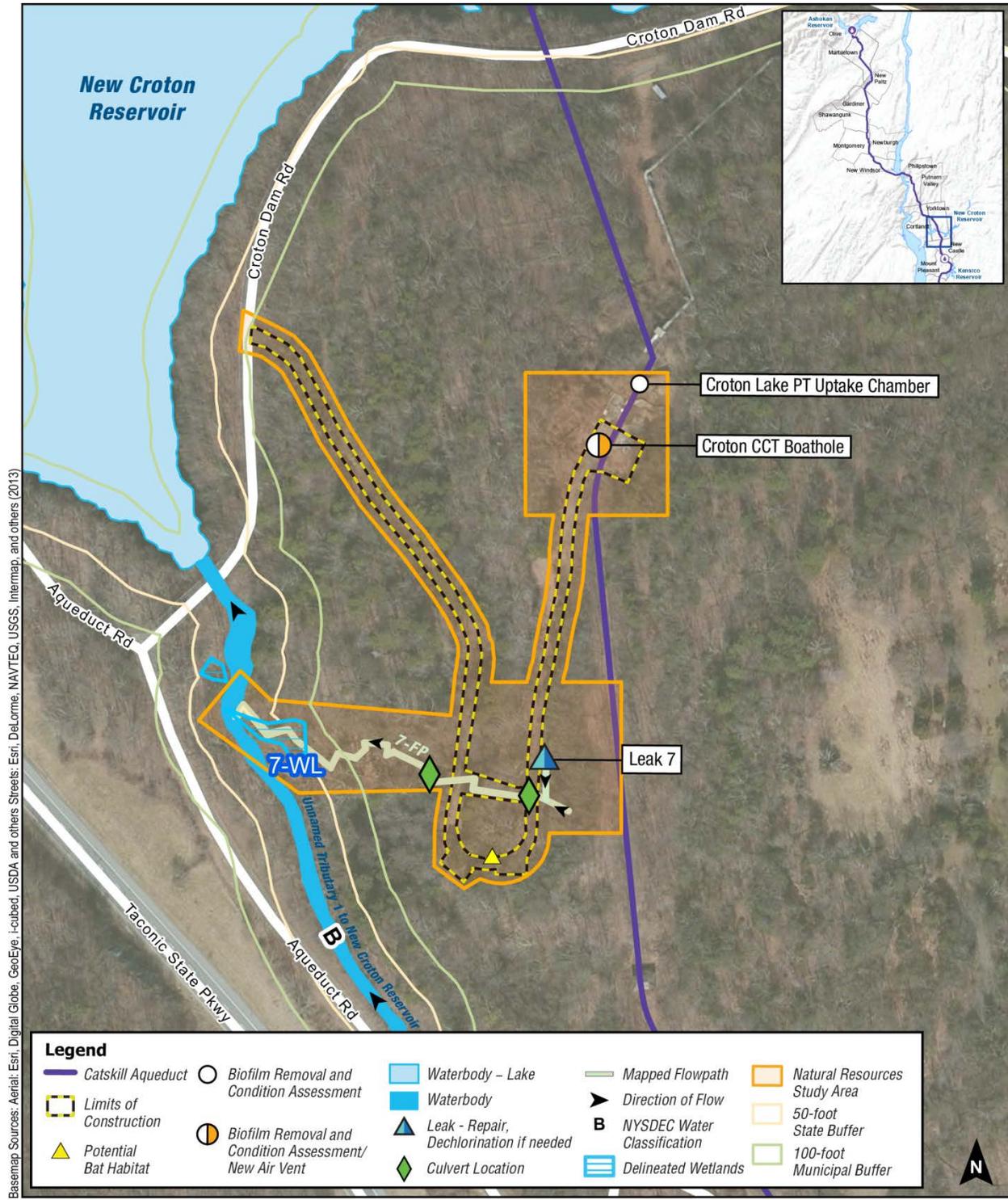
9.14.5.7 Natural Resources

As shown on **Figure 9.14-34**, the study area for the natural resources analysis is the area surrounding the limits of construction, including the Croton Lake Uptake Chamber, Croton Cut-and-Cover Boathole, and Leak 7. These boundaries are also inclusive of downstream resources potentially influenced by Leak 7.

The natural resources study area was analyzed based on field visits conducted on November 5 and 11, 2014, and August 13, 2015. The natural resources study area includes a portion of unnamed tributary 1 to New Croton Reservoir and a 0.07 acre wetland. The following sections describe these natural resources and an analysis of how the repair and rehabilitation activities could potentially affect the habitats and water resources, and the protected wildlife species they support. The potential for the repair and rehabilitation to result in changes to natural resources as a result of the proposed temporary chlorination at the Ashokan Screen Chamber is further analyzed in Section 9.19, "Project-wide Impact Analysis."

Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the lower Hudson watershed (HUC 02030101) and the Bailey Brook-Croton River subwatershed (HUC 020301010307).



Basemap Sources: Aerial: Esri, Digital Globe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

*Alignment based on field visit. The actual alignment of the stream is different than mapped by NYSDEC.

Note: CCT = Cut-and-Cover Tunnel
PT = Pressure Tunnel; FP = Flowpath
WL = Wetland; NYSDEC = N.Y.S. Department of Environmental Conservation

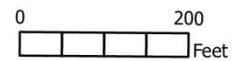


Figure 9.14-34: Natural Resources – Croton Dam Road Study Area



The naturally occurring surface water and wetlands in the natural resources study area are subject to federal jurisdiction under Sections 401 and 404 of the Clean Water Act for proposed work activities. Based on the jurisdictional determination by the New York District of the USACE, dated January 21, 2015, flow from Leak 7 (referred to as 7-FP) is not considered to be jurisdictional under Section 404 of the Clean Water Act, but Wetland 7-WL is considered to be Waters of the United States. The flowpath has permanent flows due to operation of the aqueduct, and because these flows are not the result of natural means, they would cease when the leak is repaired.

Surface water and wetlands in the study area are also subject to State and municipal jurisdiction. As a Class B stream within the natural resources study area, the unnamed tributary 1 to New Croton Reservoir is subject to State Protection of Waters regulations with a regulated 50-foot buffer to protect the streambed and banks. Additionally, the Town of Yorktown regulates activities in wetlands at least 1,000 square feet in size and natural watercourses with a 100-foot regulated buffer (Yorktown Town Code Chapter 178: Freshwater Wetlands). Therefore, activities occurring within the wetland and unnamed tributary and their 100-foot buffer may be subject to town review and approval.

Surface Water

Surface water delineations in the natural resources study area occurred over the course of several field visits between March 2013 and September 2014.

The unnamed tributary to New Croton Reservoir was delineated along the western boundary of the natural resource study area. Leak 7, with a flowpath 7-FP and associated Wetland WL-7, were also identified within the natural resources study area. Leak 7 and its associated flowpath diminish, or cease to flow, during occasional Catskill Aqueduct shutdowns. It was determined that this leak may contribute to hydrology associated with the watercourses, wetlands, and flowpaths identified within the natural resources study area, and is, therefore, discussed with the applicable resource below. The water resource name, area, and length are shown in **Table 9.14-15**.

Table 9.14-15: Water Resources and Classifications within the Croton Dam Road Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Unnamed Tributary 1 to New Croton Reservoir	2,190	550	Riverine, Upper Perennial, Rock Bottom, Seasonally Flooded (R3RB3C)
7-FP	1,310	330	Riverine, Upper Perennial, Streambed, Seasonally Flooded (R3SB3C)
7-WL	2,850	NA	Palustrine Forested Wetland, Needle-Leaved Deciduous (PFO2)
Note: NA = Not applicable.			

Unnamed Tributary 1 to New Croton Reservoir

The unnamed tributary was delineated on July 9, 2014. The stream flows north through a steep valley, receives flows from 7-FP on its eastern bank, and continues northward for approximately 250 feet to New Croton Reservoir. The tributary is entrenched, approximately 18 feet in width, and has a limited floodplain. Shoreline erosion and undercut banks were observed on both shorelines, and upstream of the point where Leak 7 enters. A storm drain from Croton Dam Road flows into the tributary's western bank. No fish were observed in the stream.

The substrate of the unnamed tributary consists of boulders and cobbles with sandy deposits, and contains many large logs and wood debris. The unnamed tributary is best classified as a "Riverine, Upper Perennial, Rock Bottom, Seasonally Flooded" system based on the Cowardin System (Cowardin et al. 1979; see **Table 9.14-15**).

Flowpath 7-FP

As previously described, 7-FP originates on the western side of the aqueduct from multiple hillside seeps that flow into a drainage ditch along the gravel access road (see **Figure 9.14-34**). The primary source of flow within 7-FP is from Leak 7, although there is a potential for secondary flow contribution from storm-derived flows that may enter 7-FP between the leak and its confluence with the unnamed tributary to New Croton Reservoir. In addition to surface drainage and groundwater flow, 7-FP also contributes to wetland hydrology at Wetland 7-WL.

The substrate of 7-FP consists of sand, gravel, and cobbles, and the water was observed to be clear. No in-stream vegetation was observed within 7-FP. Flowpath 7-FP is best classified as a "Riverine, Upper Perennial, Streambed, Seasonally Flooded" system based on the Cowardin System (Cowardin et al. 1979; see **Table 9.14-15**).

Wetlands

Wetland delineations were conducted in April 2013. No mapped NWI or NYSDEC wetlands occur in the natural resource study area. However, one palustrine forested wetland was delineated (Wetland 7-WL) within the natural resources study area during the field visit (see **Figure 9.14-34**).

Wetland 7-WL

Wetland 7-WL is a palustrine forested wetland approximately 0.07 acres in size and located at the bottom of a steep hill, west of Leak 7 and south of New Croton Reservoir. Dominant species identified during the wetland delineation include northern spicebush (*Lindera benzoin*), multiflora rose (*Rosa multiflora*), skunk cabbage (*Symplocarpus foetidus*), and spotted touch-me-not (*Impatiens capensis*). Eastern hemlock (*Tsuga canadensis*) and American beech (*Fagus grandifolia*) are abundant in the surrounding area. Dominant species observed on site meet the dominance test and prevalence index indicators for hydrophytic vegetation.

The upper 20 inches of soil is comprised of silty sand and silty clay. The wetland is primarily caused by leak water from the Catskill Aqueduct. However, surface drainage and groundwater flow draining from the surrounding forested hillside were also observed contributing to wetland hydrology. Therefore, the delineation concluded natural conditions were not present at the site. Hydric soil indicators were not observed within the wetland. However, normal conditions were

not present, because hydrology is primarily driven by the leak flow and the soils have not had time to develop hydric soil indicators. Primary indicators of wetland hydrology observed during the survey include surface water and high water table present at the surface.

Wetland hydrology is likely provided by 7-FP, surface drainage, and groundwater flow draining from the surrounding forested hillside. Wetland 7-WL drains directly into unnamed tributary 1 that subsequently flows into New Croton Reservoir.

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no projects or developments are anticipated to occur within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of the water resources within the Croton Dam Road Study Area would be the same as baseline conditions.

Analysis of Potential Effect

This section analyzes the potential for temporary and permanent disturbance associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Croton Dam Road Study Area.

Construction

Work activities related to the repair and rehabilitation have the potential to temporarily reduce vegetated areas along the leak flowpath and permanently alter flows. Prior to commencing the repair and rehabilitation, temporary sediment and erosion control measures, such as silt fencing would be installed. These temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements. Associated staging and access improvements would occur in upland areas, along the existing access road or the top of the cut-and-cover berm of the Catskill Aqueduct (see **Figure 9.14-31**). Air vent installation and biofilm removal and condition assessment would not affect water resources.

During the first 10-week shutdown period, repairs to Leak 7 would occur within the interior of the aqueduct. To complete repairs, this section of the aqueduct would be unwatered by gravity flow within the aqueduct; however, any residual water would be diverted using an internal bypass pipe which would carry residual water around the work segments and then discharge to the aqueduct downstream of the work segments. Once the work segment is prepared, curing compounds used for lining the tunnel would be applied. A non-toxic, quick-curing grout suitable for use in drinking water conduits would be used. It would expand with contact to water to fill cracks and voids within the tunnel wall and along the exterior tunnel surface. If the grout comes in contact with subsurface flows along the exterior of the tunnel wall, it would cure in place and not migrate beyond the repair site. These repair techniques would use a minimal amount of water to prepare the tunnel wall prior to application. Any wastewater generated during leak repair or residual water in the tunnel would be managed using barriers to prevent wastewater from migrating downstream and would be treated, as necessary. Given these design considerations, there would be minimal potential for contamination to 7-WL or downstream resources. Once the

leak is repaired, 7-FP would cease to flow and would no longer contribute to 7-WL. Permanent disturbance associated with leak repair is further analyzed in the “Operation” section of Section 9.14.5.7, “Natural Resources” below and on a project-wide basis in Section 9.19, “Project-wide Impact Analysis.”

If leak repair is not successful, a passive dechlorination system would be installed in 7-FP, and the site would be restored when dechlorination of the leak is no longer needed. These activities would not disturb naturally occurring water resources. Temporary bypass pumping of Leak 7 would be used to dewater the flowpath prior to it being graded. A temporary sump pit with bypass piping to a dewatering bag would be used to collect and divert water around the trenched location of the passive dechlorination system to keep the work area dry. This would also prevent sediment from entering downstream locations, specifically downstream reaches of 7-FP and unnamed tributary 1 to New Croton Reservoir. The passive dechlorination system would be outfitted with a cover to prevent rainfall or runoff from entering the system, and stormwater runoff would be rerouted at the system’s location as needed. Since there are no jurisdictional waters near the staging area or work sites, installation of a passive dechlorination system at Leak 7 would not affect naturally occurring water resources.

Anticipated temporary and permanent disturbance to water resources was quantified based on the limits of construction and proposed work activities (see **Table 9.14-16**). Leak repair would permanently disturb approximately 1,310 square feet of flowpath 7-FP, which is not a jurisdictional water, and would result in a permanent loss of 7-WL (approximately 2,850 square feet). Installation of the passive dechlorination system would also temporarily disturb 260 square feet of 7-FP, in which the activated carbon trench would have a footprint of approximately 34 square feet. Leak repair would not result in permanent disturbance to the municipal water resource buffer as the land adjacent to the flowpath and wetland would be unaffected. No disturbance would occur within the unnamed tributary 1 to New Croton Reservoir or its associated State Protection of Waters buffer. Following construction, staging areas would be restored to natural conditions.

Temporary Chlorination

Temporary chlorination of the Catskill Aqueduct would occur from 2019 through 2023, and the passive system, if necessary, would be operated to treat the design leak flow. The system would treat leak flows, and all discharges would meet regulatory requirements. Once the Catskill Aqueduct returns to typical operations in 2023, the passive dechlorination system would be removed and the site would be restored to natural conditions.

Operation

Leak repair would eliminate the leak flowpath 7-FP (see **Table 9.14-16**). The proposed leak repair would also result in the elimination of leak flow to the unnamed tributary 1 to New Croton Reservoir, restoring the stream to natural, pre-leak conditions. Anticipated changes to the unnamed tributary resulting from the repair and rehabilitation were analyzed by calculating the contribution of Leak 7 to the receiving stream during low flows and are discussed below, under “Leak Contributions during Low Flow.”

Table 9.14-16: Estimated Disturbance to Water Resources within the Croton Dam Road Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Unnamed Tributary 1 to New Croton Reservoir	2,190	0	0
7-FP	1,310	260 <i>Passive dechlorination system installation (if needed)</i>	1,310 <i>Internal leak repair (if successful)</i>
7-WL	2,850	0	2,850 <i>Internal leak repair (if successful)</i>
50-foot State Protection of Waters Buffer	8,720	0	0
100-foot Water Resource Municipal Buffer	24,820	0	0

Additionally, wetland hydrology for 7-WL is provided by a combination of inputs, primarily 7-FP, but also surface drainage, and groundwater flow draining from the surrounding forested hillside. Several groundwater seeps not associated with the leak enter 7-WL and would continue to do so after the internal leak repair. The potential cessation of leak water would reduce the overall amount of water entering the wetland system, which over time, could alter wetland vegetation and hydrology eventually resulting in the wetland not meeting hydrophytic vegetation and wetland hydrology criteria. During the wetland delineation, it was noted that typical wetland conditions were not present at the site, since the wetland is primarily caused by leak water from the Catskill Aqueduct. Hydric soil indicators were not observed within the wetland, since the formation of hydric indicators may take up to 10 years. Except for a few obligate and facultative wet species, most existing vegetation would persist with the contribution of existing surface drainage and groundwater-flow.

With these changes to hydrology and vegetation, it is anticipated that the transition to pre-leak conditions would result in a shift in vegetative communities and 7-WL would be permanently affected. Over time, 7-WL would no longer meet the definition of a wetland. Wetland 7-WL provides limited functions and values due to its size (0.07 acre), which include groundwater recharge, nutrient removal, and limited wildlife habitat. As the site changes over time in response to the cessation of leak flows, it is assumed that these wetland functions would be eliminated. However, the site would remain vegetated and low-lying areas surrounding the reservoir would continue to support forested wetland habitat. Therefore, the permanent disturbance to 7-WL represents a marginal loss of wetland habitat that is not characterized as a significant adverse impact to water resources. Permanent disturbance is further analyzed in Section 9.19, “Project wide Impact Analysis.”

Leak Contributions during Low Flow

To assess the contribution of 7-FP to the unnamed tributary, desktop calculations of critical low flows (7Q10 and 7Q2 flows) were completed. The 7Q10 and 7Q2 flows are commonly used

measures of low flow and represent the lowest 7 day average flow with return periods of 10 years and 2 years, respectively. In the analysis of Leak 7, the 7Q10 and 7Q2 were adapted to understand conditions during critical low flow periods where further flow reductions from leak repair would result in the greatest potential impact to local hydrology. Average flow was also calculated to compare with typical baseline conditions.

The analysis indicated that the unnamed tributary has a drainage area of approximately 325 acres where Leak 7 enters the stream. This drainage area was calculated using the USGS StreamStats Program.¹ Flow estimates were calculated for the tributary and compared to the measured leak flow as shown in **Table 9.14-17**.

Table 9.14-17: Estimated Leak Contributions for Croton Dam Road Study Area

Flow Scenario	Unnamed Tributary Stream Flow ¹ (gpm)	Maximum Leak Flow (gpm) ²	Leak Flow to Unnamed Tributary Flow (%)
Average	458.7	31.5	6.9
7Q2	21.1	31.5	149.3 ³
7Q10	8.8	31.5	358.0 ³
Notes:			
¹ Based on USGS gauge 0137499350 on Hunter Brook, south of Yorktown, New York and data for 2000 to 2008.			
² Leak flow is based on flow measured on March 28, 2014 during typical Catskill Aqueduct operation.			
³ With or without leak contribution, the unnamed tributary remains an intermittent stream, with 7Q10 flows less than 45 gpm.			

During average flow conditions, the leak flow would be a minor contributor to the unnamed tributary's natural flow. The estimated average daily flow for the unnamed tributary at the confluence with Leak 7 was computed as approximately 460 gpm. The maximum flow of Leak 7 is estimated to be 31.5 gpm. During average flow conditions, the flow of the leak is approximately 7 percent of the baseflow of the unnamed tributary (i.e., the portion of stream flow that is not runoff).² The State defines a stream as intermittent if its 7Q10 is less than 45 gpm (0.1 cfs). With or without leak contribution, the unnamed tributary is an intermittent stream because the 7Q10 flow of 8.8 gpm combined with the maximum leak flow of 31.5 gpm totals 40.3 gpm. This is consistent with flows observed during field visits. Flow associated with the unnamed tributary to New Croton Reservoir is primarily influenced by its drainage area. As described earlier, 7-FP enters the unnamed tributary approximately 250 linear feet upstream of New Croton Reservoir, which is a short reach in which marginal changes in flow would not significantly affect the tributary as a whole.

¹ http://water.usgs.gov/osw/streamstats/new_york.html. The historic record of flows at a nearby gauged stream was normalized (e.g., divided by the drainage area) to calculate flows independent of drainage area. This information was then multiplied by the respective receiving stream's drainage area at the point where the leak enters the waterbody, thus creating a flow distribution for the ungauged receiving stream.

² This estimate assumes that leak flow is not part of the natural flow of unnamed tributary to New Croton Reservoir.

Leak repair would return the stream to naturally occurring, pre-leak conditions. Because the tributary is currently an intermittent stream, the marginal reductions in flow and wetted widths due to leak repair would be similar to baseline conditions. There would be no effect on other surface water resources. Based on New Croton Reservoir's approximate volume of 19 billion gallons, no impacts to New Croton Reservoir are expected to occur due to the repair of Leak 7. Therefore, leak repair would restore the unnamed tributary to pre-leak conditions and would not significantly alter the stream's hydrology.

Water Resources Conclusions

Repair and rehabilitation work activities would include internal leak repair or installation of a passive dechlorination system if leak repair is not successful, which could result in temporary or permanent disturbance to water resources. Leak 7 is artificial flow sourced from the Catskill Aqueduct that is non-jurisdictional based on a USACE determination dated January 21, 2015. Internal leak repair would not result in physical disturbance to surface water or wetlands, as all access and staging would take place in upland areas. If dechlorination is necessary, protection of the unnamed tributary and Wetland 7-WL would be provided while construction is taking place near Leak 7. Dechlorinated aqueduct water that would be temporarily discharged to the unnamed tributary 1 to New Croton Reservoir would be conducted in accordance with applicable regulatory requirements. Once the Catskill Aqueduct returns to typical operations in 2023, the passive dechlorination system would be removed and the site would be restored to natural conditions.

Leak repair would eliminate the flowpath 7-FP, and leak flows would cease to contribute to the unnamed tributary 1 to New Croton Reservoir and Wetland 7-WL. However, flow associated with the unnamed tributary 1 to New Croton Reservoir is primarily influenced by its drainage area and overland flow; therefore, changes in flow as a result of the repairs to Leak 7 are anticipated to have minor effects on the unnamed tributary. The unnamed tributary would remain an intermittent stream following leak repair. Additionally, under average flow conditions, the contribution of Leak 7 compared to the baseflow of the unnamed tributary is relatively low (7 percent) indicating the majority of the average flow is comprised of other sources.

Leak repair is anticipated to eventually result in a permanent loss of 7-WL, as the wetland transitions to upland habitat. Naturally occurring wetlands along New Croton Reservoir and its tributaries would be unaffected by leak repair and continue to provide functions and values following the repair and rehabilitation. Therefore, while permanent loss of wetland habitat would occur, this habitat was likely artificially sustained by leak flow and its loss does not represent a significant adverse impact to wetlands in the study area.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Croton Dam Road Study Area.

Terrestrial Resources

The natural resources study area in the vicinity of the Croton Uptake Boathole and Leak 7 consists of hemlock-northern hardwood forest (Edinger et al. 2014). This is surrounded by deciduous forest with a successional old field at the boathole. The trees in the area include

eastern hemlock, yellow birch (*Betula alleghaniensis*), red oak (*Quercus rubra*), chestnut oak (*Quercus prinus*), box elder (*Acer negundo*), American beech, white ash (*Fraxinus americana*), black oak (*Q. velutina*), and sweet birch (*Betula lenta*). Shrubs include winged euonymus (*Euonymus alatus*) and Japanese barberry (*Berberis thunbergii*). New York fern (*Parathelypteris noveboracensis*) was observed in understory of the forested community. The following herbs were observed in the cleared area: common mugwort (*Artemisia vulgaris*), deer's tongue grass (*Dichanthelium clandestinum*), yarrow (*Achillea millefolium*), wild bergamot (*Monarda fistulosa*), vetch (*Vicia* spp.), switchgrass (*Panicum virgatum*), and bluestem (*Andropogon gerardii*). The area of hemlock-northern hardwood forest observed during field visits is not mapped as a significant natural community by the NYNHP.

The Town of Yorktown regulates removal of trees (Yorktown Town Code Chapter 270: Trees). Exemptions include tree removal that is necessary to maintain public or private rights-of-way held under New York City permits or under easements. While the limits of construction are located on City-owned land and may qualify for this exemption, terrestrial resources within the study area warrant analysis.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Croton Dam Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be the same as baseline conditions.

Work activities associated with the repair and rehabilitation would include minor tree clearing and shrub removal to establish staging areas. Nine trees consisting of two species with a range of average dbh of between 7.3 and 10.3 inches may be removed from the natural resources study area. The species of trees to be removed include three eastern hemlock and six red maple (*Acer rubrum*). These trees are located adjacent to the existing Catskill Aqueduct. Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Additionally, tree removal would be conducted on DEP property and in accordance with applicable requirements set forth by the Town of Yorktown. This tree removal is minor and would occur in discrete locations along the densely forested areas east and west of the aqueduct, and would not dramatically change the character of area or affect surrounded trees.

Following construction, all equipment would be removed from the study area, and staging areas would be restored to natural conditions. Vegetated areas temporarily cleared during construction would be restored with similar communities via reseeded. During temporary chlorination, chlorinated leak water would travel through the flowpath at the ground surface, and is not anticipated to permeate the ground beyond the defined flowpath. Chlorinated water would be treated at the leak. See Section 9.19, "Project-wide Impact Analysis," for an analysis of the potential impact at locations where chlorinated water from the aqueduct enters the surrounding environment. Following the repair and rehabilitation work activities within the natural resources study area, operation of the Catskill Aqueduct would be consistent with baseline conditions and natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Croton Dam Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected, species that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” nine species were identified as having the potential to occur in the study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these nine species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below (see **Table 9.14-18**).

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the Croton Dam Road Study Area is shown in **Table 9.14-18**. The analysis included an evaluation of the repair and rehabilitation work activities within the natural resource study area and field visits, as applicable.

Table 9.14-18: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Croton Dam Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Bog Turtle	<i>Clemmys [=Glyptemys] mühlenbergii</i>	Threatened	Endangered	Wetland 7-WL is a forested wetland and soils are not mucky. The wetland is 0.07 acre and the surrounding forested area provides a closed canopy so that it lacks open areas for basking. A Phase I Habitat Assessment is not warranted (as per USFWS guidelines). Therefore, there are no effects anticipated and no further analysis for bog turtles is warranted for this study area.	No
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on November 5 and 11, 2014, and August 13, 2015. Potential habitat exists within the successional old field and deciduous forest. Work activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, as a mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions and the leak repair would not affect breeding, nesting, or foraging habitat. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on November 5 and 11, 2014, and August 13, 2015. Potential habitat exists within the successional old field and deciduous forest. However, work activities would be largely confined to previously disturbed areas. Any eastern hognose snakes that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Upon construction completion, the staging areas would be restored to natural conditions and the leak repair would not affect breeding, nesting, or foraging habitat. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No
Spotted Turtle	<i>Clemmys guttata</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on November 5 and 11, 2014, and August 13, 2015. Potential habitat could be disturbed by leak repair resulting in permanent loss of a 0.07 acre isolated wetland and changes in hydrology. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.

Table 9.14-18: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Croton Dam Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Birds					
Bald Eagle	<i>Haliaeetus leucocephalus</i>	BGPA/ MBTA	Threatened	NYNHP identified the nearest nest to be 11,200 feet from the work sites, well beyond the DEP and USFWS recommended buffer restriction of 330 and 660 feet, respectively (USFWS 2007b). The dam on New Croton Reservoir is located approximately 2.5 miles west of the leak and the active nest. The leak is outside the flight path between the dam and the nest. Therefore, there are no effects anticipated and no further analysis for Bald Eagles is warranted for this study area.	No
Osprey	<i>Pandion haliaetus</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visits on November 5 and 11, 2014, and August 13, 2015. Potential foraging and roosting habitat includes New Croton Reservoir. Ospreys could use the shoreline habitats north of the study area but their foraging covers large areas and they likely use the entire reservoir and shoreline as well as more distant waterbodies. Also, Ospreys are not known to nest in or near the study area. Therefore, there are no effects anticipated and no further analysis for Ospreys is warranted for this study area.	No
Sharp-shinned Hawk	<i>Accipiter striatus</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visits on November 5 and 11, 2014, and August 13, 2015. Potential roosting, nesting, and foraging habitat exists within the study area. However, a variety of habitats would be available for the species' use in the vicinity during construction and no direct disturbance or mortality is anticipated. Limited tree removal is unlikely to directly affect nests, as these would be located in the forest interior beyond the construction limits. Therefore, there are no effects anticipated and no further analysis for Sharp-shinned Hawks is warranted for this study area.	No

Table 9.14-18: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Croton Dam Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	A summer habitat survey was conducted on November 21, 2013 and no individuals were incidentally observed. Potential roosting trees were identified within study area. Potential bat roosting habitat includes trees in vicinity of Leak 7. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened Unlisted	A summer habitat survey was conducted on November 21, 2013 and no individuals were incidentally observed. Potential roosting trees were identified within study area. Potential bat roosting habitat includes trees in vicinity of Leak 7 and superstructure housing the Croton Lake Uptake Boathole. There were no signs of roosting bats at the facility. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Notes: BGPA: Bald and Golden Eagle Protection Act MBTA: Migratory Bird Treaty Act					

Spotted Turtle (Clemmys guttata)

In the future with the repair and rehabilitation, there would be no direct impacts to spotted turtles (*Clemmys guttata*) during construction, as individuals would be able to utilize the site or seek out alternative suitable habitats that are available nearby. Perimeter silt fencing would be erected as required for erosion and sediment control prior to commencing work. This would help prevent individual turtles from entering the work sites during construction. However, potential habitat would be altered by leak repair because 7-FP would be eliminated. Wetland hydrology for 7-WL is partially provided by 7-FP, and the potential cessation of leak water would reduce the overall amount of water entering the wetland system. The hydrologic changes are anticipated to result in permanent loss of 7-WL. Flows in the unnamed tributary would decrease from their artificially elevated levels upon repair of the leak. During prolonged dry conditions, the tributary could revert back to an intermittent stream, and spotted turtles would be able to seek out and utilize alternative suitable habitats that are available nearby. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect spotted turtles in this study area.

Indiana Bat (Myotis sodalis)

A summer habitat survey to identify potential roosting trees was conducted on November 21, 2013. Potential bat roosting habitat includes a black oak located near the storm drain at the terminus of the roadside swale (see **Figure 9.14-34**). The presence of adjacent forest areas and a potential roost tree within the survey area indicate potential summer habitat for both bat species within the forested areas of the study area.

Repair and rehabilitation work activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct and would be localized and confined to the immediate vicinity of the Croton Lake Uptake Chamber, existing boathole, and Leak 7. Repair and rehabilitation activities at the work sites would occur with minimal clearing of brush and a limited number of trees, none of which provide potential roosting habitat. Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats. Repair and rehabilitation would not result in significant loss or modification of forested habitat for roosting Indiana bats.

There may be temporary noise from repair and rehabilitation work activities that discourages Indiana bats from roosting in the immediate vicinity of the work sites. However, there is abundant suitable habitat in the surrounding areas in which Indiana bats could roost. Flows in the unnamed tributary 1 would decrease from their artificially elevated levels due to leak repair. Over time, no measurable effects of leak repair are anticipated and foraging habitat would continue to be available within the study area and in adjacent forested areas. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, Indiana bats in the natural resources study area.

Northern Long-eared Bat (Myotis septentrionalis)

A summer habitat survey to identify potential roosting trees was conducted on November 21, 2013. While northern long-eared bats have been documented to roost in man-made structures, they are more commonly known to roost in trees (see the potential roosting habitat results for Indiana bats, above).

Repair and rehabilitation work activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct and would be localized and confined to the immediate vicinity of the Croton Lake Uptake Chamber, existing boathole, and Leak 7. Repair and rehabilitation on the work sites would occur with minimal clearing of brush and a limited number of trees, none of which provide potential roosting habitat. Tree removal would be conducted from November 1 through March 31 to avoid impacts to northern long-eared bats. Repair and rehabilitation would not result in significant loss or modification of forested habitat for roosting northern long-eared bats.

There may be temporary noise from repair and rehabilitation work activities that discourages northern long-eared bats from roosting in the immediate vicinity of the work sites; however, there is abundant suitable habitat in the surrounding areas in which northern long-eared bats could roost. Flows in the unnamed tributary would decrease from their artificially elevated levels due to leak repair. Over time, no measurable effects of leak repair are anticipated and foraging habitat would continue to be available within the study area and in adjacent forested areas. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, northern long-eared in the natural resources study area.

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to bog turtles (*Clemmys [=Glyptemys] muhlenbergii*), eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), Bald Eagles (*Haliaeetus leucocephalus*), Ospreys (*Pandion haliaetus*), or Sharp-shinned Hawks (*Accipiter striatus*) associated with the repair and rehabilitation. Repair and rehabilitation may affect, but is not likely to adversely affect, spotted turtles, Indiana bats, and northern long-eared bats.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Croton Dam Road Study Area.

9.14.5.8 Hazardous Materials

To evaluate the potential presence of hazardous materials within Croton Dam Road Study Area (see **Figure 9.14-26**), a Phase I ESA was conducted in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify RECs. The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site itself and for its neighboring properties within appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a geotechnical investigation and environmental health and safety sampling, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Geotechnical environmental investigations and sampling were undertaken for contaminants of concern including volatile and semivolatile organics, PCBs, and total petroleum hydrocarbons along the aqueduct within the study area. Chromium was noted in the soil sampling results. Total

chromium was reported in the sample collected at the Croton Lake Uptake Chamber. Chromium concentrations however were consistent over a widespread sampling area and are more likely associated with background concentrations. Along the Catskill Aqueduct, there are widespread occurrences of chromium, which are attributed to existing geological formations. The legacy data indicates that materials sampled did not identify any asbestos-containing materials, lead, PCB and mercury paints within this the study area. In addition, gasoline range organic compound and total petroleum hydrocarbons were also detected, but at low concentrations that are not considered to be indicative of contamination that warrants remedial actions.

Based on the results of the environmental investigations completed within the Croton Dam Road Study Area, no other hazardous materials are known to exist. The soil results support the reuse of excavated materials as backfill and do not suggest the need for special management, handling or health and safety measures at this time.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Croton Dam Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Croton Dam Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, excavation associated with the work activities for the installation of a new air vent would occur on previously disturbed soils and access road improvements would occur on previously disturbed and undisturbed soils. Following construction and temporary chlorination of the repair and rehabilitation, equipment and the passive dechlorination system would be removed from the Croton Dam Road Study Area. The staging areas would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Croton Dam Road Study Area.

9.14.5.9 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Croton Dam Road Study Area.

Access to the repair and rehabilitation limits of construction for the work sites within the Croton Dam Road Study Area would be via Croton Dam Road to a DEP access road (see **Figure 9.14-26**). Croton Dam Road is a two-lane, two-way local roadway. To the extent available, construction

vehicles would travel on truck-permitted roadways directly to and from the Croton Dam Road Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area. There is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site. However, there are no DEP employees who work at or visit the study area on a daily basis, and the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Croton Dam Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Croton Dam Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and, therefore, be the basis of this transportation analysis. Of these activities, internal leak repair at Leak 7 would generate the most vehicle trips. Internal leak repair would occur in fall ~~2018~~2017, for 24 hours per day, 7 days a week for approximately 4 weeks during the first 10-week shutdown (see **Table 9.14-14**).

In the future with the repair and rehabilitation, construction vehicles would travel along Croton Dam Road to the DEP access road. The estimated number of peak-day one-way vehicle trips associated with the internal leak repair is 32 vehicle trips, or approximately 64 peak-day vehicle round trips that would travel to and from the study area. The majority of the peak daily vehicle round trips, approximately 40 vehicle round trips or 40 PCEs, would be workers either traveling to and from the study area, or traveling directly to and from the staging area (depending on parking capacity), with potentially 8 daily shuttle trips between the study area and the staging area. The remaining approximately 16 peak-day vehicle round trips (22 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with the internal leak repair is approximately 32 peak-hour vehicle trip ends (36 PCEs). This includes approximately 20 vehicle trip ends (20 PCEs) from workers traveling directly to and from the staging area. It also includes approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 8 vehicle trip ends (12 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming two 12-hour shifts, this would be during the 6 AM to 7 AM, and 6 PM to 7 PM hours, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in 36 peak-hour PCEs along Croton Dam Road, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, "Transportation." The work activities at the Croton Dam Road Study Area would be short-term (totaling 15 weeks over 2.5 years; see **Table 9.14-14**) and would not generate public parking or transportation demands or pedestrian activity within the Croton Dam Road

Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in potential significant adverse impacts to transportation within the Croton Dam Road Study Area.

9.14.5.10 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation work activities within the Croton Dam Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation activities as shown on **Figure 9.14-35**.

The Croton Dam Road Noise Study Area includes residential parcels and a recreational trail within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Town of Yorktown Noise Control Ordinance §216-2, which prohibits excessive noise between 11 PM and 7 AM, Sunday evening through Friday morning, and 10 PM and 8 AM, Friday evening through Sunday morning. The Town of Yorktown Ordinance §300-67 also prohibits adverse noise impacts from watershed and water supply facilities.

Existing ambient noise levels within the Croton Dam Road Study Area are influenced by vehicular traffic traveling on Taconic State Parkway, Aqueduct Road, Croton Dam Road, and other local roadways. The existing noise levels within the study area are comparable to a quiet suburban and rural residential environment based on the distance from major transportation corridors and the population density of the area. Typical noise levels (measured as L_{eq}) for quiet suburban and rural communities are 40 dBA during the daytime and 34 dBA during the nighttime.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP’s understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Croton Dam Road Study Area within the timeframe of the impact analysis.

Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Croton Dam Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Croton Dam Road Study Area would occur on two sites. The stationary noise-generating equipment that would be used within the Croton Dam Road Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating

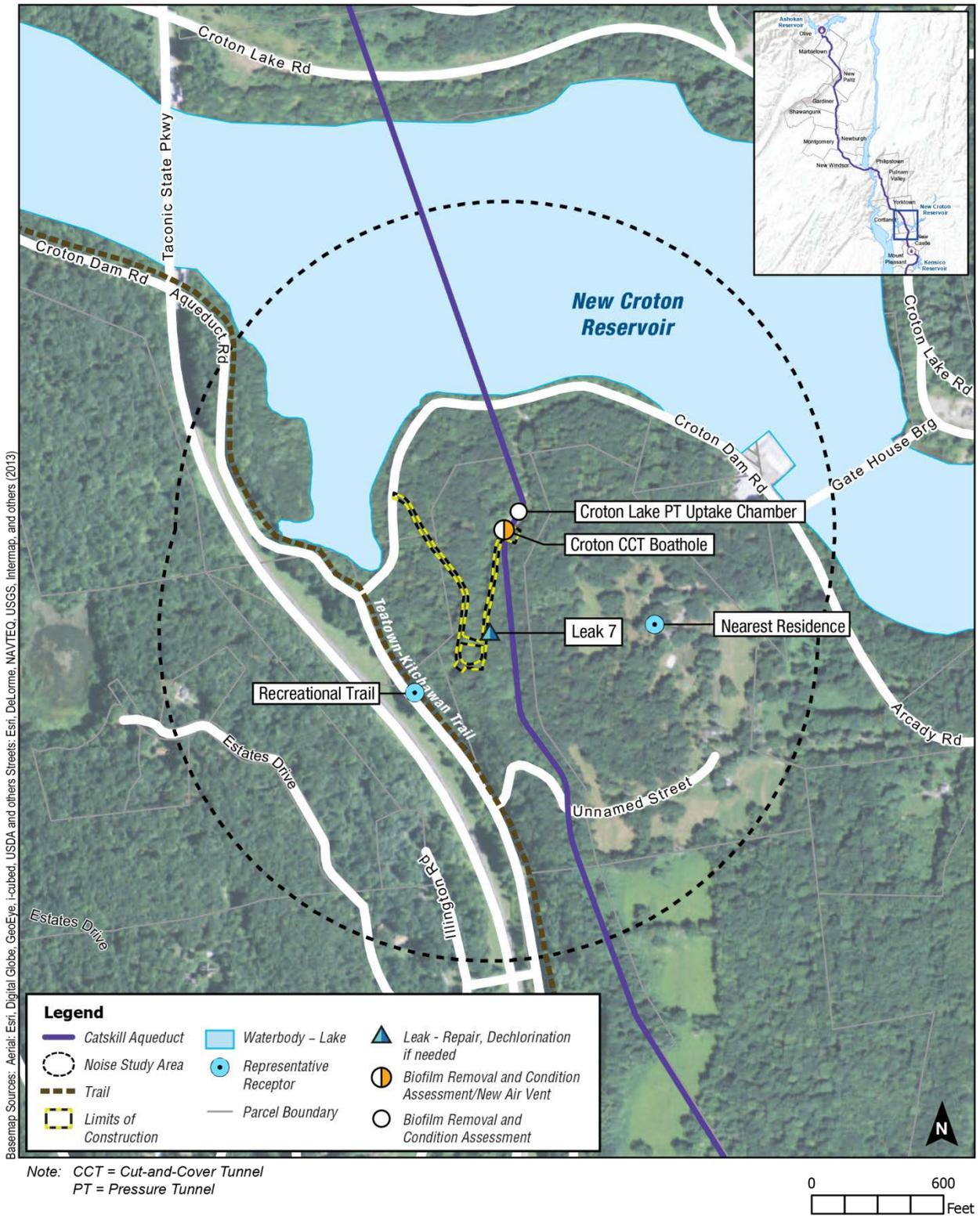


Figure 9.14-35: Noise - Croton Dam Road Study Area



equipment associated with leak repair would emit the most noise. Internal leak repairs would occur in fall ~~2018~~2017 for up to 24 hours per day, 7 days a week for approximately 4 weeks during the first 10-week shutdown (see **Table 9.14-14**). Other noise-producing equipment would also be utilized within the study area for a limited period during work activities. However, this equipment would not be expected to be louder than those associated with leak repair.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the leak repair. Associated equipment reference noise levels are shown in **Table 9.14-19**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.14-19: Stationary Source Construction Equipment Modeled for Repair and Rehabilitation Work Activities within the Croton Dam Road Study Area - Noise Analysis and Reference Noise Levels (L_{eq})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA) ¹
Backhoe	76
Ventilation Fan	85
Generator	82

Note:
¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.

Table 9.14-20 shows the results of the stationary construction noise analysis. Leak repairs within the Croton Dam Road Study Area during the repair and rehabilitation could produce noise levels (L_{eq}) of approximately 64 dBA at the nearest residence approximately 760 feet away from the leak repair activities and approximately 68 dBA at the recreational trail approximately 435 feet away from the leak repair activities.

Table 9.14-20: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors within the Croton Dam Road Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)	Town of Yorktown Noise Limit (dBA)	Potential for Code Exceedance (Yes or No)
Nearest Residence	757	64	NA	Yes ¹
Recreational Trail	435	68	NA	Yes ¹

Notes:
NA = Not Applicable
¹ Repair and rehabilitation work activities have the potential to occur during hours when excessive noise is prohibited, as defined by the Town of Yorktown.

Although there would be an increase in stationary noise levels, work would primarily occur in the fall and winter months when residents typically have windows closed, and noise levels inside would be further reduced to an interior noise level (L_{eq}) of approximately 40 dBA. Repair and

rehabilitation work activities have the potential to occur during hours when excessive noise is prohibited, as defined by the Town of Yorktown, DEP would work with the Town of Yorktown, as appropriate.

Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Croton Dam Road Study Area. The repair and rehabilitation would be temporary in nature with the peak work activities occurring during leak repair in fall ~~2018~~2017 for a limited period (e.g., 4 weeks).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Croton Dam Road Study Area.

9.14.5.11 Neighborhood Character

The character of the Croton Dam Road Study Area is largely defined by a mix of residential, public services, and undesignated land use associated with the Taconic State Parkway, owned by NYSDOT, and its physical setting within a rural location (see **Figure 9.14-29**). The Catskill Aqueduct traverses the study area in a general north to south direction. In the northwest corner of the study area, two unnamed tributaries flow to an inlet of New Croton Reservoir, next to which is located Aqueduct Road, which branches off to Croton Dam Road bending to the north. The limits of construction for the work sites and associated access road are located in a public services corridor owned and maintained by DEP.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Croton Dam Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning and socioeconomic conditions, an impact analysis for the Jacob Road Study Area was not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," and Section 9.3.4, "Socioeconomic Conditions." As described in Section 9.14.5.4, "Open Space and Recreation," Section 9.14.5.5, "Historic and Cultural Resources," and Section 9.14.5.6, "Visual Resources," the work activities would not affect open space and recreation, historic and cultural resources, and visual resources in the Croton Dam Road Study Area. Furthermore, the public policy impact analysis provided in Section 9.14.2, "Town of Yorktown Impact Analysis," concluded the work activities were consistent with applicable plans.

As discussed in Section 9.14.5.9, "Transportation," during construction, the work activities in the Croton Dam Road Study Area would be short-term (totaling 15 weeks over 2.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and

noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts related to neighborhood character within the Croton Dam Road Study Area.

9.14.6 KITCHAWAN ROAD STUDY AREA IMPACT ANALYSIS

Within the Kitchawan Road Study Area, the aqueduct consists of the Kitchawan Cut-and-Cover Tunnel. One access manhole with a culvert drain sluice gate is located in the study area (see **Figure 9.14-36**).

Work activities within the Kitchawan Road Study Area would include: sluice gate replacement and associated streambank restoration and protection; and biofilm removal and condition assessment.

9.14.6.1 Study Area Location and Description

The Kitchawan Road Study Area is located along the upper Catskill Aqueduct in the Town of Yorktown. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. The study area is bounded by Kitchawan Road (State Route 134) to the south and includes Old Kitchawan Road and a portion of Arcady Road in its eastern section, with an unnamed tributary to New Croton Reservoir flowing from southwest to northeast. The proposed work site within the study area is located at the culvert drain sluice gate access manhole. Access to the work site would be provided by driving over the cut-and-cover tunnel from an entrance off Kitchawan Road. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work site. **Figure 9.14-36** shows an aerial photograph of the study area, including the path of the aqueduct, the limits of construction for each work site, and the proposed access route.

The study area consists of residential, public services, open space and recreation, and agricultural land uses. Land cover is forested with scattered residential homes. The limits of construction for the work site and associated access route are located in a public services corridor with grassy cover, which is owned and maintained by DEP. **Figure 9.14-37** shows a map of the land uses in the study area and its surroundings.

The study area is entirely located within a single-family residential (R1-200) zoning district, as designated by the Town of Yorktown Zoning Code (see **Figure 9.14-38**). The Catskill Aqueduct is a permitted use as a water supply facility within the single-family residential (R1-200) zoning district.

There are no federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

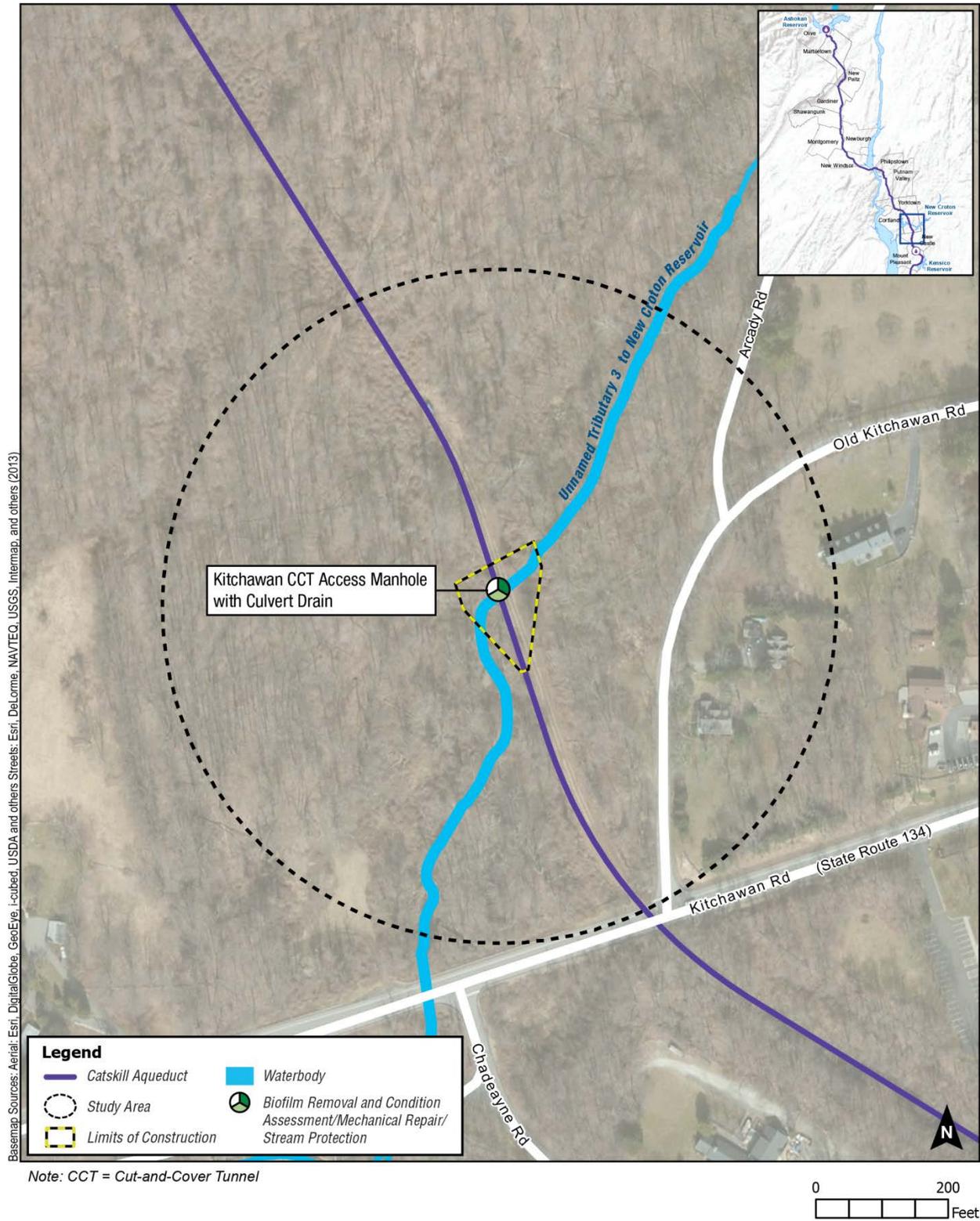


Figure 9.14-36: Study Area – Kitchawan Road



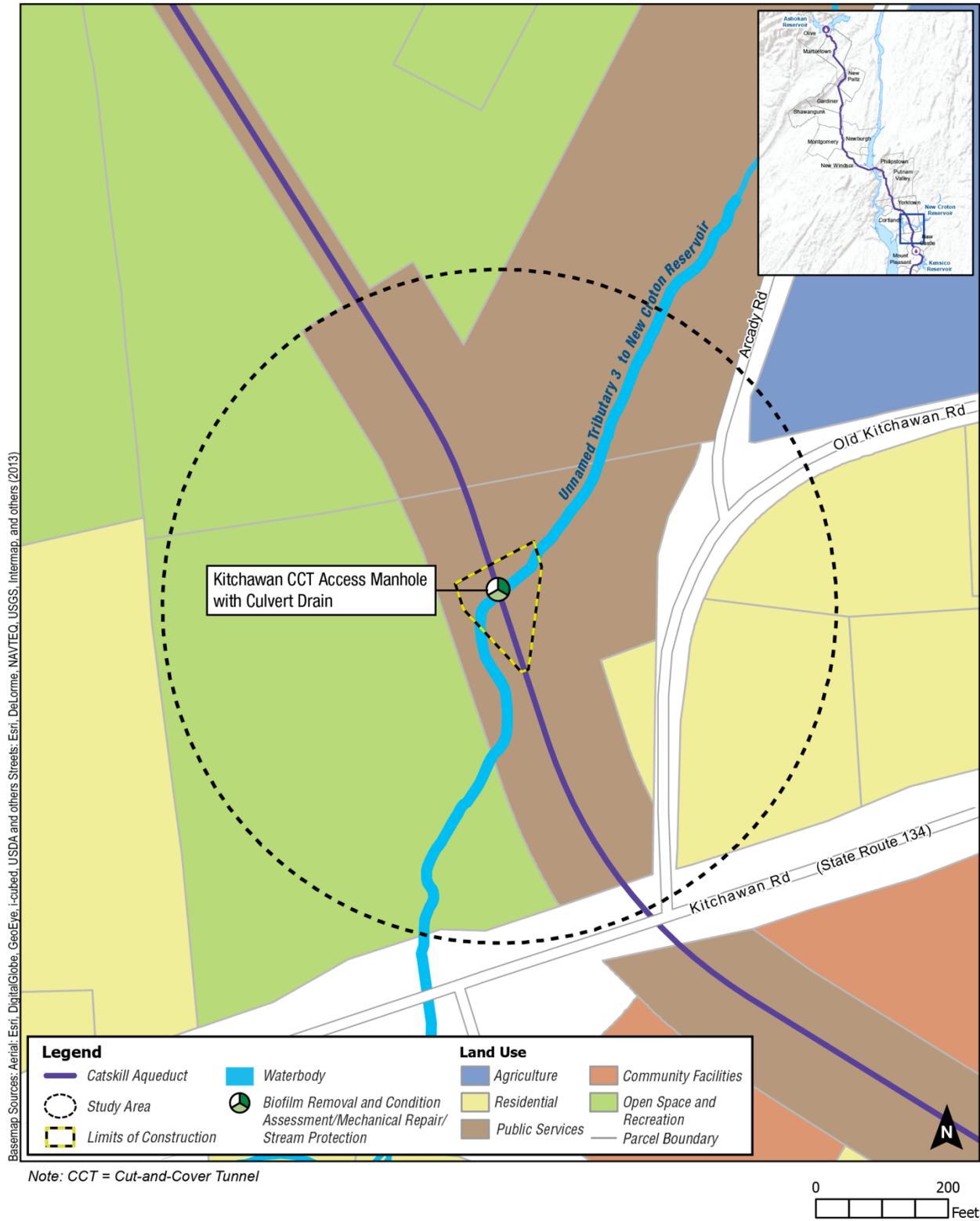


Figure 9.14-37: Land Use – Kitchawan Road Study Area



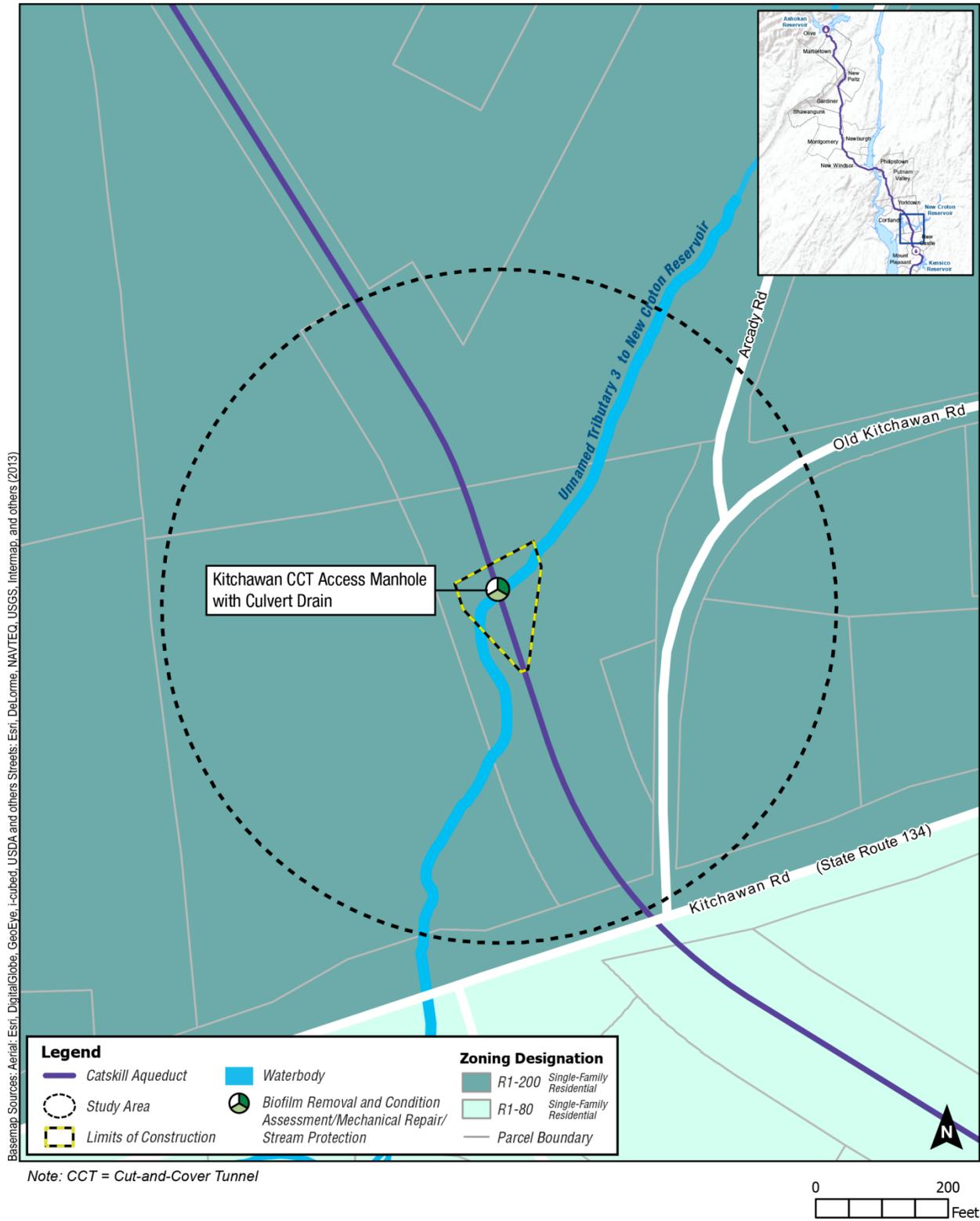


Figure 9.14-38: Zoning – Kitchawan Road Study Area



9.14.6.2 Proposed Activities within the Kitchawan Road Study Area

To support activities within the Kitchawan Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas would provide additional parking, and equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. A site plan showing a layout of limits of construction for the work site, which would occupy a total of 14,500 square feet, is shown on **Figure 9.14-39**. The schedule for work within the study area is shown in **Table 9.14-21**. The duration of active construction within the Kitchawan Road Study Area is estimated to total 11 weeks over 1.5 years.

Work in the study area would begin in summer ~~2019~~2018 with staging and access improvements. Improvements may involve minor grading and the removal of approximately five trees near the culvert, in addition to underbrush clearing and gravel placement for leveling and erosion control.

Following the staging and access improvements, streambank protection measures associated with the culvert drain sluice gate access manhole in summer ~~2019~~2018 would take place. Work would entail the restoration of riprap aprons on either end of the culvert to their original as-built conditions and the removal of accumulated debris from within the culvert. Temporary in-stream disturbance would cover a total area of approximately 1,190 square feet. To facilitate a dry work area, sandbags would be installed upstream of the culvert, and the stream would be diverted to a point downstream, which would include a turbidity curtain for sediment control. Replacement of the culvert drain sluice gate, which would require unwatering of the aqueduct, would occur during the second 10-week shutdown in fall ~~2019~~2018. In conjunction with sluice gate replacement, the gate stem and manhole cover would be replaced, and the concrete walls of the manhole would be repaired. During the repair work, sandbags would be installed inside the aqueduct to prevent any residual water from entering the natural environment.

Biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019, with access into the aqueduct provided by the access manhole. It would also serve as a collection point for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”).

Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

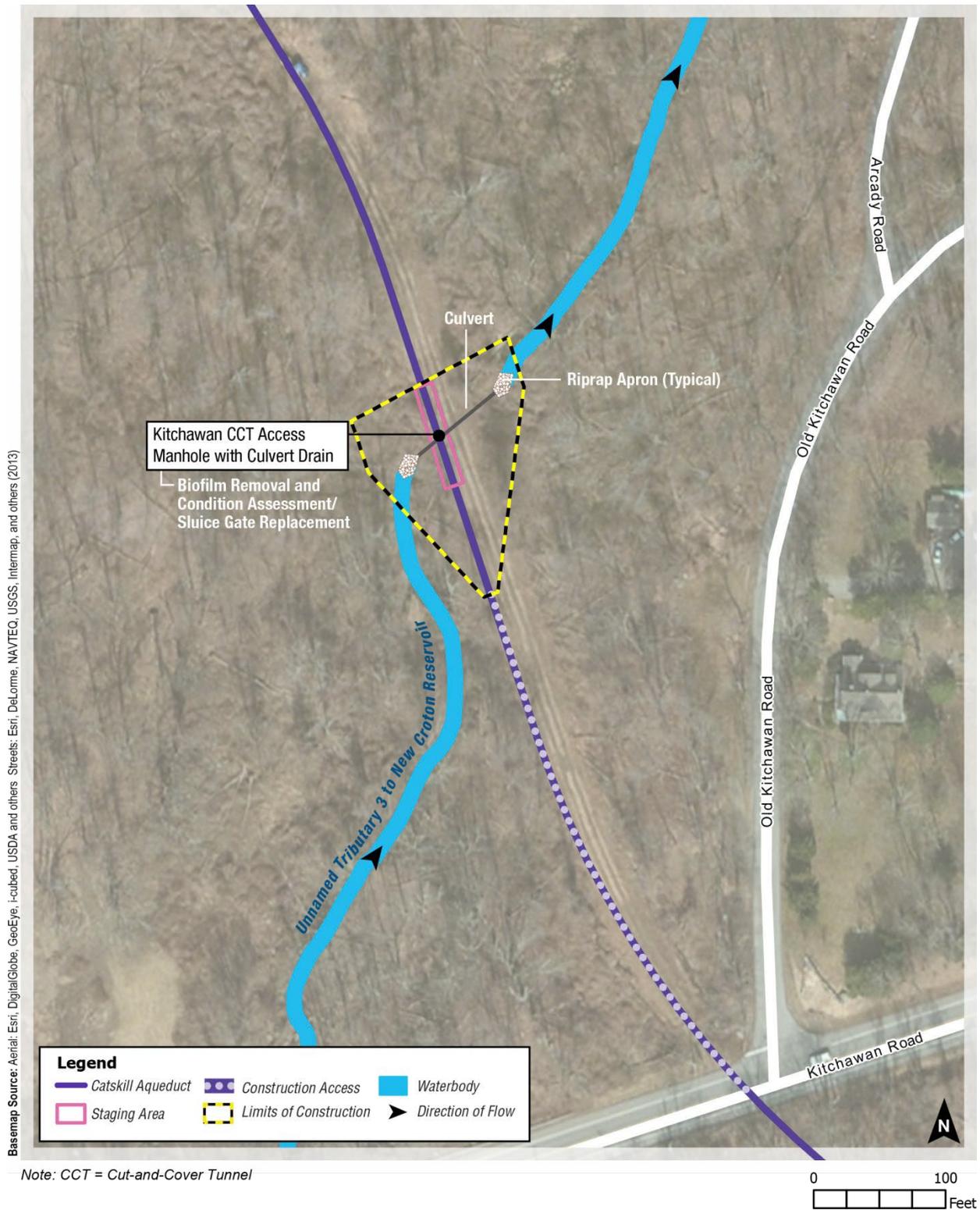


Figure 9.14-39: Site Plan – Kitchawan Road Study Area



Table 9.14-21: Schedule of Work Activities within the Kitchawan Road Study Area

Work Activity	Dates	Duration	Work Hours	Crew Size ¹
Staging and Access Improvements ²	Summer 2019 2018	2 weeks	Monday to Friday, 7 AM to 5 PM	8
Streambank Restoration and Protection	Summer 2019 2018	3 weeks	Monday to Friday, 7 AM to 5 PM	10
Sluice Gate Replacement	Fall 2019 2018 (Second 10-week shutdown)	4 weeks	7 days a week, 7 AM to 7 PM	12
Biofilm Removal and Condition Assessment	Fall 2020 2019 (Third 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	21
Note: ¹ Crew size refers to the number of people anticipated at the work site(s). ² Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>).				

Impact categories analyzed for the Kitchawan Study Area are presented in Sections 9.14.6.3, “Open Space and Recreation” through 9.14.6.9, “Neighborhood Character” and include: open space and recreation; visual resources; natural resources including water resources, terrestrial resources, federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.14.2, “Town of Yorktown Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” an impact analysis related to land use and zoning; socioeconomic conditions; community facilities and services; historic and cultural resources; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, federal/State Candidate Species, and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area is not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.14.6.3 Open Space and Recreation

As shown on **Figure 9.14-40**, one open space and recreation resource exists within the Kitchawan Road Study Area. Approximately 7.5 acres of Teatown Lake Reservation are located within the north and western portion of the Kitchawan Road Study Area. Teatown Lake Reservation is a non-profit nature preserve and environmental education center which encompasses approximately 1,000 acres. Primary uses include outdoor recreation such as hiking, picnicking, snowshoeing, and mountain biking. No mapped hiking trails or designated recreational resources are located within the portion of Teatown Lake Reservation in the study area.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP’s understanding that no plans to expand or create new open space or recreational resources are anticipated within the Kitchawan Road Study Area within the timeframe of the impact analysis.

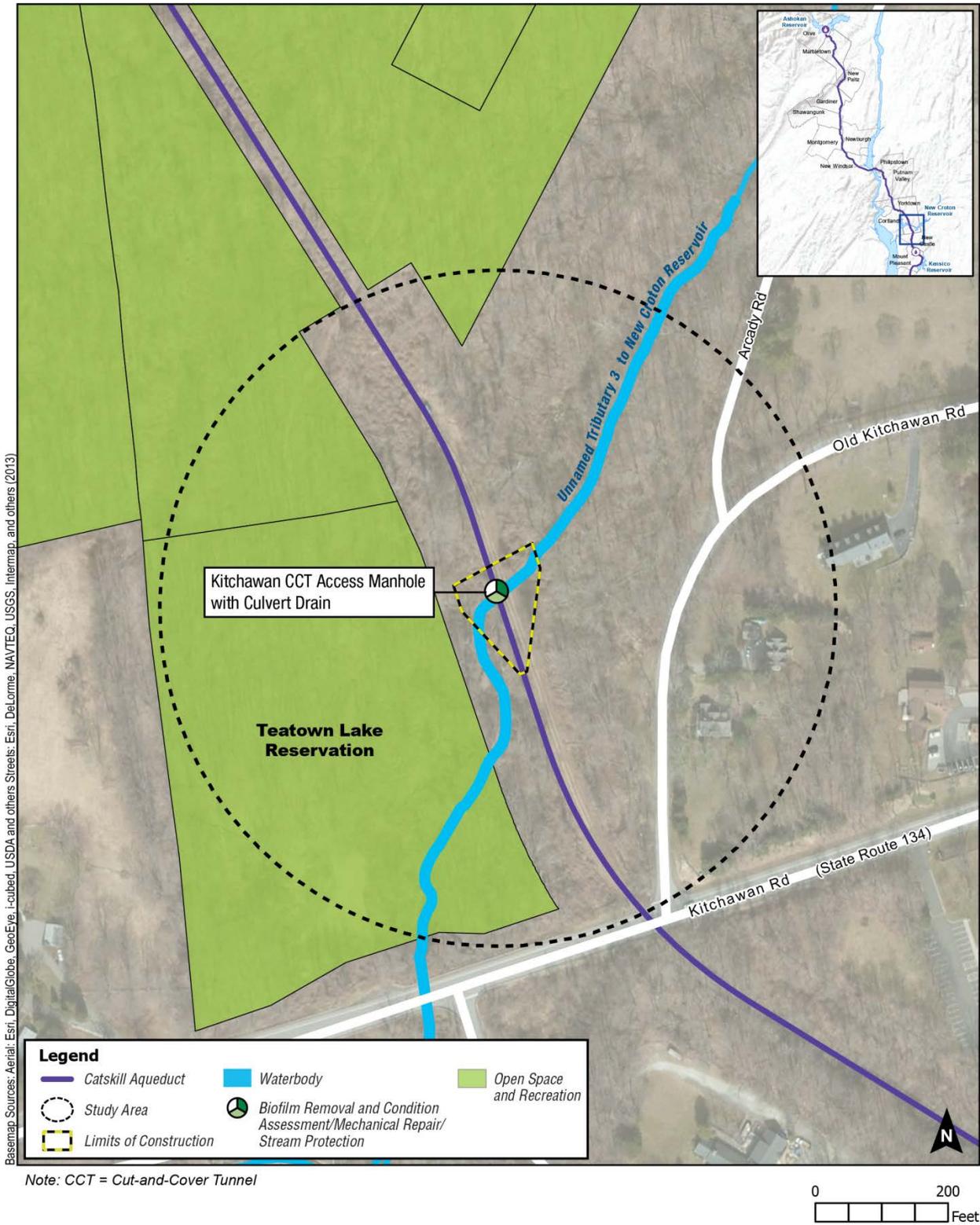


Figure 9.14-40: Open Space and Visual Resources – Kitchawan Road Study Area



Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open space is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Kitchawan Road Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities within the Kitchawan Road Study Area would be short-term (intermittently over 1.5 years). Work activities would include the restoration of riprap aprons on either end of the culvert to their original as-built conditions, removal of accumulated debris from within the culvert, replacement of the culvert drain sluice gate, and biofilm removal and conditional assessment of the aqueduct. The proposed limits of construction, which would occupy 14,500 square feet, would be located east of Teatown Lake Reservation. Vehicle access for construction would be provided by driving over the cut-and-cover tunnel from an entrance off Kitchawan Road. Repair and rehabilitation work activities within the Kitchawan Road Study Area would not disrupt the use of the open space. They may temporarily affect views looking east from Teatown Lake Reservation. However, no trails or recreational amenities are present in the study area.

As discussed in the Section 9.14.6.8, “Noise,” for the Kitchawan Road Study Area, while Teatown Lake Reservation is not a noise-sensitive receptor since there are no maintained formal trails, there may be temporary increases in noise levels due to the work activities of the rehabilitated Catskill Aqueduct within the study area. Noise levels may affect recreational uses of the preserve; however, upon completion of the repair and rehabilitation work activities, the recreational uses within the preserve would be unaffected.

Following construction, all equipment and vehicles would be removed from the Kitchawan Road Study Area and staging areas would be restored to baseline conditions. The streambank restoration measures would be consistent with as-built conditions and are permanent structures that would remain following construction. Following repair and rehabilitation activities, operation of the aqueduct would be consistent with baseline conditions

As such, the repair and rehabilitation would not encroach upon, cause a loss of open space, affect the use or physical character of, or permanently disrupt views from Teatown Lake Reservation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Kitchawan Road Study Area.

9.14.6.4 Visual Resources

The study area for the visual resources analysis is the area within the Kitchawan Road Study Area, and it also includes view corridors that extend beyond based on the locations that are publicly accessible.

As shown on **Figure 9.14-40**, visual resources, consisting of one locally significant resource, the Teatown Lake Reservation, were identified within the Kitchawan Road Study Area. The Teatown Lake Reservation is an approximately 1,000-acre nature preserve and environmental education center that is open to the public for recreational uses. No mapped hiking trails or designated recreational resources are located within the portion of Teatown Lake Reservation in the study area.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within Kitchawan Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Kitchawan Road Study Area would be the same as baseline conditions.

The work areas at the manhole location are not located within the Teatown Lake Reservation, and are not visible from the reservation due to the existing dense vegetation.

During construction, the repair and rehabilitation work activities within the Kitchawan Road Study Area would be short-term (intermittently over 1.5 years). Work activities would include the restoration of riprap aprons on either end of the culvert to their original as-built conditions, removal of accumulated debris from within the culvert, replacement of the culvert drain sluice gate and conditional assessment of the aqueduct. The limits of construction would be located east of Teatown Lake Reservation. Repair and rehabilitation work activities, equipment, and vehicles within the Kitchawan Road Study Area may temporarily disrupt views looking east from Teatown Lake Reservation. However, no trails or recreational amenities are present in the study area. While some tree removal may be required for the construction staging area, this would not greatly detract from the aesthetics of the area because the staging area would be screened from view by the surrounding forested land. Following completion of the repair and rehabilitation work activities, the construction equipment and vehicles would be removed from the Kitchawan Road Study Area. Additionally, the permanent streambank restoration measures would be consistent with baseline conditions and would not be visible from the Teatown Lake Reservation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Kitchawan Road Study Area.

9.14.6.5 Natural Resources

As shown on **Figure 9.14-41**, the natural resources study area for analysis is the immediate area surrounding the limits of construction, including Kitchawan Cut-and-Cover Tunnel culvert drain access manhole. Resources potentially occurring within the natural resources study area were identified through an evaluation of aerial photographs, NYSDEC water classification data, NYSDEC freshwater wetlands maps, USFWS NWI maps, national hydrography data, published soil survey maps, USGS topographic maps, and agency consultations.

Based on the desktop analysis, the natural resources study area contains mowed roadside/pathway surrounded by deciduous forests. An unnamed tributary to New Croton Reservoir (referred to herein as unnamed tributary 3) also flows through the natural resources study area.

These habitats have the potential to support protected water resources, terrestrial resources, and wildlife species, and an analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the Bailey Brook-Croton River subwatershed (HUC 020301010307) of the Lower Hudson Watershed (HUC 02030101).

Unnamed tributary 3 to New Croton Reservoir is subject to federal jurisdiction under Sections 401 and 404 of the Clean Water Act for proposed work activities. As a B(TS) classified stream, the unnamed tributary is subject to State Protection of Waters regulations with a regulated 50-foot buffer to protect the streambed and banks. In addition, the Town of Yorktown regulates activities in wetlands at least 1,000 square feet in size and natural watercourses with a 100-foot regulated buffer (Yorktown Town Code Chapter 178: Freshwater Wetlands). Work activities within water resources and their 100-foot buffer may be subject to Town review and approval.

Resources potentially occurring within the study area were identified through a desktop evaluation of NYSDEC water classification data, NYSDEC freshwater wetlands maps, USFWS NWI maps, national hydrography data, published soil survey maps, and USGS topographic maps. Based on the desktop analysis, there are no mapped wetlands within the natural resources study area.

Surface Water

One surface water, the unnamed tributary 3 to New Croton Reservoir, was identified within the natural resources study area. The water resource name, area, and length are shown in **Table 9.14-22**.

Table 9.14-22: Water Resources and Classifications within the Kitchawan Road Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Unnamed Tributary 3 to New Croton Reservoir	1,800	250	Riverine, Lower Perennial, Unconsolidated Bottom, Intermittently Flooded (R2UBJ)

Unnamed Tributary 3 to New Croton Reservoir

Unnamed tributary 3 to New Croton Reservoir flows in a southwest to northeast direction through the natural resources study area (see **Figure 9.14-41**). Based on the desktop analysis, this watercourse would be best classified as a “Riverine, Lower Perennial, Unconsolidated Bottom, Intermittently Flooded” system based on the Cowardin System (Cowardin et al. 1979). Outside of the study area, unnamed tributary 3 to New Croton Reservoir continues to flow north to New Croton Reservoir, which is part of the New York City Water Supply System.

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the study area would be the same as baseline conditions.

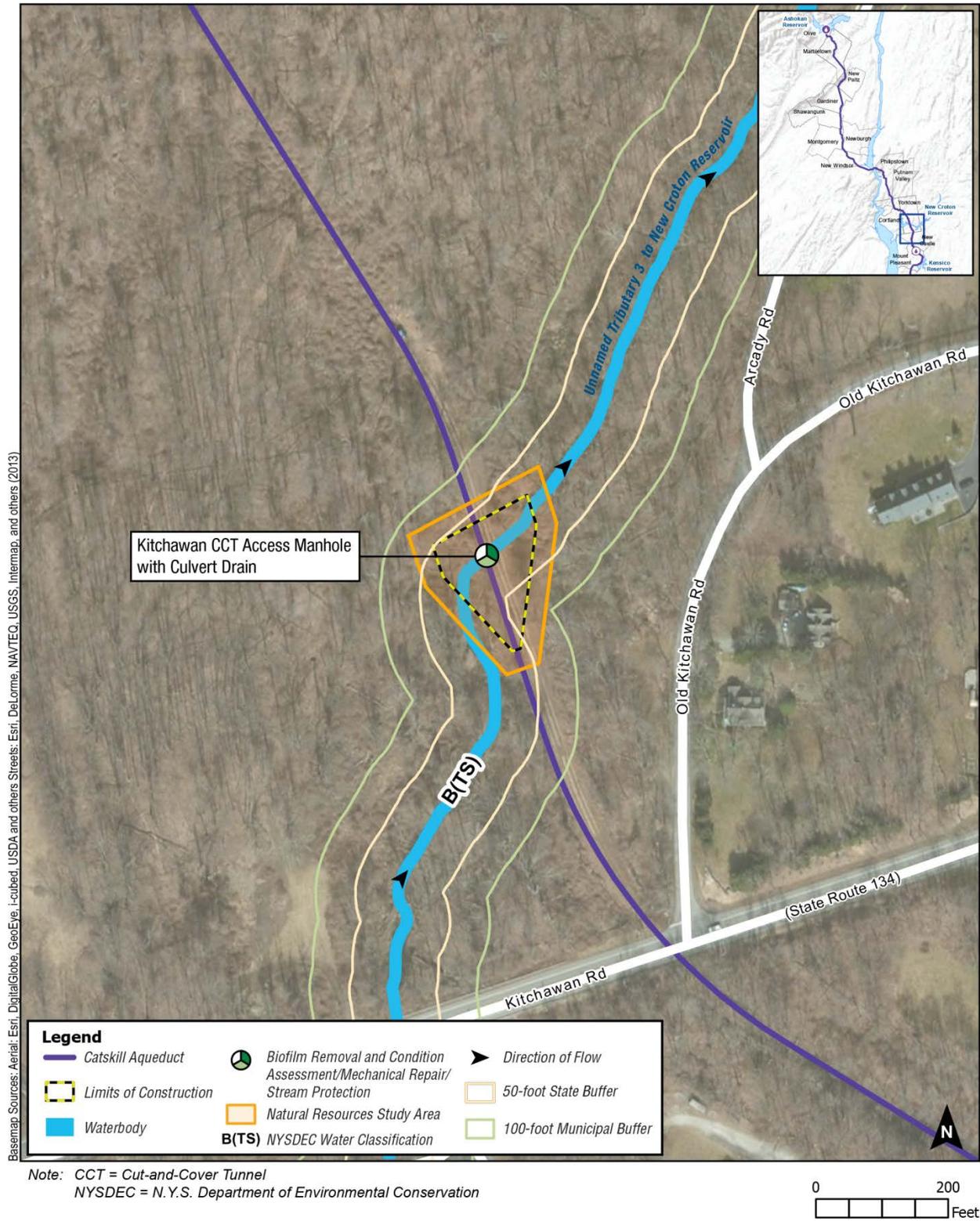


Figure 9.14-41: Natural Resources- Kitchawan Road Study Area



Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Kitchawan Road Study Area.

Construction

Work activities related to the repair and rehabilitation would temporarily disturb surface water and vegetated riparian areas, and have the potential to temporarily alter flows in the unnamed tributary 3 to New Croton Reservoir.

The site may be accessed multiple times during construction. As the unnamed tributary 3 to New Croton Reservoir supports wild trout and can be designated as a coldwater fishery, in-water construction activities are generally prohibited from October 1 to April 30 unless otherwise authorized. DEP would complete this work outside of the coldwater fisheries window (e.g., during the summer months), as presented within Section 9.19, “Project-wide Impact Analysis,” to limit potential adverse impacts to trout.

Prior to commencement of the repair and rehabilitation, sediment and erosion control measures would be installed to prevent the transport of sediment resulting from temporary disturbance to water resources within the study area. All access and staging activities would occur in upland areas along the top of the cut-and-cover berm. Equipment would then use the side-slope of the berm to reach both the inlet and outlet of the culvert.

The original riprap aprons installed at the upstream and downstream ends of the culvert during the aqueduct’s original construction have deteriorated and are no longer protecting the shoreline. As part of the repair and rehabilitation, the riprap aprons would be restored to their original, as-built condition. To complete the culvert drain repairs and maintain a dry work area, sandbags would be installed upstream of the culvert, and the stream would be diverted to a point downstream, which would include a turbidity curtain for sediment control. To protect the stream and its banks, and prevent sediment and other pollutants from entering the waterway, these temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements. All stream flow would be diverted around the work site and the diversion would be for the shortest possible duration. Therefore, downstream resources would not be affected.

Anticipated temporary disturbance to water resources and regulated buffers was quantified based on the limits of construction and proposed work activities (see **Table 9.14-23**). Construction staging would occur on top of the aqueduct and the temporary stream diversion would occur in the stream, resulting in approximately 1,190 square feet of temporary disturbance and no permanent disturbance to the unnamed tributary 3 to New Croton Reservoir. Within the State Protection of Waters buffer approximately 12,120 square feet of temporary disturbance would occur. Additionally, approximately 13,340 square feet of temporary disturbance would occur within the municipal water resource buffer. No permanent disturbance to water resources is proposed. Following construction, temporarily disturbed areas would be restored to natural conditions.

Table 9.14-23: Estimated Disturbance to Water Resources within the Kitchawan Road Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Unnamed Tributary 3 to New Croton Reservoir	1,800	1,190 <i>Temporary stream diversion and temporary downstream turbidity curtain</i>	0
50-foot State Protection of Waters Buffer	21,540	12,120 <i>Construction staging area and construction equipment use</i>	0
100-foot Municipal Water Resource Buffer	27,880	13,340 <i>Construction staging area and construction equipment use</i>	0

Riprap would be restored at both the inlet and outlet of the culvert. Riprap aprons placed at the culvert’s inlet and outlet would provide erosion protection and are consistent with original as-built conditions. Additionally, riprap aprons at the culvert drain have been sized based upon the maximum discharge capacity, even though it is unlikely flows of this magnitude would be discharged at the site.

Discharges of raw aqueduct water and groundwater could take place during a shutdown of the Catskill Aqueduct and could occur in the future during DEP’s typical operations when access to the aqueduct is required for maintenance or inspection. The aqueduct would be unwatered with temporary stream protection measures in place prior to reconstructing the culvert drain sluice gate. Unwatering events to surface water may also occur at any time after stream protection measures are in place during and following construction and, therefore, are described in “Operation” below.

Operation

Upon completion of the culvert drain sluice gate repairs and streambank restoration and protection, the function of the sluice gates would be restored and discharges of raw water to unnamed tributary 3 to New Croton Reservoir could occur in the future during DEP’s typical operations. The aqueduct could be unwatered via the sluice gates to conduct maintenance or inspection. During the aqueduct shutdowns, groundwater may infiltrate the aqueduct. Groundwater would flow by gravity to the culvert drain sluice gate and could also be discharged to the unnamed tributary. This would be a rare event.

An analysis was conducted to determine if the raw water discharge would be greater than the bankfull stream flow. Bankfull flow is the flow that just fills the channel to the top of its banks (i.e., stream capacity) and at the point in which water begins to flow onto the floodplain. Bankfull flow was predicted for unnamed tributary 3 to New Croton Reservoir using the USGS StreamStats Program. If the discharge associated with an unwatering event is greater than the bankfull flow, indirect downstream effects, such as an increase in erosion and scouring over the baseline could occur. A maximum discharge flow of approximately 13,600 gpm would be expected when the culvert drain is operated during a 1.5-year storm event. This is less than the calculated bankfull flow of unnamed tributary 3 to New Croton Reservoir of approximately

38,100 gpm, meaning it would be similar to baseline conditions. Additionally, groundwater infiltration at this site is expected to be 50 to 100 gpm, which would not be expected to create flooding conditions. These discharges would not result in a bankfull event. Therefore, indirect downstream impacts such as increases in erosion and scouring would be minimal.

Based on this analysis, the stream would not be affected by aqueduct discharges at this location. It is unlikely this site would be used for unwatering on a routine basis because raw aqueduct water in this segment is more easily discharged to the Saw Mill River at the Harlem Railroad Steel Pipe Siphon Blow-off Chambers (see Washington Avenue Study Area in the Village of Pleasantville). Rather, the sluice gate would be used to discharge infiltrated groundwater during the repair and rehabilitation and future maintenance. Therefore, discharges would be below the calculated bankfull flows. They would be rare and last several hours or days in duration, depending on the length of the shutdown of the Catskill Aqueduct, and are not anticipated to contribute to erosion of the stream channel.

Water Resources Conclusion

Water resources in the natural resources study area are limited to unnamed tributary 3 to New Croton Reservoir. Work activities would result in temporary disturbance to the unnamed tributary 3 to New Croton Reservoir. The unnamed tributary would be temporarily diverted and the area temporarily disturbed. Upon completion of the repair and restoration work, the unnamed tributary would be returned to its original location. Restoring the riprap aprons to their original condition would be an in-kind repair and would be beneficial in that these would minimize future scouring when the sluice gate is operated. Other areas temporarily affected by work activities would also be restored to natural conditions following construction; therefore, there would be no construction-related effects on surface water or wetlands. Discharges would be limited to groundwater infiltration and possibly unwatering events that are not anticipated to result in erosion and sediment control issues that may adversely affect the stream channel.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Kitchawan Road Study Area.

Terrestrial Resources

Terrestrial resources within the natural resources study area is characterized as a deciduous forest that may be similar to a rich mesophytic forest (Edinger et al. 2014). During construction, tree removal may be needed. The Town of Yorktown regulates tree removal (Yorktown Town Code Chapter 270: Trees). Exemptions include tree removal that is necessary to maintain public or private rights-of-way held under New York City permits or under easements. While the limits of construction are located on City-owned land and may qualify for this exemption, terrestrial resources within the study area warrant an analysis.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Kitchawan Road Study Area within the timeframe of the impact analysis. Natural processes such as changes in habitat due to natural vegetative succession are anticipated

to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be the same as baseline conditions.

Within the natural resources study area, removal of approximately five trees may be needed to facilitate repairs. The trees proposed for removal are located on DEP property in the immediate vicinity of the work area, on and adjacent to the existing Catskill Aqueduct. Tree removal would occur in discrete locations near the culvert along the cleared corridor, and would not dramatically change the character of the area or affect surrounding trees. Any tree removal needed would be conducted from November 1 through March 31 to avoid impacts to potential roosting trees for Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Due to the limited number of trees that may need to be removed, this activity appears to be exempt from Town of Yorktown tree removal regulations. However if applicable, tree removal on DEP property would be conducted in accordance with the requirements set forth by the Town of Yorktown.

Following construction, all equipment would be removed from the natural resources study area and staging areas would be restored to natural conditions. Operation of the Catskill Aqueduct would be consistent with baseline conditions. Natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Kitchawan Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected, species that could occur up to 0.25 mile from the work site were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” nine species were identified as having the potential to occur in the natural resources study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these nine species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.14-24**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and desktop assessments, as applicable.

Table 9.14-24: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Kitchawan Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Bog Turtle	<i>Clemmys</i> [= <i>Glyptemys</i>] <i>muhlenbergii</i>	Threatened	Endangered	Based upon the desktop analysis there are no mapped wetlands present within the natural resources study area. Perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work site. Upon construction completion, the site would be restored to natural conditions and is not anticipated to affect potential habitat. Therefore, there are no effects anticipated and no further analysis for bog turtles is warranted for this study area.	No
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	Work activities would be largely confined to previously disturbed areas, if any isolated areas of potential habitat exist at the sites, as a mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work site. Finally, upon construction completion, the site would be restored to and the new streambank restoration measures that remain would not affect habitat. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	Disturbance would be temporary and limited to areas previously disturbed. Should any potential habitat exist at the site, a variety of habitats would be available for the species use in the vicinity during construction. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No
Spotted Turtle	<i>Clemmys guttata</i>	Unlisted	Special Concern	Based upon the desktop analysis there are no mapped wetlands present within the natural resources study area. Perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work site. Finally, upon construction completion, the site would be restored to natural conditions and the new streambank restoration measures that remain would be consistent with as-built conditions and are not anticipated to affect habitat. Therefore, there are no effects anticipated and no further analysis for spotted turtles is warranted for this study area.	No
Birds					
Osprey	<i>Pandion haliaetus</i>	MBTA	Special Concern	Disturbance would be temporary and limited to previously disturbed areas. Should any potential habitat exist at the site, a variety of habitats would be available for the species use in the vicinity during construction. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Ospreys is warranted for this study area.	No

Table 9.14-24: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Kitchawan Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Sharp-shinned Hawk	<i>Accipiter striatus</i>	MBTA	Special Concern	Disturbance would be temporary and limited to previously disturbed areas. Should any potential habitat exist at the site, a variety of habitats would be available for the species use in the vicinity during construction. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Sharp-shinned Hawks is warranted for this study area.	No
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	No significant loss or modification of roosting or foraging habitat would occur and foraging habitat would continue to be available in adjacent forested areas. There may be temporary noise that discourages Indiana bats from roosting in the immediate vicinity of the work site; however, there is abundant suitable habitat in the surrounding areas that Indiana bats could use for roosting and foraging. Any removal of trees and would be conducted from November 1 through March 31 to avoid impacts to potential roosting bats. Therefore, there are no effects anticipated and no further analysis for Indiana bats is warranted for this study area.	No
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	<u>Threatened</u> <u>Unlisted</u>	No significant loss or modification of roosting or foraging habitat would occur and foraging habitat would continue to be available in adjacent forested areas. There may be temporary noise that discourages northern long-eared bats from roosting in the immediate vicinity of the work site; however, there is abundant suitable habitat in the surrounding areas that could be used for roosting and foraging. Any removal of trees and would be conducted from November 1 through March 31 to avoid impacts to potential roosting bats. Therefore, there are no effects anticipated and no further analysis for northern long-eared bats is warranted for this study area.	No
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	If any potential habitat exists at the site, a variety of habitats would be available for the species use in the vicinity. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for New England cottontails is warranted for this study area.	No
Note: MBTA: Migratory Bird Treaty Act					

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There are no effects anticipated to bog turtles (*Clemmys [=Glyptemys] muhlenbergii*), eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), spotted turtles (*Clemmys guttata*), Ospreys (*Pandion haliaetus*), Sharp-shinned Hawks (*Accipiter striatus*), Indiana bats, northern long-eared bats, or New England cottontails (*Sylvilagus transitionalis*) associated with the repair and rehabilitation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Kitchawan Road Study Area.

9.14.6.6 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Kitchawan Road Study Area (see **Figure 9.14-36**), a Phase I ESA would be completed for the proposed sluice gate replacement and associated streambank restoration and protection in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify RECs. The Phase I ESA would include site reconnaissance, research on current/historic use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard.

The proposed sluice gate replacement and associated streambank restoration and protection would occur on a previously disturbed section of the Catskill Aqueduct (see **Figure 9.14-39**). Given the findings of previous subsurface investigations along similar portions of the aqueduct corridor, no subsurface ground contamination is anticipated. However, where RECs are identified, a Phase II subsurface soil investigation would be recommended to be completed for contaminants of concern (COC) prior to construction. The COC to be evaluated along the segment of the aqueduct in the study area that would be affected as part of the repair and rehabilitation work would include volatile and semivolatile organics, PCBs, and total petroleum hydrocarbons. The investigation would be recommended to be completed to determine the contamination levels, if any, of the on-site soils prior to the commencement of any work activities. Subsurface soil testing would be conducted to ensure that contaminated soil is not reused as backfill (per 6 NYCRR Part 375). Should any areas of contamination be identified, the contract documents would be revised to identify requirements for proper handling and disposal of the material.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Kitchawan Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Kitchawan Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up

power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. DEP would handle all materials in accordance with applicable federal, State, and local regulations and guidelines. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, soil disturbance associated with the work activities for the sluice gate replacement and associated streambank restoration and protection would occur on previously disturbed soils.

If any soil contamination is identified, the excavated material would be transported to an authorized off-site storage facility. All waste material, including contaminated soil would be temporarily secured using non-permeable base material, covered with plastic or geotextile to prevent soil loss, and removed from the proposed repair and rehabilitation work site within the Kitchawan Road Study Area at the end of each workday. All soils to be removed as part of the repair and rehabilitation would be transported off-site and disposed of in accordance with all federal, State and local laws. Following repair and rehabilitation, all equipment would be removed from the Kitchawan Road Study Area. The staging areas would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Kitchawan Road Study Area.

9.14.6.7 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Kitchawan Road Study Area.

Access to the repair and rehabilitation limits of construction for the work site would be via Kitchawan Road (State Route 134; see **Figure 9.14-36**). Kitchawan Road is a two-lane, two-way urban minor arterial roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Kitchawan Road Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area. There is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site; however, there are no DEP employees who work at or visit the study area on a daily basis, and the low number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Kitchawan Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Kitchawan Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be

the basis of this transportation analysis. Of these activities, biofilm removal and condition assessment would generate the most vehicle trips (see **Figure 9.14-39**). Biofilm removal and condition assessment would occur in fall ~~2020~~2019 between the hours of 7 AM and 7 PM, 7 days a week for approximately one week during the third 10-week shutdown.

In the future with the repair and rehabilitation, construction vehicles would travel along Kitchawan Road. The estimated number of peak-day one-way vehicle trips associated with biofilm removal and condition assessment is 33 vehicle trips, or approximately 66 peak-day vehicle round trips that would travel to and from the study area. The majority of the peak daily vehicle round trips, approximately 42 vehicle round trips or 42 PCEs, would be workers traveling directly to and from the staging area, with an additional 8 daily shuttle trips between the study area and the staging area. The remaining approximately 16 peak-day vehicle round trips (21 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with biofilm removal and condition assessment is approximately 33 peak-hour vehicle trip ends (36 PCEs). This includes approximately 21 vehicle trip ends (21 PCEs) from workers traveling directly to and from the staging area, approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 8 vehicle trip ends (11 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 12-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

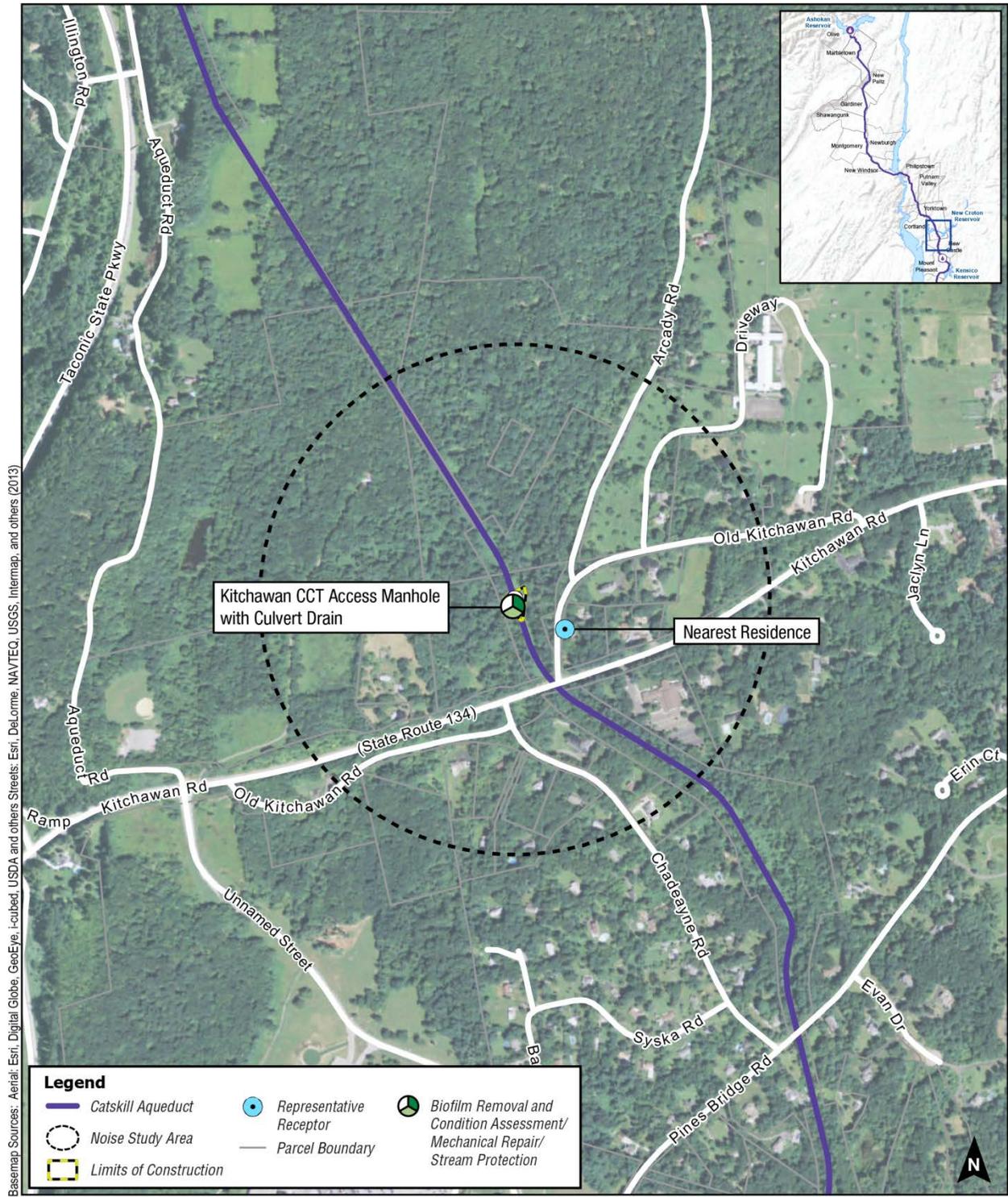
The repair and rehabilitation would result in approximately 36 peak-hour PCEs along Kitchawan Road, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, “Transportation.” The work activities at the Kitchawan Road Study Area would be short-term (totaling 11 weeks over 1.5 years; see **Table 9.14-21**) and would not generate public parking or transportation demands or pedestrian activity within the Kitchawan Road Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in potential significant adverse impacts to transportation within the Kitchawan Road Study Area.

9.14.6.8 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation activities within the Kitchawan Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation activities as shown on **Figure 9.14-42**.



Basemap Sources: Aerial: Esri, Digital Globe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Note: CCT = Cut-and-Cover Tunnel

Figure 9.14-42: Noise – Kitchawan Road Study Area



The Kitchawan Road Noise Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work site that are considered noise-sensitive receptors for this analysis. The work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Town of Yorktown Noise Control Ordinance §216-2 which prohibits excessive noise between 11 PM and 7 AM, Sunday evening through Friday morning, and 10 PM and 8 AM, Friday evening through Sunday morning. The Town of Yorktown Ordinance §300-67 also prohibits adverse noise impacts from watershed and water supply facilities.

Existing ambient noise levels within the Kitchawan Road Study Area are influenced by vehicular traffic traveling on Kitchawan Road and other nearby local roads. The existing noise levels within the study area are comparable to a quiet suburban residential environment, based on the distance from major transportation corridors, and the population density of the area. Typical noise levels (measured as L_{eq}) for quiet suburban residential communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Kitchawan Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Kitchawan Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Kitchawan Road Study Area would occur on one site. The stationary noise-generating equipment associated with streambank restoration and protection was the basis of this stationary noise analysis. Streambank restoration and protection would occur in summer ~~2019~~2018 between the hours of 7 AM and 5 PM, Monday through Friday for approximately 3 weeks prior to the second shutdown. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities; however, this equipment would not be expected to be louder than those associated with streambank restoration and protection.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for streambank restoration and protection. Associated equipment reference noise levels are shown in **Table 9.14-25**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.14-25: Stationary Source Construction Equipment Modeled at the Kitchawan Road Study Area - Noise Analysis and Reference Noise Levels (L_{eq})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA)
Excavator	81
Generator	82
Backhoe	76
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	

Table 9.14-26 shows the results of the stationary construction noise analysis. Streambank restoration and protection within the Kitchawan Road Study Area during the repair and rehabilitation could produce a noise level (L_{eq}) of approximately 68 dBA at the nearest residence approximately 340 feet away from the streambank restoration and protection activities. Repair and rehabilitation work activities would not occur during hours when excessive noise is prohibited, as defined by the Town of Yorktown.

Table 9.14-26: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors within the Kitchawan Road Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)	Town of Yorktown Noise Limit (dBA)	Potential for Exceedance (Yes or No)
Nearest Residence	342	68	NA	No
Note: NA = Not Applicable				

Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Kitchawan Road Study Area. The repair and rehabilitation would be temporary in nature, with the peak work activities occurring during streambank restoration and protection in summer ~~2019~~2018 for a limited period (e.g., 3 weeks).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Kitchawan Road Study Area.

9.14.6.9 Neighborhood Character

The character of the Kitchawan Road Study Area is largely defined by a mix of residential, public services, open space and recreation, and agricultural land uses and its physical setting within a quiet suburban location (see **Figure 9.14-37**). The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. The study area is bounded by Kitchawan Road to the south and includes Old Kitchawan Road and a portion of Arcady Road in its eastern

section, with an unnamed tributary to New Croton Reservoir flowing from southwest to northeast. The limits of construction for the work site and associated access route are located in a public services corridor with grassy cover, which is owned and maintained by DEP.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Kitchawan Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; and historic and cultural resources, an impact analysis for the Kitchawan Road Study Area is not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," Section 9.3.4, "Socioeconomic Conditions," and Section 9.3.7, "Historic and Cultural Resources," respectively. As described in Section 9.14.6.3, "Open Space and Recreation," and Section 9.14.6.4, "Visual Resources," the work activities would not affect open space and recreation and visual resources in the Kitchawan Road Study Area. Furthermore, the public policy impact analysis provided in Section 9.14.2, "Town of Yorktown Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.14.6.7, "Transportation," and 9.14.6.8, "Noise," during construction, the work activities in the Kitchawan Road Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Kitchawan Road Study Area Impact Analysis.

9.14.7 PINES BRIDGE ROAD STUDY AREA IMPACT ANALYSIS

Within the Pines Bridge Road Study Area, the aqueduct consists of the Kitchawan Cut-and-Cover Tunnel. One access manhole is located in the study area (see **Figure 9.14-43**).

Work activities within the Pines Bridge Road Study Area would include: biofilm removal and condition assessment and staging and access improvements.

9.14.7.1 Study Area Location and Description

The Pines Bridge Road Study Area is located along the upper Catskill Aqueduct in the Town of Yorktown. The Catskill Aqueduct traverses the study area in a general north to south direction. The study area is bounded by Pines Bridge Road to the south and includes Chadeayne Road in its western section, and the intersection with Evan Drive to the east with an unnamed tributary to New Croton Reservoir flowing from southwest to northeast. The proposed work site within the study area is located at the access manhole. Access to the work site would be via a new temporary access road from Pines Bridge Road. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work site. **Figure 9.14-43** shows an aerial photograph of the study area, including the path of the aqueduct, the limits of construction for the work site, and the construction limits associated with the proposed access route improvements. **Figure 9.14-44** shows photographs of the study area.

The study area consists of residential, vacant land, and public service land uses. Land cover is forested with scattered residential homes. The limits of construction for the work site and associated access route are located in a public services corridor that is lightly wooded with grassy cover, which is owned and maintained by DEP. **Figure 9.14-45** shows a map of the land uses in the study area and its surroundings.

The study area is entirely located within a one-family residential (R1-80) zoning district, as designated by the Town of Yorktown Zoning Code (see **Figure 9.14-46**). The Catskill Aqueduct is a permitted use as a water supply facility within the one-family residential (R1-80) zoning district.

There are no federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

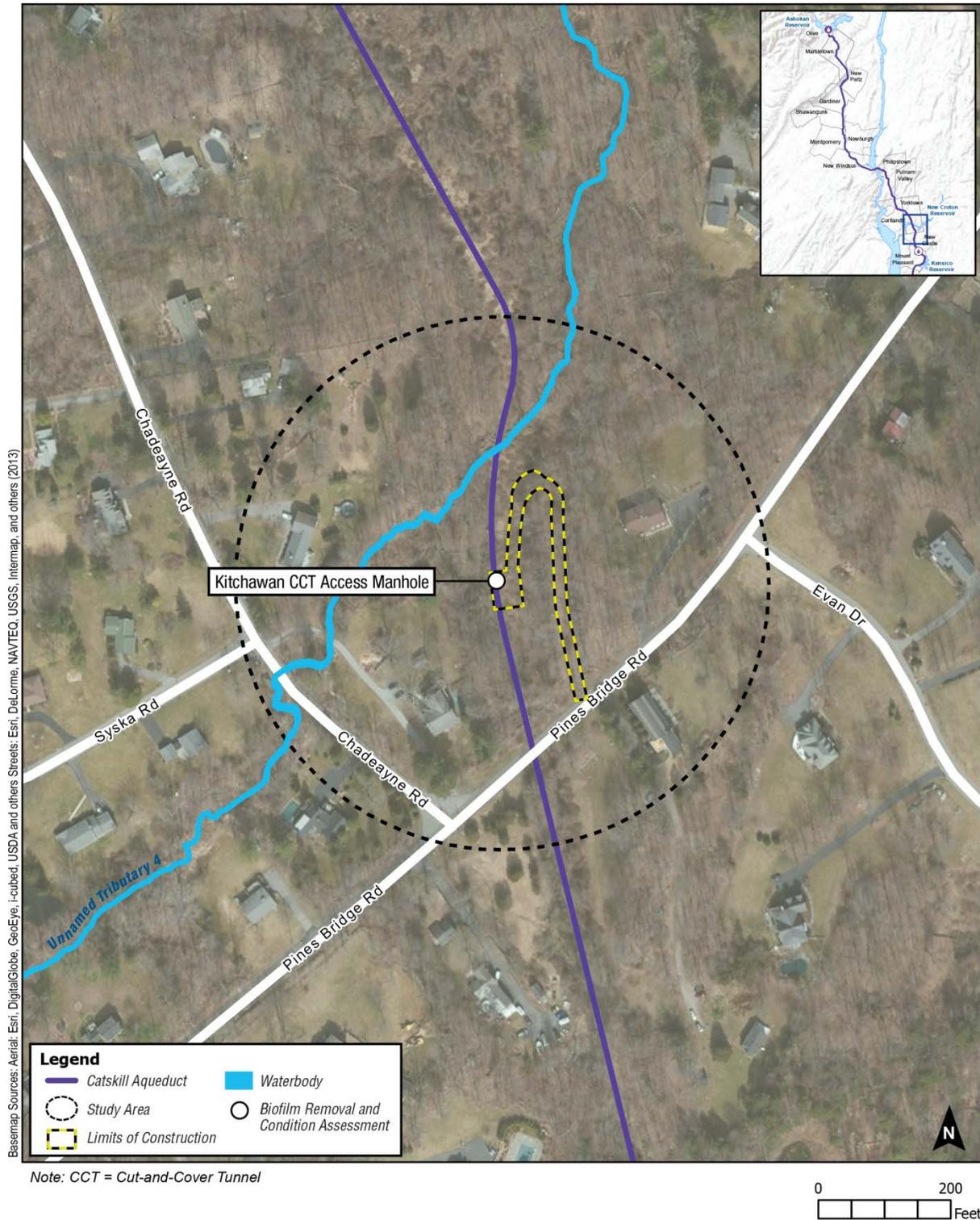


Figure 9.14-43: Study Area – Pines Bridge Road





Photograph 1: Looking southwest towards Kitchawan CCT Access Manhole. Photo taken from the berm of the aqueduct where access road off Pines Bridge Road is proposed.



Photograph 2: Looking north towards location of proposed access road off Pines Bridge Road.

Figure 9.14-44: Photographs – Pines Bridge Road Study Area



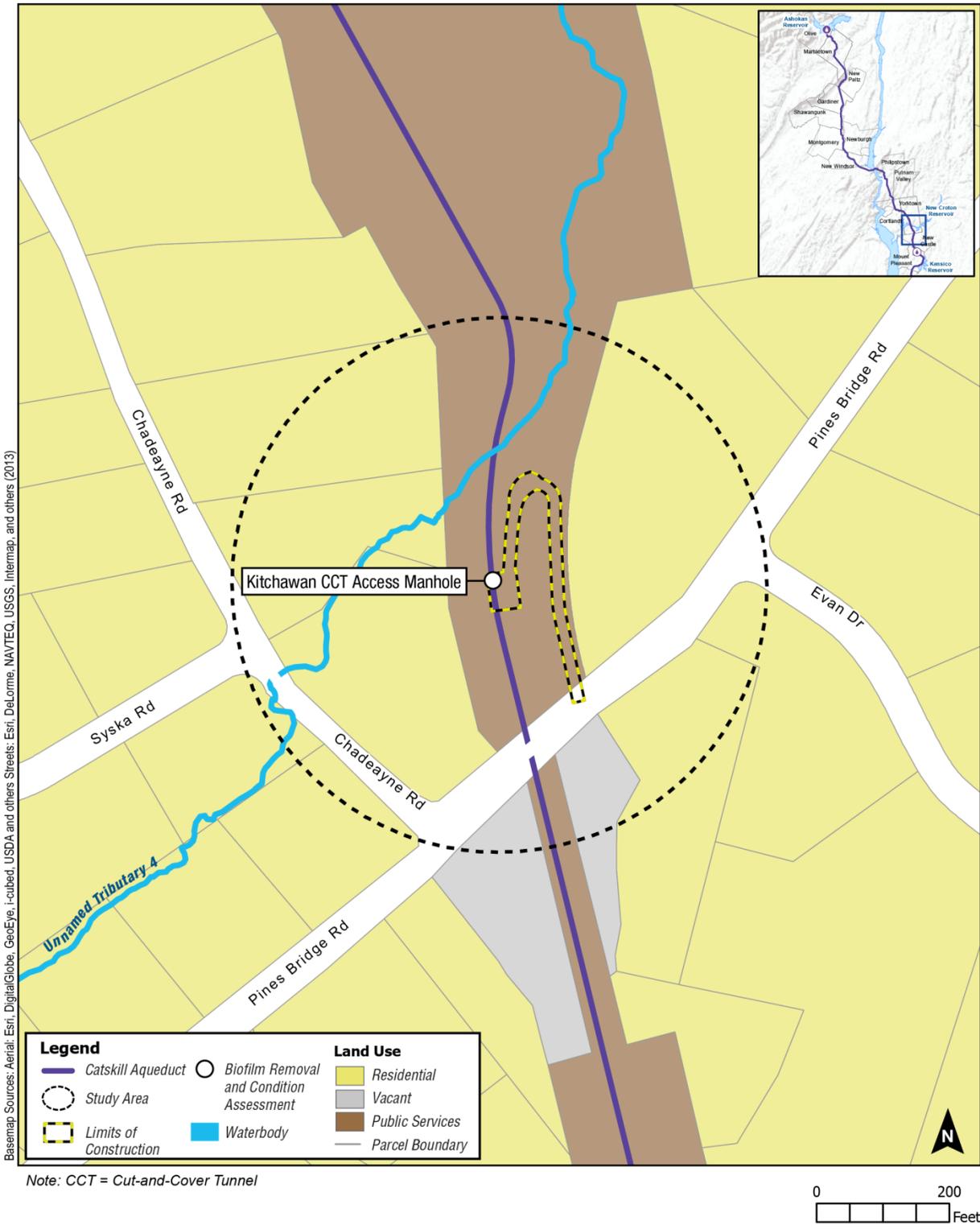


Figure 9.14-45: Land Use – Pines Bridge Road Study Area



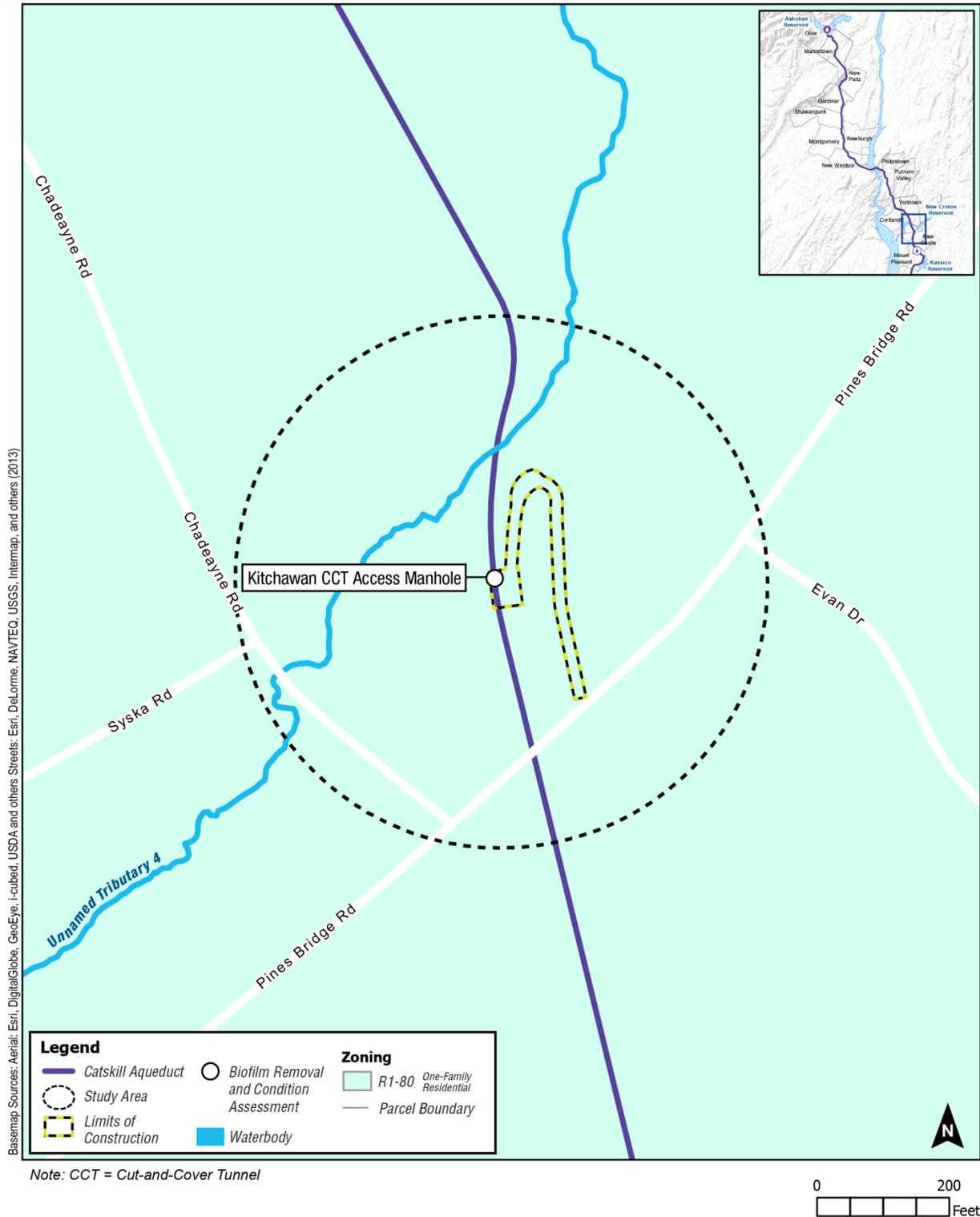


Figure 9.14-46: Zoning – Pines Bridge Road Study Area



9.14.7.2 Proposed Activities within the Pines Bridge Road Study Area

To support activities within the Pines Bridge Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. On-site staging of equipment and materials would occur within the limit of construction. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work area as needed. A site plan showing a layout of limits of construction for the work site, which would occupy a total of 12,100 square feet, is shown on **Figure 9.14-47**. The schedule for work within the study area is shown in **Table 9.14-27**. The duration of active construction within the Pines Bridge Road Study Area is estimated to total 4 weeks over 1.5 years.

Work in the study area would begin in summer 2019 with staging and access improvements. Access to the manhole would be provided via Pines Bridge Road, from which a new temporary access road would be built that parallels the aqueduct before turning west toward the aqueduct, south of the unnamed tributary to New Croton Reservoir. Since the work site served by the access road is in a lightly wooded area, grading and tree removal would be required, in addition to underbrush clearing and gravel placement for leveling and erosion control. One tree would be removed north of the new temporary access road.

Biofilm removal and condition assessment would occur during the third 10-week shutdown in fall 2020, with access into the aqueduct provided by the access manhole.

Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Table 9.14-27: Schedule of Work Activities within the Pines Bridge Road Study Area

<u>Work Activity</u>	<u>Dates</u>	<u>Duration</u>	<u>Work Hours</u>	<u>Crew Size¹</u>
<u>Staging and Access Improvements²</u>	<u>Summer 2019</u>	<u>2 weeks</u>	<u>Monday to Friday, 7 AM to 5 PM</u>	<u>8</u>
<u>Biofilm Removal and Condition Assessment</u>	<u>Fall 2020 (Third 10-week shutdown)</u>	<u>2 weeks</u>	<u>7 days a week, 7 AM to 7 PM</u>	<u>21</u>
Note:				
¹ Crew size refers to the number of people anticipated at the work site(s).				
² Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>).				

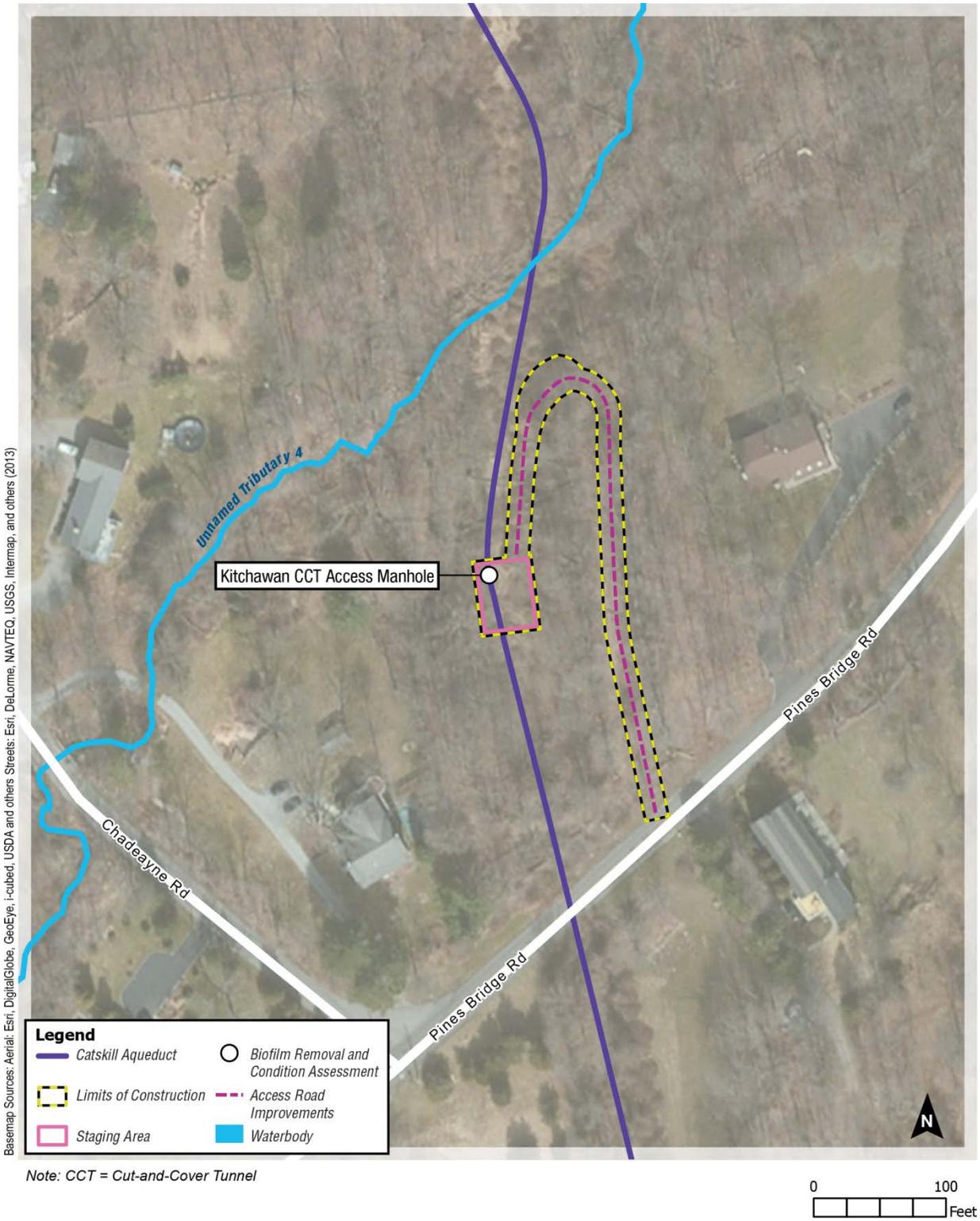


Figure 9.14-47: Site Plan – Pines Bridge Road Study Area



Impact categories analyzed for the Pines Bridge Study Area are presented in Sections 9.14.7.3, “Natural Resources” through 9.14.7.7, “Neighborhood Character” and include: natural resources including water resources, terrestrial resources, federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.14.2, “Town of Yorktown Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” an impact analysis related to land use and zoning; socioeconomic conditions; community facilities and services; open space and recreational resources, historic and cultural resources; visual resources, the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, federal/State Candidate Species, and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area is not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.14.7.3 Natural Resources

As shown on **Figure 9.14-48**, the natural resources study area for analysis is the immediate area surrounding the limits of construction, including a Kitchawan Cut-and-Cover Tunnel access manhole. Resources potentially occurring within the natural resources study area were identified through an evaluation of aerial photographs, NYSDEC water classification data, NYSDEC freshwater wetlands maps, USFWS NWI maps, national hydrography data, published soil survey maps, USGS topographic maps, and agency consultations.

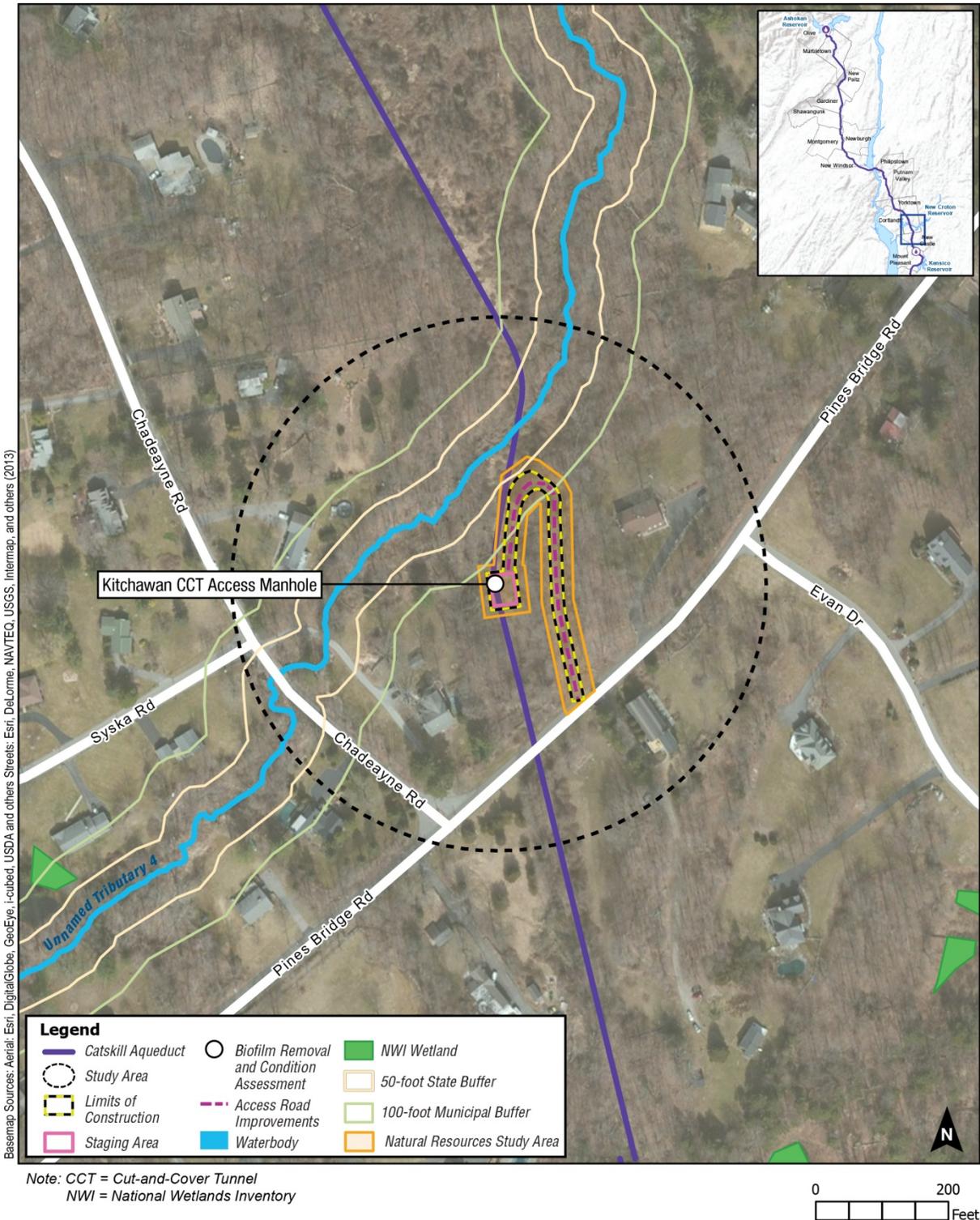
Based on the desktop analysis, the natural resources study area contains mowed roadside/pathway surrounded by deciduous forests. An unnamed tributary to New Croton Reservoir (referred to herein as unnamed tributary 4) flows to the north of the natural resources study area.

These habitats have the potential to support protected water resources, terrestrial resources, and wildlife species, and an analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the Bailey Brook-Croton River subwatershed (HUC 020301010307) of the Lower Hudson Watershed (HUC 02030101).

Unnamed tributary 4 to New Croton Reservoir is subject to federal jurisdiction under Sections 401 and 404 of the Clean Water Act for proposed work activities. As a B(T) classified stream, the unnamed tributary is subject to State Protection of Waters regulations with a regulated 50-foot buffer to protect the streambed and banks. In addition, the Town of Yorktown regulates activities in wetlands at least 1,000 square feet in size and natural watercourses with a 100-foot regulated buffer (Yorktown Town Code Chapter 178: Freshwater Wetlands). Work activities within water resources and their 100-foot buffer may be subject to Town review and approval.



Baseemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.14-48: Natural Resources- Pines Bridge Road Study Area



Resources potentially occurring within the study area were identified through a desktop evaluation of NYSDEC water classification data, NYSDEC freshwater wetlands maps, USFWS NWI maps, national hydrography data, published soil survey maps, and USGS topographic maps. Based on the desktop analysis, there are no mapped wetlands within the natural resources study area.

Surface Water

One surface water, the unnamed tributary 4 to New Croton Reservoir, was identified just north of the natural resources study area.

Unnamed Tributary 4 to New Croton Reservoir

Unnamed tributary 4 to New Croton Reservoir flows in a southwest to northeast direction through the natural resources study area (see **Figure 9.14-48**). Based on the desktop analysis, this watercourse would be best classified as a “Riverine, Intermittent, Streambed, Seasonally Flooded” system based on the Cowardin System (Cowardin et al. 1979). Outside of the study area, unnamed tributary 4 to New Croton Reservoir continues to flow north to New Croton Reservoir, which is part of the New York City Water Supply System.

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the study area would be the same as baseline conditions.

Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Pines Bridge Road Study Area.

Construction

Work activities related to the repair and rehabilitation would occur outside the regulated federal buffer area surrounding unnamed tributary 4 to New Croton Reservoir. Work activities within Town’s 100-foot buffer may be subject to Town review and approval. The amount of disturbance within the Town’s regulated buffer total approximately 2,500 square feet and would comply with the Town’s requirements and would be subject to Town review and approval, as required.

Prior to commencement of the repair and rehabilitation, sediment and erosion control measures would be installed to prevent the transport of sediment resulting from temporary disturbance to water resources within the study area. Most access and staging activities would occur in upland areas adjacent to the cut-and-cover berm.

No permanent disturbance to water resources is proposed. Following construction, temporarily disturbed areas would be restored to natural conditions.

Water Resources Conclusion

Water resources in the natural resources study area are limited to the buffer surrounding the unnamed tributary 4 to New Croton Reservoir. There would be no disturbance to the unnamed tributary 4 to New Croton Reservoir. Other areas temporarily affected by work activities would be restored to natural conditions following construction; therefore, there would be no construction-related effects on surface water.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Pines Bridge Road Study Area.

Terrestrial Resources

The terrestrial resources within the natural resources study area are characterized as deciduous forest that may be similar to a rich mesophytic forest (Edinger et al. 2014). During construction, tree removal may be needed. The Town of Yorktown regulates tree removal (Yorktown Town Code Chapter 270: Trees). Exemptions include tree removal that is necessary to maintain public or private rights-of-way held under New York City permits or under easements. While the limits of construction are located on City-owned land and may qualify for this exemption, terrestrial resources within the study area warrant an analysis.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Pines Bridge Road Study Area within the timeframe of the impact analysis. Natural processes such as changes in habitat due to natural vegetative succession are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be the same as baseline conditions.

Within the natural resources study area, removal of one tree may be needed to facilitate the access road improvement. The tree proposed for removal is located on DEP property in the immediate vicinity of the work area, adjacent to the existing Catskill Aqueduct. Tree removal would occur in a discrete location along the cleared corridor, and would not dramatically change the character of the area or affect surrounding trees. Any tree removal needed would be conducted from November 1 through March 31 to avoid impacts to potential roosting trees for Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Due to the limited number of trees that may need to be removed, this activity appears to be exempt from Town of Yorktown tree removal regulations. However if applicable, tree removal on DEP property would be conducted in accordance with the requirements set forth by the Town of Yorktown.

Following construction, all equipment would be removed from the study area and staging areas would be restored to natural conditions. Operation of the Catskill Aqueduct would be consistent with baseline conditions. Natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Pines Bridge Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected, species that could occur up to 0.25 mile from the work site were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” nine species were identified as having the potential to occur in the natural resources study area. Therefore, an analysis of the potential for impacts to these nine species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.14-28**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and desktop assessments, as applicable.

Table 9.14-28: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Pines Bridge Road Natural Resources Study Area

<u>Common Name</u>	<u>Scientific Name</u>	<u>Federal Listing</u>	<u>State Listing</u>	<u>Analysis of Potential Disturbance</u>	<u>Warrants Further Analysis</u>
<u>Amphibians and Reptiles</u>					
<u>Bog Turtle</u>	<u><i>Clemmys</i> [=<i>Glyptemys</i>] <i>muhlenbergii</i></u>	<u>Threatened</u>	<u>Endangered</u>	<u>Based upon the desktop analysis there are no mapped wetlands present within the natural resources study area. Perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work site. Upon construction completion, the site would be restored to natural conditions and is not anticipated to affect potential habitat. Therefore, there are no effects anticipated and no further analysis for bog turtles is warranted for this study area.</u>	<u>No</u>
<u>Eastern Box Turtle</u>	<u><i>Terrapene carolina</i></u>	<u>Unlisted</u>	<u>Special Concern</u>	<u>Work activities would be largely confined to previously disturbed areas, if any isolated areas of potential habitat exist at the sites, as a mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work site. Finally, upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.</u>	<u>No</u>
<u>Eastern Hognose Snake</u>	<u><i>Heterodon platyrhinos</i></u>	<u>Unlisted</u>	<u>Special Concern</u>	<u>Disturbance would be temporary and limited to areas previously disturbed. Should any potential habitat exist at the site, a variety of habitats would be available for the species use in the vicinity during construction. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.</u>	<u>No</u>
<u>Spotted Turtle</u>	<u><i>Clemmys guttata</i></u>	<u>Unlisted</u>	<u>Special Concern</u>	<u>Based upon the desktop analysis there are no mapped wetlands present within the natural resources study area. Perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work site. Finally, upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for spotted turtles is warranted for this study area.</u>	<u>No</u>
<u>Birds</u>					
<u>Osprey</u>	<u><i>Pandion haliaetus</i></u>	<u>MBTA</u>	<u>Special Concern</u>	<u>Disturbance would be temporary and limited to previously disturbed areas. Should any potential habitat exist at the site, a variety of habitats would be available for the species use in the vicinity during construction. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Ospreys is warranted for this study area.</u>	<u>No</u>

Table 9.14-28: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Pines Bridge Road Natural Resources Study Area

<u>Common Name</u>	<u>Scientific Name</u>	<u>Federal Listing</u>	<u>State Listing</u>	<u>Analysis of Potential Disturbance</u>	<u>Warrants Further Analysis</u>
<u>Sharp-shinned Hawk</u>	<u><i>Accipiter striatus</i></u>	<u>MBTA</u>	<u>Special Concern</u>	<u>Disturbance would be temporary and limited to previously disturbed areas. Should any potential habitat exist at the site, a variety of habitats would be available for the species use in the vicinity during construction. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Sharp-shinned Hawks is warranted for this study area.</u>	<u>No</u>
<u>Mammals</u>					
<u>Indiana Bat</u>	<u><i>Myotis sodalis</i></u>	<u>Endangered</u>	<u>Endangered</u>	<u>No significant loss or modification of roosting or foraging habitat would occur and foraging habitat would continue to be available in adjacent forested areas. There may be temporary noise that discourages Indiana bats from roosting in the immediate vicinity of the work site; however, there is abundant suitable habitat in the surrounding areas that Indiana bats could use for roosting and foraging. Any removal of trees would be conducted from November 1 through March 31 to avoid impacts to potential roosting bats. Therefore, there are no effects anticipated and no further analysis for Indiana bats is warranted for this study area.</u>	<u>No</u>
<u>Northern Long-eared Bat</u>	<u><i>Myotis septentrionalis</i></u>	<u>Threatened</u>	<u>Threatened</u>	<u>No significant loss or modification of roosting or foraging habitat would occur and foraging habitat would continue to be available in adjacent forested areas. There may be temporary noise that discourages northern long-eared bats from roosting in the immediate vicinity of the work site; however, there is abundant suitable habitat in the surrounding areas that could be used for roosting and foraging. Any removal of trees would be conducted from November 1 through March 31 to avoid impacts to potential roosting bats. Therefore, there are no effects anticipated and no further analysis for northern long-eared bats is warranted for this study area.</u>	<u>No</u>
<u>New England Cottontail</u>	<u><i>Sylvilagus transitionalis</i></u>	<u>Unlisted</u>	<u>Special Concern</u>	<u>If any potential habitat exists at the site, a variety of habitats would be available for the species use in the vicinity. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for New England cottontails is warranted for this study area.</u>	<u>No</u>
<u>Note:</u> <u>MBTA: Migratory Bird Treaty Act</u>					

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There are no effects anticipated to bog turtles (*Clemmys [=Glyptemys] muhlenbergii*), eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), spotted turtles (*Clemmys guttata*), Ospreys (*Pandion haliaetus*), Sharp-shinned Hawks (*Accipiter striatus*), Indiana bats, northern long-eared bats, or New England cottontails (*Sylvilagus transitionalis*) associated with the repair and rehabilitation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Pines Bridge Road Study Area.

9.14.7.4 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Pines Bridge Road Study Area (see **Figure 9.14-43**), a Phase I ESA would be completed for the proposed access road construction in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify potential RECs. The Phase I ESA would include site reconnaissance, research on current/historic use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard.

The proposed temporary access road construction would occur on a previously disturbed section of the Catskill Aqueduct (see **Figure 9.14-47**). Given the findings of previous subsurface investigations along similar portions of the aqueduct corridor, no subsurface ground contamination is anticipated. However, where RECs are identified, a Phase II subsurface soil investigation would be recommended to be completed for contaminants of concern (COC) prior to construction. The COC to be evaluated along the segment of the aqueduct in the study area that would be affected as part of the repair and rehabilitation work would include volatile and semivolatile organics, PCBs, and total petroleum hydrocarbons. The investigation would be recommended to be completed to determine the contamination levels, if any, of the on-site soils prior to the commencement of any work activities. Subsurface soil testing would be conducted to ensure that contaminated soil is not reused as backfill (per 6 NYCRR Part 375). Should any areas of contamination be identified, the contract documents would be revised to identify requirements for proper handling and disposal of the material.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Pines Bridge Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Pines Bridge Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up

power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements.

If any soil contamination is identified, the excavated material would be transported to an authorized off-site facility for disposal and/or proper management. All waste material, including contaminated soil would be temporarily secured using non-permeable base material, covered with plastic or geotextile to prevent soil loss, and removed from the proposed repair and rehabilitation work site within the Pines Bridge Road Study Area as necessary. All potentially contaminated or excess uncontaminated soils to be removed as part of the repair and rehabilitation would be transported off-site and managed in accordance with all federal, State and local laws. Following repair and rehabilitation, all equipment would be removed from the Pines Bridge Road Study Area. The staging areas would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Pines Bridge Road Study Area.

9.14.7.5 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Pines Bridge Road Study Area.

Access to the repair and rehabilitation limits of construction for the work site would be via Pines Bridge Road (see **Figure 9.14-43**). Pines Bridge Road is a two-lane, two-way urban major collector roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Pines Bridge Road Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area. There is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site; however, there are no DEP employees who work at or visit the study area on a daily basis, and the low number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Pines Bridge Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Pines Bridge Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be the basis of this transportation analysis. Of these activities, staging and access

improvements would generate the most vehicle trips (see **Table 9.14-27**). Staging and access improvements would occur in summer 2019 between the hours of 7 AM and 5 PM, Monday through Friday for approximately two weeks prior to the second 10-week shutdown.

In the future with the repair and rehabilitation, construction vehicles would travel along Pines Bridge Road. The estimated number of peak-day one-way vehicle trips associated with staging and access improvements would be 25 vehicle trips, or approximately 50 peak-day vehicle round trips that would travel to and from the study area. Approximately 16 vehicle round trips or 16 PCEs, would be workers traveling directly to and from the staging area, with an additional 4 daily shuttle trips between the study area and the staging area. The remaining approximately 30 peak-day vehicle round trips (64 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with staging and access improvements would be approximately 25 peak-hour vehicle trip ends (42 PCEs). This includes approximately 8 vehicle trip ends (8 PCEs) from workers traveling directly to and from the staging area, approximately 2 peak-hour shuttle trips between the study area and the staging area, and approximately 15 vehicle trip ends (32 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 10-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 42 peak-hour PCEs along Pines Bridge Road, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, “Transportation.” The work activities at the Pines Bridge Road Study Area would be short-term (totaling 4 weeks over 1.5 years; see **Table 9.14-27**) and would not generate public parking or transportation demands or pedestrian activity within the Pines Bridge Road Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in potential significant adverse impacts to transportation within the Pines Bridge Road Study Area.

9.14.7.6 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation activities within the Pines Bridge Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation activities as shown on **Figure 9.14-49**.

The Pines Bridge Road Noise Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work site that are considered noise-sensitive receptors for this analysis.

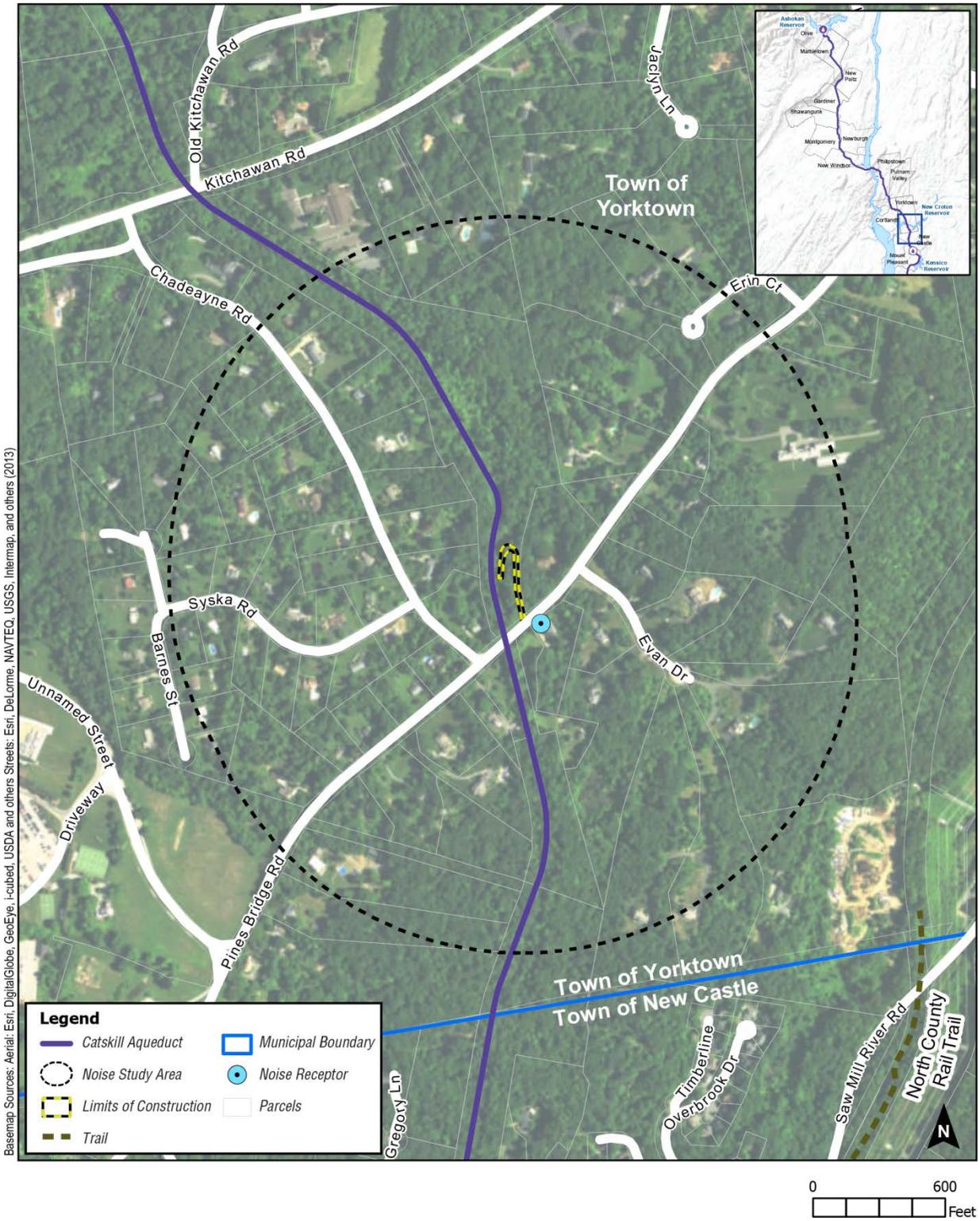
The work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Town of Yorktown Noise Control Ordinance §216-2 which prohibits excessive noise between 11 PM and 7 AM, Sunday evening through Friday morning, and 10 PM and 8 AM, Friday evening through Sunday morning. The Town of Yorktown Ordinance §300-67 also prohibits adverse noise impacts from watershed and water supply facilities.

Existing ambient noise levels within the Pines Bridge Road Study Area are influenced by local vehicular traffic traveling on Pines Bridge Road and other nearby local roads. The existing noise levels within the study area are comparable to a quiet suburban residential environment, based on the distance from major transportation corridors, and the population density of the area. Typical noise levels (measured as L_{eq}) for quiet suburban residential communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Pines Bridge Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Pines Bridge Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Pines Bridge Road Study Area would occur on site. The stationary noise-generating equipment associated with staging and access improvements was the basis of this stationary noise analysis. Staging and access improvements would occur in summer 2019 between the hours of 7 AM and 5 PM, Monday through Friday for approximately 2 weeks prior to the second shutdown. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities; however, this equipment would not be expected to be louder than those associated with staging and access improvements.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for staging and access improvements. Associated equipment reference noise levels are shown in **Table 9.14-29**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.14-49: Noise – Pines Bridge Road Study Area



Table 9.14-29: Stationary Source Construction Equipment Modeled at the Pines Bridge Road Study Area - Noise Analysis and Reference Noise Levels (L_{eq})

<u>Equipment Type</u>	<u>Reference Noise Level (L_{eq}) at 50 feet (dBA)</u>
<u>Dozer</u>	<u>81</u>
<u>Roller</u>	<u>78</u>
<u>Dump Truck</u>	<u>80</u>
Note: City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	

Table 9.14-30 shows the results of the stationary construction noise analysis. Staging and access improvements within the Pines Bridge Road Study Area during the repair and rehabilitation could produce a noise level (L_{eq}) of approximately 82 dBA at the nearest residence approximately 67 feet away from the staging and access improvements activities. Repair and rehabilitation work activities would not occur during hours when excessive noise is prohibited, as defined by the Town of Yorktown.

Table 9.14-30: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors within the Pines Bridge Road Study Area

<u>Nearest Noise-Sensitive Receptor</u>	<u>Distance from Site (Feet)</u>	<u>Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)</u>	<u>Town of Yorktown Noise Limit (dBA)</u>	<u>Potential for Exceedance (Yes or No)</u>
<u>Nearest Residence</u>	<u>67</u>	<u>82</u>	<u>NA</u>	<u>No</u>
Note: NA = Not Applicable				

Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Pines Bridge Road Study Area. The repair and rehabilitation would be temporary in nature, with the peak work activities occurring during staging and access improvements in summer 2019 for a limited period (e.g., 2 weeks).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse or long term impacts to sensitive receptors within the Pines Bridge Road Study Area.

9.14.7.7 Neighborhood Character

The character of the Pines Bridge Road Study Area is largely defined by a mix of residential, vacant lands, and public service land uses and its physical setting within a quiet suburban location (see **Figure 9.14-45**). The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. The study area is bounded by Pines Bridge Road to the south

and includes Chadeayne Road in its western section, with an unnamed tributary to New Croton Reservoir flowing from southwest to northeast. The limits of construction for the work site and associated access route are located in a public services corridor with grassy cover, which is owned and maintained by DEP.

DEP has consulted with the Town of Yorktown and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Pines Bridge Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; and historic and cultural resources, open space and recreation and visual resources, an impact analysis for the Pines Bridge Road Study Area is not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," Section 9.3.4, "Socioeconomic Conditions," Section 9.3.6, "Open Space and Recreation," Section 9.3.7, "Historic and Cultural Resources," and Section 9.3.8, "Visual Resources," respectively. Furthermore, the public policy impact analysis provided in Section 9.14.2, "Town of Yorktown Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.14.7.5, "Transportation," and 9.14.7.6, "Noise," during construction, the work activities in the Pines Bridge Road Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Pines Bridge Road Study Area Impact Analysis.

9.15 TOWN OF NEW CASTLE

9.15.1 TOWN OF NEW CASTLE PROJECT DESCRIPTION

The Town of New Castle is located in Westchester County, New York on the eastern side of the Hudson River. It is bounded by the Town of Yorktown to the north, the Town of Somers to the north and northeast, the Town of Bedford to the northeast, the Town of Mount Kisco to the east, the Town of North Castle to the south, the Town of Mount Pleasant to the southwest, the Village of Pleasantville to the southwest, the Town of Ossining to the west, the Village of Croton-on-Hudson to the west, and the Town of Cortlandt to the northwest in Westchester County, New York. The Town of New Castle is approximately 23.4 square miles. General boundaries of locations where activities associated with the repair and rehabilitation would occur within the Town of New Castle are shown on **Figure 9.15-1**.

The Catskill Aqueduct stretches for approximately 3 miles in a southerly direction through the Town of New Castle. The repair and rehabilitation work activities within the Town of New Castle are shown in **Table 9.15-1**.

Table 9.15-1: Schedule of Work Activities within the Town of New Castle

Work Activity	Study Area		
	Somerstown Turnpike	Station Place	Campfire Road
Staging and Access Improvements	✓	✓	-
Streambank Restoration and Protection	✓	-	✓
Sluice Gate Replacement	✓	-	✓
Boathole Preparation	-	✓	-
Boathole Installation	-	✓	-
Biofilm Removal and Condition Assessment	✓	✓	✓
Small-scale Wash Water Treatment	-	✓	-
Notes: - = Work activity not proposed. ✓ = Work activity proposed.			

The Somerstown Turnpike, Station Place and Campfire Road study areas in the Town of New Castle encompass the work analyzed as part of the repair and rehabilitation in this municipality. Additional work activities in the town do not warrant further assessment. Work sites located outside the study areas include activities that would primarily be conducted within the aqueduct interior (see Section 9.3, “Screening Assessment and Impact Analysis Methodology”). In the Town of New Castle, they include biofilm removal and condition assessment at access manholes not located in these study areas, and culvert drain sluice gate replacement. See Section 9.2, “Project Description,” for an overall description of repair and rehabilitation. Section 9.15.2, “Town of New Castle Impact Analysis,” below provides a discussion of local regulations in the Town of New Castle jurisdictional limits.

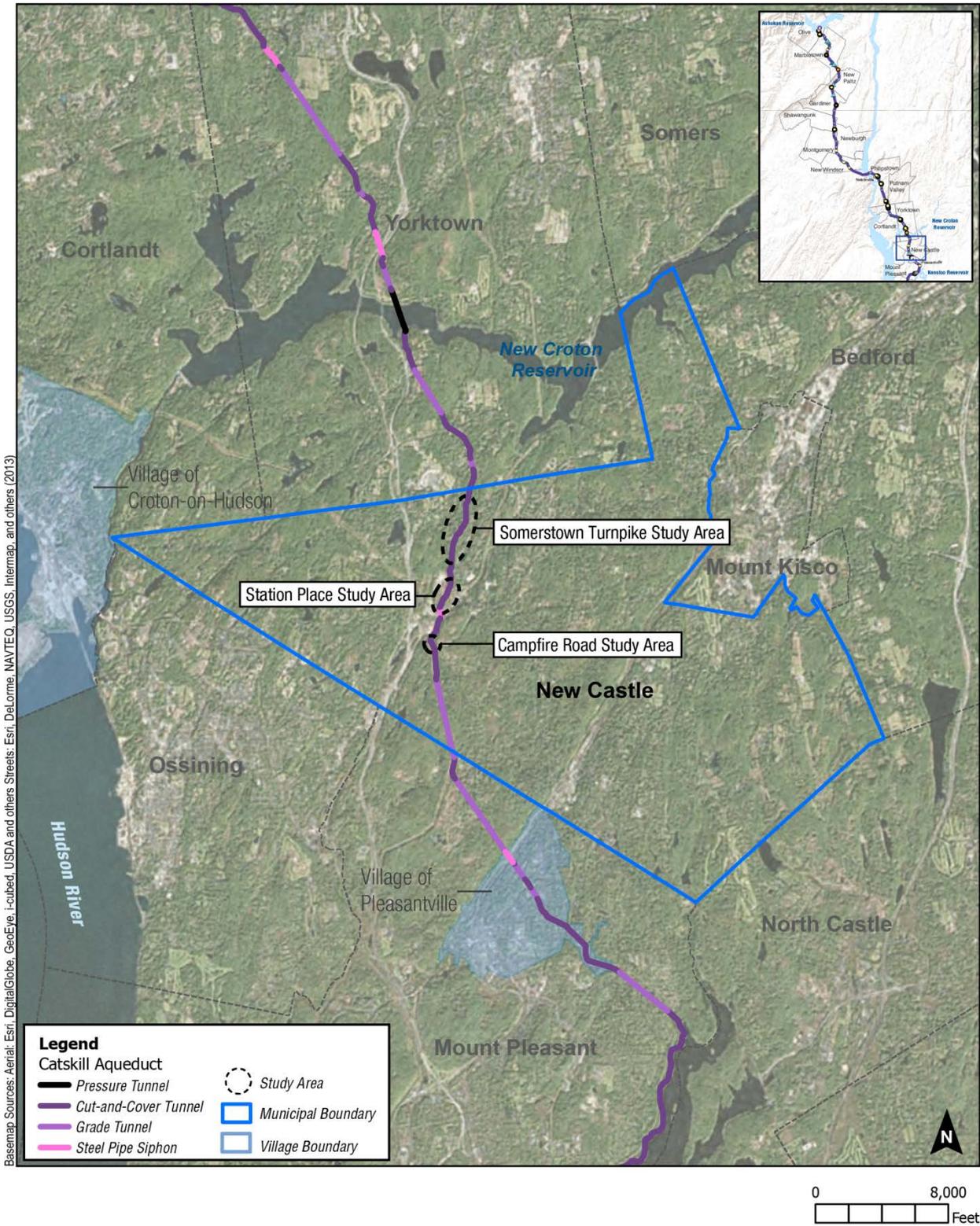


Figure 9.15-1: Town of New Castle Study Areas



The following sections provide a description of the study area, proposed activities, and impact analysis for the three study areas:

- Section 9.15.3 – Somerstown Turnpike Study Area Impact Analysis
- Section 9.15.4 – Station Place Study Area Impact Analysis
- Section 9.15.5 – Campfire Road Study Area Impact Analysis

9.15.2 TOWN OF NEW CASTLE IMPACT ANALYSIS

9.15.2.1 Public Policy

Because public policies would not vary for study areas in the same town, public policies were evaluated on a town-wide basis. As discussed in Section 9.3.3, “Land Use, Zoning, and Public Policy,” the repair and rehabilitation’s consistency with the applicable policies of Westchester County’s Westchester 2025 Plan (2008) and the Town of New Castle Comprehensive Plan (2016) in the Somerstown Turnpike, Station Place, and Campfire Road study areas are analyzed as follows.

Westchester 2025 Plan (2008)

Westchester County’s Westchester 2025 Plan (Westchester County 2008) is a framework to help the 45 municipalities within the County develop comprehensive plans that achieve a balance between economic and environmental concerns, while serving the future needs of the local communities within Westchester County. The recommendations outlined in the Plan include those recommended by the Westchester County Planning Board to municipalities as guidance for their own decision-making. Based upon a review of these recommendations, the potential effects of the repair and rehabilitation within the Somerstown Turnpike, Station Place, and Campfire Road study areas were evaluated for compatibility with two applicable recommendations:

- (1) *Preserve natural resources: Preserve and protect the county’s natural resources and environment, both physical and biotic. Potential impacts on water resources (water bodies, wetlands, coastal zones and groundwater), significant land resources (unique natural areas, steep slopes, ridgelines and prime agricultural land) and biotic resources (critical habitat, plant communities and biotic corridors) require careful consideration as part of land management and development review and approval.*

There are no significant land resources within study areas in the Town of New Castle. Water resources and biotic resources within the Somerstown Turnpike, Station Place, and Campfire Road study areas are discussed in the respective “Natural Resources” sections.

Under this recommendation, the Westchester 2025 Plan prioritizes the preservation of natural resources in order to balance this alongside land management and development. This recommendation was analyzed for repair and rehabilitation as work in the study areas would potentially impact existing natural resources directly or indirectly.

As part of the work at Somerstown Turnpike and Campfire Road study areas, riprap aprons would be installed at the inlet and outlet of the culverts under the aqueduct, restoring these areas to their original, as-built condition. Unwatering of the aqueduct would be required and this may result in raw water discharges to an unnamed tributary to Cornell Brook in Somerstown Turnpike Study Area and an unnamed tributary to Pocantico River in Campfire Road Study Area. Additionally, diversion of these waters around in-stream work would be required in order to complete certain work elements.

The proposed action would not be expected to affect water resources for several reasons. While discharges of raw aqueduct water could take place at any time during construction or future maintenance, this would consist of uncontaminated raw water from the aqueduct. Sediment and erosion control measures would also be put in place for all construction activities. Restoring the riprap aprons to their original condition would result in minimal fill and would be beneficial in that these would minimize future scouring when the sluice gate of the culvert drain is operated. As a result, work activities are not anticipated to result in significant increases in turbidity, scouring, or other adverse impacts to water resources.

Select tree removal on DEP property may be needed at each study area in the Town of New Castle to establish better access to the proposed work sites. However, this would not permanently affect critical biotic habitat or corridors within the study area. The work sites occur in previously disturbed areas at existing DEP facilities. Tree removal is required because access to these areas has not been needed for some time, and trees have grown in unmaintained areas along the aqueduct. Furthermore, following construction, areas temporarily disturbed during construction would be restored to baseline conditions.

As such, the repair and rehabilitation would not affect natural resources or biotic resources and would be consistent with this Plan's recommendation.

- (2) *Engage in Regional Initiatives: Work with neighboring jurisdictions in the Hudson Valley, Connecticut, New Jersey, Long Island and New York City in planning initiatives aimed at sound land use, transportation, economic development, housing and environmental policies.*

Repair and rehabilitation supports the goal of supplying clean drinking water to the City's 8 million residents and 1 million upstate residents. As described in Section 9.3.3, "Land Use, Zoning, and Public Policy" and Section 9.3.4, "Socioeconomic Conditions," land use and zoning and socioeconomic conditions would not be affected by the repair and rehabilitation within study areas in the Town of New Castle. The potential for impacts to transportation is analyzed in detail in the respective "Transportation" sections.

Under this recommendation, the Westchester 2025 Plan prioritizes inter-agency cooperation in order to facilitate regional initiatives. This recommendation was analyzed for repair and rehabilitation, as work within the study areas would potentially impact existing land use, transportation, economic development, housing, and environmental policies directly or indirectly.

On a daily basis, over 1 billion gallons of water are delivered from large reservoirs spanning several counties and jurisdictions within the State to these water consumers. As part of the repair and rehabilitation, DEP has coordinated with State and local jurisdictions to ensure that current

and future water supplies are maintained. Through this coordination, repair and rehabilitation work activities within the Somerstown Turnpike, Station Place, and Campfire Road study areas would comply with existing land use, transportation, economic development, housing, and environmental policies, as applicable and discussed within the relevant sections of this environmental review. Therefore, the repair and rehabilitation would be consistent with this Plan's recommendation.

Town of New Castle Comprehensive Plan (2016)

The Town of New Castle Comprehensive Plan (New Castle 2016) is a guide for the future growth and development of the Town, through a series of coordinated goals, policies, and strategies. The 2016 Comprehensive Plan is an update of the Town Development Plan which was originally written in 1989. The Comprehensive Plan is organized according to plan principles put forth by the American Planning Association which include: Livable Built Environment, Harmony with Nature, Resilient Economy, Healthy Community, and Responsible Regionalism. Each chapter sets forth various goals that address the issues outlined in the chapter. Based upon a review of these goals, the potential effects of the repair and rehabilitation within the applicable study areas were evaluated relative to compatibility with the four goals below:

(1) *Livable Built Environment*

- *Goal 5. Preserve and protect historic resources*

Historic and cultural resources were identified within the Station Place Study Area. Historic and cultural resources were not identified within the Somerstown Turnpike and Campfire Road study areas. The potential for impacts to these resources within the Station Place Study Area are evaluated in the Section 9.15.4.4, "Historic and Cultural Resources."

Under this goal, the Comprehensive Plan recommends the preservation and protection of historical resources in order to maintain the Town's bucolic residential character while simultaneously directing new development to commercial areas to support the Town's diverse needs. This goal was analyzed for repair and rehabilitation as work in the study area would potentially impact existing historic resources directly or indirectly.

The Sarles' Tavern site is a historic inn and tavern which is no longer standing. It is located approximately 250 feet from the northern-most limits of construction within the Station Place Study Area. A new boathole would be installed approximately 1,500 feet south of the Sarles' Tavern site to provide direct access to the aqueduct interior, similar to a manhole but larger in size. Repair and rehabilitation work activities would be located outside this historic site. Therefore, the repair and rehabilitation would be consistent with this goal.

(2) *Harmony with Nature*

- *Goal 1. Protect and maintain the Town's environmentally sensitive areas and resources (watersheds, wetlands, streams, steep slopes, floodplains, viewsheds, etc.)*

Visual resources within the Somerstown Turnpike, Station Place, and Campfire Road study areas are discussed in the respective "Visual Resources" sections. Water resources within the

Somerstown Turnpike, Station Place, and Campfire Road study areas are discussed in the respective “Natural Resources” sections.

Under this goal, the Comprehensive Plan recommends protecting environmentally sensitive resources in order to preserve the Town's environmental assets. This goal was analyzed for repair and rehabilitation as work in the study areas would potentially impact existing visual and natural resources directly or indirectly.

The repair and rehabilitation within the Station Place, Somerstown Turnpike, and Campfire Road study areas would not permanently affect landforms and natural features such as watersheds, wetlands, streams, steep slopes, floodplains, and viewsheds. Visual resources located in the study areas include open space resources, trails, and an historic site. Permanent streambank restoration measures would be consistent with as-built conditions and would not be visible from these resources. Similarly, the new boathole at Station Place Study Area would be low profile and would not alter visual and aesthetic resource conditions within the study area. Minor tree clearing and shrub removal to improve site access and staging areas would be conducted at existing DEP facilities adjacent to the existing Catskill Aqueduct. These forested areas border the aqueduct, and select tree removal would not dramatically change the character of area or affect surrounded viewsheds.

As part of the work, water resources including streams and wetlands would be temporarily disturbed within the Somerstown Turnpike and Campfire Road study areas. The proposed action would not be expected to affect water resources for several reasons. While discharges of raw aqueduct water could take place at any time during construction or future maintenance, this would consist of uncontaminated raw water from the aqueduct. Sediment and erosion control measures would also be put in place for all construction activities. Restoring the riprap aprons to their original condition would result in minimal fill and would be beneficial in that these would minimize future scouring when the sluice gate of the culvert drain is operated. As a result, work activities are not anticipated to result in significant increases in turbidity, scouring, or other adverse impacts to water resources. Within the Station Place Study Area, the work sites are located in a town-regulated buffer to an unnamed tributary to Pocantico River, and this stream would be unaffected by the repair and rehabilitation. Therefore, the repair and rehabilitation would be consistent with this goal.

- *Goal 4. Protect and manage open spaces and undeveloped lands*

Open space and recreation were identified within the Station Place, Somerstown Turnpike, and Campfire Road study areas. The potential for impacts to these resources are discussed in the respective “Open Space and Recreation” sections.

Under this goal, the Comprehensive Plan recommends protecting open spaces in order to preserve the Town's environmental assets. This goal was analyzed for repair and rehabilitation as work in the study areas would potentially impact existing open spaces directly or indirectly.

The repair and rehabilitation within the Station Place, Somerstown Turnpike, and Campfire Road study areas would not permanently affect open spaces and undeveloped lands. Construction would take place on DEP property at existing facilities along the Catskill Aqueduct.

Approximately 1 acre of a locally owned Town of New Castle open space parcel is located within the western portion of the Somerstown Turnpike Study Area. In total, the locally owned Town of New Castle open space parcel is approximately 1.4 acres and is a forested area on Glenwood Road with no identifiable amenities. Work activities would not detract from open spaces and undeveloped lands of the study area because the repair and rehabilitation activities would take place over a thousand feet from locally owned open space and activities would not negatively affect the open space within the study area.

Approximately 2,000 feet of the 125-mile North County Trailway is located within the Station Place Study Area. Repair and rehabilitation related to the installation of the boathole at the Millwood North Cut-and-Cover Tunnel would not affect usage of the North Country Trailway. Work activities would not detract from open spaces and undeveloped lands of the study area because the repair and rehabilitation work activities would be located in a secluded area behind a dense stand of trees and would not negatively affect the surrounding open space. Two open space resources exist within the Campfire Road Study Area: Gedney Park and the Gedney Park Red Trail. Approximately 5 acres of Gedney Park are located within the eastern portion of the Campfire Road Study Area. Work activities located at the Millwood South access manhole would be approximately 150 feet from the Red Trail hiking trail and approximately 250 feet from the baseball field. Work activities would not detract from open spaces and undeveloped lands of the study area because the repair and rehabilitation activities would be located in a secluded area behind a dense stand of trees and they would not negatively affect the surrounding open spaces.

As such, the repair and rehabilitation within the Somerstown Turnpike, Station Place, and Campfire Road study areas would not affect open space resources within the Town of New Castle. Therefore, the repair and rehabilitation would be consistent with this goal.

(3) *Responsible Regionalism*

- *Goal 4. Evaluate regional impacts (traffic, environmental, population, etc.) of major land use and infrastructure projects*

Repair and rehabilitation supports the goal of supplying clean drinking water to the City's 8 million residents and 1 million upstate residents. As described in Section 9.3.3, "Land Use, Zoning, and Public Policy" and Section 9.3.4, "Socioeconomic Conditions," land use and zoning and socioeconomic conditions would not be affected by the repair and rehabilitation within study areas in the Town of New Castle. The potential for impacts to transportation is analyzed in the respective "Transportation" sections.

Under this goal, the Comprehensive Plan recommends inter-municipal coordination in order to responsibly integrate the Town's Plan with those of its neighbors. This goal was analyzed for repair and rehabilitation, as work within the study areas would potentially impact transportation, economic development, housing, and environmental policies directly or indirectly.

On a daily basis, over 1 billion gallons of water is delivered from large reservoirs spanning several counties and jurisdictions within the State to these water consumers. As part of the repair and rehabilitation, DEP has coordinated with State and local jurisdictions to ensure that current

and future water supplies are maintained. Through this coordination, repair and rehabilitation work activities within the Somerstown Turnpike, Station Place, and Campfire Road study areas would comply with existing land use, transportation, economic development, housing, and environmental policies, as applicable and discussed within the relevant sections of this environmental review. Therefore, the repair and rehabilitation would be consistent with this goal.

Repair and rehabilitation would therefore be consistent with the Westchester 2025 Plan and the Town of New Castle Comprehensive Plan and would not result in significant adverse impacts to public policy within the Somerstown Turnpike, Station Place, and Campfire Road study areas.

9.15.3 SOMERSTOWN TURNPIKE STUDY AREA IMPACT ANALYSIS

Within the Somerstown Turnpike Study Area, the aqueduct consists of the Millwood North Cut-and-Cover Tunnel. Two access manholes with culvert drain sluice gates are located in the study area (see **Figure 9.15-2**).

Work activities within the Somerstown Turnpike Study Area would include: culvert drain sluice gate replacement and associated streambank restoration and protection; and biofilm removal and condition assessment (see **Table 9.15-2**).

9.15.3.1 Study Area Location and Description

The Somerstown Turnpike Study Area is located along the upper Catskill Aqueduct in the Town of New Castle. The Catskill Aqueduct traverses the study area in a general northeast to southwest direction. The study area is bounded to the east by State Route 100, known as Somerstown Turnpike at the south end of the study area and as Saw Mill River Road heading north. Shingle House Road and Hidden Hollow Lane traverse the study area from north to south. Cornell Brook, a tributary to New Croton Reservoir, flows to the north along the eastern edge of the study area, and two unnamed tributaries to Cornell Brook bisect the study area in the northern and central regions, respectively, flowing west to east. Proposed work sites within the study area are located at the two culvert drain access manholes, which for the purposes of this analysis are referred to as North Culvert and South Culvert. Both would be accessed by driving over the cut-and-cover tunnel from an entrance off Somerstown Turnpike. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work sites. **Figure 9.15-2** shows an aerial photograph of the study area, including the path of the aqueduct, and limits of construction for each work site. **Figure 9.15-3** shows two photographs of the study area.

The study area consists of residential, public services, open space and recreation, and vacant land uses. Land cover in the western portion of the study area is forested with scattered residential development, while the eastern portion of the study area is more densely developed with residential housing. The limits of construction for the work site (North Culvert) and associated access route are located in a public services corridor with grassy cover, which is owned and maintained by DEP. **Figure 9.15-4** shows a map of the land uses in the study area and its surroundings.

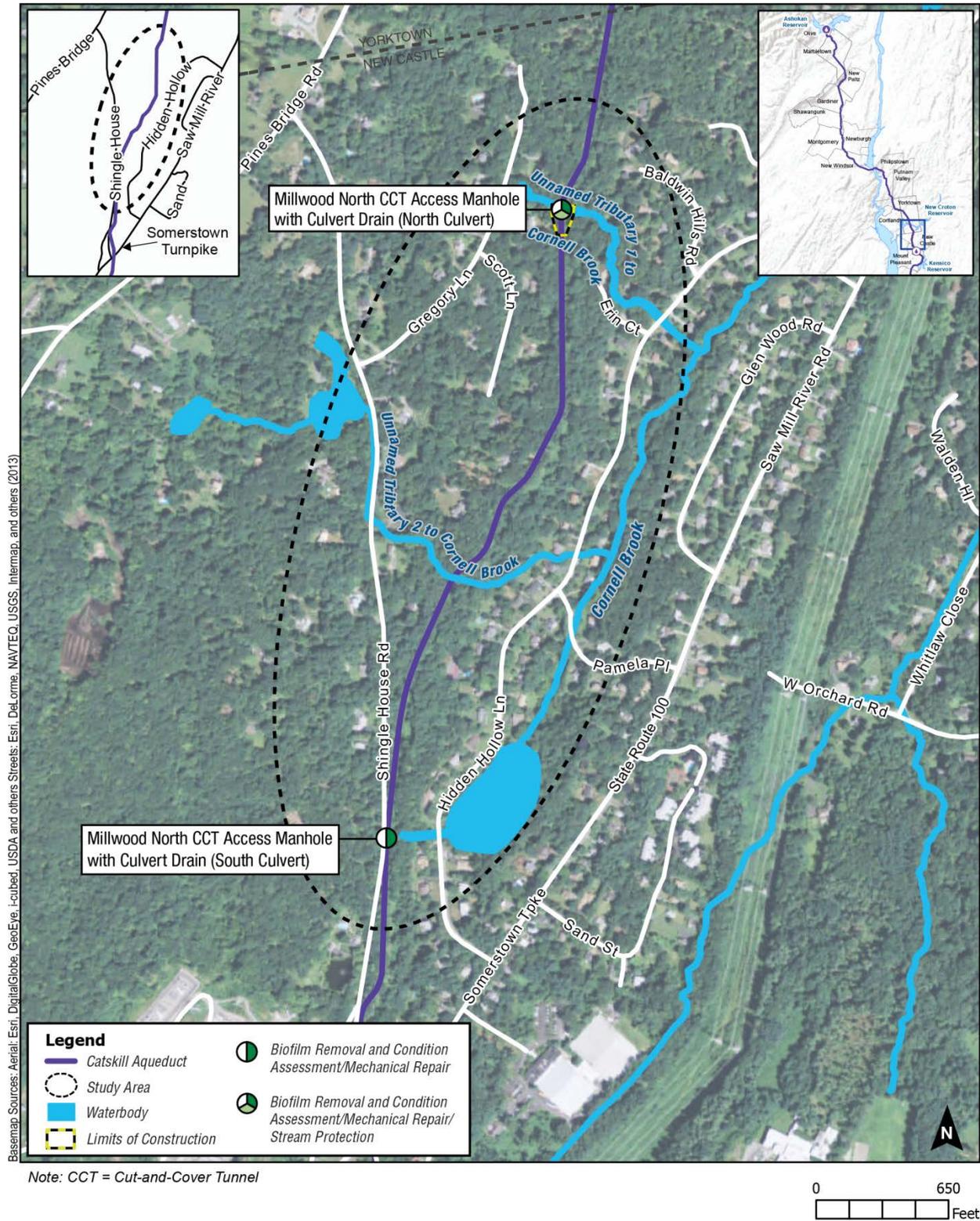


Figure 9.15-2: Study Area – Somertown Turnpike





Photograph 1: View of the aqueduct right-of-way looking north.



Photograph 2: View looking north toward the access manhole.

Figure 9.15-3: Photographs – Somerstown Turnpike Study Area



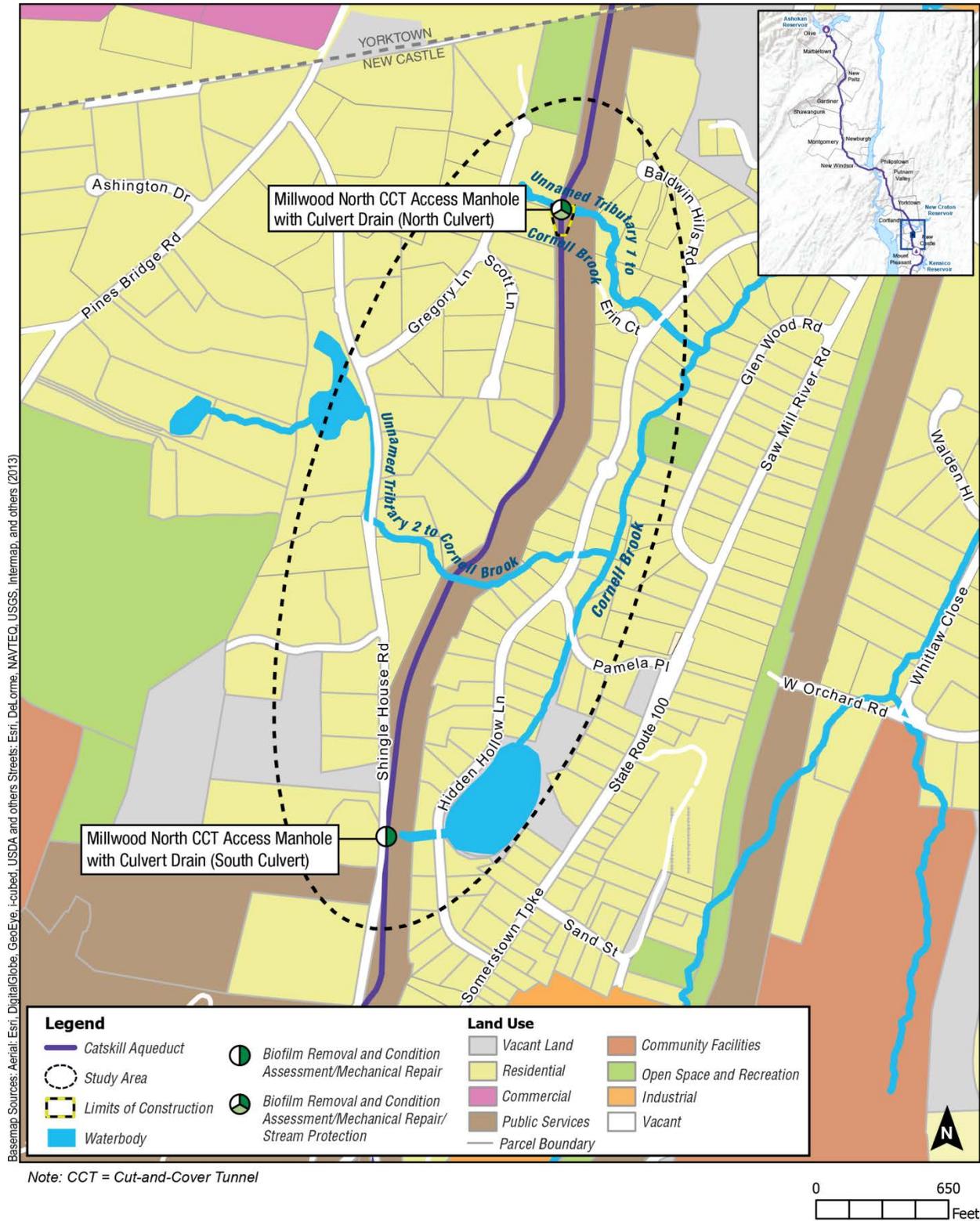


Figure 9.15-4: Land Use – Somerset Turnpike Study Area



The study area is located within two zoning districts; retail business (B-R) and single-family residential (R-1/2A and R-2A), as designated by the Town of New Castle Zoning Code (see **Figure 9.15-5**). The Catskill Aqueduct is a permitted use as a public utility facility within the retail business (B-R), and single-family residential (R-1/2A and R-2A) zoning districts.

There are no federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

9.15.3.2 Proposed Activities within the Somerstown Turnpike Study Area

To support activities within the Somerstown Turnpike Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as the primary staging area from which workers would be transported to the site daily. Several secondary staging areas would provide additional parking, and equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. Site plans showing layouts of the limits of construction at the work site at the North Culvert, which would occupy a total of approximately 12,700 square feet, is shown on **Figure 9.15-6**. As discussed in Section 9.3, work activities at the South Culvert (see **Figure 9.15-7**) would primarily be conducted within the aqueduct interior and do not warrant further analysis. The schedule for work within the study area is shown in **Table 9.15-2**. The duration of active construction within the Somerstown Turnpike Study Area is estimated to total 11 weeks over 1.5 years.

Work in the study area would begin in summer ~~2019~~2018 with staging and access improvements. Improvements may involve minor grading and the removal of approximately 21 trees, in addition to underbrush clearing and gravel placement for leveling and erosion control.

Following the staging and access improvements, stream protection measures associated with the North Culvert in summer ~~2019~~2018 would take place. Streambank protection measures at the South Culvert are being constructed as part of a DEP erosion control project (CRO-497) along the Catskill Aqueduct in the Town of North Castle. That project was analyzed as part of a separate environmental review. Work would entail the restoration of riprap aprons on either end of the culvert to their original as-built conditions and the removal of accumulated debris from within the culvert. Temporary in-stream disturbance would cover a total area of approximately 1,750 square feet. No permanent in-stream disturbance would occur. To facilitate a dry work area, sandbags would be installed upstream of the culvert, and the stream would be diverted to points downstream, which would include a turbidity curtain for sediment control. Replacement of the sluice gates at both the North and South Culvert drains, which would require unwatering of the aqueduct, would occur during the second 10-week shutdown in fall ~~2019~~2018. In conjunction with culvert drain sluice gate replacement, the gate stems and manhole covers would be replaced, and the concrete walls of the manholes would be repaired. During the repair work, sandbags would be installed inside the aqueduct to prevent any residual water from entering the natural environment.

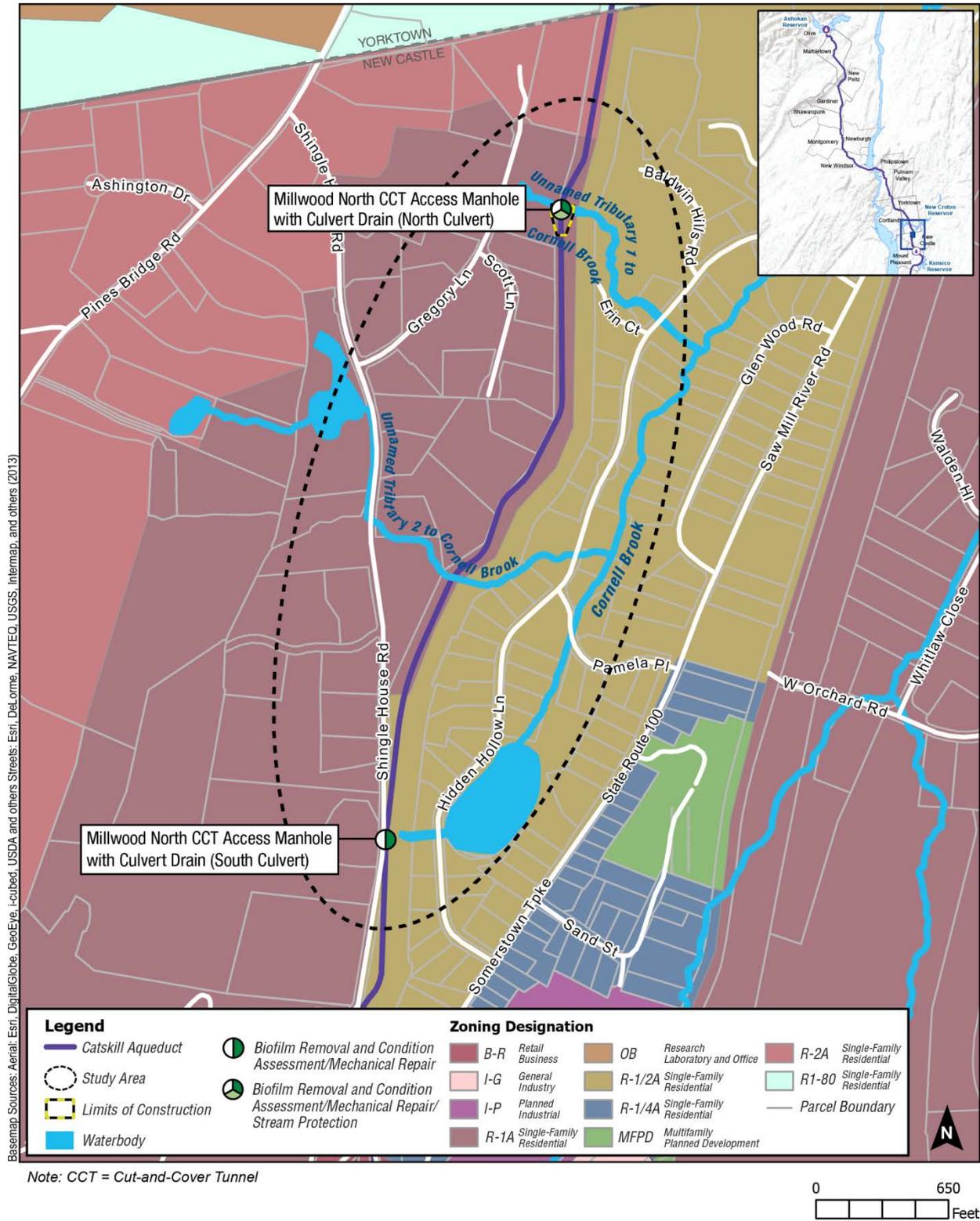


Figure 9.15-5: Zoning – Somerset Turnpike Study Area



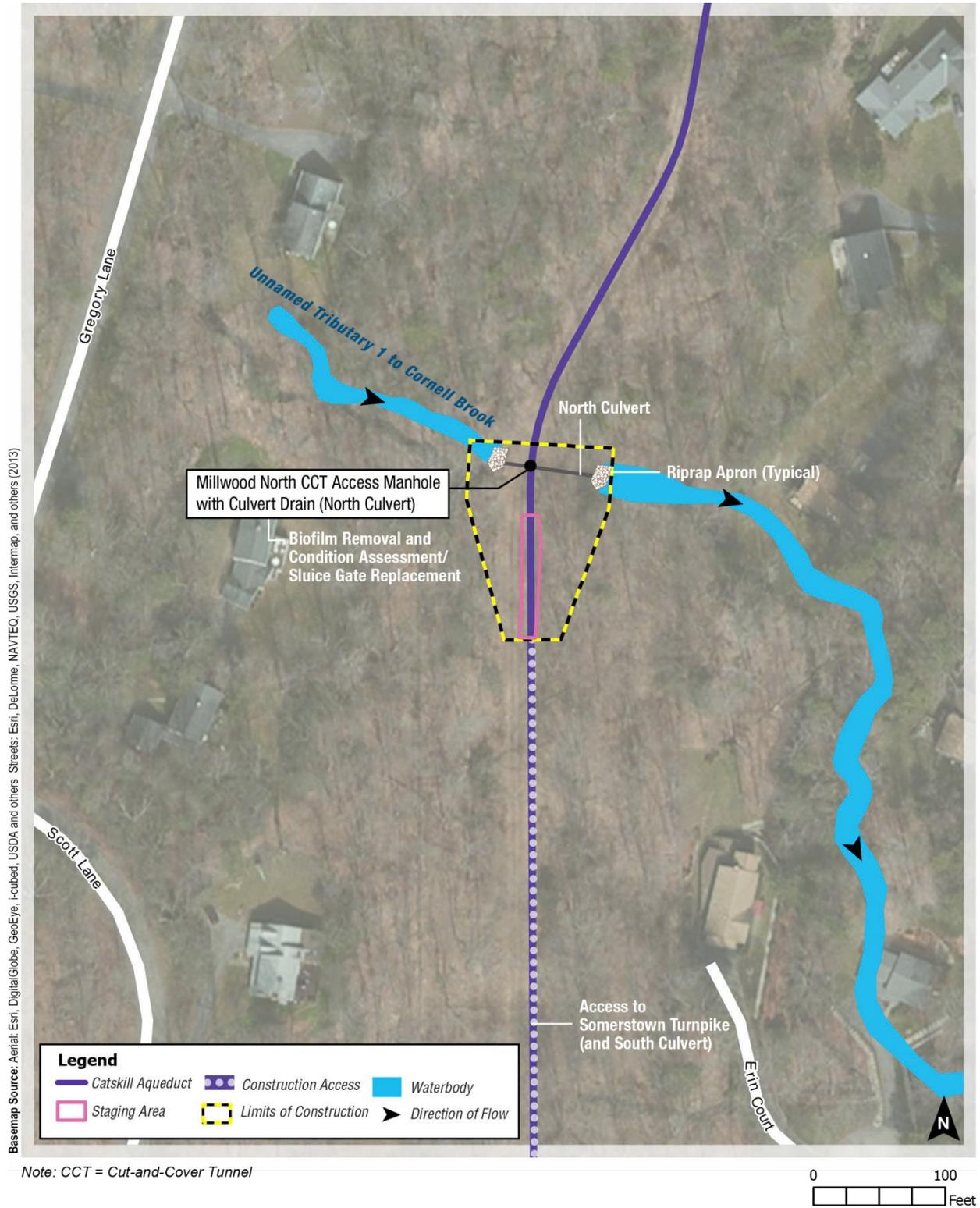


Figure 9.15-6: Site Plan for Millwood North CCT Access Manhole with Culvert Drain (North Culvert) – Somerset Turnpike Study Area



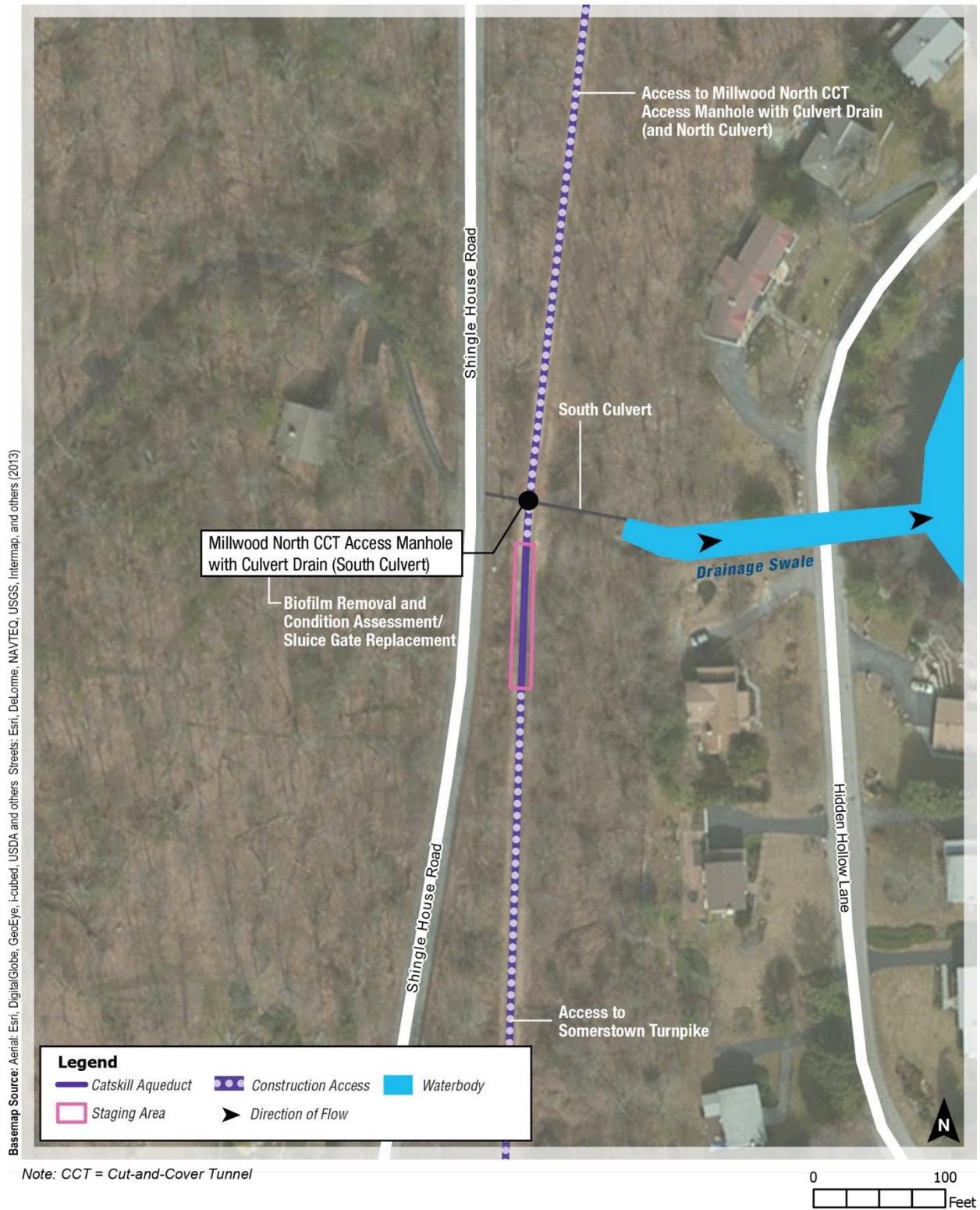


Figure 9.15-7: Site Plan for Millwood North CCT Access Manhole with Culvert Drain (South Culvert) – Somerset Turnpike Study Area



Table 9.15-2: Schedule of Work Activities within the Somerstown Turnpike Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Staging and Access Improvements ³	Summer 2019 2018	2 weeks	Monday to Friday, 7:30 AM to 6 PM	8
Streambank Restoration and Protection (North Culvert)	Summer 2019 2018	3 weeks	Monday to Friday, 7:30 AM to 6 PM	10
Culvert Drain Sluice Gate Replacement	Fall 2019 2018 (Second 10-week shutdown)	4 weeks	7 days a week, 7 AM to 7 PM	12
Biofilm Removal and Condition Assessment	Fall 2020 2019 (Third 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	21
Notes:				
¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per the Town of New Castle Noise Control Ordinance §90-6(B). ² Crew size refers to the number of people anticipated at the work site(s). ³ Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>).				

Biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019, with access into the aqueduct provided by the access manholes. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Somerstown Turnpike Study Area are presented in Sections 9.15.3.3, “Open Space and Recreation” through 9.15.3.9, “Neighborhood Character,” and include open space and recreation; visual resources; natural resources including water resources, terrestrial resources, federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.15.2, “Town of New Castle Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” an impact analysis related to land use and zoning; socioeconomic conditions; community facilities and services; historic and cultural resources; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, federal/State Candidate Species, and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area is not warranted. Finally, impacts related to project-wide natural resources, water and sewer

infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.15.3.3 Open Space and Recreation

As shown on **Figure 9.15-8**, one town-owned open space and recreation resource exists within the Somersetown Turnpike Study Area. Approximately 1 acre of the Town of New Castle open space parcel is located within the eastern portion of the Somersetown Turnpike Study Area. In total, the locally owned Town of New Castle open space parcel is approximately 1.4 acres and is a forested area on Glenwood Road with no identifiable amenities.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP’s understanding that no plans to expand or create new open space or recreational resources are anticipated within the Somersetown Turnpike Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open space is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Somersetown Turnpike Study Area would be the same as baseline conditions.

Repair and rehabilitation activities in the area of the North Culvert would be far from the open space parcel and would be screened from view by the surrounding forested land and housing.

During construction, the repair and rehabilitation work activities within the Somersetown Turnpike Study Area would be short-term (intermittently over 1.5 years). The site preparation activities at the North Culvert may require select clearing of trees and shrubs. The open space parcel is not located near any work activities within the Somersetown Turnpike Study Area.

As discussed in Section 9.15.3.8, “Noise,” the repair and rehabilitation work activities would temporarily increase noise levels within the Somersetown Turnpike Study Area. However, the locally owned Town of New Castle open space parcel within the study area does not contain noise-sensitive receptors and would not be located near any work activities within the Somersetown Turnpike Study Area.

Following construction, all equipment would be removed from the Somersetown Turnpike Study Area and staging areas would be restored to baseline conditions. The streambank restoration measures would be consistent with as-built conditions and are permanent structures that would remain following construction. Following the repair and rehabilitation within the Somersetown Turnpike Study Area, operation of the repaired and rehabilitated Catskill Aqueduct would be consistent with baseline conditions and would not disrupt recreational use of adjacent open spaces. As such, the repair and rehabilitation would not encroach upon, cause a loss of open space, impact the use or physical character of, or disrupt views from the Town of New Castle open space parcel.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Somersetown Turnpike Study Area.

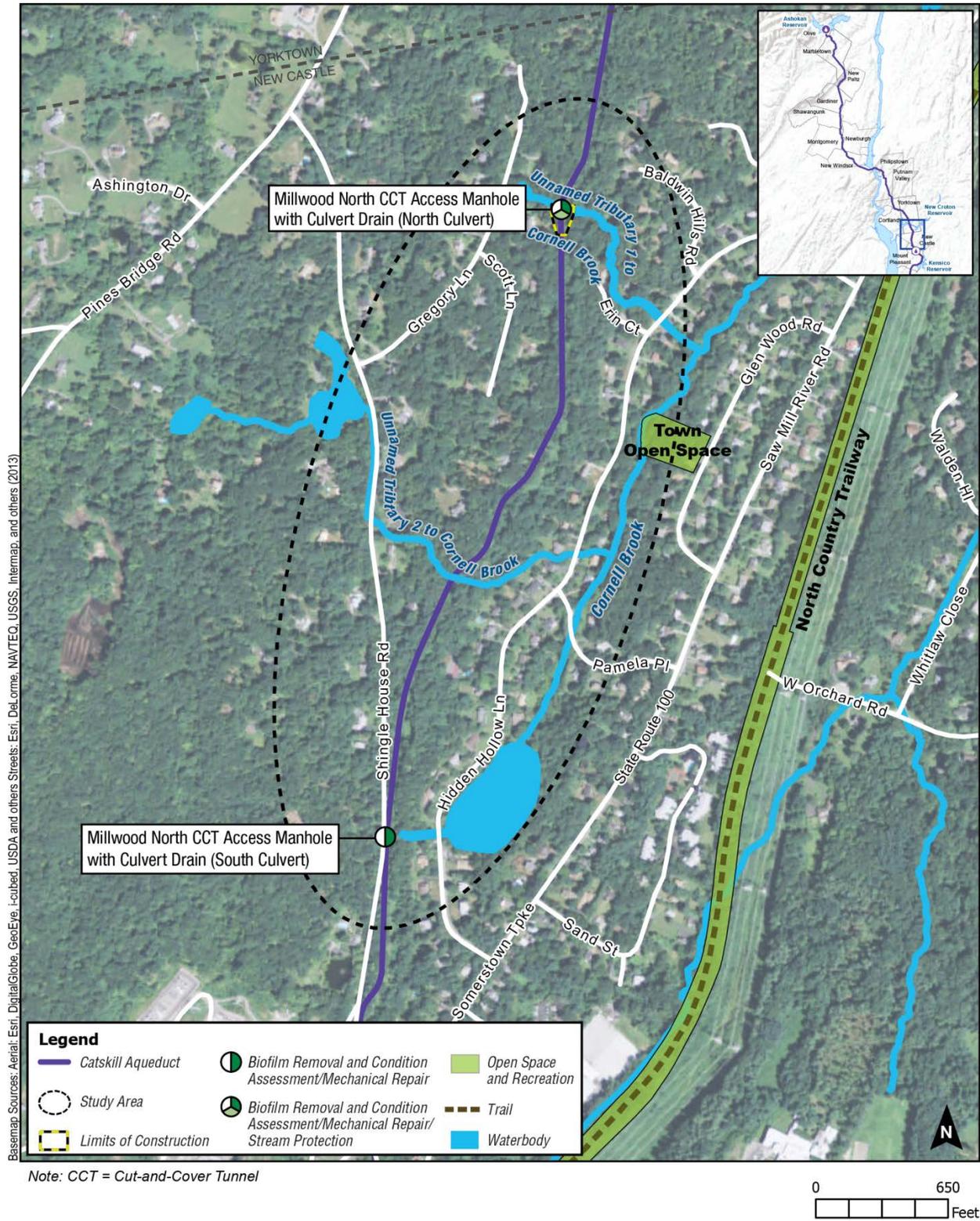


Figure 9.15-8: Open Space and Visual Resources – Somertown Turnpike Study Area



9.15.3.4 Visual Resources

The study area for the visual resources analysis is the area within the Somerstown Turnpike Study Area. It also includes view corridors that extend beyond the study area, based on locations that are publicly accessible.

Visual resources in the study area are limited to the forested 1.4-acre Town of New Castle open space parcel described in the previous section and shown on **Figure 9.15-8**.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources within the Somerstown Turnpike Study Area within the timeframe of the impact analysis. Natural process, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Somerstown Turnpike Study Area would be the same as baseline conditions.

The work areas at the manhole locations are in wooded areas. They do not have views to or from the Somerstown Turnpike Study Area and the open space parcel, due to a large span of residential development with existing dense vegetation.

During construction, the repair and rehabilitation work activities within the Somerstown Turnpike Study Area would be short-term (intermittently over 1.5 years). The site preparation activities at the North Culvert may require select clearing of trees and shrubs. These areas are hidden from the viewshed of the Town of New Castle open space parcel by a large span of residential development with existing dense vegetation. The Town of New Castle open space parcel would not be located near any work activities within the Somerstown Turnpike Study Area.

Following construction, all equipment would be removed from the Somerstown Turnpike Study Area and staging areas would be restored to baseline conditions. Additionally, the permanent streambank restoration measures would be consistent with as-built conditions and would not be visible from the open space parcel. Following the repair and rehabilitation within the Somerstown Turnpike Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not disrupt views to or from any visual resources. As such, the repair and rehabilitation would not disrupt views from the visual resource of the Town of New Castle open space parcel.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Somerstown Turnpike Study Area.

9.15.3.5 Natural Resources

As shown on the study area for the natural resources analysis is the immediate area surrounding the limits of construction that include the North Culvert (see **Figure 9.15-9**).

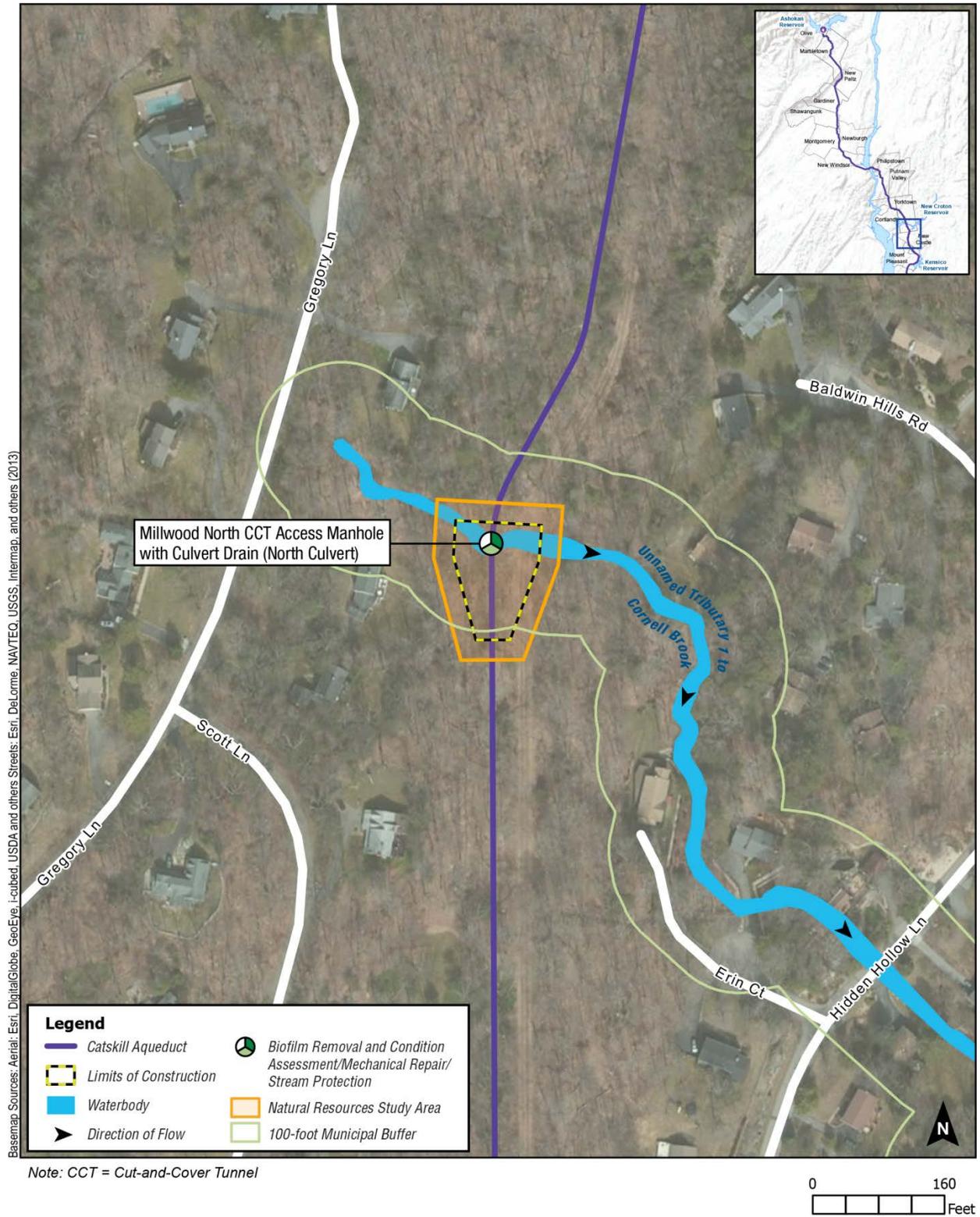


Figure 9.15-9: Natural Resources for Site Plan for Millwood North CCT Access Manhole with Culvert Drain (North Culvert) - Somerstown Turnpike Study Area



Resources potentially occurring within the natural resources study area were identified through a desktop assessment of aerial photographs, NYSDEC water classification data, NYSDEC freshwater wetlands maps, USFWS National Wetlands Inventory (NWI) maps, national hydrography data, published soil survey maps, and USGS topographic maps, as well as agency consultations.

Based on the desktop assessment, the natural resources study area contains deciduous forest. The study area also contains a mowed roadside/pathway. Water resources in the natural resources study area include an unnamed tributary to Cornell Brook. The natural resources study area has the potential to support protected water resources and wildlife species, and an analysis of the potential effects to these natural resources that could result from the repair and rehabilitation activities is presented below.

Water Resources

The Somerstown Turnpike natural resources study area is within the Lower Hudson River drainage basin, more specifically within the Lower Hudson Watershed (hydrologic unit code [HUC] 02030101) of the Bailey Brook-Croton River subwatershed (HUC 020301010307). The water resources in the natural resources study area are subject to federal jurisdiction under Sections 401 and 404 of the Clean Water Act, but are unclassified waters not subject to State Protection of Waters regulations. In addition, the Town of New Castle also regulates activities within wetlands and any natural or artificial watercourses and their 100-foot buffers (New Castle Town Code Chapter 137: Wetlands). This municipal regulation encompasses the work in and alongside the stream including staging areas on top of the aqueduct berm. Therefore, work activities occurring within the water resources and their 100-foot buffers may be subject to Town review and approval.

Based on the desktop assessment, there are no mapped wetlands within the natural resources study area. A surface water resource was assigned a community classification based on the habitat descriptions the Cowardin System (Cowardin et al. 1979). The water resource name, length, area, and classification is shown in **Table 9.15-3**.

Table 9.15-3: Water Resources and Classifications within the Somerstown Turnpike Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Unnamed Tributary 1 to Cornell Brook	2,580	200	Riverine, Intermittent, Unconsolidated Bottom (R4UB)

Surface Water

Based upon the desktop assessment, Cornell Brook is a Class B(TS) stream located east of the natural resources study area that has multiple unnamed tributaries. One of its unnamed tributaries crosses under the aqueduct and is located within the natural resources study area, as shown on **Figure 9.15-9**.

Unnamed Tributary 1 to Cornell Brook

Unnamed tributary 1 to Cornell Brook originates west of the natural resources study area and flows east through the North Culvert under the aqueduct to eventually join Cornell Brook. Unnamed tributary 1 to Cornell Brook is located within the natural resources study area at the North Culvert. This is a first order stream and flows are anticipated to be intermittent. Based on the desktop assessment, the watercourse is best classified as a “Riverine, Intermittent, Unconsolidated Bottom” system based on the Cowardin System (Cowardin et al. 1979).

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated to occur within the natural resource study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the study area would be similar to baseline conditions.

Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Somerstown Turnpike Study Area.

Construction

Work activities related to the repair and rehabilitation would result in temporary disturbance to portions of unnamed tributary 1 to Cornell Brook and would have the potential to temporarily alter flows in the tributary. Prior to commencement of the repair and rehabilitation, sediment and erosion control measures would be installed to prevent the transport of sediment resulting from temporary disturbance into water resources within the study area. All access and staging activities would occur in upland areas along the top of the cut-and-cover berm. Equipment would then use the side-slope of the berm to reach both the inlet and outlet of the culvert.

The riprap aprons installed at the inlet and outlet of the culverts during the aqueduct’s original construction have deteriorated and are no longer stabilizing the shoreline. As part of the repair and rehabilitation, the riprap aprons at the North Culvert would be restored to their original, as-built condition. To complete the culvert drain repairs and maintain a dry work area, sandbags would be installed upstream of the culvert, and surface water would be diverted to a point downstream, which would include a turbidity curtain for sediment control. The temporary diversion of unnamed tributary 1 would be conducted in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements. Diversion would be for the shortest possible duration. Upon completion of streambank restoration measures, surface water flows would be returned to their original location and temporarily disturbed areas would be restored to natural conditions.

Riprap aprons would be restored at both the inlet and outlet of the North Culvert to provide erosion protection and would be consistent with original as-built conditions. Additionally, riprap aprons at the culvert drain would be sized based upon the maximum discharge capacity, even though it is unlikely that flows of this magnitude would be discharged at this site.

Anticipated temporary disturbances to water resources and regulated buffers were quantified based on the limits of construction and proposed work activities (see **Table 9.15-4**). Construction staging and activities would result in approximately 1,750 square feet of temporary disturbance to the unnamed tributary 1. There would be no permanent disturbance to the unnamed tributary 1 to Cornell Brook because riprap aprons would be in-kind repairs. Approximately 10,390 square feet of temporary disturbance would occur within the municipal water resource buffer. Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native riparian vegetation.

Table 9.15-4: Estimated Disturbance to Water Resources within the Somerset Turnpike Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Unnamed Tributary 1 to Cornell Brook	2,580	1,750 <i>Temporary stream diversion and temporary downstream turbidity curtain</i>	0
100-foot Municipal Water Resource Buffer	20,490	10,390 <i>Construction staging area and construction equipment use</i>	0

Discharges of raw aqueduct water and groundwater could take place during a shutdown of the Catskill Aqueduct. The aqueduct would be unwatered with temporary stream protection measures in place prior to reconstructing the culvert drain sluice gate. Unwatering events to surface water would also occur at any time following construction and therefore are described in “Operation” below.

Operation

Upon completion of the culvert drain sluice gate repairs and streambank restoration and protection, the function of the sluice gates would be restored and discharges of raw water could occur in the future during DEP’s typical operations. Even though no work activities at the South Culvert warrant an assessment, this site could be used to unwater the aqueduct. The aqueduct could be unwatered via the sluice gates at the North and South Culverts to conduct maintenance or inspection. During the aqueduct shutdowns, groundwater may infiltrate into the aqueduct. Groundwater would flow by gravity to the culvert drain sluice gates and could also be discharged to the receiving surface water. This would be a rare event.

An analysis was conducted to determine if the raw water discharge associated with an unwatering event is greater than the bankfull stream flow. Bankfull discharge is associated with a

1.5-year storm and is therefore, an indication of flows routinely experienced by a stream. If the discharge associated with an unwatering event is greater than the bankfull flow, indirect downstream effects, such as erosion and scouring could be reasonably expected. The calculations determined that bankfull flow of unnamed tributary 1 to Cornell Brook was approximately 9,900 gpm at the North Culvert drain sluice gate location and approximately 4,000 gpm at the South Culvert drain sluice gate location using the USGS StreamStats Program. These flows are equal to or greater than the maximum discharge flows of approximately 6,700 and 4,000 gpm, respectively, when the North and South Culverts are operated during a 1.5-year storm event. The analysis also determined that groundwater infiltration at each culvert is expected to be approximately 50 to 100 gpm. The groundwater infiltration rate is lower than the bankfull stream flow at the respective sites; therefore, groundwater infiltration would not be expected to create flooding conditions. These discharges would not result in a bankfull event and indirect downstream impacts such as increases in erosion and scouring would be minimal.

Based on this analysis, the stream would not be affected by unwatering at this location. It is unlikely that this site would be used for unwatering on a routine basis because raw aqueduct water in this segment is more easily discharged to Saw Mill River at the Harlem Railroad Steel Pipe Siphon Blow-off Chambers (see Washington Avenue Study Area in the Village of Pleasantville). Rather, the culvert drain sluice gate would be used to discharge infiltrated groundwater during the repair and rehabilitation and future maintenance, which would not exceed the unnamed tributary's bankfull flow. Therefore, discharges would be below the calculated bankfull flows, would be rare and last several hours or days in duration, depending on the length of the shutdown of the Catskill Aqueduct, and are not anticipated to contribute to erosion of the stream channel.

Water Resources Conclusions

Repair and rehabilitation of the North Culvert would result in temporary disturbance to unnamed tributary 1 to Cornell Brook. Surface water would be temporarily diverted during construction and the in-stream areas temporarily disturbed. Upon completion of repair and restoration work, surface water flows would be returned to their original location. Restoring the riprap aprons to their original condition would result in minimal fill and would be beneficial in that these would minimize future scouring when the culvert drain sluice gate is operated. Other areas temporarily affected by work activities would also be restored to natural conditions following construction. Discharges would be limited to groundwater infiltration and unwatering events that are not anticipated to result in erosion and sediment control issues that may adversely affect the stream channel.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Somerset Turnpike Study Area.

Terrestrial Resources

The natural resources study area consists of mowed roadside/pathway and deciduous forest. During construction, tree removal may be required and the Town of New Castle regulates removal of trees at least 4 inches dbh (New Castle Town Code Chapter 121: Tree Preservation). Exemptions include any removal of trees required by public entities, agencies, or electrical

utilities that by operation of law are exempt from the permit requirements of this chapter. While the Town may not regulate the removal of trees associated with the repair and rehabilitation, terrestrial resources within the study area warrant an analysis.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no new initiatives that would affect terrestrial resources are anticipated within the Somerstown Turnpike Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be the same as baseline conditions.

Within the natural resources study area at the North Culvert, it is anticipated that removal of approximately 21 trees may be needed to facilitate repairs. These trees are located on DEP property in the immediate vicinity of the work areas adjacent to the existing Catskill Aqueduct. Tree removal would occur in discrete locations along the densely forested areas east and west of the aqueduct along the cleared corridor, and would not dramatically change the character of the area or affect surrounding trees. Any removal of trees would be conducted from November 1 through March 31 to avoid impacts to potential roosting trees for Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Given that tree removal would be conducted on DEP property, this activity appears to be exempt from Town of New Castle tree removal regulations; however, if applicable, tree removal on DEP property would be conducted in accordance with applicable requirements set forth by the Town of New Castle.

Following construction, all equipment would be removed from the natural resources study area and staging areas would be restored to natural conditions. Operation of the Catskill Aqueduct would be consistent with baseline conditions, and natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Somerstown Turnpike Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, "Natural Resources," as having the potential to be affected by activities within the natural resources study area. Species that could be affected within the study area and could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, "Natural Resources," nine species were identified to have the potential to be affected by the repair and rehabilitation within the natural resources study areas. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these nine species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened, Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.15-5**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and desktop assessments, as applicable.

Table 9.15-5: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Somerset Turnpike Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Bog Turtle	<i>Clemmys</i> [= <i>Glyptemys</i>] <i>muhlenbergii</i>	Threatened	Endangered	Based upon the desktop assessment, there are no mapped wetlands present. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work site. Finally, upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for bog turtles is warranted for this study area.	No
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	While work activities would be largely confined to previously disturbed areas, if any isolated areas of potential habitat exist at the sites, as a highly mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work site. Finally, upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	Disturbance would be temporary and limited to areas previously disturbed. Should any potential habitat exist at the site, a variety of habitats would be available for the species, use in the vicinity during construction. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No
Spotted Turtle	<i>Clemmys guttata</i>	Unlisted	Special Concern	While work activities would be largely confined to previously disturbed areas, if any isolated areas of potential habitat exist at the sites, any spotted turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work site. Finally, upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for spotted turtles is warranted for this study area.	No

Table 9.15-5: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Somerset Turnpike Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Birds					
Osprey	<i>Pandion haliaetus</i>	MBTA	Special Concern	Disturbance would be temporary and limited to previously disturbed areas. Should any potential habitat exist at the site, a variety of habitats would be available for the species use in the vicinity during construction. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Ospreys is warranted for this study area.	No
Sharp-shinned Hawk	<i>Accipiter striatus</i>	MBTA	Special Concern	Disturbance would be temporary and limited to previously disturbed areas. Should any potential habitat exist at the site, a variety of habitats would be available for the species use in the vicinity during construction. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Sharp-shinned Hawks is warranted for this study area.	No
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	Any removal of trees and would be conducted from November 1 through March 31 to avoid impacts to potential roosting bats. Potential foraging habitat along the unnamed tributary would be minimally affected during construction, and foraging habitat would continue to be available in the canopy within the natural resources study area and in adjacent forested areas. Therefore, there are no effects anticipated and no further analysis for Indiana bats is warranted for this study area.	No
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened Unlisted	Any removal of trees and would be conducted from November 1 through March 31 to avoid impacts to potential roosting bats. Potential foraging habitat along the unnamed tributary would be minimally affected during construction, and foraging habitat would continue to be available in the canopy within the natural resources study area and in adjacent forested areas. Therefore, there are no effects anticipated and no further analysis for northern long-eared bats is warranted for this study area.	No
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	If any potential habitat exists at the site, a variety of habitats would be available for the species use in the vicinity. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for New England cottontails is warranted for this study area.	No
Note: MBTA: Migratory Bird Treaty Act					

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects anticipated to bog turtles (*Clemmys [=Glyptemys] muhlenbergii*), eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), spotted turtles (*Clemmys guttata*), Ospreys (*Pandion haliaetus*), Sharp-shinned Hawks (*Accipiter striatus*), Indiana bats, northern long-eared bats, or New England cottontails (*Sylvilagus transitionalis*) associated with the repair and rehabilitation. Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Somerstown Turnpike Study Area.

9.15.3.6 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Somerstown Turnpike Study Area, a Phase I Environmental Site Assessment (ESA) would be completed in general conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Practice E 1527-13 and CEQR requirements to identify Recognized Environmental Condition (RECs). The Phase I ESA would include site reconnaissance, research on current/historic use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard.

The proposed culvert drain sluice gates replacement and associated streambank restoration and protection would occur on a previously disturbed section of the Catskill Aqueduct. Given the findings of previous subsurface investigation along similar portions of the aqueduct corridor, no subsurface ground contamination is anticipated. However, where RECs are identified, a Phase II subsurface soil investigation would be recommended to be completed for contaminants of concern (COC) prior to construction. The COC to be evaluated along the segment of the aqueduct in the study area that would be affected as part of the repair and rehabilitation work would include: volatile and semivolatile organics, polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons. The investigation would be recommended to be completed to determine the contamination levels, if any, of the on-site soils prior to the commencement of any work activities. Subsurface soil testing would be conducted to ensure that contaminated soil is not reused as backfill (per 6 NYCRR IV B Part 375). Should any areas of contamination be identified, the construction contract documents would be revised to identify requirements for proper handling and disposal of the material.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Somerstown Turnpike Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Somerstown Turnpike Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance

chemicals during construction. DEP would handle all materials in accordance with applicable federal, State, and local regulations and guidelines. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements, and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, minor soil disturbance associated with the work activities for the culvert drain sluice gate replacement, and associated streambank restoration and protection, would occur on previously disturbed soils.

If any soil contamination is identified, the excavated material would be transported to an authorized off-site storage facility. All waste material, including contaminated soil, would be temporarily secured using non-permeable base material, covered with plastic or geotextile to prevent soil loss, and removed from the proposed construction, repair and rehabilitation areas within the Somerstown Turnpike Study Area at the end of each workday. All soils to be removed as part of the repair and rehabilitation would be transported off site and disposed of in accordance with all federal, State, and local laws.

Following construction, all construction-related equipment would be removed from the Somerstown Turnpike Study Area. The staging area would be restored and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Somerstown Turnpike Study Area.

9.15.3.7 Transportation

The transportation study area consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Somerstown Turnpike Study Area.

Access to the repair and rehabilitation limits of construction work sites within the Somerstown Turnpike Study Area would be via Somerstown Turnpike (State Route 100, see **Figure 9.15-2**). Somerstown Turnpike is a two-lane, two-way urban minor arterial roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Somerstown Turnpike Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area. There is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site. However, there are no DEP employees who work at or visit the study area on a daily basis, and the low number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Somerstown Turnpike Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Somerstown Turnpike Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be the basis of this transportation analysis. Of these activities, biofilm removal and condition assessment would generate the most vehicle trips (see **Table 9.15-2**). Biofilm removal and condition assessment would occur in fall ~~2020~~2019 between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the third 10-week shutdown.

In the future with the repair and rehabilitation, construction vehicles would travel along Somerstown Turnpike. The estimated number of peak-day one-way vehicle trips associated with the biofilm removal and condition assessment is 33 vehicle trips, or approximately 66 peak-day vehicle round trips that would travel to and from the study area. The majority of the peak daily vehicle round trips, approximately 42 vehicle round trips or 42 Passenger Car Equivalents (PCEs), would be workers traveling directly to and from the staging area, with an additional 8 daily shuttle trips between the study area and the staging area. The remaining approximately 16 peak-day vehicle round trips (21 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with biofilm removal and condition assessment is approximately 33 peak-hour vehicle trip ends (36 PCEs). This includes approximately 21 vehicle trip ends (21 PCEs) from workers traveling directly to and from the staging area, approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 8 vehicle trip ends (11 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one, 12-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 36 peak-hour PCEs along Somerstown Turnpike, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, “Transportation.” The work activities at the Somerstown Turnpike Study Area would be short-term (totaling 11 weeks over 1.5 years; see **Table 9.15-2**) and would not generate public parking or transportation demands or pedestrian activity within the Somerstown Turnpike Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Somerstown Turnpike Study Area.

9.15.3.8 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation activities within the Somerstown Turnpike Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the Somerstown Turnpike Study Area.

The noise study area established for the analysis is the area within 1,500 feet of the repair and rehabilitation activities (North Culvert) as shown on **Figure 9.15-10**, which encompasses areas within the Towns of New Castle and Yorktown.

The Somerstown Turnpike Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise codes. The repair and rehabilitation is subject to the Town of New Castle Noise Control Ordinance §90-6(B), which allows audible construction noise only between 7:30 AM and 8 PM, Monday through Friday, and 10 AM and 5 PM, weekends and holidays. The northern extent of the study area encompasses parcels in the Town of Yorktown. Noise-producing activities in the Somerstown Turnpike Study Area are also subject to the Town of Yorktown Noise Control Law §216-2, which prohibits excessive noise between 11 PM and 7 AM, Sunday evening through Friday morning and 10 PM and 8 AM, Friday evening through Sunday morning. The Town of Yorktown Ordinance §300-67 also prohibits adverse noise impacts from watershed and water supply facilities.

Existing ambient noise levels within the Somerstown Turnpike Study Area are influenced by vehicular traffic traveling on Somerstown Turnpike and other nearby local roadways. The existing noise levels within the study area are comparable to a quiet suburban residential environment, based on the distance from major transportation corridors, the population density of the area, and other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Towns of New Castle and Yorktown and Westchester County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Somerstown Turnpike Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Somerstown Turnpike Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Somerstown Turnpike Study Area would occur at two work sites. The stationary noise-generating equipment associated with streambank restoration and protection was the basis of this stationary noise analysis. Streambank restoration and protection would occur in summer ~~2019~~2018 between the hours of 7:30 AM and 6 PM, Monday through Friday for approximately 3 weeks prior to the second 10-week shutdown. Work conducted while the aqueduct is in service would be adjusted to comply with allowable work hours per town noise codes. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities; however, this equipment would not be expected to be louder than those associated with streambank restoration and protection.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for streambank restoration and protection. Associated equipment reference noise levels are shown in **Table 9.15-6**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

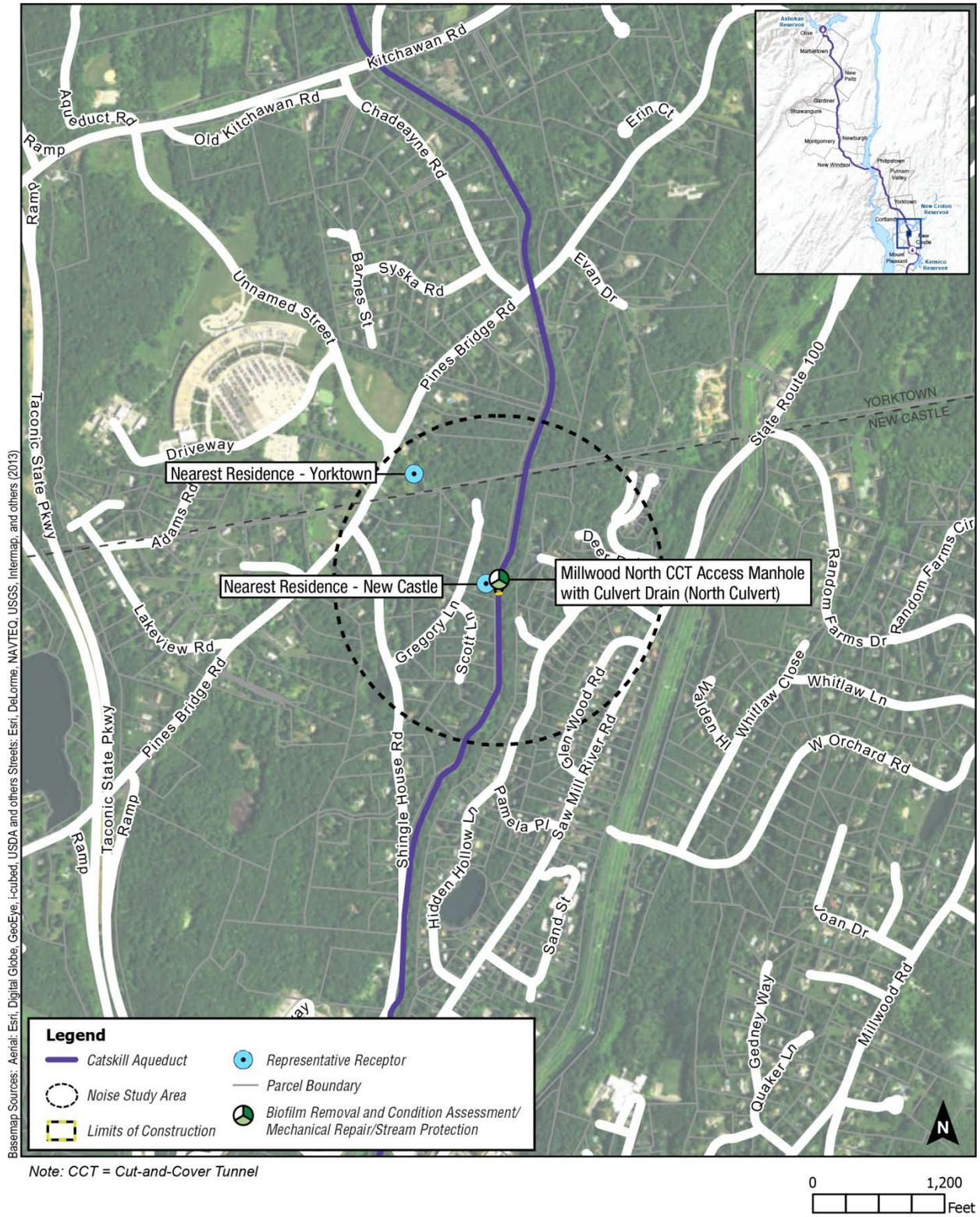


Figure 9.15-10: Noise – Somerstown Turnpike Study Area



Table 9.15-6: Stationary Source Construction Equipment Modeled at the Somersetown Turnpike Study Area - Noise Analysis and Reference Noise Levels (L_{eq})

Equipment Type	Reference Noise Level (L _{eq}) at 50 feet (dBA)
Excavator	81
Generator	82
Backhoe	76
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	

Table 9.15-7 shows the results of the stationary construction noise analysis. Streambank restoration and protection within the Somersetown Turnpike Study Area during the repair and rehabilitation could produce noise levels (L_{eq}) of approximately 78 dBA at the nearest residence in the Town of New Castle and 57 dBA at the nearest residence in the Town of Yorktown.

Table 9.15-7: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors Within the Somersetown Turnpike Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level (L _{eq}) at Noise-Sensitive Receptor (dBA)	Town of New Castle Noise Limit (dBA)	Town of Yorktown Noise Limit (dBA)	Potential for Exceedance (Yes or No)
Nearest Residence - New Castle	116	78	NA	NA	No
Nearest Residence - Yorktown	1,243	57	NA	NA	No
Notes: NA = Not Applicable					

Repair and rehabilitation work activities would comply with the Towns of New Castle and Yorktown town codes. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Somersetown Turnpike Study Area. The repair and rehabilitation would be temporary in nature, with the peak work activities occurring during streambank restoration and protection in summer ~~2019~~2018 for a limited period (e.g., 3 weeks).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Somersetown Turnpike Study Area.

9.15.3.9 Neighborhood Character

The character of the Somersetown Turnpike Study Area is largely defined by a mix of residential, commercial, public services, open space and recreation, and vacant land uses and its physical

setting within a suburban location (see **Figure 9.15-4**). The Catskill Aqueduct traverses the study area in a general northeast to southwest direction. The study area is bounded to the east by State Route 100, known as Somerstown Turnpike at the south end of the study area and as Saw Mill River Road heading north. Shingle House Road and Hidden Hollow Lane traverse the study area from north to south, and Cornell Brook, a tributary to New Croton Reservoir, flows to the north along its eastern edge.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Somerstown Turnpike Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

The limits of construction for the work site and associated access route are located in a public services corridor with grassy cover, which is owned and maintained by DEP.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; and historic and cultural resources, an impact analysis for the Somerstown Turnpike Study Area is not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," Section 9.3.4, "Socioeconomic Conditions," and Section 9.3.7, "Historic and Cultural Resources," respectively. As described in Section 9.15.3.3, "Open Space and Recreation," and Section 9.15.3.4, "Visual Resources," the work activities would not affect open spaces and recreation and visual resources in the Somerstown Turnpike Study Area. Furthermore, the public policy impact analysis provided in Section 9.15.2, "Town of New Castle Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.15.3.7, "Transportation," and 9.15.3.8, "Noise," during construction, the work activities in the Somerstown Turnpike Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Somerstown Turnpike Study Area.

9.15.4 STATION PLACE STUDY AREA IMPACT ANALYSIS

Within the Station Place Study Area, the aqueduct consists of the Millwood North Cut-and-Cover Tunnel, transitioning to the Putnam Siphon at a boathole in its southern portion. An access manhole along the cut-and-cover tunnel is also located within the study area (see **Figure 9.15-11**).

Work activities within the Station Place Study Area would include: staging and access improvements; boathole preparation and installation; biofilm removal and condition assessment; and small-scale wash water treatment.

9.15.4.1 Study Area Location and Description

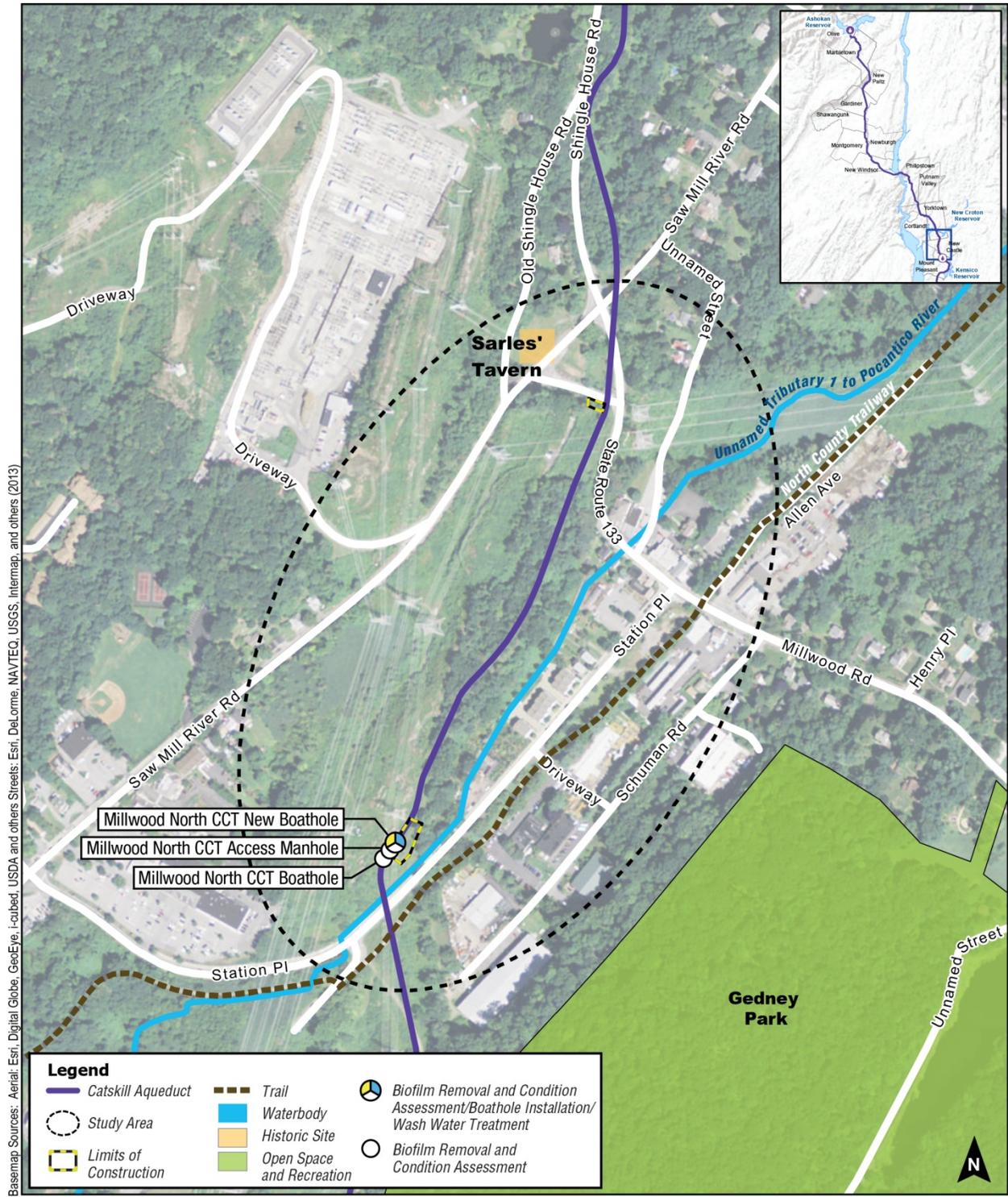
The Station Place Study Area is located along the upper Catskill Aqueduct in the Town of New Castle. The Catskill Aqueduct traverses the study area in a general northeast to southwest direction. The study area is traversed longitudinally in the north by Saw Mill River Road, which parallels the aqueduct to the west, and in the south by Station Place, which runs perpendicular to Millwood Road (State Route 133) in the northeast portion of the study area. The North County Trailway, a paved multi-use rail trail, parallels Station Place to its south. An unnamed tributary to Pocantico River runs from south to north roughly parallel to Station Place. Access would be provided by driving over the cut-and-cover tunnel from an entrance off Millwood Road.

The proposed work sites within the study area are located at the entrance off Millwood Road and in the area surrounding the existing Millwood North Cut-and-Cover Tunnel boathole and access manhole. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work site. **Figure 9.15-11** shows an aerial photograph of the study area, including the path of the aqueduct, limits of construction of the work site, and the proposed access route. **Figure 9.15-12** shows a photograph of the boathole within the study area.

The study area consists of public service, residential, commercial, and industrial land uses, in addition to vacant land, community facilities, and open space and recreation parcels. Overhead electrical transmission lines run through the study area. The limits of construction for the work sites and associated access route are located in a public services corridor with grassy cover, which is owned and maintained by DEP and separated from adjacent properties by a forested zone. **Figure 9.15-13** shows a map of the land uses in the study area and its surroundings.

The study area is located within six zoning districts, including: three single-family residential districts (R-1/2A, R-1/4A, and R-1A); two business districts, designed business and business retail (B-D and B-R); and two industrial districts, general industry and planned industry (I-G and I-P), as designated by the Town of New Castle Zoning Code (see **Figure 9.15-14**). The Catskill Aqueduct is a permitted use as a public utility facility, and is located within the retail business (B-R) and single-family residential (R-1A and R-1/4A) zoning districts.

The site of Sarles' Tavern, listed on the National Register of Historic Places, is located within the study area (see Section 9.15.4.4, "Historic and Cultural Resources"). There are no other federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.



Basemap Sources: Aerial: Esri, Digital Globe, GeoEye, i-cubed, USDA, and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

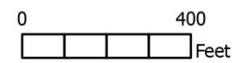


Figure 9.15-11: Study Area – Station Place

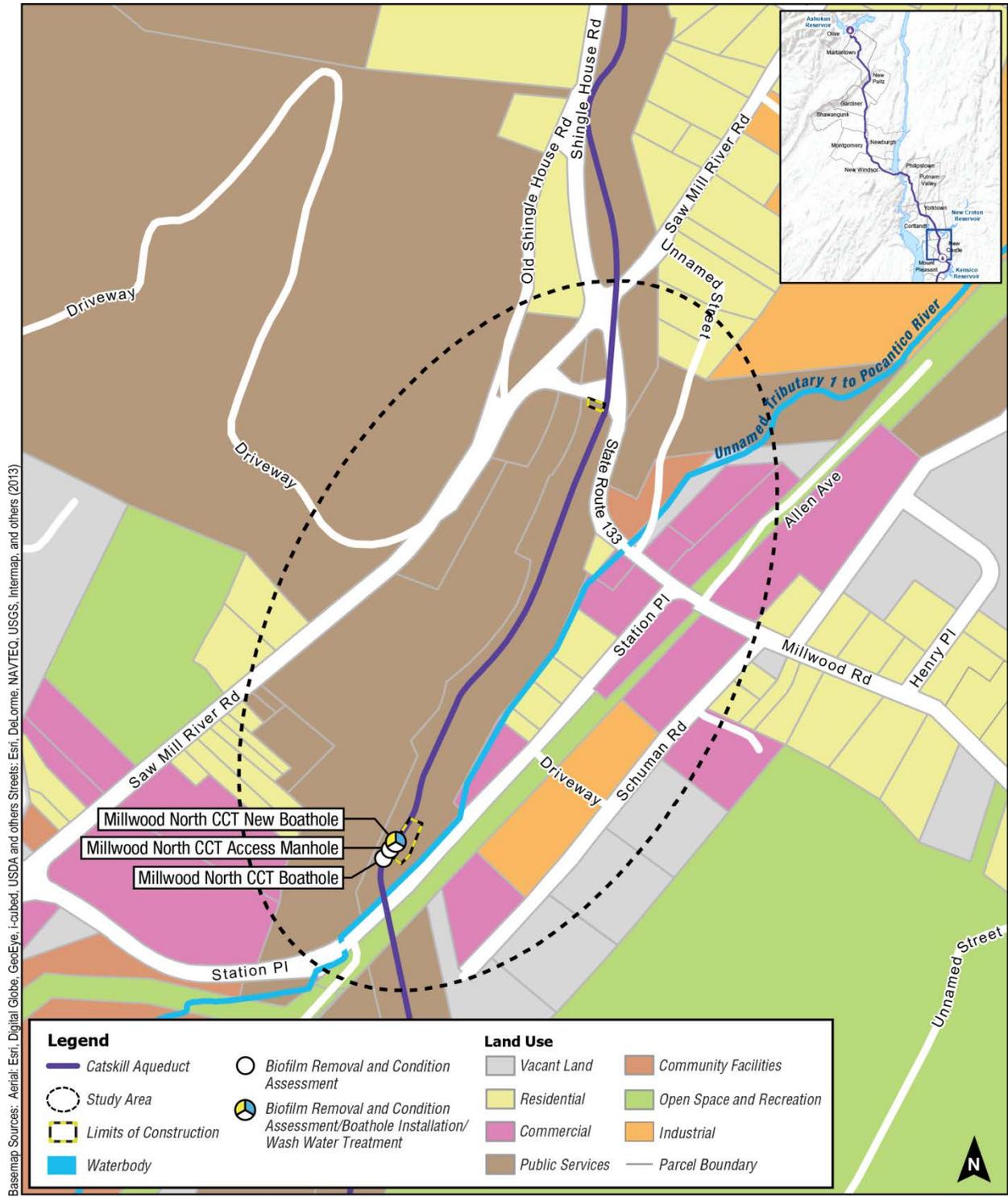




Photograph 1: Looking southwest at Millwood North Cut-and-Cover Tunnel boathole and proposed staging area.

Figure 9.15-12: Photograph – Station Place Study Area





Basemap Sources: Aerial, Esri, Digital Globe, GeoEye, i-cubed, USDA, and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Note: CCT = Cut-and-Cover Tunnel

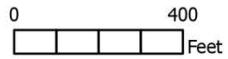


Figure 9.15-13: Land Use – Station Place Study Area



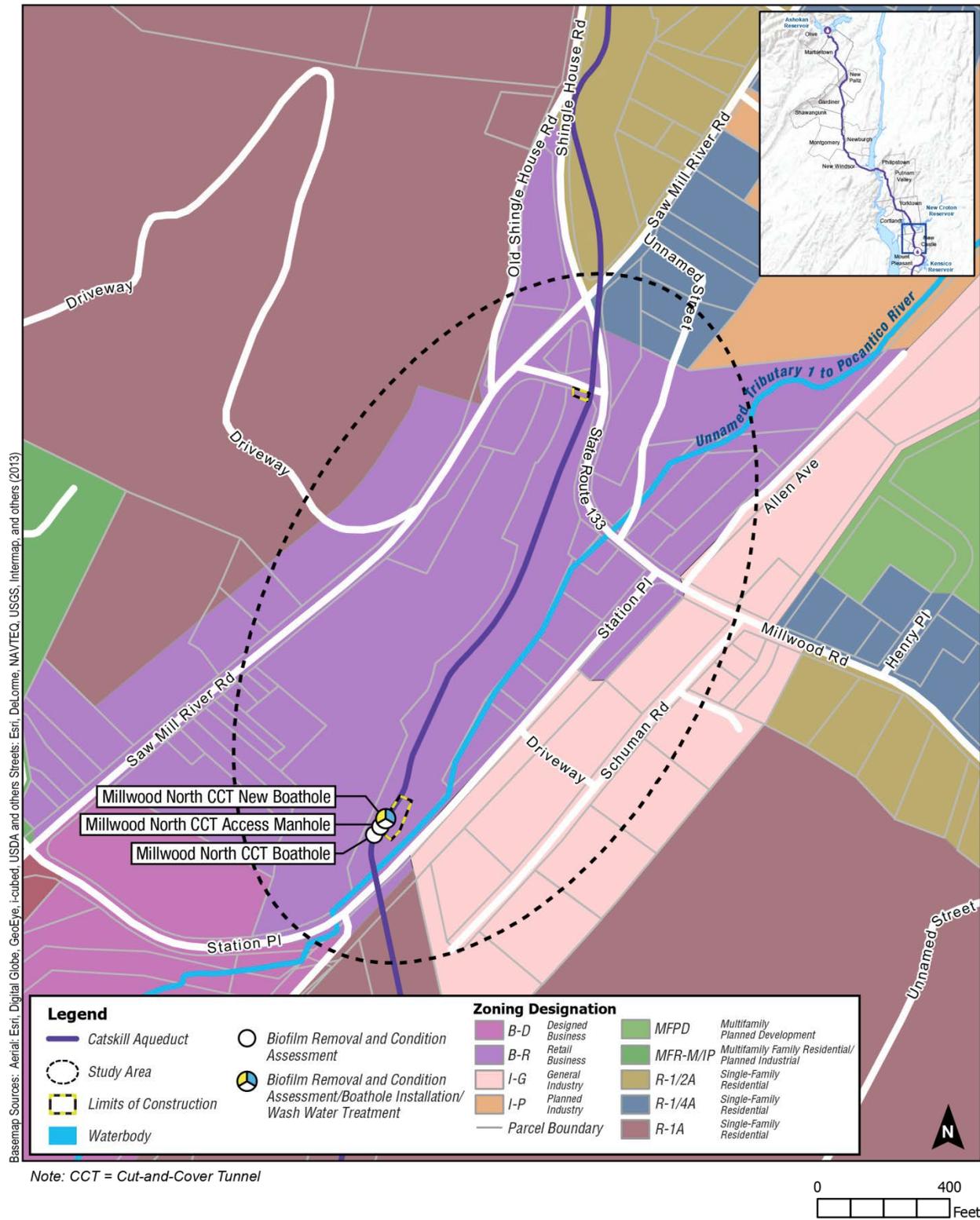


Figure 9.15-14: Zoning – Station Place Study Area



9.15.4.2 Proposed Activities within the Station Place Study Area

To support activities within the Station Place Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas would provide additional parking, and equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. Site plans showing layouts of the entrance off Millwood Road and the new boathole within the limits of construction at work sites, which would occupy a total of 8,100 square feet, are shown on **Figure 9.15-15** and **Figure 9.15-16**, respectively. The schedule for work within the study area is shown in **Table 9.15-8**. The duration of active construction within the Station Place Study Area is estimated to total 9 weeks over 1.5 years.

Table 9.15-8: Schedule of Work Activities within the Station Place Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Staging and Access Improvements ³	Summer 2019 2018	2 weeks	Monday to Friday, 7:30 AM to 6 PM	8
Boathole Preparation	Summer 2019 2018	3 weeks	Monday to Friday, 7:30 AM to 6 PM	10
Boathole Installation	Fall 2019 2018 (Second 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	8
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	Fall 2020 2019 (Third 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	21
Notes:				
¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per the Town of New Castle Noise Control Law §90-46(B).				
² Crew size refers to the number of people anticipated at the work site(s).				
³ Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>).				

Work in the study area would begin with staging and access improvements in summer ~~2019~~2018. At the entrance off Millwood Road, grading of approximately 1,300 square feet would be required to facilitate loading and unloading of heavy equipment restricted from traveling over the cut-and-cover tunnel (see **Figure 9.15-15**). The removal of up to 17 trees may also be required, in addition to underbrush clearing and gravel placement for leveling and erosion control.

Following the staging and access improvements, the new boathole preparation would occur. The work would consist of the excavation of approximately 45 cubic yards of soil and construction of a cast-in-place concrete collar. Boathole installation, which requires unwatering of the aqueduct to tie into the crown of the cut-and-cover tunnel, would take place during the second 10-week shutdown in fall ~~2019~~2018 (see **Figure 9.15-16**).

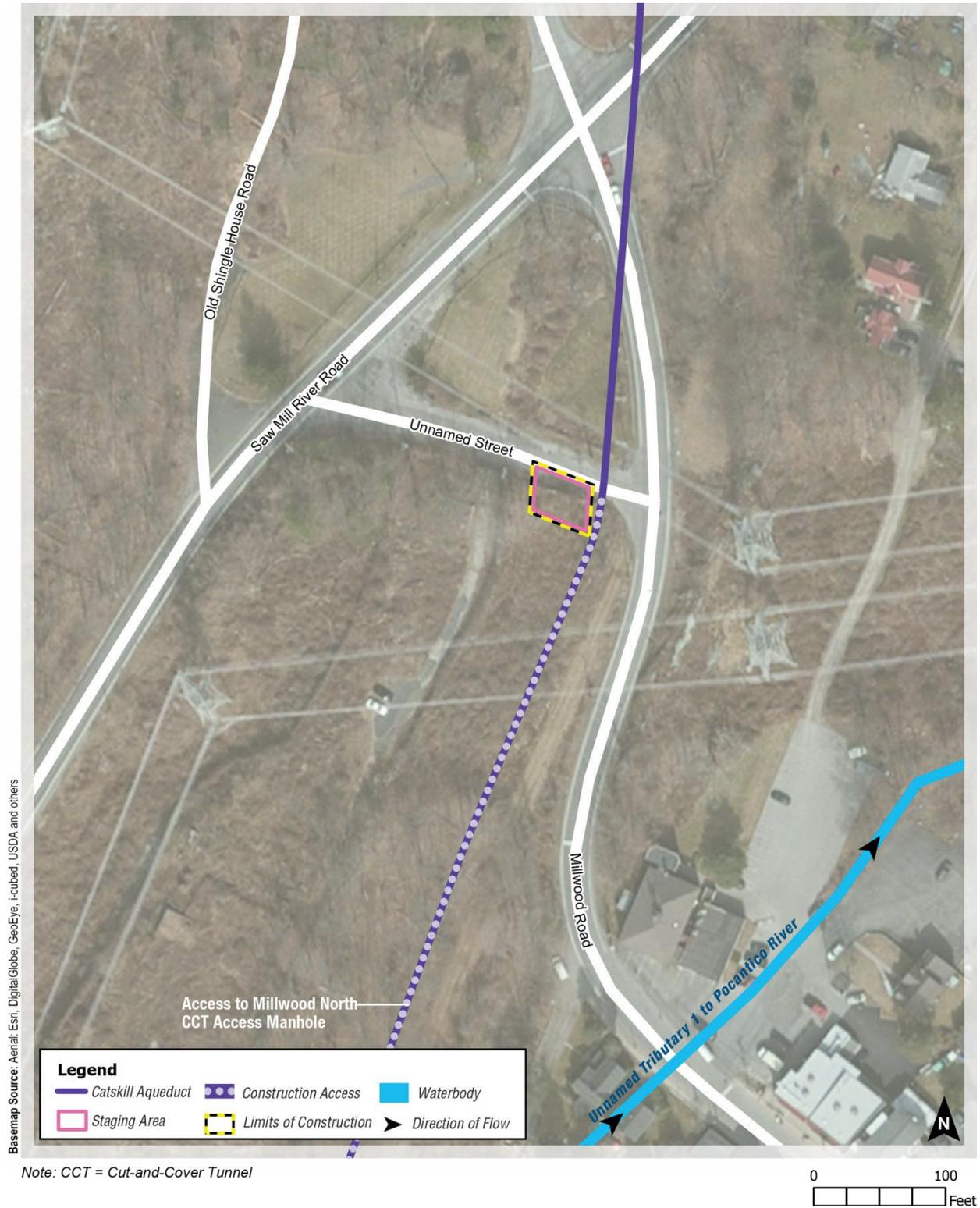


Figure 9.15-15: Site Plan for Access at Millwood Road – Station Place Study Area



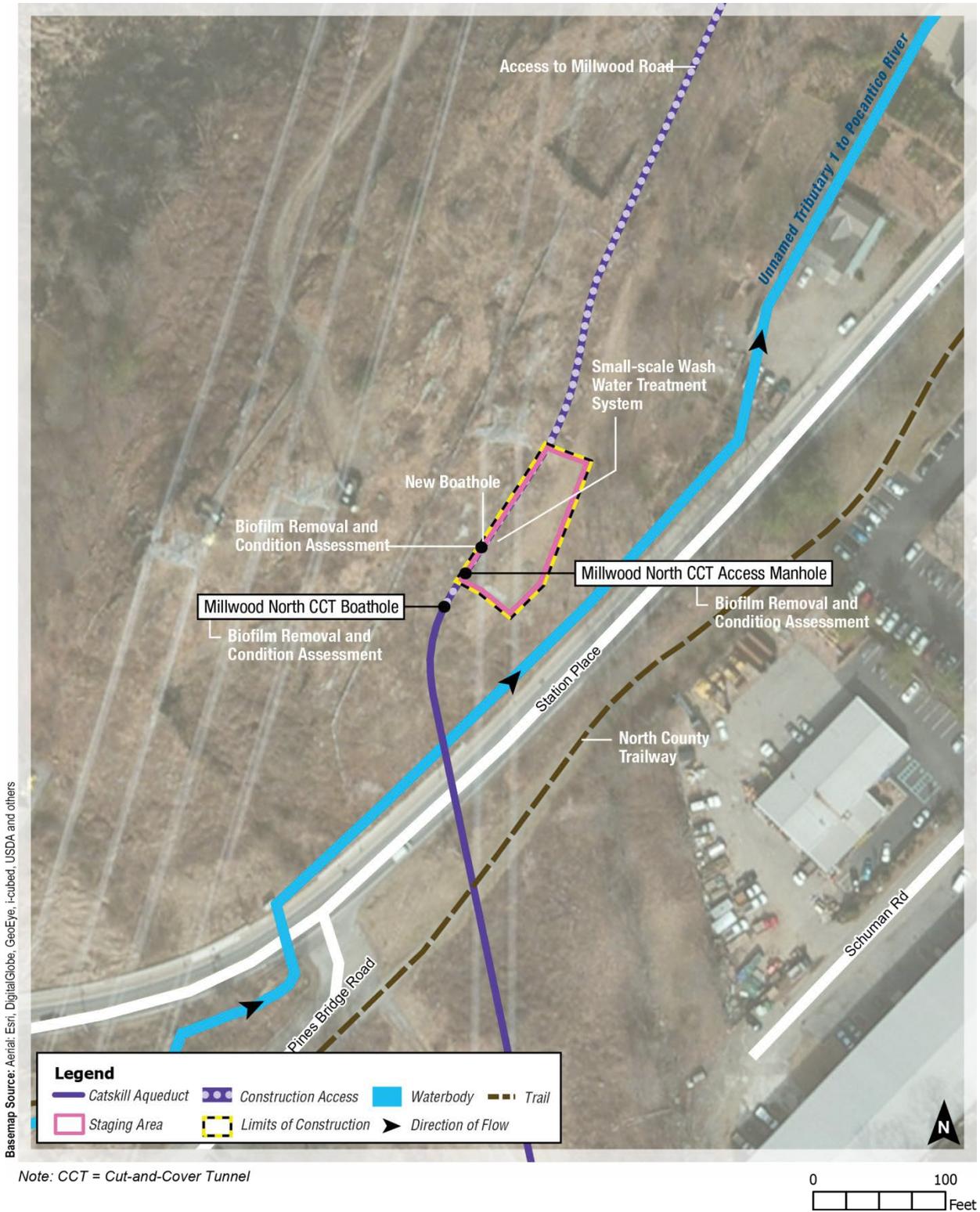


Figure 9.15-16: Site Plan for Millwood North CCT Access Manhole – Station Place Study Area



Biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019, with access into the aqueduct provided by the new boathole, existing boathole, and existing access manhole (see **Figure 9.15-16**). These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct (see Section 9.2, “Project Description”). Potential treatment locations include the new boathole, at which a small-scale wash water treatment system could be established. Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Station Place Study Area are presented in Section 9.15.4.3, “Open Space and Recreation” through Section 9.15.4.10, “Neighborhood Character,” and include: open space and recreation; historic and cultural resources; visual resources; natural resources including water resources, terrestrial resources, and federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.15.2, “Town of New Castle Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” an impact analysis related to land use and zoning; socioeconomic conditions; community facilities and services; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area are not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.15.4.3 Open Space and Recreation

As shown on **Figure 9.15-17**, one open space resource, the North Country Trailway, exists within the Station Place Study Area. Approximately 2,000 feet of the 125-mile North Country Trailway is located within the Station Place Study Area. The North Country Trailway provides a linear park through Westchester County with uses that include biking and jogging. The North Country Trailway runs northeast to southwest through the study area, separated from the proposed Millwood Cut-and-Cover Tunnel boathole by Station Place.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP’s understanding that no plans to expand or create new open space or recreational resources are anticipated within the Station Place Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open space is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Station Place Study Area would be the same as baseline conditions.

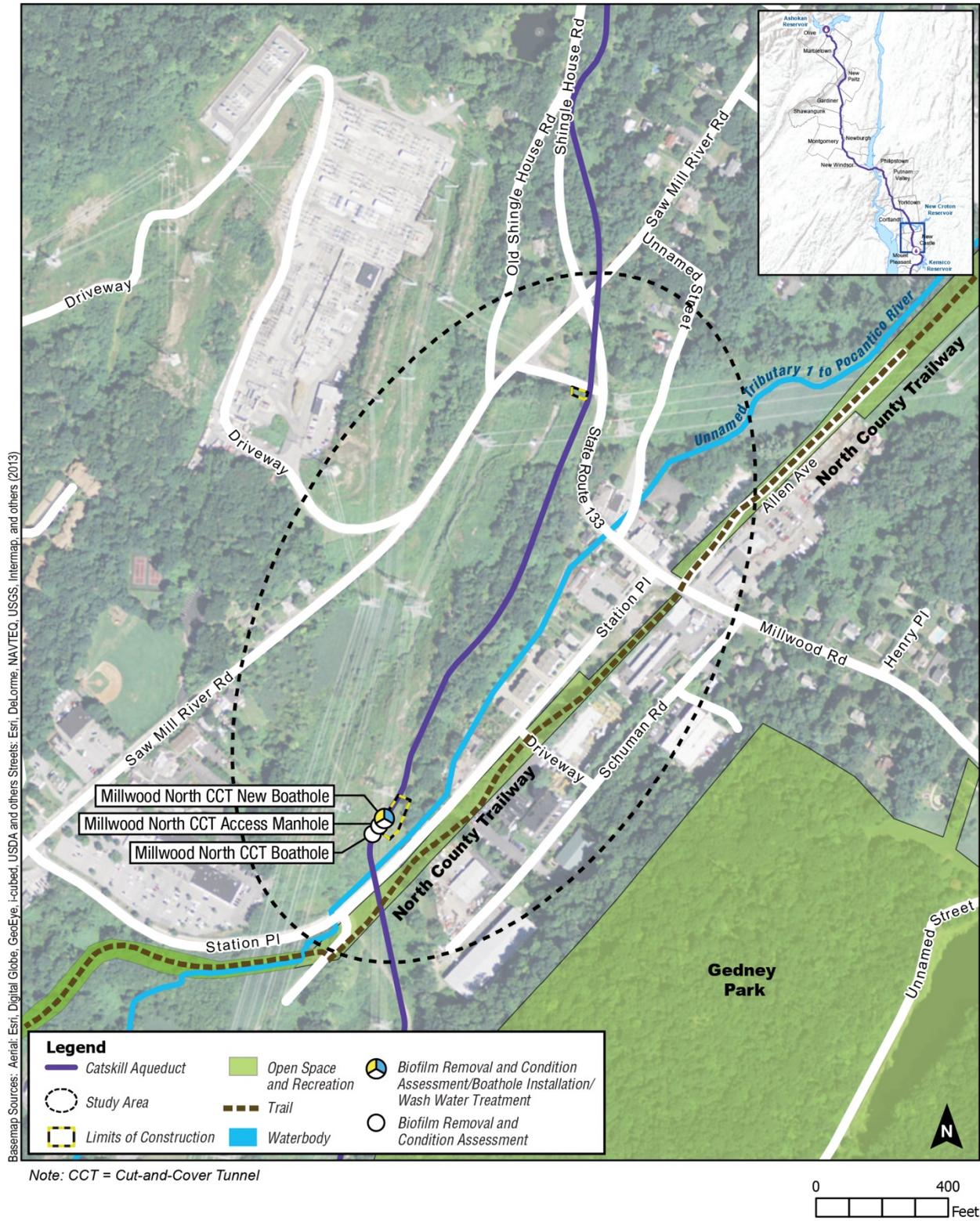


Figure 9.15-17: Open Space and Visual Resources - Station Place Study Area



During construction, the repair and rehabilitation, work activities within the Station Place Study Area would be short-term (intermittently over 1.5 years; see **Table 9.15-8**). Repair and rehabilitation related to the installation of the boathole at the Millwood North Cut-and-Cover Tunnel would not affect usage of or views from the North Country Trailway as the proposed boathole is separated from the trailway by a road, dense undergrowth vegetation, and changes in grade. Following construction, all equipment would be removed from the Station Place Study Area and staging areas would be restored to baseline conditions. The boathole is a permanent structure that would remain following construction.

Following the repair and rehabilitation within the Station Place Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not disrupt recreational use of the North County Trailway.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Station Place Study Area.

9.15.4.4 Historic and Cultural Resources

As shown on **Figure 9.15-18**, there is one site listed on the National Register of Historic Places, Sarles' Tavern (NR Number 90NR02450), located in the northern portion of the Station Place Study Area. Sarles' Tavern was a historic inn and tavern that is no longer standing, but was once located approximately 250 feet from the northern-most limits of construction at the entrance off Millwood Road.

In the future without the repair and rehabilitation, it is assumed that historic and cultural resources within the Station Place Study Area would be the same as baseline conditions.

The new boathole would be located approximately 1,500 feet south of Sarles' Tavern. Areas of previous disturbance associated with construction of the Catskill Aqueduct were identified and compared to the potential for ground disturbance within the Station Place Study Area to determine if the repair and rehabilitation could affect archeological resources. The Station Place Study Area does not have the potential to contain archeological resources. The Station Place Study Area is located in the Millwood Cut-and-Cover Tunnel right-of-way which was previously disturbed in 1910 to 1913 during original construction of the Catskill Aqueduct.

The Millwood North Cut-and-Cover Tunnel was constructed by excavating earth and rock to form a large continuous open trench, placing the Catskill Aqueduct components, and covering the Catskill Aqueduct with an earth embankment.

Work activities would occur on previously disturbed soils. Following the State Historic Preservation Office's (SHPO) review of the repair and rehabilitation, SHPO concluded in a letter dated July 6, 2015 that there were no concerns regarding potential impacts to historic or archeological resources associated with the repair and rehabilitation work activities within the study area, and no additional archeological investigations are necessary.

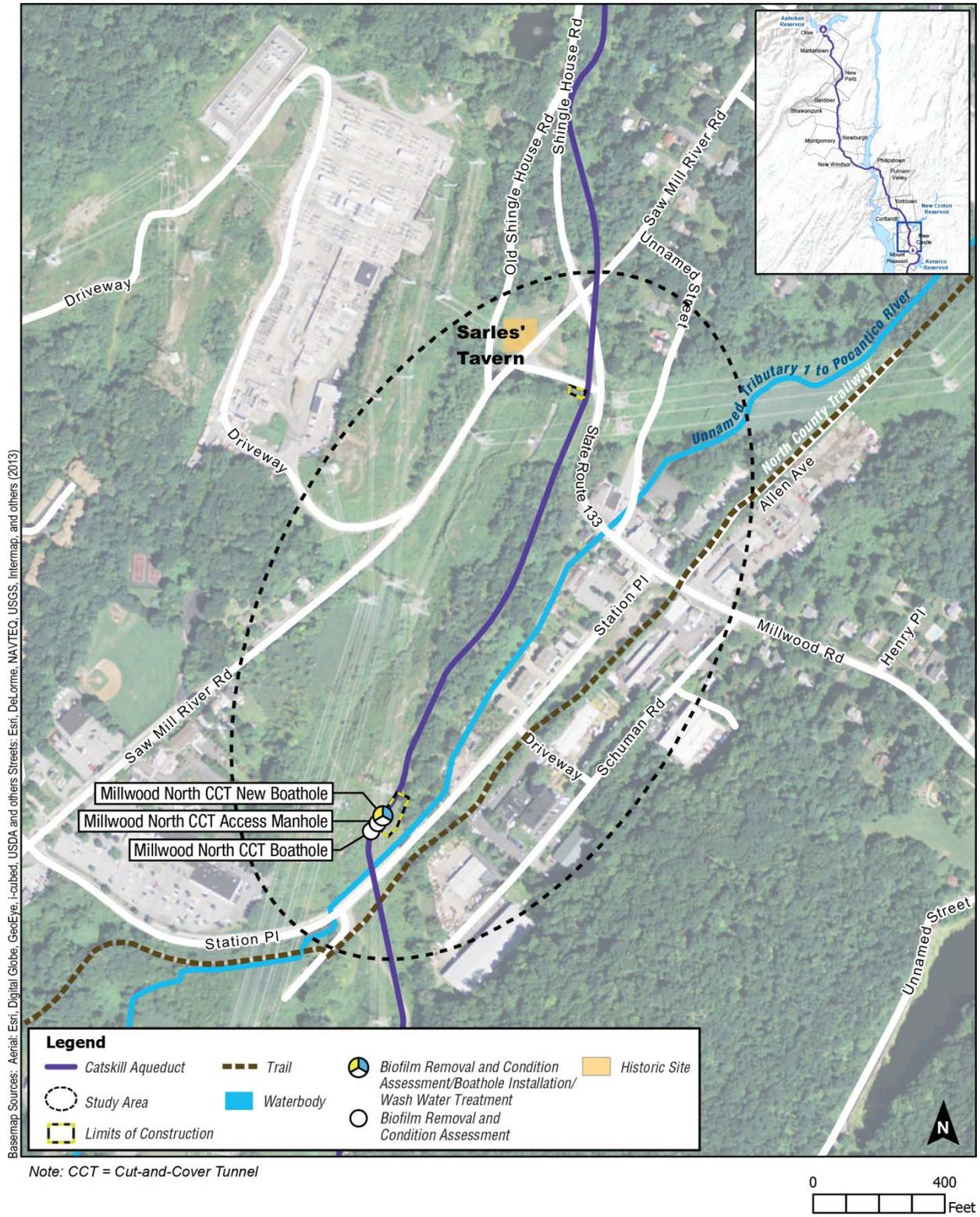


Figure 9.15-18: Historic and Cultural Resources - Station Place Study Area



Work activities would be short-term (intermittently over 1.5 years; see **Table 9.15-8**) and would not affect the site of Sarles' Tavern. The repair and rehabilitation work activities within the Station Place Study Area would not result in new permanent structures or additions to existing structures within the Sarles' Tavern site because the entrance off Millwood Road and new boathole would be located outside this historic site. Following repair and rehabilitation work activities within the Station Place Study Area, the operation of the Catskill Aqueduct would be consistent with baseline conditions and would not affect historic and cultural resources. Repair and rehabilitation work activities within the Station Place Study Area would be in compliance with the Town of New Castle code Chapter 76, Historic Preservation discussed in Section 9.3.3.3, "Town Codes."

Therefore, although there is one site within the Station Place Study Area listed on the National Register of Historic Places, the repair and rehabilitation would not result in significant adverse impacts to historic and cultural resources within the Station Place Study Area.

9.15.4.5 Visual Resources

The visual resources study area is the area within the Station Place Study Area. It also includes view corridors that extend beyond based on the locations that are publicly accessible.

As discussed in Section 9.15.4.3, "Open Space and Recreation" and Section 9.15.4.4, "Historic and Cultural Resources," shown on **Figure 9.15-17** and **Figure 9.15-18** above, two visual resources, consisting of one locally significant resource, the North Country Trailway, and one site listed on the National Register of Historic Places, Sarles' Tavern, were identified within the Station Place Study Area.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Station Place Study Area within the timeframe of the impact analysis. Natural process, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Station Place Study Area would be the same as baseline conditions.

The North Country Trailway runs northeast to southwest through the study area, separated from the proposed Millwood Cut-and-Cover Tunnel boathole by Station Place. This resource is open to the public for recreational purposes, although it would not have views of the Millwood Cut-and-Cover Tunnel boathole due to the existing slope and existing dense vegetation. The site of Sarles' Tavern would have no views of the Millwood Cut-and-Cover Tunnel boathole, although it may have views to the temporary staging area at the entrance to Millwood Road that would be located approximately 250 feet from the Sarles' Tavern site.

During construction, work activities would be short-term (intermittently over 1.5 years; see **Table 9.15-8**) and would not impact the Sarles' Tavern. Construction of the Millwood Cut-and-Cover Tunnel boathole would occur approximately 1,500 feet south of the Sarles' Tavern site. This would not greatly detract from the aesthetics of the area because the staging area would be adjacent to the cut-and-cover berm and powerlines, and is currently unforested.

Following construction, all equipment would be removed from the Station Place Study Area and staging areas would be restored to baseline conditions. The new boathole at the Millwood North Cut-and-Cover Tunnel is a permanent structure that would remain following construction. Following the repair and rehabilitation work activities within the Station Place Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not result in changes to the future visual and aesthetic resource conditions of the views to Sarles' Tavern or the North Country Trailway.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Station Place Study Area.

9.15.4.6 Natural Resources

The study area for the natural resource analysis is the area surrounding the limits of construction for this segment of the Millwood North Cut-and-Cover Tunnel (see **Figure 9.15-19**).

The general ecology of the natural resources study areas was analyzed based on field visits conducted on October 9, 2014 and August 17, 2015 at the Station Place Study Area. The majority of the natural resources study area is classified as mowed roadside/pathway. Surrounding this mowed roadside/pathway is a mature maple-basswood rich mesic forest. There are no wetlands or watercourses in the natural resources study area, but a portion of the natural resources study area is within the 100-foot regulated buffer of an unnamed tributary to Pocantico River. These habitats have the potential to support protected wildlife species, and an analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Water Resources

The natural resources study area is within the Lower Hudson River drainage basin, more specifically within the Lower Hudson Watershed (HUC 02030101) and the Bailey Brook-Croton River subwatershed (HUC 020301010307). The unnamed tributary 1 to the Pocantico River is mapped immediately east of the natural resources study area and flows southwest to northeast (see **Figure 9.15-19**).

There are no surface water or wetlands in the natural resources study area that are subject to federal jurisdiction under Sections 401 and 404 of the Clean Water Act or State Protection of Waters regulations. However, the unnamed tributary 1 to the Pocantico River is within 100 feet of the natural resources study area. The Town of New Castle regulates activities within wetlands and any natural or artificial watercourses and their 100-foot buffers (New Castle Town Code Chapter 137: Wetlands). Work activities would encroach upon the 100-foot buffer of the unnamed tributary to Pocantico River, and town review and approval may be needed.

Surface Water

Based on the desktop assessment and the results of a field visit on October 9, 2014, a NYSDEC Class C waterbody, identified as an unnamed tributary to Pocantico River, is mapped to the east of the natural resources study area. The surface water was assigned a community classification according to the habitat descriptions in Cowardin et al. (Cowardin et al. 1979).

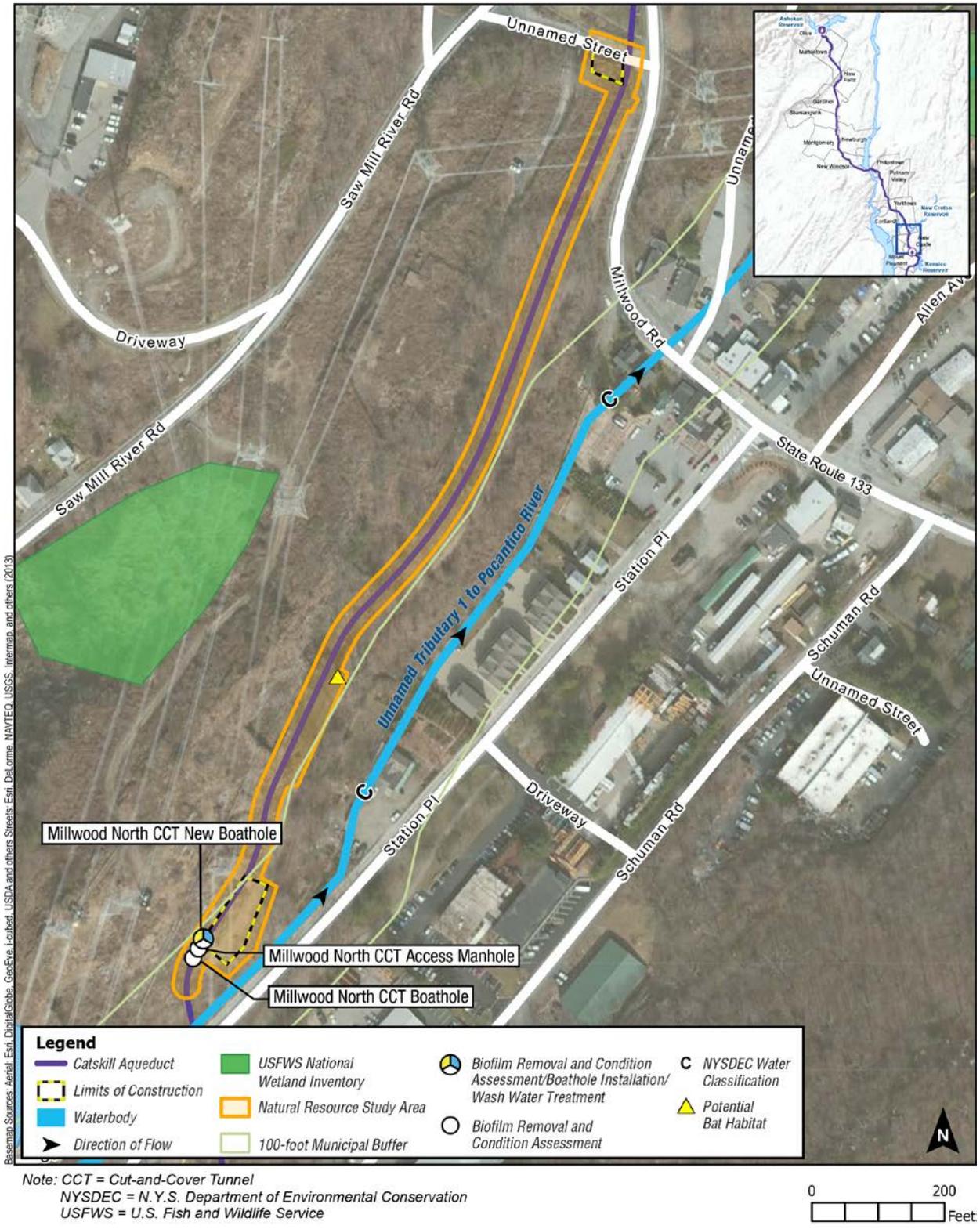


Figure 9.15-19: Natural Resources - Station Place Study Area



Unnamed Tributary 1 to Pocantico River

The unnamed tributary 1 to the Pocantico River flows in a general south to north direction, parallel to Station Place. The watercourse is approximately 3 feet in width, has a slight gradient to the south, a sand and gravel bottom, with vegetation consisting of a mix of herbaceous weeds along and within the channel. This watercourse is classified as a “Riverine, Intermittent, Unconsolidated Bottom, Intermittently Flooded” system based on the Cowardin System (Cowardin et al. 1979).

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated to occur within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the Station Place Study Area would be the same as baseline conditions.

Analysis of Potential Effect

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Station Place Study Area.

Construction

Work activities associated with installation of a boathole would be localized and confined to the immediate vicinity on top of the Millwood Cut-and-Cover Tunnel and the designated staging areas. Clearing of trees and brush would be necessary for the staging areas, and this would occur along the existing cut-and-cover tunnel potentially within the municipal water resource buffer.

Prior to commencing the repair and rehabilitation, temporary sediment and erosion control measures such as silt fences would be installed to avoid indirect effects on the unnamed tributary 1 to the Pocantico River. Within the limit of construction, localized construction dewatering (e.g., installing a barrier and pump to keep the work area dry) may be necessary to facilitate excavation for blow-off chambers and discharge pipes. These temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements to ensure that the tributary and its streambanks are protected, and sediment and other pollutants are prevented from entering the waterway.

Anticipated temporary disturbance to the unnamed tributary and regulated buffer was quantified based on the limits of construction and proposed work activities (see **Table 9.15-9**). Construction staging and activities would result in approximately 6,250 square feet of temporary disturbance within with the municipal water resource buffer. Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native vegetation. No permanent effects to water resources are anticipated within the Station Place Study Area.

Table 9.15-9: Estimated Disturbance to Water Resources within the Station Place Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
100-foot Municipal Water Resource Buffer	14,270	6,250 <i>Construction staging area and construction equipment use</i>	0

Operation

Following the repair and rehabilitation, operation of the Catskill Aqueduct within the study area would be consistent with baseline conditions. Water resources would persist and be unaffected by maintenance activities. Native vegetation planted in temporarily disturbed areas within the 100-foot municipal water resource buffer would become established and surrounding vegetation would colonize the area, thereby providing a protected stream buffer consistent with baseline conditions.

Water Resources Conclusions

No wetlands or watercourses were identified within the natural resources study area; however, the construction staging area does encroach on the protected 100-foot municipal buffer to the unnamed tributary 1 to Pocantico River. Temporary sediment and erosion control measures would be implemented to avoid impacts to the unnamed tributary or its buffer.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Station Place Study Area.

Terrestrial Resources

The terrestrial resources within the natural resources study area is dominated by a mowed roadside/pathway, with areas of maple-basswood rich mesic forest. Tree species include basswood (*Tilia americana*) and Norway maple (*Acer platanoides*). Shrub species include autumn olive (*Elaeagnus umbellata Thunb.*), blackberry (*Rubus L.*) and sassafras (*Sassafras albidum*). Herbs include common mugwort (*Artemisia vulgaris*), evening primrose (*Oenothera spp.*), sweet birch saplings (*Betula lenta*), aster (*Aster spp.*), poison ivy (*Toxicodendron radicans*), and goldenrod (*Solidago spp.*).

The Town of New Castle regulates removal of trees with a dbh of at least 4 inches (New Castle Town Code Chapter 121: Tree Preservation). Exemptions include any removal of trees required by public entities, agencies, or electrical utilities that by operation of law are exempt from the permit requirements of this chapter. While the repair and rehabilitation work activities may not be subject to Town review and approval, an analysis of terrestrial resources in the study area is warranted.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP’s understanding that no new initiatives that would affect terrestrial resources are anticipated within

the Station Place Study Area within the timeframe of the impact analysis. Natural process, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be the same as baseline conditions.

Work activities associated with the repair and rehabilitation would include minor tree clearing and shrub removal for the purpose of improving site access and staging areas. Approximately 17 trees consisting of eight species with a range of average dbh of between 6.3 and 33.5 inches may be removed to establish clear access for construction vehicles along the cut-and-cover berm. The most common species of trees to be removed include six basswood and five Norway maple. These trees are located adjacent to the existing Catskill Aqueduct, along the forested areas east and west of the aqueduct, and would not dramatically change the character of the area or affect surrounded trees. Removal of trees would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Additionally, tree removal would be conducted on DEP property and in accordance with applicable requirements set forth by the Town of New Castle.

Following construction, all equipment would be removed from the study area, and staging areas would be restored to natural conditions. Vegetated areas temporarily cleared during construction are anticipated to grow back with similar communities. Following the repair and rehabilitation work activities within the natural resources study area, operation of the Catskill Aqueduct would be consistent with baseline conditions and natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Station Place Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section include an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. Species that could be affected within the study area and could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” eight species were identified to have the potential to be affected by the repair and rehabilitation within the natural resources study areas. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these eight species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat resulting from natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within natural resources study area is shown in **Table 9.15-10**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and field visits, as applicable.

Table 9.15-10: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Station Place Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 9, 2014 and August 17, 2015. Potential habitat exists within the mowed pathway/roadside community of the study area. While work activities would be largely confined to previously disturbed areas, if any isolated areas of potential habitat exist at the sites, as a highly mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions and the new boathole that remains would not affect breeding, nesting, or foraging habitat. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platirhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 9, 2014 and August 17, 2015. Potential nesting habitat exists within the mowed pathway/roadside community of the study area. While work activities would be largely confined to previously disturbed areas, if any isolated areas of potential habitat exist at the sites, as a highly mobile species, any eastern hognose snake that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions and the new boathole that remains would not affect nesting habitat. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No
Birds					
Cooper's Hawk	<i>Accipiter cooperii</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visits on October 9, 2014 and August 17, 2015. Potential nesting habitat exists within the patches of deciduous forest. The adjacent forest could also provide stopover habitat (resting and foraging) for migrating Cooper's Hawks and during the winter. Because Cooper's Hawks are considered relatively tolerant of human disturbance and fragmentation, potential effects would be minimal. Finally, upon construction completion, the staging areas would be restored to natural conditions and the new boathole that remains would not affect breeding, nesting, or foraging habitat. Therefore, there are no effects anticipated and no further analysis for Cooper's Hawks is warranted for this study area.	No

Table 9.15-10: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Station Place Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Osprey	<i>Pandion haliaetus</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visits on October 9, 2014 and August 17, 2015. Permanent disturbance would be limited to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Upon construction completion, sites would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Ospreys is warranted for this study area.	No
Sharp-shinned Hawk	<i>Accipiter striatus</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visits on October 9, 2014 and August 17, 2015. Potential nesting and foraging habitat and potential stopover habitat (resting and foraging) for migrating Sharp-shinned Hawks. The clearing and grading would occur in previously disturbed areas and would not affect nesting habitat in deep forests. As a highly mobile species, any hawks that might use the forest edges for foraging are expected to instead utilize similar, adjacent habitats during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Sharp-shinned Hawks is warranted for this study area.	No
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	A summer habitat survey was conducted on August 17, 2015 and no individuals were incidentally observed. One potential roost tree was identified. A dead white ash (<i>Fraxinus americana</i>) tree had bark that was beginning to exfoliate. The presence of adjacent forest areas and a potential roost tree within the survey area indicate potential summer habitat for Indiana bats within the forested areas of the study area. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened Unlisted	A summer habitat survey was conducted on August 17, 2015 and no individuals were incidentally observed. One potential roost tree was identified. A dead white ash tree had bark that was beginning to exfoliate. The presence of adjacent forest areas and a potential roost tree within the survey area indicate potential summer habitat for northern long-eared bats within the forested areas of the study area. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.

Table 9.15-10: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Station Place Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	No habitat and no individuals were incidentally observed during the field visits on October 9, 2014 and August 17, 2015. The proposed access path is through an open, maintained pathway, and the surrounding area is mature forest, not the young forest required by the species. Therefore, there are no effects anticipated and no further analysis for New England cottontails is warranted for this study area.	No
<p>Note: MBTA: Migratory Bird Treaty Act</p>					

Indiana Bat (*Myotis sodalis*)

Repair and rehabilitation requires tree removal, and one identified potential roost tree would be removed from November 1 through March 31 to avoid impacts to Indiana bats. Repair and rehabilitation would not result in significant loss or modification of forested habitat for roosting Indiana bats because trees would be removed from an existing cleared public utility corridor. No streams exist in the study area, but foraging habitat would continue to be available in adjacent forested areas. There may be temporary noise that discourages Indiana bats from roosting in the immediate vicinity of the work sites; however, there is abundant suitable habitat in the surrounding areas within which Indiana bats could roost. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, Indiana bats in this study area.

Northern Long-eared Bat (*Myotis septentrionalis*)

Repair and rehabilitation requires tree removal, and one identified potential roost tree would be removed from November 1 through March 31 to avoid impacts to northern long-eared bats. Repair and rehabilitation would not result in significant loss or modification of forested habitat for roosting northern long-eared bats because trees would be removed from an existing cleared public utility corridor. No streams exist in the study area, but foraging habitat would continue to be available in adjacent forested areas. There may be temporary noise that discourages northern long-eared bats from roosting in the immediate vicinity of the work sites; however, there is abundant suitable habitat in the surrounding areas within which northern long-eared bats could roost. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, northern long-eared bats in this study area.

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), Cooper's Hawks (*Accipiter cooperii*), Ospreys (*Pandion haliaetus*), Sharp-shinned Hawks (*Accipiter striatus*), or New England cottontails (*Sylvilagus transitionalis*) associated with the repair and rehabilitation. Repair and rehabilitation may affect, but is not likely to adversely affect, Indiana bats and northern long-eared bats.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Station Place Study Area.

9.15.4.7 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Station Place Study Area (see **Figure 9.15-11**), a Phase I ESA was conducted in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify RECs. The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a geotechnical investigation, were

collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Geotechnical environmental investigations and sampling were undertaken for COC including volatile and semivolatile organics, PCBs, and total petroleum hydrocarbons along the aqueduct within the study area.

Chromium and mercury were noted in the soil sampling results. Total chromium was reported in the sample collected at the Millwood North Cut-and-Cover Tunnel Boathole (see **Figure 9.15-16**). Chromium concentrations, however, were consistent over a widespread sampling area and are more likely associated with background concentrations. Along the Catskill Aqueduct, there are widespread occurrences of chromium, which are attributed to existing geological formations. Mercury was detected in one sample, but is also naturally occurring in soils, and is therefore also likely to be the result of background concentrations. In addition, although gasoline range organics were not detected in the samples, total petroleum hydrocarbons were also detected, but at low concentrations that are not considered to be indicative of contamination that warrants remedial actions.

Based on the results of the environmental investigations completed within the Station Place Study Area, no other hazardous materials are known to exist. The soil results support the reuse of excavated materials associated with the boathole installation as backfill and do not suggest the need for special management, handling or health and safety measures at this time.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Station Place Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Station Place Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, excavation associated with the work activities for the installation of a new boathole would occur on previously disturbed soils. Following construction, all equipment would be removed from the Station Place Study Area. Staging areas would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Station Place Study Area.

9.15.4.8 Transportation

The transportation study area consists of the major convergent roadways that would potentially be used by employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Station Place Study Area (see **Figure 9.15-11**).

Access to the limits of construction for the work sites would be obtained by driving over the cut-and-cover tunnel from Millwood Road (State Route 133) (see **Figure 9.15-11**). Millwood Road is a two-lane, two-way urban minor arterial roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Station Place Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area. There is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees access the site. There are DEP employees who work at and visit the study area. These DEP employee vehicles would access the site via Millwood Road.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Station Place Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Station Place Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be the basis of this transportation analysis. Of these activities, biofilm removal and condition assessment would generate the most vehicle trips. Biofilm removal and condition assessment would occur in fall ~~2020~~2019 between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the third 10-week shutdown (see **Table 9.15-8**).

In the future with the repair and rehabilitation, construction vehicles would travel along Millwood Road. The estimated number of peak-day one-way vehicle trips associated with the biofilm removal and condition assessment is 33 vehicles trips, or approximately 66 peak-day vehicle round trips that would travel to and from the study area. The majority of the peak daily vehicle round trips, approximately 42 vehicle round trips or 42 PCEs, would be workers traveling directly to and from the staging area, with an additional 8 daily shuttle trips between the study area and the staging area. The remaining approximately 16 peak-day vehicle round trips (21 PCEs) would be trucks or other construction vehicles.

During a peak-day, the estimated number of peak-hour vehicle trip ends associated with biofilm removal and condition assessment is approximately 33 peak-hour vehicle trip ends (36 PCEs). This includes approximately 21 vehicle trip ends (21 PCEs) from workers traveling directly to and from the staging area, approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 8 vehicle trip ends (11 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 12-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 36 peak-hour PCEs within the Station Place Study Area, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, “Transportation.” The work activities at the Station Place Study Area would be short-term (totaling 9 weeks over 1.5 years; see **Table 9.15-8**) and would not generate public parking or transportation demands or pedestrian activity within the Station Place Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Station Place Study Area.

9.15.4.9 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation work activities within the Station Place Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The noise study area is the area within 1,500 feet of the repair and rehabilitation work activities as shown on **Figure 9.15-20**.

The Station Place Noise Study Area includes residential parcels and one trail within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Town of New Castle Noise Control Law §90-6(B), which allows audible construction noise only between 7:30 AM and 8 PM, Monday through Friday, and 10 AM and 5 PM, weekends and holidays.

Existing ambient noise levels within the Station Place Study Area are influenced by vehicular traffic traveling on the Taconic State Parkway, Station Place, Saw Mill River Road, Allen Avenue, and other nearby local roads. The existing noise levels within the study area are comparable to a quiet suburban residential environment, based on the distance from major transportation corridors, the population density of the area, and other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP’s understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Station Place Study Area within the timeframe of the impact analysis.

Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Station Place Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Station Place Study Area would occur at two work sites. The stationary noise-generating equipment that would be used within the Station Place Study Area was evaluated to determine

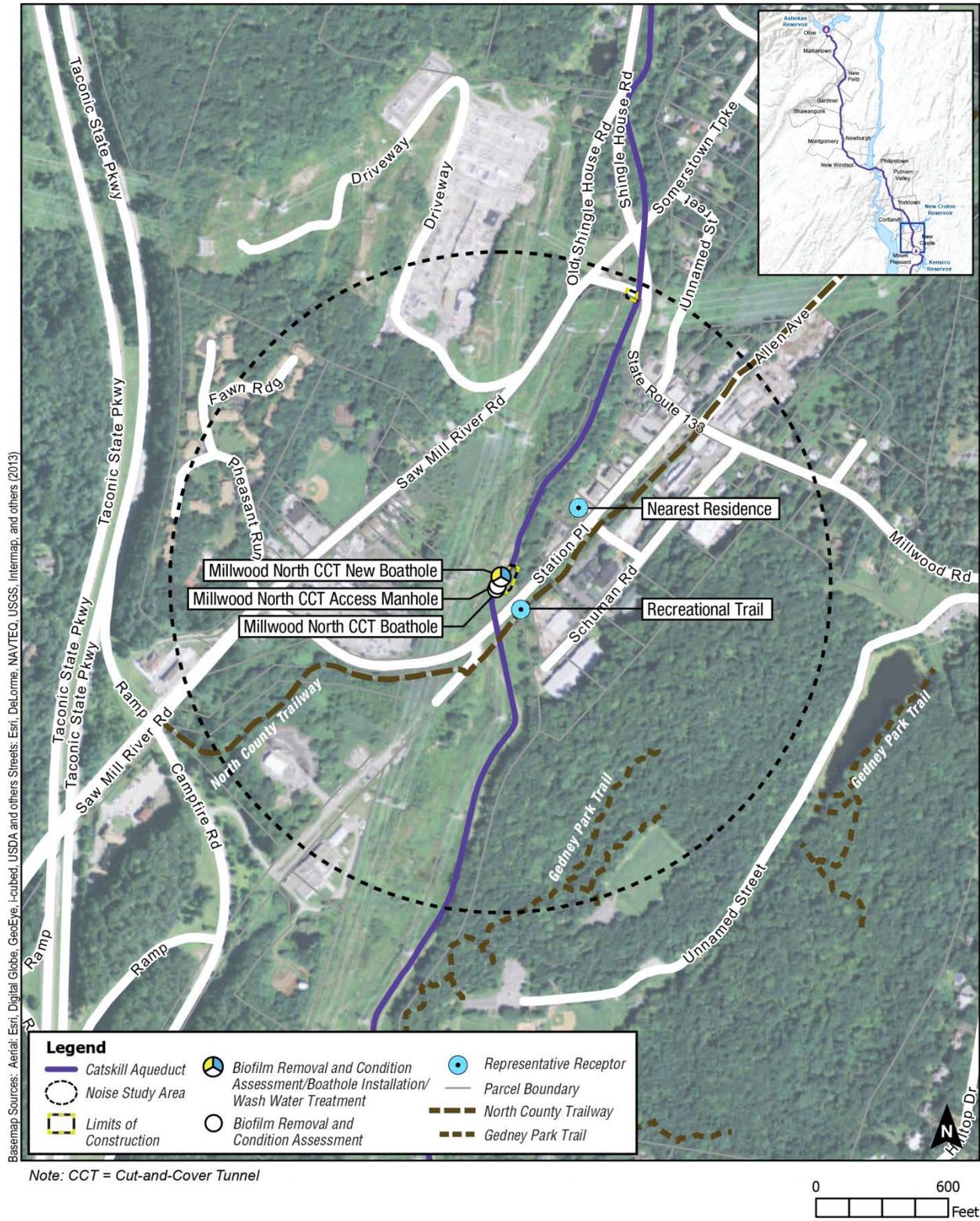


Figure 9.15-20: Noise – Station Place Study Area



which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with the boathole installation would emit the most noise. Boathole installation would occur in fall ~~2019~~2018, between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the second 10-week shutdown (see **Table 9.15-8**). Other noise-producing equipment would also be utilized within the study area for a limited period during work activities, however, this equipment would not be expected to be louder than those associated with boathole installation.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the boathole installation. Associated equipment reference noise levels are shown in **Table 9.15-11**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.15-11: Stationary Source Construction Equipment Modeled at the Station Place Study Area - Noise Analysis and Reference Noise Levels (L_{eq})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA)
Concrete Mixer Truck	81
Crane	77
Generator	82
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	

Table 9.15-12 shows the results of the stationary construction noise analysis. Boathole installation within the Station Place Study Area during the repair and rehabilitation could produce noise levels (L_{eq}) of approximately 65 dBA at the nearest residence and 75 dBA at the nearest recreational trail. Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Town of New Castle. DEP would work with the Town of New Castle, as appropriate.

Table 9.15-12: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors within the Station Place Study Area

Location	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)	Town of New Castle Noise Limit (dBA)	Potential for Exceedance (Yes or No)
Nearest Residence	490	65	NA	Yes ¹
Recreational Trail (North County Trailway)	154	75	NA	Yes ¹
Notes: NA = Not Applicable ¹ Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Town of New Castle.				

Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Station Place Study Area. The repair and rehabilitation would be temporary in nature with the peak work activities occurring during boathole installation in fall ~~2019~~2018 for a limited period (e.g., 2 weeks).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Station Place Study Area.

9.15.4.10 Neighborhood Character

The character of the Station Place Study Area is largely defined by a mix of public service, residential, commercial, and industrial land uses and its physical setting within a suburban location (see **Figure 9.15-13**). The Catskill Aqueduct traverses the study area in a general northeast to southwest direction. The study area is traversed longitudinally in the north by Saw Mill River Road and in the south by Station Place, which runs perpendicular to Millwood Road in the northeast portion of the study area. An unnamed tributary to Pocantico River runs from south to north roughly parallel to Station Place.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Station Place Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

The limits of construction for the work site and associated access route are located in a public services corridor with grassy cover, which is owned and maintained by DEP and separated from adjacent properties by a forested zone.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; and socioeconomic conditions, an impact analysis for the Station Place Study Area are not warranted, as discussed in the following sections: Section 9.3.3, "Land Use and Zoning," and Section 9.3.4, "Socioeconomic Conditions," respectively. As described in Section 9.15.4.3, "Open Space and Recreation," Section 9.15.4.4, "Historic and Cultural Resources," and Section 9.15.4.5, "Visual Resources," the work activities would not affect open space and recreation, historic and cultural resources, and visual resources in the Station Place Study Area. Furthermore, the public policy impact analysis provided in Section 9.15.2, "Town of New Castle Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.15.4.8, "Transportation," and 9.15.4.9, "Noise," during construction, the work activities in the Station Place Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases

in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Station Place Study Area.

9.15.5 CAMPFIRE ROAD STUDY AREA IMPACT ANALYSIS

Within the Campfire Road Study Area, the aqueduct consists of the Millwood South Cut-and-Cover Tunnel. One access manhole with a culvert drain is located in the study area (see **Figure 9.15-21**).

Work activities within the Campfire Road Study Area would include: culvert drain sluice gate replacement and associated streambank restoration and protection; and biofilm removal and condition assessment.

9.15.5.1 Study Area Location and Description

The Campfire Road Study Area is located along the upper Catskill Aqueduct in the Town of New Castle. The Catskill Aqueduct traverses the study area in a general north to south direction. The study area is located to the north of Campfire Road and to the south of Station Place. The proposed work site within the study area is located at the culvert drain access manhole. Access to the work site would be provided by either driving north over the cut-and-cover tunnel from Campfire Road or south over the cut-and-cover tunnel from Station Place. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work site. **Figure 9.15-21** shows an aerial photograph of the study area, including the path of the aqueduct, and the limits of construction for the work site.

The study area consists of residential, public services, open space and recreation, and vacant land uses. Land cover is forested with scattered residential development. An electrical utility right-of-way owned by Consolidated Edison Company of New York (with associated overhead cables and lattice towers) traverses the study area in a general north to south direction. The limits of construction for the work site and associated access routes are located in a public services corridor with grassy cover, which is owned and maintained by DEP. **Figure 9.15-22** shows a map of the land uses in the study area and its surroundings.

The study area is located within a single-family residential (R-1A) zoning district, as designated by the Town of New Castle Zoning Code (see **Figure 9.15-23**). The Catskill Aqueduct is a permitted use as a public utility facility within the single-family residential (R-1A) zoning district.

There are no federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

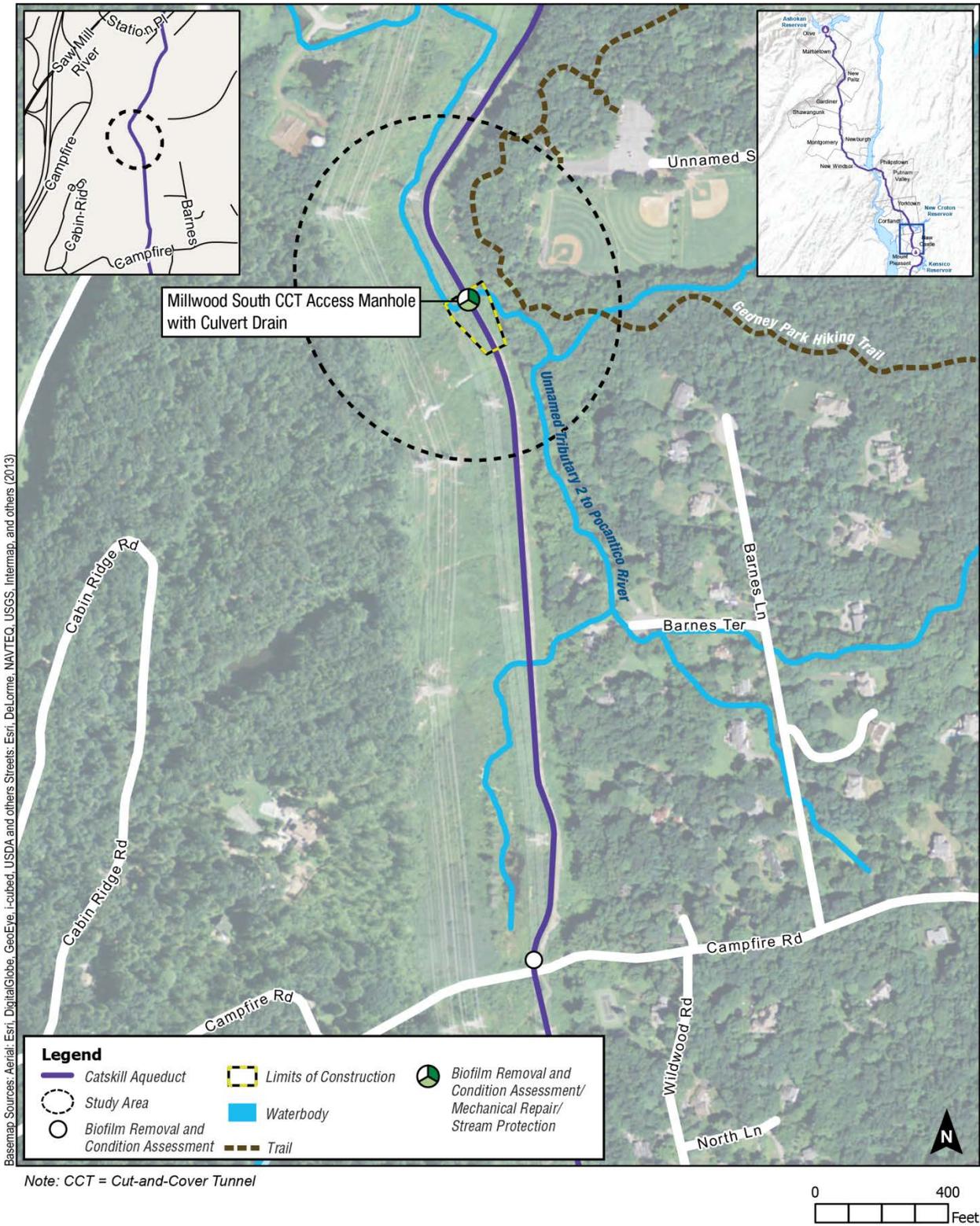


Figure 9.15-21: Study Area – Campfire Road



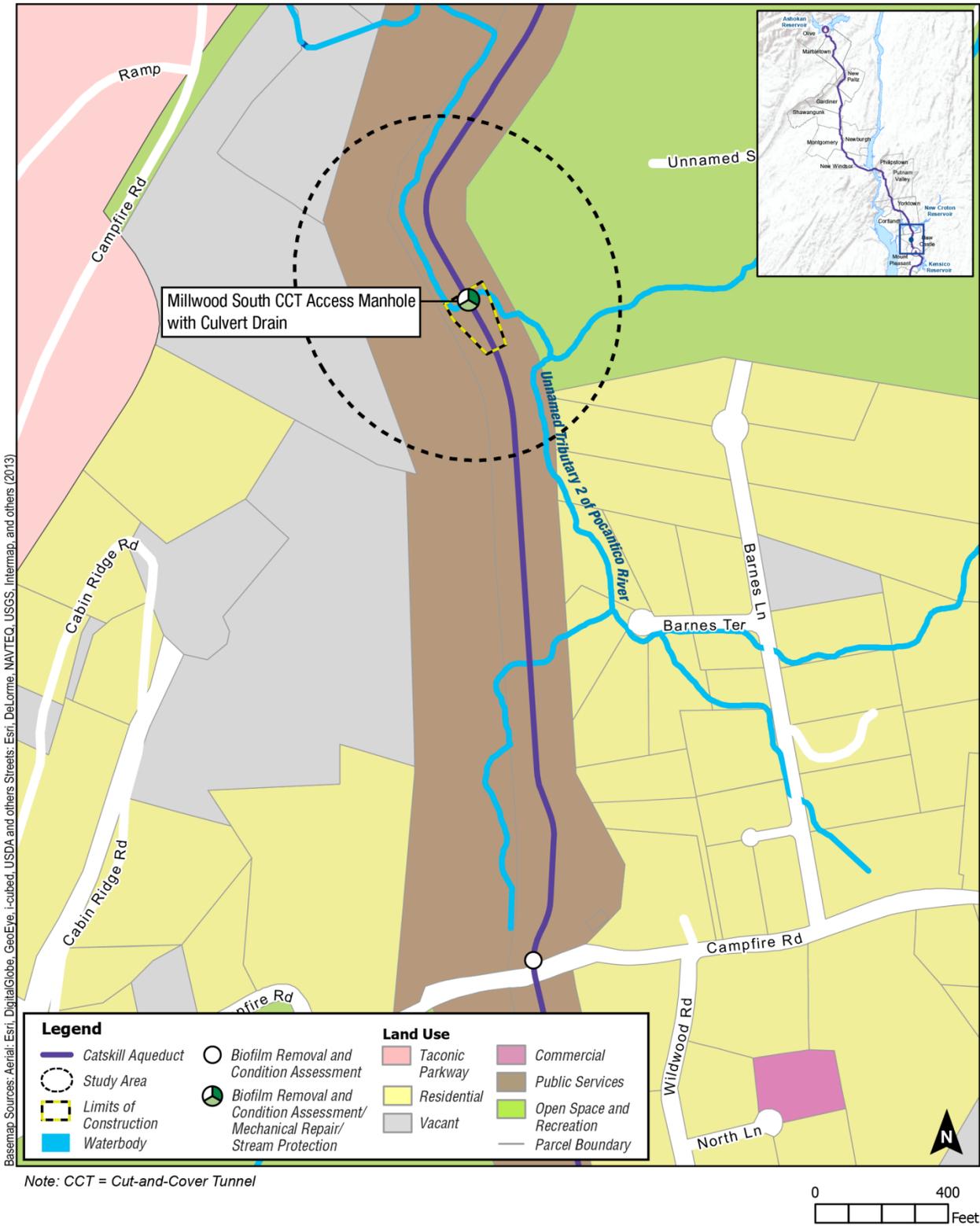
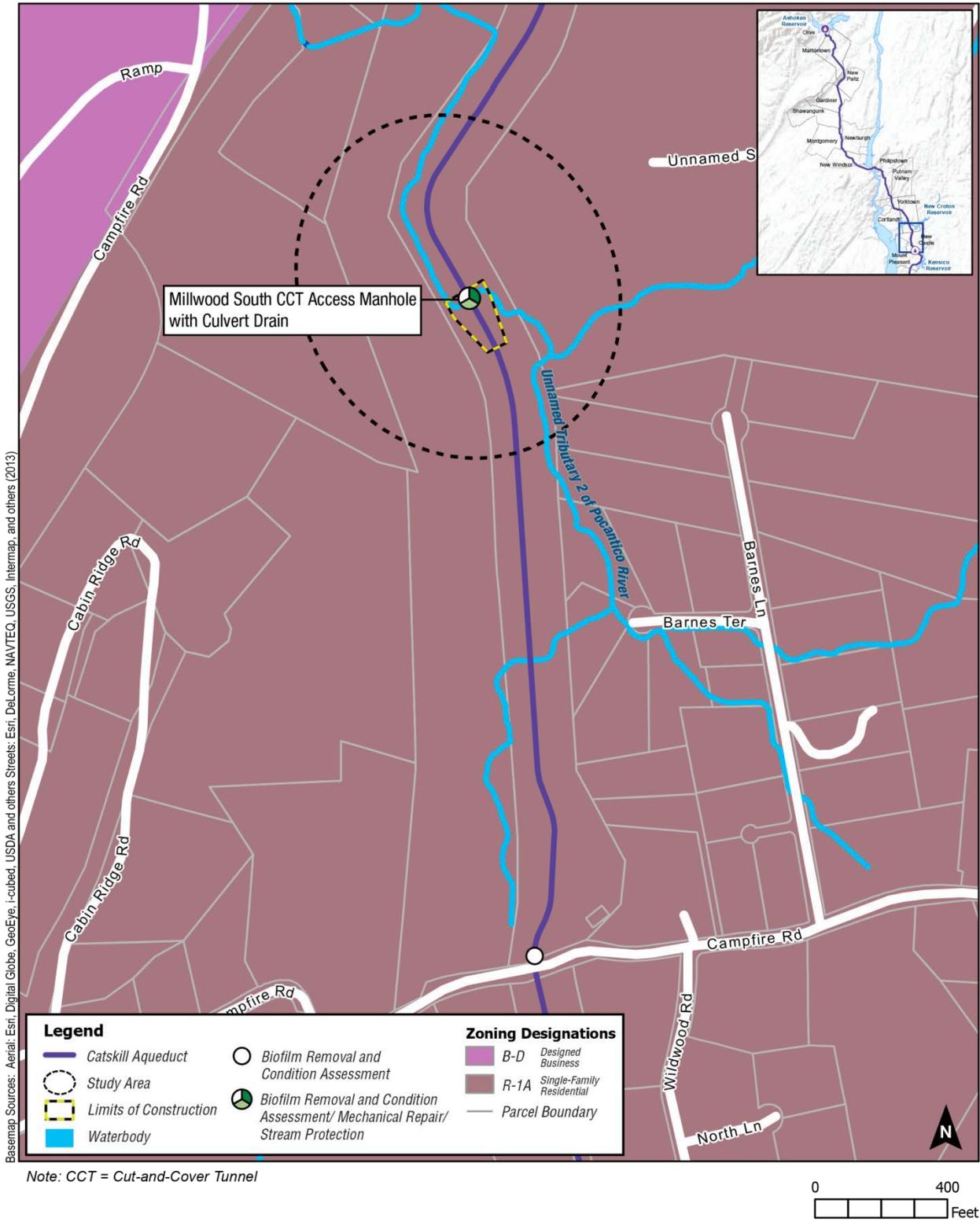


Figure 9.15-22: Land Use – Campfire Road Study Area





Basemap Sources: Aerial: Esri, Digital Globe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.15-23: Zoning – Campfire Road Study Area



9.15.5.2 Proposed Activities within the Campfire Road Study Area

To support activities within the Campfire Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas would provide additional parking, and equipment and materials would be staged on site. No staging or access improvements would be necessary other than underbrush clearing and gravel placement for leveling and erosion control in the study area. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. A site plan showing a layout of the limits of construction for the work site, which would occupy a total of 0.5 acre, and access along the aqueduct, is shown on **Figure 9.15-24**. The schedule for work within the study area is shown in **Table 9.15-13**. The duration of active construction within the Campfire Road Study Area is estimated to total 9 weeks over 1.5 years.

Table 9.15-13: Schedule of Work Activities within the Campfire Road Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Streambank Restoration and Protection	Summer 2019 2018	3 weeks	Monday to Friday, 7:30 AM to 6 PM	10
Culvert Drain Sluice Gate Replacement	Fall 2019 2018 (Second 10-week shutdown)	4 weeks	7 days a week, 7 AM to 7 PM	12
Biofilm Removal and Condition Assessment	Fall 2020 2019 (Third 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	21
Notes:				
¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per Town of New Castle Noise Control Ordinance §90-6(B).				
² Crew size refers to the number of people anticipated at the work site(s).				

Work in the study area would begin with streambank restoration and protection measures associated with the culvert drain access manhole in summer ~~2019~~2018 (see **Figure 9.15-24**). Work would entail the restoration of riprap aprons on either end of the culvert to their original as-built conditions and the removal of accumulated debris from within the culvert. Temporary in-stream disturbance would cover a total area of approximately 590 square feet, and there would be no permanent in-stream disturbance because riprap aprons would be in-kind repairs. To facilitate a dry work area, sandbags would be installed upstream of the culvert, and the stream would be diverted to a point downstream, which would include a turbidity curtain for sediment control. Replacement of the culvert drain sluice gate, which would require unwatering of the aqueduct, would occur during the second 10-week shutdown in fall ~~2019~~2018. In conjunction with culvert drain sluice gate replacement, the gate stem and manhole cover would be replaced, and the concrete walls of the manhole would be repaired. During the repair work, sandbags would be installed inside the aqueduct to prevent any residual water from entering the natural environment.

Biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019, with access into the aqueduct provided by access manhole (see **Figure 9.15-24**).

The manhole would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Campfire Road Study Area are presented in Sections 9.15.5.3, “Open Space and Recreation” through 9.15.5.9, “Neighborhood Character,” and include: open space and recreation; visual resources; natural resources including water resources, federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.15.2, “Town of New Castle Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” an impact analysis related to land use and zoning; socioeconomic conditions; community facilities and services; historic and cultural resources; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, terrestrial resources, wildlife, federal/State Candidate Species, and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area is not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.15.5.3 Open Space and Recreation

As shown on **Figure 9.15-25**, one open space and recreation resource exist within the Campfire Road Study Area: Gedney Park. The eastern portion of the Campfire Road Study Area contains approximately 5 acres of Gedney Park, including a hiking trail (the Red Trail) and a portion of a ballfield. Gedney Park is an approximately 125-acre Town of New Castle public park that provides recreational opportunities including approximately 3.5 miles of trails for hiking, picnicking, and organized sport amenities (soccer and baseball). The entrance to Gedney Park is located at 155 Millwood Road, Millwood, New York, and is not within the study area. Additionally, the North County Trailway runs northeast to southwest north of the Campfire Road Study Area, by Station Place (see **Figure 9.15-25**). However, this open space resource is located outside the study area.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP’s understanding that no plans to expand or create new open space or recreational resources are anticipated within the Campfire Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open spaces is anticipated to continue. Therefore, in the future

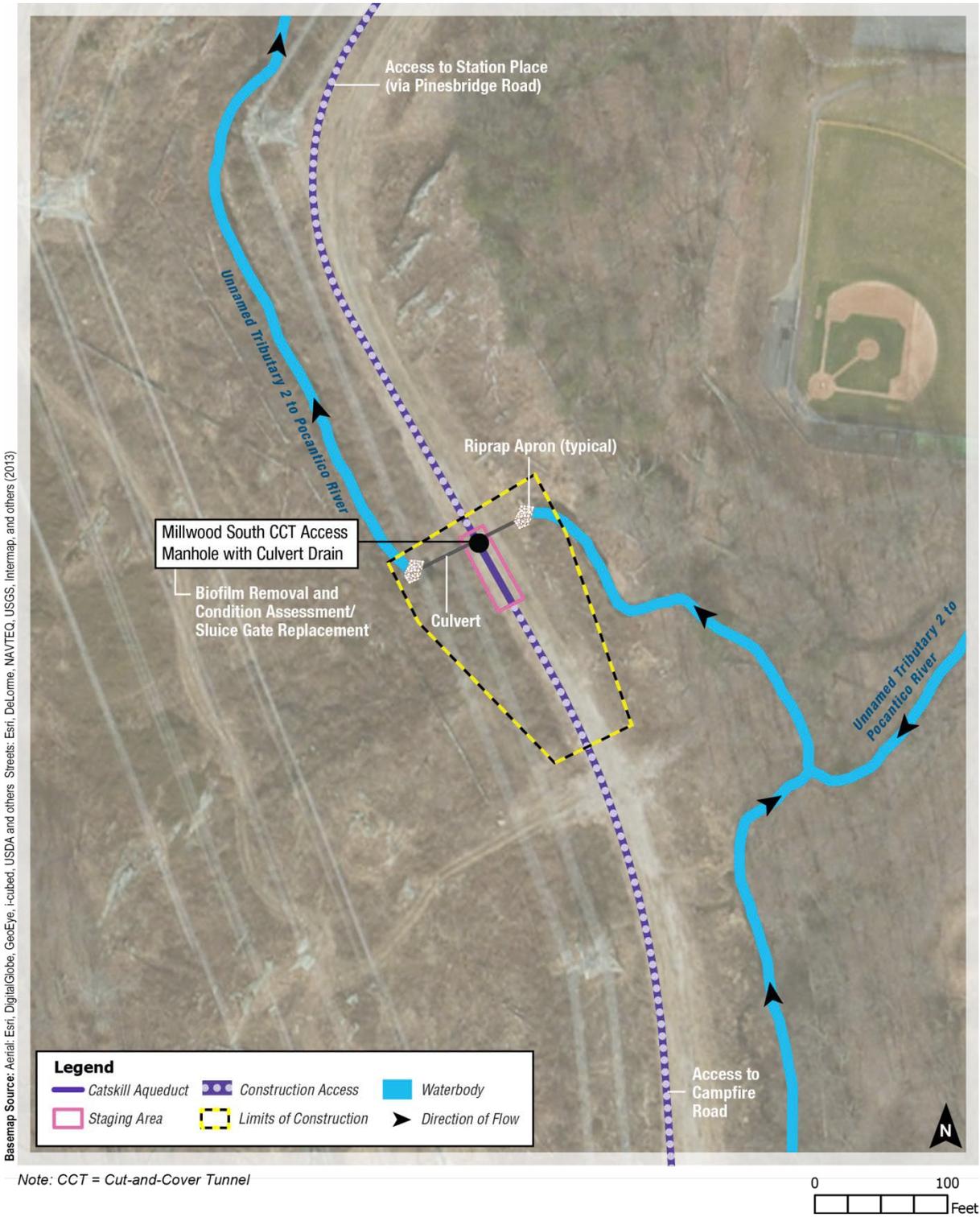


Figure 9.15-24: Site Plan – Campfire Road Study Area



without the repair and rehabilitation, it is assumed that open space and recreation resources within the Campfire Road Study Area would be the same as baseline conditions.

As shown on **Figure 9.15-25**, a segment of the Gedney Park Red Trail and the baseball field located within the study area are east of the Millwood South access manhole and outside the repair and rehabilitation construction staging areas and limits of construction for the work sites. Hikers on the trail may have limited views of the work area through the densely forested area along the trail. The work site may be accessed from Station Place which would entail crossing the North County Trailway and driving south over the cut-and-cover tunnel.

During construction, the repair and rehabilitation work activities within the Campfire Road Study Area would be short-term (intermittently over 1.5 years; see **Table 9.15-13**). The work activities would be located adjacent to, but not within, Gedney Park, approximately 150 feet from the hiking trail and approximately 250 feet from the baseball field. No tree clearing is anticipated with the work activities. Construction would not disrupt the use of the open space, nor detract from the aesthetics of the area because the work activities would be located behind a forest area, separating construction from the park. If the work site is accessed from Station Place by driving south over the cut-and-cover tunnel, occasional crossing of the North County Trailway would occur. Vehicles would proceed with caution while crossing the trailway and yield to trail users.

As discussed in Section 9.15.5.8, “Noise,” for the Campfire Road Study Area, there may be temporary increases in noise levels due to the work activities within the study area that may affect recreational uses of the trails and use of the baseball field within Gedney Park. However, upon completion of the repair and rehabilitation work activities, the recreational uses within Gedney Park would be unaffected.

Following construction, all equipment would be removed from the Campfire Road Study Area and staging areas would be restored to baseline conditions. The streambank restoration measures would be consistent with as-built conditions and are permanent structures that would remain following construction. Operation of the Catskill Aqueduct would be consistent with baseline conditions and would not disrupt recreational use of adjacent open spaces. As such, the repair and rehabilitation would not encroach upon, cause a loss of open space, impact the use or physical character of, or disrupt views from Gedney Park.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Campfire Road Study Area.

9.15.5.4 Visual Resources

The visual resources study area is the area within the Campfire Road Study Area, and also includes view corridors that extend beyond the study area based on the locations that are publicly accessible.

As shown on **Figure 9.15-25**, visual resources, consisting of one locally significant resource, Gedney Park, and a segment of the Gedney Park Hiking Trail, were identified within the Campfire Road Study Area.

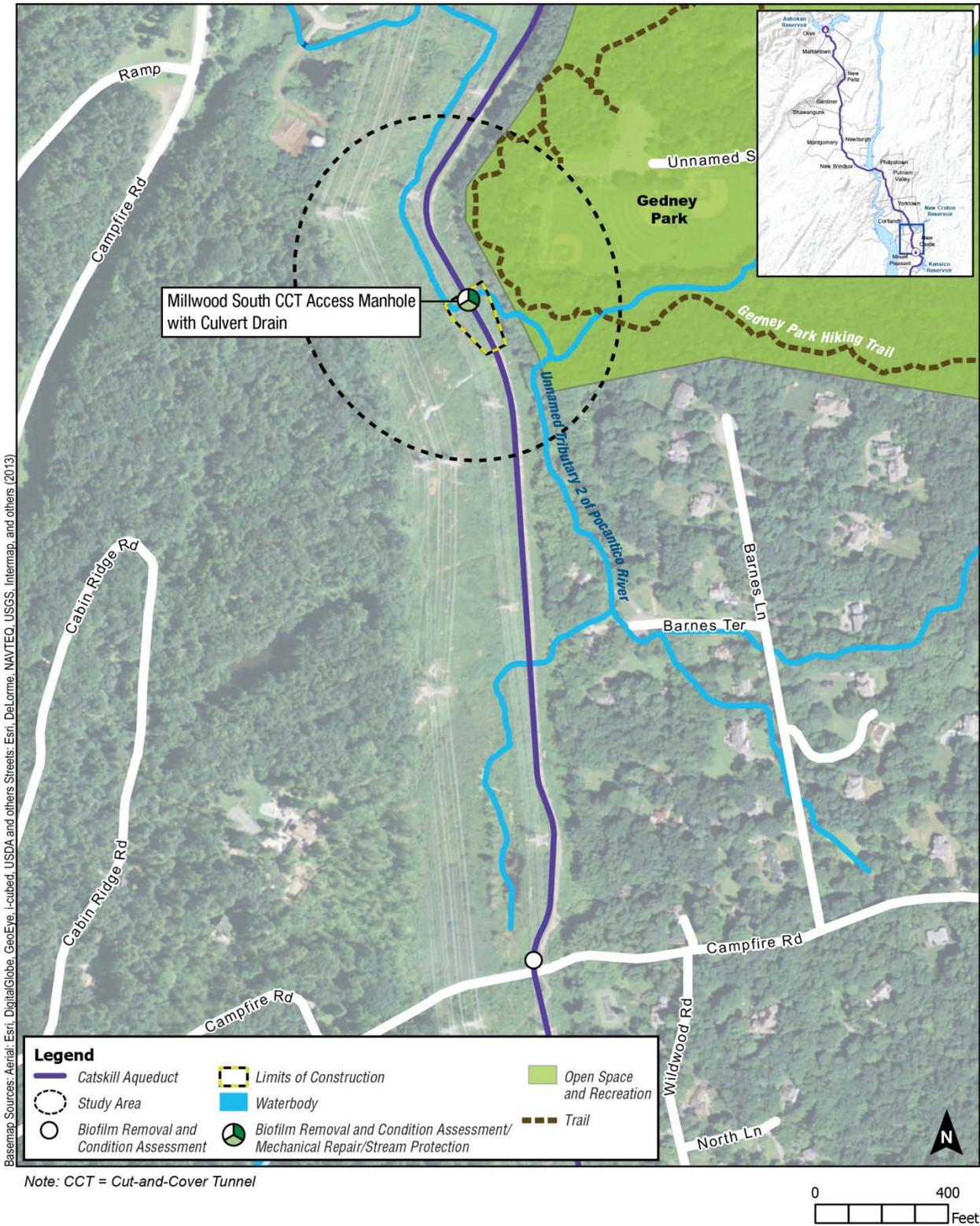


Figure 9.15-25: Open Space and Visual Resources – Campfire Road Study Area



DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Campfire Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Campfire Road Study Area would be the same as baseline conditions.

As shown on **Figure 9.15-25**, the segment of Gedney Park Hiking Trail and baseball field located within the study area are east of the Millwood South access manhole. They are outside the repair and rehabilitation construction staging areas and the limits of construction for the work sites. Hikers on the trail may have limited views of the work area through the densely forested area along the trail.

During construction, the repair and rehabilitation work activities within the Campfire Road Study Area would be short-term (intermittently over 1.5 years; see **Table 9.15-13**). Work activities are located adjacent to, but not within, Gedney Park. Tree clearing is not anticipated. Construction would not detract from the aesthetics of the area because the staging area would be located behind a forest area, separating construction from the park. Work activities would be approximately 150 feet from the hiking trail and approximately 250 feet from the baseball field, and would not be visible from other nearby recreational amenities within Gedney Park.

Following construction, all equipment would be removed from the Campfire Road Study Area and staging areas would be restored to baseline conditions. The streambank restoration measures would be consistent with as-built conditions and are permanent structures that would remain following construction. Operation of the Catskill Aqueduct would be consistent with baseline conditions and would not disrupt views of adjacent visual resources. As such, the repair and rehabilitation would not encroach upon, cause a loss of open space, affect the use or physical character of, or disrupt views from the visual resources of Gedney Park.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Campfire Road Study Area.

9.15.5.5 Natural Resources

The study area for the natural resources analysis is the immediate area surrounding the limits of construction for the Millwood South Cut-and-Cover Tunnel access manhole with a culvert drain (see **Figure 9.15-26**).

Resources potentially occurring within the natural resources study area were identified through a desktop assessment of aerial photographs, NYSDEC water classification data, NYSDEC freshwater wetlands maps, USFWS NWI maps, national hydrography data, published soil survey maps, and USGS topographic maps, as well as agency consultations.

Based on the desktop assessment, the habitat in the natural resources study area appears to contain mowed lawn and old field communities bordered to the east by deciduous forest and wetland habitat. An unnamed tributary to Pocantico River flows through a NYSDEC-mapped

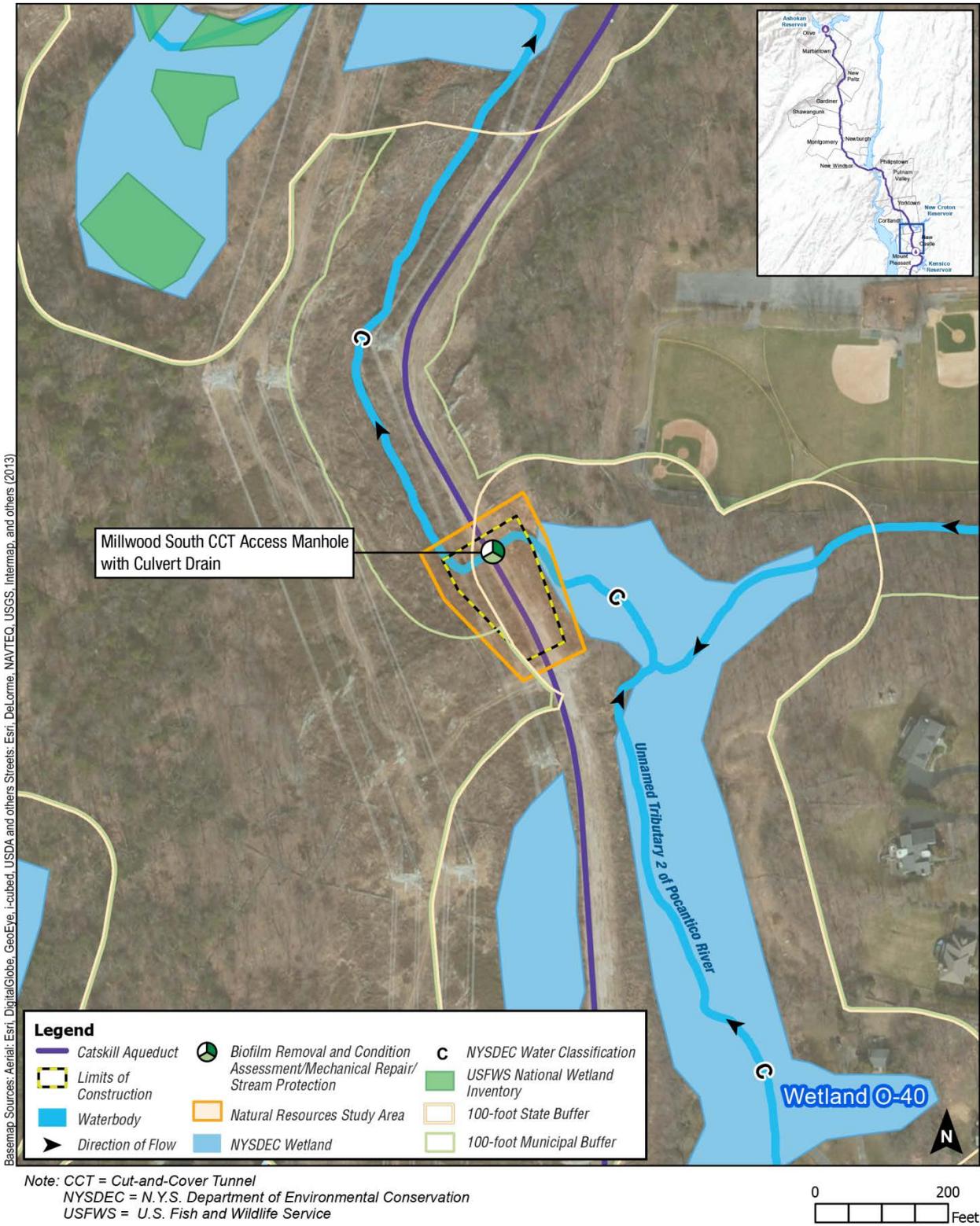


Figure 9.15-26: Natural Resources - Campfire Road Study Area



wetland in the natural resources study area. These habitats have the potential to support protected water resources and wildlife species, and an analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Water Resources

The natural resources study area is within the Lower Hudson River (HUC 02030101) drainage basin, more specifically within the of the Bailey Brook-Croton River subwatershed (HUC 020301010307) and the Pocantico River subwatershed (HUC 020301010402). Based upon the desktop assessment, there is one surface water, identified as the unnamed tributary 2 to Pocantico River, and one mapped NYSDEC wetland, located within the natural resources study area.

The natural resources study area includes surface water and wetlands that are subject to federal, State, and municipal regulations. These water resources are subject to federal jurisdiction under Sections 401 and 404 of the Clean Water Act. As a Class C stream, the unnamed tributary 2 to Pocantico River is not subject to State Protection of Waters regulations. Wetlands in the natural resources study area are associated with a NYSDEC Class II freshwater wetland and would be regulated with a protective 100-foot buffer. In addition, the Town of New Castle regulates activities within wetlands and any natural or artificial watercourses and their 100-foot buffers (New Castle Town Code Chapter 137: Wetlands). This municipal regulation encompasses the work in and alongside the stream including staging areas on top of the aqueduct berm; therefore, work activities occurring within the stream and its 100-foot buffer may be subject to Town review and approval.

Surface Water

Based upon the desktop assessment, the unnamed tributary 2 to Pocantico River was assigned a community classification according to the habitat descriptions in Cowardin et al. (Cowardin et al. 1979) as shown in **Table 9.15-14**.

Table 9.15-14: Water Resources and Classifications within the Campfire Road Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Unnamed Tributary 2 to Pocantico River	1,050	270	Riverine, Lower Perennial, Unconsolidated Bottom (R2UB)
NYSDEC Wetland 0-40	21,670	NA	Palustrine Emergent (PEM)
Note: NA = Not Applicable			

Unnamed Tributary 2 to Pocantico River

Unnamed tributary 2 to Pocantico River flows from southeast of the natural resources study area and then turns and flows east to west through the study area before turning and flowing north toward its confluence with Pocantico River. The watercourse is best classified as a “Riverine,

Lower Perennial, Unconsolidated Bottom” system based on the Cowardin System (Cowardin et al. 1979).

Wetlands

Based upon the desktop assessment, there is one mapped NYSDEC wetland present along the eastern portion of the natural resources study area (see **Figure 9.15-26**). Identified by the State as Wetland O-40 and totaling approximately 31.3 acres in size, this wetland is associated with the unnamed tributary and likely abuts the eastern side of the cut-and-cover berm. As a Class II NYSDEC wetland, it is classified as “Palustrine Emergent” based on the Cowardin System (Cowardin et al. 1979; 6 NYCRR 644.5).

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated to occur within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the Campfire Road Study Area would be the same as baseline conditions.

Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Campfire Road Study Area.

Construction

Work activities related to the repair and rehabilitation would have the potential to result in temporary disturbance to portions of the unnamed tributary and may temporarily alter flow. Prior to commencement of the repair and rehabilitation, sediment and erosion control measures would be installed to prevent the transport of sediment resulting from temporary disturbance into water resources within the study area. All access and staging activities would occur in upland areas along the top of the cut-and-cover berm. Equipment would then use the side-slope of the berm to reach both the inlet and outlet of the culvert.

The original riprap aprons installed at the upstream and downstream ends of the culvert during the aqueduct’s original construction have deteriorated and are no longer protecting the shoreline. As part of the repair and rehabilitation, the riprap aprons would be restored to their original, as-built condition. To complete the culvert drain repairs and maintain a dry work area, sandbags would be installed upstream of the culvert, and the stream would be diverted to a point downstream. A turbidity curtain would be used for sediment control. The temporary diversion of the unnamed tributary 2 to Pocantico River would be conducted in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements. Diversion would be for the shortest possible duration. Upon completion of streambank restoration, the unnamed

tributary 2 to Pocantico River would be returned to its original location and temporarily disturbed areas would be restored to natural conditions.

Riprap aprons placed at the culvert’s inlet and outlet would provide erosion protection and are consistent with original as-built conditions. Additionally, riprap aprons at the culvert drain would be sized based upon the maximum discharge capacity, even though it is unlikely flows of this magnitude would be discharged at this site.

Anticipated temporary disturbance to water resources and regulated buffers were quantified based on the limits of construction and proposed work activities (see **Table 9.15-15**). The in-stream diversion would result in approximately 590 square feet of temporary disturbance. Approximately 20,080 square feet of temporary disturbance would occur within the municipal water resource buffer in support of these activities. No disturbance to the NYSDEC wetland is anticipated. However, in-stream work would result in approximately 17,170 square feet of temporary disturbance to the 100-foot State wetland buffer. Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native vegetation. No permanent disturbances to water resources are anticipated within the natural resources study area because riprap aprons would be in-kind repairs.

Table 9.15-15: Estimated Disturbance to Water Resources within the Campfire Road Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
NYSDEC Wetland	21,670	0	0
Unnamed Tributary 2 to Pocantico River	1,050	590 <i>Temporary stream diversion and temporary downstream turbidity curtain</i>	0
100-foot Municipal Water Resource Buffer	33,030	20,080 <i>Construction staging area</i>	0
100-foot State Wetland Buffer	24,880	17,170 <i>Temporary in-stream work</i>	0

Discharges of raw aqueduct water and groundwater may take place during a shutdown of the Catskill Aqueduct and could occur in the future during DEP’s typical operations when access to the aqueduct is required for maintenance or inspection. The aqueduct would be unwatered with temporary stream protection measures in place prior to reconstructing the culvert drain sluice gate. Unwatering events to surface water would also occur at any time following construction and therefore are described in “Operation” below.

Operation

Upon completion of the culvert drain sluice gate repairs and streambank restoration and protection, the function of the sluice gates would be restored and discharges of raw water to the unnamed tributary 2 to Pocantico River could occur in the future during DEP’s typical operations. The aqueduct could be unwatered via the sluice gates to conduct maintenance or inspection. During the aqueduct shutdowns, groundwater may infiltrate the aqueduct.

Groundwater would flow by gravity to the culvert drain sluice gate and could also be discharged to the unnamed tributary 2 to Pocantico River. This would be a rare event.

An analysis was conducted to determine if the raw water discharge associated with an unwatering event is greater than the bankfull stream flow. Bankfull flow is the flow that just fills the channel to the top of its banks (i.e., stream capacity) and at the point in which water begins to flow onto the floodplain. Bankfull flow was predicted for unnamed tributary 2 to Pocantico River using the USGS StreamStats Program. If the discharge associated with an unwatering event is greater than the bankfull flow, indirect downstream effects, such as an increase in erosion and scouring over the baseline could be reasonably expected. The calculations determined that bankfull flow of the unnamed tributary 2 to Pocantico River was approximately 5,500 gpm using the USGS StreamStats Program. During unwatering, the maximum discharge flow of 13,400 gpm would exceed the bankfull flow, when the culvert drain is operated during a 2-year storm event. While a bankfull event is possible when unwatering at this location, it is unlikely this site would be used for unwatering on a routine basis because raw aqueduct water in this segment is more easily discharged to Saw Mill River at the Harlem Railroad Steel Pipe Siphon Blow-off Chambers. Rather, the culvert drain sluice gate would be used to discharge infiltrated groundwater during the repair and rehabilitation and future maintenance, which would not exceed the unnamed tributary's bankfull flow. The analysis determined that groundwater infiltration at this site is expected to be 50 to 100 gpm. The groundwater infiltration rate is lower than the bankfull stream flow. Therefore, groundwater infiltration would not be expected to create flooding conditions.

In the event that this culvert drain sluice gate is used for unwatering, the following measures would be taken to prevent a bankfull event. To unwater the aqueduct at this location, the sluice gate would be opened only approximately 1-inch (as measured by the position of the rising stem) to limit unwatering flows to approximately 300 gpm. Any aqueduct unwatering from this culvert drain sluice gate would be performed only while visually monitoring streambank flow. The gate can be further opened as head within the aqueduct decreases and flow is monitored to ensure flow remains in the streambank and does not flood adjacent properties or the road. Discharges would be rare and last several hours or days in duration, depending on the length of the shutdown of the Catskill Aqueduct, are not anticipated to cause scouring, and would not result in a bankfull event or alter stream capacity of the unnamed tributary.

Water Resources Conclusion

Repair and rehabilitation activities would include repairs to the culvert sluice drain gate. As a result of these activities temporary disturbance to watercourses may occur. Based on desktop studies there is one NYSDEC-mapped wetland within the natural resources study area. No impacts to this wetland are anticipated at this time. The repair and replacement of the culvert drain sluice gate would result in temporary disturbance to the unnamed tributary 2 to Pocantico River. The unnamed tributary would be temporarily diverted and the area temporarily disturbed. Upon completion of repair and restoration work, the unnamed tributary would be returned to its original location. Restoring the riprap aprons to their original condition would result in minimal fill and would be beneficial in that these would minimize future scouring when the culvert drain sluice gate is operated. Other areas temporarily affected by work activities would also be

restored to natural conditions following construction. Discharges would be limited to groundwater infiltration and dewatering events that are not anticipated to result in erosion and sediment control issues that may adversely affect the stream channel.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Campfire Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. Species that could be affected within the study area and could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” six species were identified to have the potential to be affected by the repair and rehabilitation within the natural resources study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these six species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.15-16**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and desktop assessments, as applicable.

Table 9.15-16: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Campfire Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Bog Turtle	<i>Clemmys</i> [= <i>Glyptemys</i>] <i>muhlenbergii</i>	Threatened	Endangered	Based upon the desktop assessment, there is one mapped wetland present along the eastern portion of the natural resources study area; however, no impacts to this wetland are anticipated at this time. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites. Finally, upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for bog turtles is warranted for this study area at this time.	No
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	While work activities would be largely confined to previously disturbed areas, if any isolated areas of potential habitat exist at the sites, as a highly mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites. Finally, upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	Disturbance would be temporary and limited to areas previously disturbed. Should any potential habitat exist at the sites, a variety of habitats would be available for the species use in the vicinity during construction. Upon construction completion, sites would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No
Spotted Turtle	<i>Clemmys guttata</i>	Unlisted	Special Concern	Based upon the desktop assessment, there is one mapped wetland present along the eastern portion of the natural resources study area; however, no impacts to this wetland are anticipated at this time. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites. Finally, upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for spotted turtles is warranted for this study area.	No

Table 9.15-16: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Campfire Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Birds					
Cooper's Hawk	<i>Accipiter cooperii</i>	MBTA	Special Concern	Disturbance would be temporary and limited to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species use in the vicinity during construction. Upon construction completion, sites would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Cooper's Hawks is warranted for this study area.	No
Mammals					
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	If any potential habitat exists at the sites of construction, a variety of habitats would be available for the species use in the vicinity. Upon construction completion, the site would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for New England cottontails is warranted for this study area.	No
Note: MBTA: Migratory Bird Treaty Act					

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects anticipated to bog turtles (*Clemmys [=Glyptemys] muhlenbergii*), eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), spotted turtles (*Clemmys guttata*), Cooper's Hawks (*Accipiter cooperii*), or New England cottontails (*Sylvilagus transitionalis*) associated with the repair and rehabilitation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Campfire Road Study Area.

9.15.5.6 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Campfire Road Study Area (see **Figure 9.15-21**), a Phase I ESA would be completed for the proposed culvert drain sluice gate replacement and associated streambank restoration and protection site in general conformance with the scope and limitations of the ASTM Practice E 1527-13 and CEQR requirements to identify RECs. The Phase I ESA would include site reconnaissance, research on current/historic use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard.

The proposed culvert drain sluice gate replacement and associated streambank restoration and protection site would occur on a previously disturbed section of the Catskill Aqueduct. Given the findings of previous subsurface investigation along similar portions of the aqueduct corridor, no subsurface ground contamination is anticipated. However, where RECs are identified, a Phase II subsurface soil investigation would be recommended to be completed for COC prior to construction. The COC to be evaluated along the segment of the aqueduct in the study area, that would be affected as part of the repair and rehabilitation work would include volatile and semivolatile organics, PCBs, and total petroleum hydrocarbons. Subsurface soil testing would be conducted to ensure that contaminated soil is not reused as backfill (per 6 NYCRR IV B Part 375). Should any areas of contamination be identified, the contract documents would be revised to identify requirements for proper handling and disposal of the material.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Campfire Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Campfire Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. DEP would handle all materials in accordance with applicable federal, State and local regulations and guidelines. The use and storage of all of these would be

in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, soil disturbance associated with the work activities for the culvert drain sluice gate replacement and associated streambank restoration and protection would occur on previously disturbed soils; access road improvements would occur on both previously disturbed and undisturbed soils.

If any soil contamination is identified, the excavated material would be transported to an authorized off-site storage facility. All waste material, including contaminated soil, would be temporarily secured using non-permeable base material, covered with plastic or geotextile to prevent soil loss, and removed from the proposed construction, repair and rehabilitation areas within the Campfire Road Study Area at the end of each workday. All soils to be removed as part of the repair and rehabilitation would be transported off site and disposed of in accordance with all federal, State, and local laws.

Following construction, all equipment would be removed from the Campfire Road Study Area. The staging area would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Campfire Road Study Area.

9.15.5.7 Transportation

The transportation study area consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Campfire Road Study Area.

Access to the repair and rehabilitation limits of construction for the work sites within the Campfire Road Study Area would be either via Campfire Road or Station Place (see **Figure 9.15-21**). Campfire Road is a two-lane, two-way local roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Campfire Road Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area. There is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site; however, there are no DEP employees who work at or visit the study area on a daily basis, and the low number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Campfire Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Campfire Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be the basis of this transportation analysis. Of these activities, biofilm removal and condition assessment would generate the most vehicle trips. Biofilm removal and condition assessment would occur in fall ~~2020~~2019 between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the third 10-week shutdown (see **Table 9.15-13**).

In the future with the repair and rehabilitation, construction vehicles would travel along Campfire Road. The estimated number of peak-day one-way vehicle trips associated with biofilm removal and condition assessment is 33 vehicle trips, or approximately 66 peak-day vehicle round trips that would travel to and from the study area. The majority of the peak daily vehicle round trips, approximately 42 vehicle round trips or 42 PCEs, would be workers traveling directly to and from the staging area, with an additional 8 daily shuttle trips between the study area and the staging area. The remaining approximately 16 peak-day vehicle round trips (21 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with biofilm removal and condition assessment is approximately 33 peak-hour vehicle trip ends (36 PCEs). This includes approximately 21 vehicle trip ends (21 PCEs) from workers traveling directly to and from the staging area, approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 8 vehicle trip ends (11 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 12-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak-hour for existing traffic.

The repair and rehabilitation would result in approximately 36 peak-hour PCEs along Campfire Road, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, “Transportation.” The work activities at the Campfire Road Study Area would be short-term (approximately 9 weeks over 1.5 years; see **Table 9.15-13**) and would not generate public parking or transportation demands or pedestrian activity within the Campfire Road Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Campfire Road Study Area.

9.15.5.8 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation activities within the Campfire Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The noise study area is the area within 1,500 feet of the repair and rehabilitation work activities as shown on **Figure 9.15-27**.

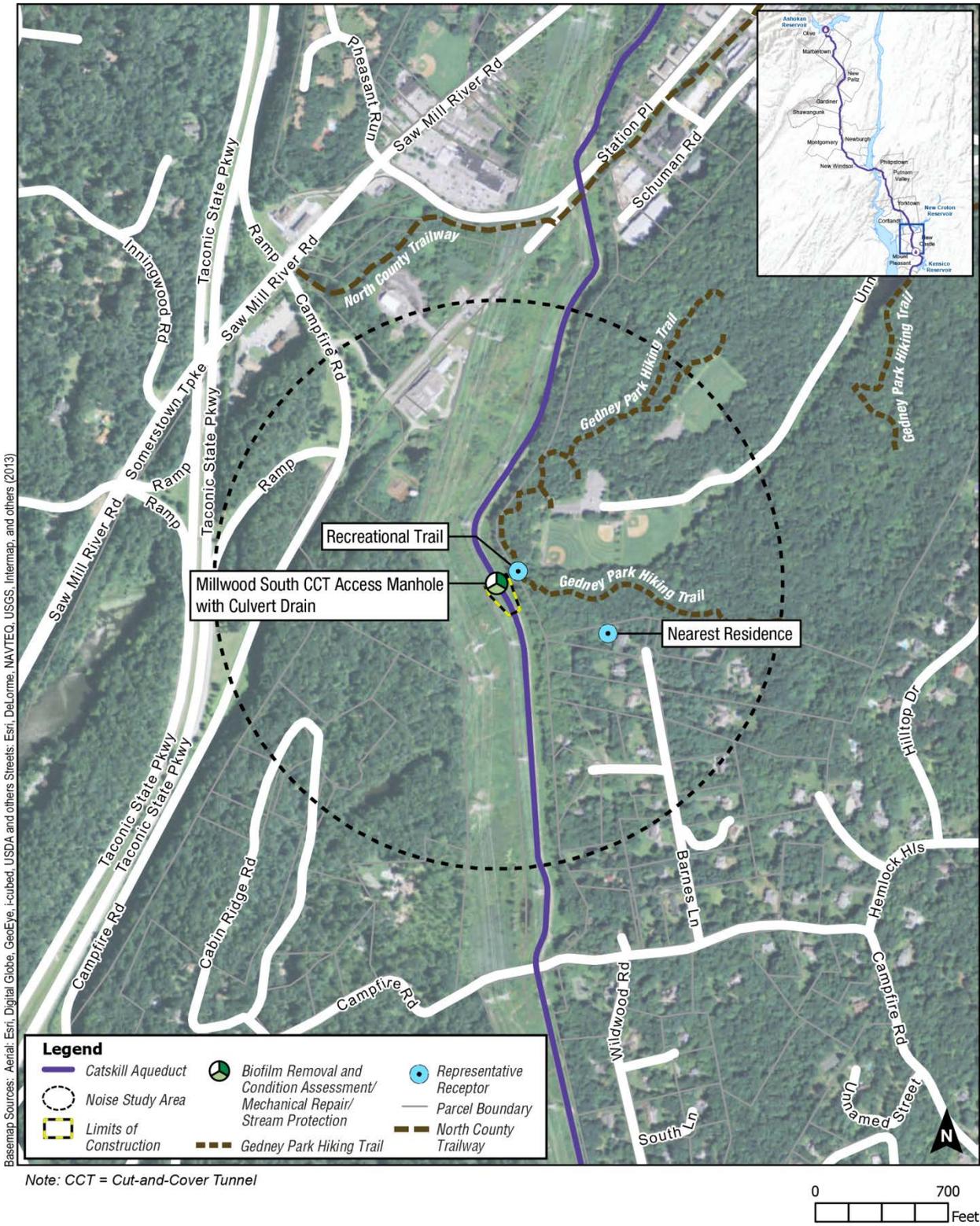


Figure 9.15-27: Noise – Campfire Road Study Area



The Campfire Road Noise Study Area includes residential parcels and a recreational trail within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Town of New Castle Noise Control Ordinance §90-6(B), which allows audible construction noise only between 7:30 AM and 8 PM, Monday through Friday, and 10 AM and 5 PM, weekends and holidays.

Existing ambient noise levels within the Campfire Road Study Area are influenced by vehicular traffic traveling on Taconic State Parkway and other nearby local roadways. The existing noise levels within the study area are comparable to a quiet suburban residential environment, based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban residential communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Campfire Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Campfire Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Campfire Road Study Area would occur on one site. The stationary noise-generating equipment associated with streambank restoration and protection was the basis of this stationary noise analysis. Streambank restoration and protection would occur in summer ~~2019~~2018 between the hours of 7:30 AM and 6 PM, Monday through Friday for approximately 3 weeks prior to the second 10-week shutdown (see **Table 9.15-13**). Work conducted while the aqueduct is in service would be adjusted to comply with allowable work hours per town noise codes. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities; however, this equipment would not be expected to be louder than those associated with streambank restoration and protection.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for streambank restoration and protection. Associated equipment reference noise levels are shown in **Table 9.15-17**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.15-18 shows the results of the stationary construction noise analysis. Streambank restoration and protection within the Campfire Road Study Area during the repair and rehabilitation could produce noise levels (L_{eq}) of approximately 63 dBA at the nearest residence and approximately 77 dBA at the recreational trail.

Table 9.15-17: Stationary Source Construction Equipment Modeled at the Campfire Road Study Area - Noise Analysis and Reference Noise Levels (L_{eq})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA)
Excavator	81
Generator	82
Backhoe	76

Note:
¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.

Table 9.15-18: Stationary Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors within the Campfire Road Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)	Town of New Castle Noise Limit (dBA)	Potential for Exceedance (Yes or No)
Nearest Residence	633	63	NA	No
Recreational Trail	126	77	NA	No

Note:
 NA = Not Applicable

Repair and rehabilitation work activities would comply with the Town of New Castle town code. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Campfire Road Study Area. The repair and rehabilitation would be temporary in nature, with the peak work activities occurring during streambank restoration and protection in summer ~~2019~~2018 for a limited period (e.g., 3 weeks).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Campfire Road Study Area.

9.15.5.9 Neighborhood Character

The character of the Campfire Road Study Area is largely defined by a mix of residential, public services, open space and recreation, and vacant land uses and its physical setting within a rural location (see **Figure 9.15-22**). The Catskill Aqueduct traverses the study area in a general north to south direction. The study area is located to the east and north of Campfire Road and to the south of Station Place.

DEP has consulted with the Town of New Castle and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated

within the Campfire Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

The limits of construction for the work site and associated access routes are located in a public services corridor with grassy cover, which is owned and maintained by DEP.

As described in Section 9.3.16, “Neighborhood Character,” there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; and historic and cultural resources, an impact analysis for the Campfire Road Study Area are not warranted, as discussed in the following sections: Section 9.3.3, “Land Use, Zoning, and Public Policy,” Section 9.3.4, “Socioeconomic Conditions,” and Section 9.3.7, “Historic and Cultural Resources,” respectively. As described in Section 9.15.5.3, “Open Space and Recreation,” and Section 9.15.5.4, “Visual Resources,” the work activities would not affect open space and recreation and visual resources in the Campfire Road Study Area. Furthermore, the public policy impact analysis provided in Section 9.15.2, “Town of New Castle Impact Analysis,” concluded the work activities were consistent with applicable plans.

As described in Sections 9.15.5.7, “Transportation, and 9.15.5.8, “Noise,” during construction, the work activities in the Campfire Road Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Campfire Road Study Area.

9.16 TOWN OF MOUNT PLEASANT

9.16.1 TOWN OF MOUNT PLEASANT PROJECT DESCRIPTION

The Town of Mount Pleasant is located in Westchester County, New York, on the eastern side of the Hudson River. It is bounded by the Towns of New Castle and Ossining to the north, the Town of Greenburgh to the south, the Town of North Castle and Kensico Reservoir to the east, and the Hudson River to the west. The Town of Mount Pleasant encompasses approximately 32.7 square miles. It includes portions of three incorporated villages, including the Village of Pleasantville, through which the Catskill Aqueduct traverses. The general boundaries of the locations where activities associated with the repair and rehabilitation would occur within the Town of Mount Pleasant are shown on **Figure 9.16-1**.

The Catskill Aqueduct stretches for approximately 9 miles, traversing in a southeasterly direction and turning near the Nanny Hagen Road Study Area to a southwesterly direction through the Town of Mount Pleasant. Notable sites along the aqueduct within the Town of Mount Pleasant that are associated with the repair and rehabilitation include the Catskill Influent Chamber, Kensico Upper and Lower Effluent Chambers, and Kensico Reservoir.

The repair and rehabilitation work activities within the Town of Mount Pleasant are shown in **Table 9.16-1**. Repair and rehabilitation work activities within the Village of Pleasantville are assessed in Section 9.17, “Village of Pleasantville.”

Table 9.16-1: Schedule of Work Activities within the Town of Mount Pleasant

Work Activity	Study Area		
	Chappaqua Road	Nanny Hagen Road	Westlake Drive
Staging and Access Improvements	-	✓	✓
Primary Staging Area Management	-	✓	-
Internal Leak Repair	✓	-	-
Concrete Repair	-	✓	-
Manhole Abandonment	-	-	✓
Boathole Preparation	-	✓	-
Boathole Installation	-	✓	-
Streambank Restoration and Protection	✓	-	-
Sluice Gate Replacement	✓	-	-
Biofilm Removal and Condition Assessment	✓	✓	-
Large-scale Wash Water Treatment	-	✓	-
Sediment Removal	-	✓	✓
Notes:			
- = Work activity not proposed.			
✓ = Work activity proposed.			

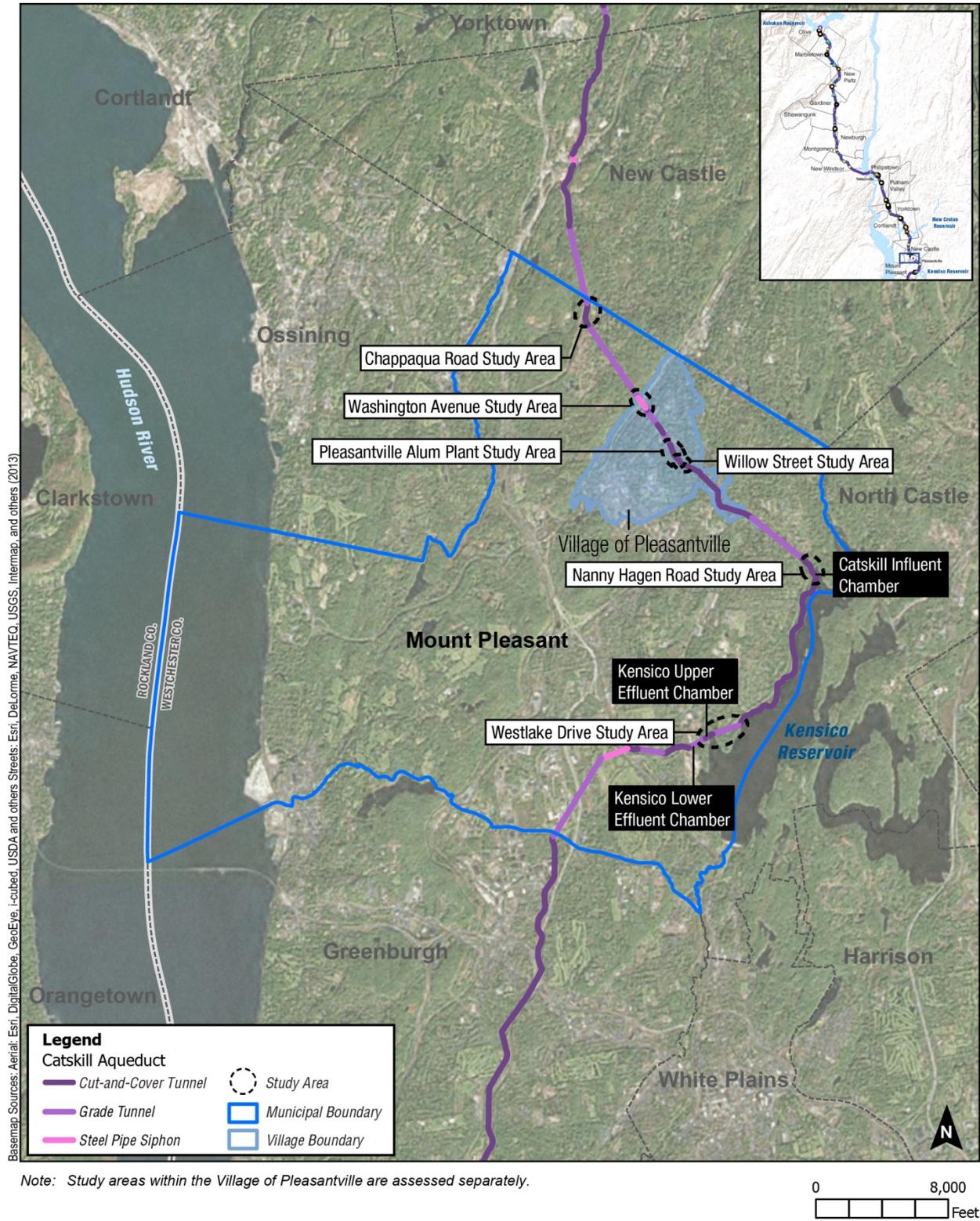


Figure 9.16-1: Town of Mount Pleasant Study Areas



These three study areas in the Town of Mount Pleasant encompass the majority of work that would occur as part of the repair and rehabilitation in this municipality. Additional work activities in the town do not warrant further analysis. Work sites located outside the study area include activities that would primarily be conducted within the aqueduct interior (see Section 9.3, “Screening Assessment and Impact Analysis Methodology”). In the Town of Mount Pleasant, they include biofilm removal and condition assessment at access manholes not located in these study areas. See Section 9.2, “Project Description,” for an overall project description of the repair and rehabilitation. Section 9.16.2, “Town of Mount Pleasant Impact Analysis,” provides a discussion of applicable local regulations in the Town of Mount Pleasant. The following sections provide a description of the study area, proposed activities, and impact analysis for the three study areas:

- Section 9.16.3 – Chappaqua Road Study Area Impact Analysis
- Section 9.16.4 – Nanny Hagen Road Study Area Impact Analysis
- Section 9.16.5 – Westlake Drive Study Area Impact Analysis

9.16.2 TOWN OF MOUNT PLEASANT IMPACT ANALYSIS

9.16.2.1 Public Policy

Because local public policies would not vary for study areas in the same town, public policies were evaluated on a town-wide basis. As discussed in Section 9.3.3, “Land Use, Zoning, and Public Policy,” the repair and rehabilitation’s consistency with the applicable policies of the Westchester County’s Westchester 2025 Plan (Westchester County 2008) in the Chappaqua Road, Nanny Hagen Road, and Westlake Drive study areas are analyzed as follows.

Westchester 2025 Plan (2008)

Westchester 2025 Plan is a framework to assist the 45 municipalities within the County to develop comprehensive plans that achieve a balance between economic and environmental concerns, while serving the future needs of the local communities within Westchester County. The recommendations outlined in the Plan include those recommended by the Westchester County Planning Board to municipalities as guidance for their own decision making. Based upon a review of these recommendations, the potential effects of the repair and rehabilitation work activities within the Chappaqua Road, Nanny Hagen Road, and Westlake Drive study areas are evaluated relative to compatibility with two applicable recommendations:

- (1) *Preserve natural resources: Preserve and protect the county’s natural resources and environment, both physical and biotic. Potential impacts on water resources (water bodies, wetlands, coastal zones and groundwater), significant land resources (unique natural areas, steep slopes, ridgelines and prime agricultural land) and biotic resources (critical habitat, plant communities and biotic corridors) require careful consideration as part of land management and development review and approval.*

There are no significant land resources within the study areas in the Town of Mount Pleasant. Water resources and biotic resources within the Chappaqua Road, Nanny Hagen Road, and Westlake Drive study areas are discussed in detail within the respective “Natural Resources” sections. Water resources in Nanny Hagen Road and Westlake Drive study areas consist of Kensico Reservoir, a body of water maintained by DEP as part of its water supply system and described further in Section 3.1.1, “Catskill Water Supply System Overview,” an unnamed tributary to Kensico Reservoir, and an intermittent tributary to Kensico Reservoir. Additionally, water resources in Chappaqua Road Study Area consist of an unnamed tributary to Pocantico River and several wetlands.

Under this recommendation, the Westchester 2025 Plan prioritizes the preservation of natural resources in order to balance this alongside land management and development. This recommendation was analyzed for the repair and rehabilitation as work in the study areas would potentially impact existing natural resources directly or indirectly, depending on the study area.

As part of the work at the Chappaqua Road Study Area, leaks in the Catskill Aqueduct would be repaired. During construction, a temporary diversion around in-stream work would be required in order to complete certain work elements. Additionally, riprap aprons would be installed at the culvert drain sluice gate, restoring the historic stream protection measures at these sites. Unwatering of the aqueduct would be required. This may result in raw water discharges to unnamed tributary 3 to Pocantico River in the Chappaqua Road Study Area.

At Kensico Reservoir, the Catskill Influent Chamber in the Nanny Hagen Road Study Area would continue to operate by releasing water from the Catskill Aqueduct into Kensico Reservoir. Concrete repairs to the Catskill Influent Chamber would be completed while the aqueduct is shut down. Additionally, the discharge of treated biofilm wash waters to Kensico Reservoir may also be required at Nanny Hagen Road Study Area. During temporary chlorination, aqueduct water would be dechlorinated at the Pleasantville Alum Plant prior to discharging to Kensico Reservoir. Finally, sediment removal from within the Catskill Kensico Bypass and decommissioning of an existing manhole are proposed to preserve the function of the Bypass for emergency water supply and to repair a known structural deficiency within the Westlake Drive Study Area.

The proposed action would not be expected to affect water resources for several reasons. Sediment and erosion control measures would also be put in place for all construction activities. Leak repairs in Chappaqua Road Study Area would restore pre-leak flows within the receiving unnamed tributary 3 to Pocantico River and would restore wetlands to pre-leak hydrology. Restoring the riprap aprons to their original condition would result in minimal fill and would be beneficial in that these would minimize future scouring when culvert drain sluice gates are operated. While discharges of raw aqueduct water could take place at any time during construction or future maintenance, this would consist of uncontaminated raw water from the aqueduct.

Kensico Reservoir would be unaffected by the repair and rehabilitation. Discharge of treated biofilm wash water or dechlorinated aqueduct water that would be temporarily discharged to the Kensico Reservoir would be conducted in accordance with applicable regulatory requirements established as part of required discharge permits. A temporary drawdown of Kensico Reservoir

could occur to facilitate repair and rehabilitation. The drawdown would be within the normal operating range of water surface elevations within the reservoir. If a drawdown is not feasible, these repairs would require temporary in-water work, and there would be no permanent disturbance to Kensico Reservoir.

Select tree removal on DEP property may be needed at Nanny Hagen Road and Westlake Drive study areas to establish better access to the proposed work sites. However, this would not permanently affect critical biotic habitat or corridors within the study area. The work sites occur in previously disturbed areas at existing DEP facilities. Tree removal is required because access to these areas has not been needed for some time, and trees have grown in unmaintained areas along the aqueduct. Furthermore, following construction, areas temporarily disturbed during construction would be restored to baseline conditions.

As such, the repair and rehabilitation within the Chappaqua Road, Nanny Hagen Road, and Westlake Drive study areas would not affect natural resources or biotic resources and would be consistent with this recommendation.

- (2) *Engage in Regional Initiatives: Work with neighboring jurisdictions in the Hudson Valley, Connecticut, New Jersey, Long Island and New York City in planning initiatives aimed at sound land use, transportation, economic development, housing and environmental policies.*

The repair and rehabilitation supports the goal of supplying clean drinking water to the City's 8 million residents and 1 million upstate residents. As described in Section 9.3, land use and zoning and socioeconomic conditions would not be affected by the repair and rehabilitation within study areas in the Town of Mount Pleasant. The potential for impacts are analyzed in the respective "Transportation" sections.

Under this recommendation, the Westchester 2025 Plan prioritizes regional cooperation in order to better facilitate regional initiatives. This recommendation was analyzed for repair and rehabilitation as work within the study areas would potentially impact existing land use, transportation, economic development, housing, and environmental policies directly or indirectly, depending on the study area.

On a daily basis, over 1 billion gallons of water are delivered from large reservoirs spanning several counties and jurisdictions within the State to these water consumers. The repair and rehabilitation would require DEP to work with State and local jurisdictions to ensure that current and future water supplies are maintained. Throughout this coordination, repair and rehabilitation work activities within the Chappaqua Road, Nanny Hagen Road, and Westlake Drive study areas would comply with existing land use, transportation, economic development, housing and environmental policies and would therefore be consistent with this recommendation.

Repair and rehabilitation would be consistent with the Westchester 2025 Plan in the Town of Mount Pleasant and would not result in significant adverse impacts to public policy within the Chappaqua Road, Nanny Hagen Road, and Westlake Drive study areas.

9.16.3 CHAPPAQUA ROAD STUDY AREA IMPACT ANALYSIS

In the Chappaqua Road Study Area, the aqueduct consists of the Sarles Cut-and-Cover Tunnel. Two leaks (Leaks 8 and 9) have been identified within this segment, formed as water flows down-gradient from the base of the cut-and-cover berm before seeping into the surroundings. Two access manholes, including one with a culvert drain sluice gate, are also located within the study area (see **Figure 9.16-2**).

Work activities within the Chappaqua Road Study Area would include: internal leak repair; sluice gate replacement and associated streambank restoration and protection; and biofilm removal and condition assessment.

9.16.3.1 Study Area Location and Description

The Chappaqua Road Study Area is located along the upper Catskill Aqueduct in the Town of Mount Pleasant, with a small part of its north end falling within the Town of New Castle, Westchester County. The Catskill Aqueduct traverses the study area in a general north to south direction. Chappaqua Road crosses the northern portion of the study area from east to west, and Charles Court is located along its southeastern border. An unnamed tributary to Pocantico River also traverses the study area from the northeast to southwest direction. Proposed work sites within the study area are located at the two access manholes, accessible by driving on top of the cut-and-cover tunnel from an entrance off of Chappaqua Road. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work sites. **Figure 9.16-2** shows an aerial photograph of the study area, including the path of the aqueduct, and limits of construction for the work sites.

The study area includes residential, open space and recreation, and public service land uses, with a parcel each of vacant and commercial land uses. The area consists of grassy fields along a utility corridor owned by Consolidated Edison of New York in the western half of the study area and a mixture of wooded areas and residential development in the east. The limits of construction for both work sites and the associated access route are located entirely in a public services corridor with grassy cover, which is owned and maintained by DEP. **Figure 9.16-3** shows a map of the land uses within the study area and its surroundings.

Zoning in the study area is residential, including single-family residential (R-40) zoning as designated by the Town of Mount Pleasant Zoning Code and single-family residential (R-1A) zoning as designated by the Town of New Castle Zoning Code (see **Figure 9.16-4**). The Catskill Aqueduct is located within the single-family residential (R-40) zoning district, which provides for low-density single-family housing. The Catskill Aqueduct is a permitted use as a water supply facility within the single-family residential (R-40) zoning district.

A portion of Edith Macy Conference Center, managed by Girl Scouts of America, lies within the northwest portion of the study area (see **Figure 9.16-2**). There are no federal, State, or local designated historic districts, landmarks, or known archeological resources within the study area.

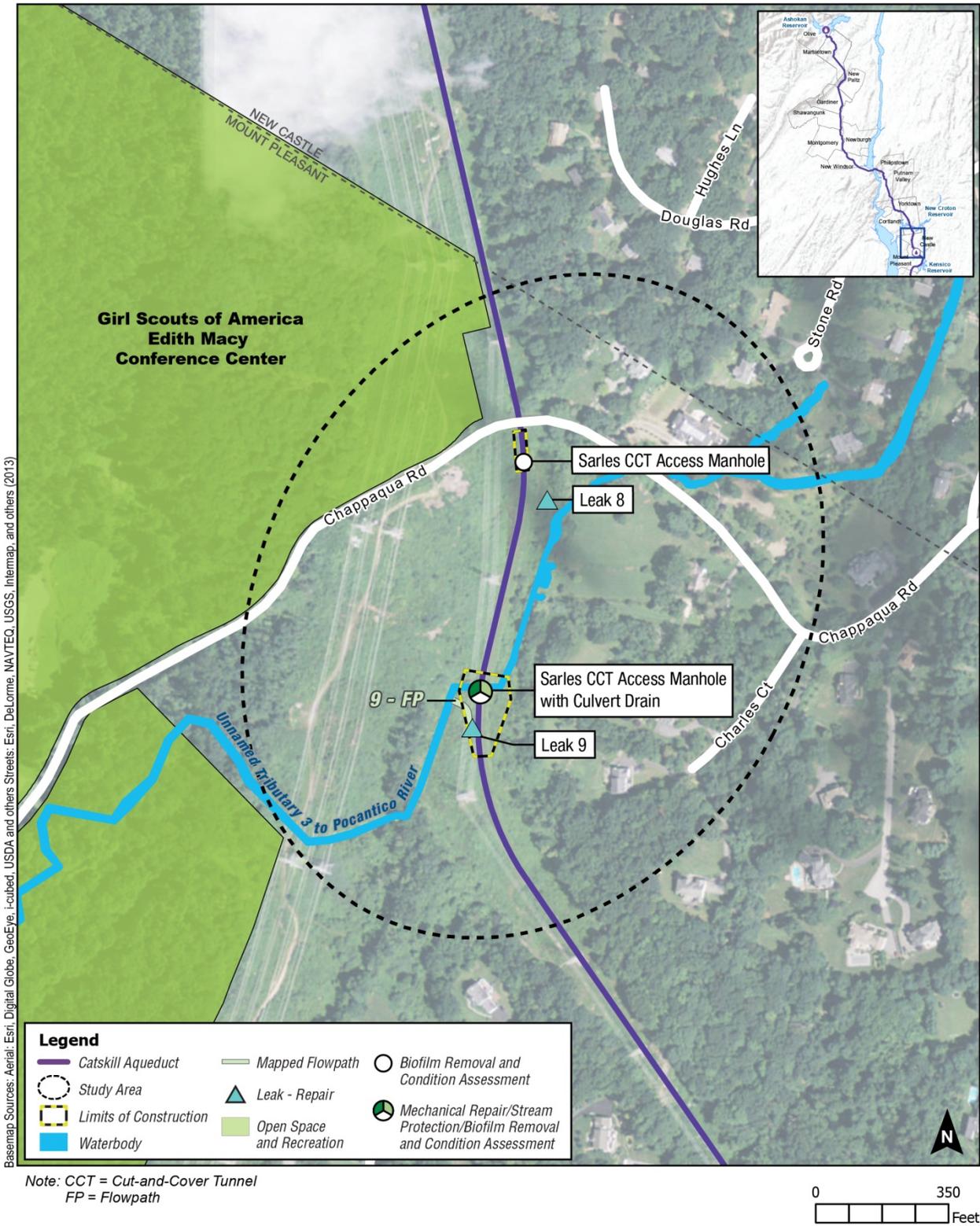
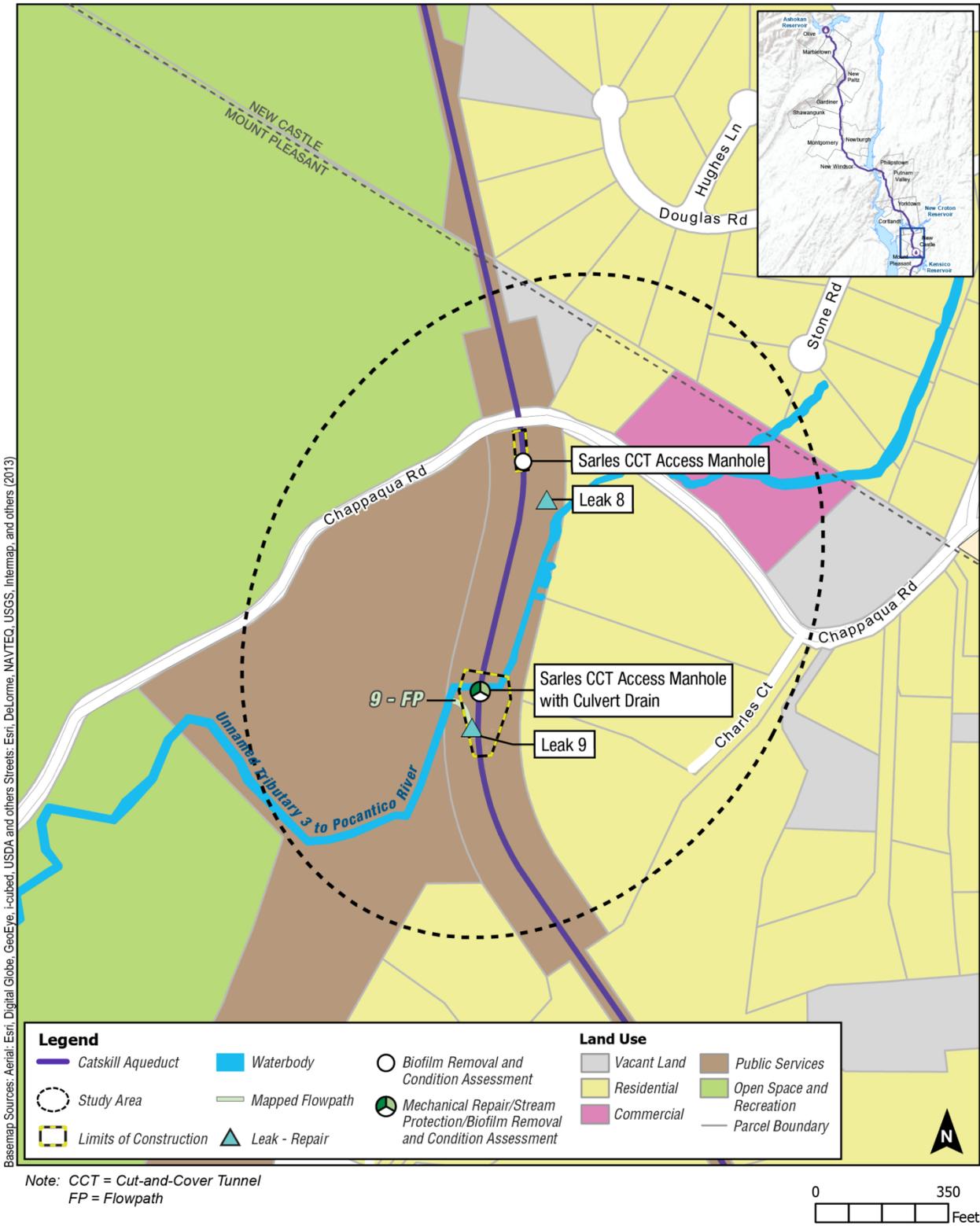


Figure 9.16-2: Study Area – Chappaqua Road

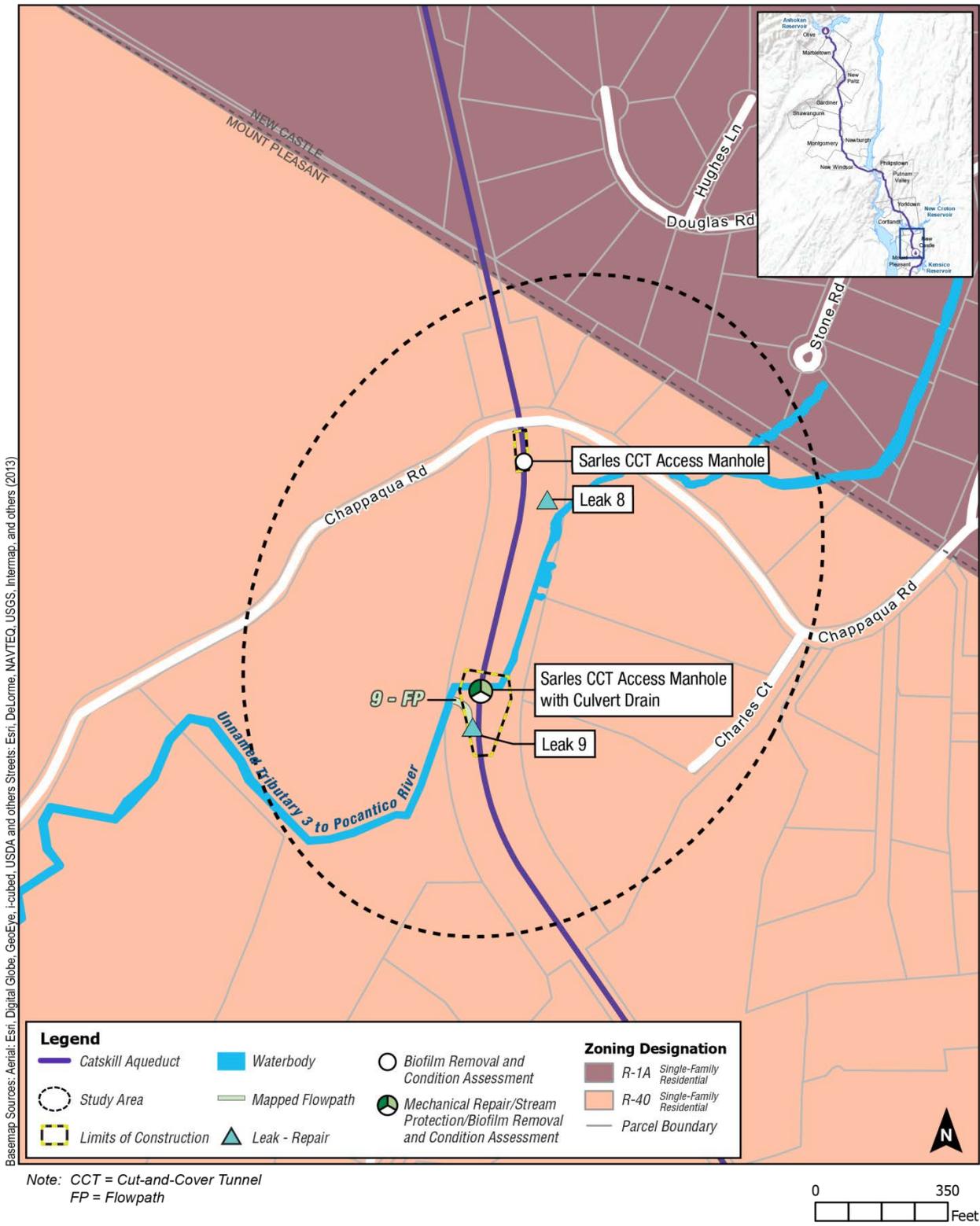




Basemap Sources: Aerial: Esri, Digital Globe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.16-3: Land Use - Chappaqua Road Study Area





Basemap Sources: Aerial: Esri, Digital Globe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.16-4: Zoning - Chappaqua Road Study Area



9.16.3.2 Description of Leaks 8 and 9

Leaks 8 and 9 are both toe-of-slope leaks that are the result of seepage from two locations at the base of the cut-and-cover berm. Leak 8 is on the eastern side of the aqueduct, and Leak 9 is on its western side. **Figure 9.16-5** and **Figure 9.16-6** show photographs of Leaks 8 and 9. Both leaks are located in an area of dense brush.

As shown on **Figure 9.16-2**, Leak 8 is located approximately 200 feet to the south of Chappaqua Road and approximately 70 feet to the east of the aqueduct's center line, originating at a point along the aqueduct's toe-of-slope. An emergent wetland to the east of the aqueduct would receive flows from Leak 8 but is also fed by naturally occurring groundwater and surface water. In turn, the wetland (including flows from Leak 8) contributes to unnamed tributary to 3 Pocantico River located east of the wetland. Leak 8 does not have a distinct flowpath and leak flow could not be measured.

Leak 9, also shown on **Figure 9.16-2**, is located approximately 600 feet southwest of Leak 8 and approximately 15 feet west of the aqueduct's centerline. It originates at a point below the ground surface along the aqueduct's toe-of-slope. Leak 9 forms a small, shallow flowpath, 9-FP, that travels northwest from the base of the aqueduct embankment through an overland, undefined channel for approximately 70 feet before converging with the unnamed tributary 3 to Pocantico River. Flow from 9-FP may be aqueduct water heavily influenced by an upstream drainage swale along the western side of the aqueduct berm. It was not possible to isolate leak flow from that of the drainage swale. Therefore, flow from Leak 9 could not be measured.

9.16.3.3 Proposed Activities within Chappaqua Road Study Area

To support activities within the Chappaqua Road Study Area, the Croton Lake Pressure Tunnel Downtake Chamber (within the Chapman Road Study Area in the Town of Yorktown) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas would provide additional parking. Equipment and materials would be staged on site. No staging or access improvements would be necessary other than underbrush clearing and gravel placement for leveling and erosion control. Erosion and sediment control measures, such as silt fencing and hay bales, would be installed at the perimeter of the work sites as needed. A site plan showing a layout of the limits of construction for the work sites, which would occupy a total of approximately 0.6 acre, is shown on **Figure 9.16-7**. The schedule for work within the study area is shown in **Table 9.16-2**. The duration of active construction within the Chappaqua Road Study Area is estimated to total 13 weeks over 2.5 years.



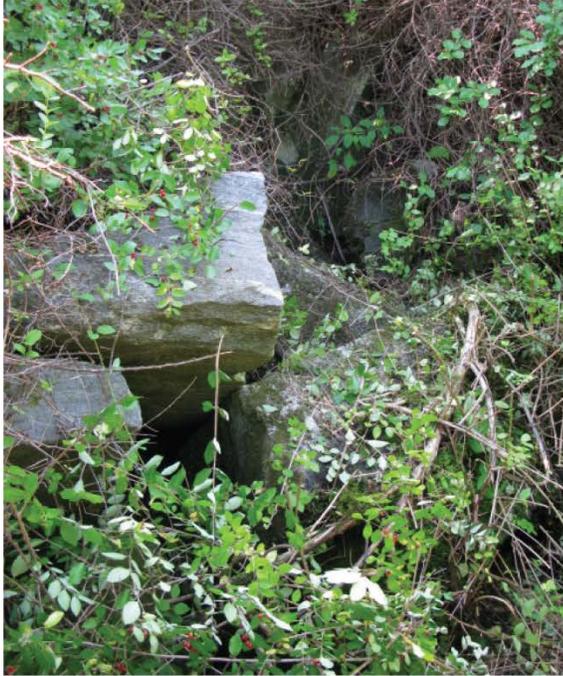
Photograph 1: Watercourse east of the aqueduct containing flow from Leak 8. Photograph taken facing upstream (north).



Photograph 2: Chappaqua Road Study Area with wetlands in the foreground and the aqueduct berm in the background. Photograph taken facing west.

Figure 9.16-5: Photographs – Leak 8 – Chappaqua Road Study Area





Photograph 3: Riprap at the base of the aqueduct berm. Leak 9 originates from the riprap. Photograph taken facing southeast.



Photograph 4: Leak 9 with shallow water depths as it flows north along aqueduct. Photograph taken facing upstream (south).

Figure 9.16-6: Photographs – Leak 9 - Chappaqua Road Study Area



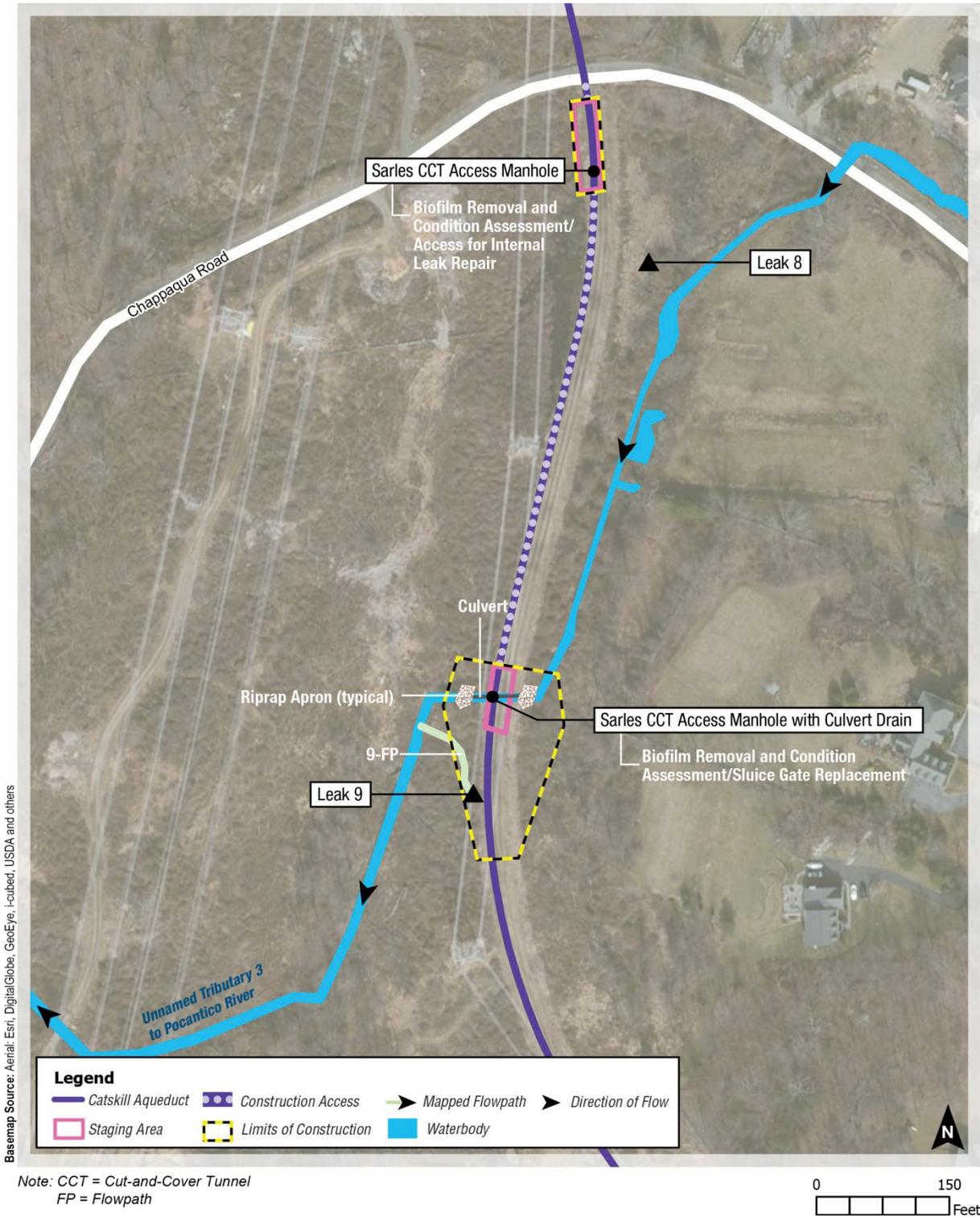


Figure 9.16-7: Site Plan – Leaks 8 and 9 - Chappaqua Road Study Area



Table 9.16-2: Schedule of Work Activities within the Chappaqua Road Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Internal Leak Repair	Fall 2018 2017 (First 10-week shutdown)	4 weeks	7 days a week, 24 hours per day	10
Streambank Restoration and Protection	Summer 2019 2018	3 weeks	Monday to Friday, 8 AM to 5 PM	10
Sluice Gate Replacement	Fall 2019 2018 (Second 10-week shutdown)	4 weeks	7 days a week, 7 AM to 7 PM	12
Biofilm Removal and Condition Assessment	Fall 2020 2019 (Third 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	21
Notes:				
¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per the Town of Mount Pleasant Noise Control Law §139-18.				
² Crew size refers to the number of people anticipated at the work site(s).				

Work in the study area would begin with internal leak repair during the first 10-week shutdown in fall ~~2018~~2017. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. A carbon fiber liner would be applied to repair the leak following localized biofilm removal and inspection of the tunnel wall for cracks. Once repaired, the leak contribution to the flowpath is expected to permanently cease. The flowpath would become dry except for contributions from runoff and groundwater.

Stream protection measures associated with the culvert drain sluice gate would take place in summer ~~2019~~2018. Work would entail the restoration of riprap aprons on either end of the culvert to their original as-built conditions and the removal of accumulated debris from within the culvert. Temporary in-stream disturbance would cover a total area of approximately 560 square feet within unnamed tributary 3 to Pocantico River, and there would be no permanent in-stream disturbance. To facilitate a dry work area, sandbags would be installed upstream of the culvert, and the stream would be diverted to a point downstream, which would include a turbidity curtain for sediment control.

Replacement of the culvert drain sluice gate, which would require unwatering of the aqueduct, would occur during the second 10-week shutdown in fall ~~2019~~2018. In conjunction with sluice gate replacement, the gate stem, manhole cover, and access ladder would be replaced, and the concrete walls of the manhole would be repaired. During the repair work, sandbags would be installed inside the aqueduct to minimize any residual water from entering the natural environment.

Lastly, biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019. The two access manholes would provide access into the aqueduct. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Similar to internal leak repair, the aqueduct would be unwatered during this shutdown and any residual water would be diverted through an internal bypass pipe around the work segments. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would

then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Chappaqua Road Study Area are presented in Section 9.16.3.4, “Open Space and Recreation,” through Section 9.16.3.10, “Neighborhood Character,” and include open space and recreation; visual resources; natural resources including water resources and federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.16.2, “Town of Mount Pleasant Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” impact analyses related to land use and zoning; socioeconomic conditions; community facilities and services; historic and cultural resources; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, terrestrial resources, wildlife, federal/State Candidate Species, and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area are not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.16.3.4 Open Space and Recreation

As shown on **Figure 9.16-8**, one open space resource exists within the Chappaqua Road Study Area: the Girl Scouts of America Edith Macy Conference Center. Comprising approximately 4 acres of the Girl Scouts of America property, the Edith Macy Conference Center lies within the northwestern portion of the Chappaqua Road Study Area. In total, the Edith Macy Conference Center is approximately 107 acres. It is a privately owned facility that provides recreation in the form of hiking, jogging, and swimming in addition to its purpose as a conference center. As shown on **Figure 9.16-8**, only a small corner of the Edith Macy Conference Center is located within the study area, northwest and outside of the repair and rehabilitation work sites.

DEP has consulted with the Towns of Mount Pleasant and New Castle and Westchester County, and it is DEP’s understanding that no plans to expand or create new open space or recreational resources are anticipated within the Chappaqua Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open spaces is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Chappaqua Road Study Area would be the same as baseline conditions.

During construction, the view of the repair and rehabilitation work activities from the conference center would be screened by the surrounding forested land. The repair and rehabilitation work activities within the Chappaqua Road Study Area would be short-term (totaling 13 weeks over 2.5 years; see **Table 9.16-2**). No significant site modifications would be required.

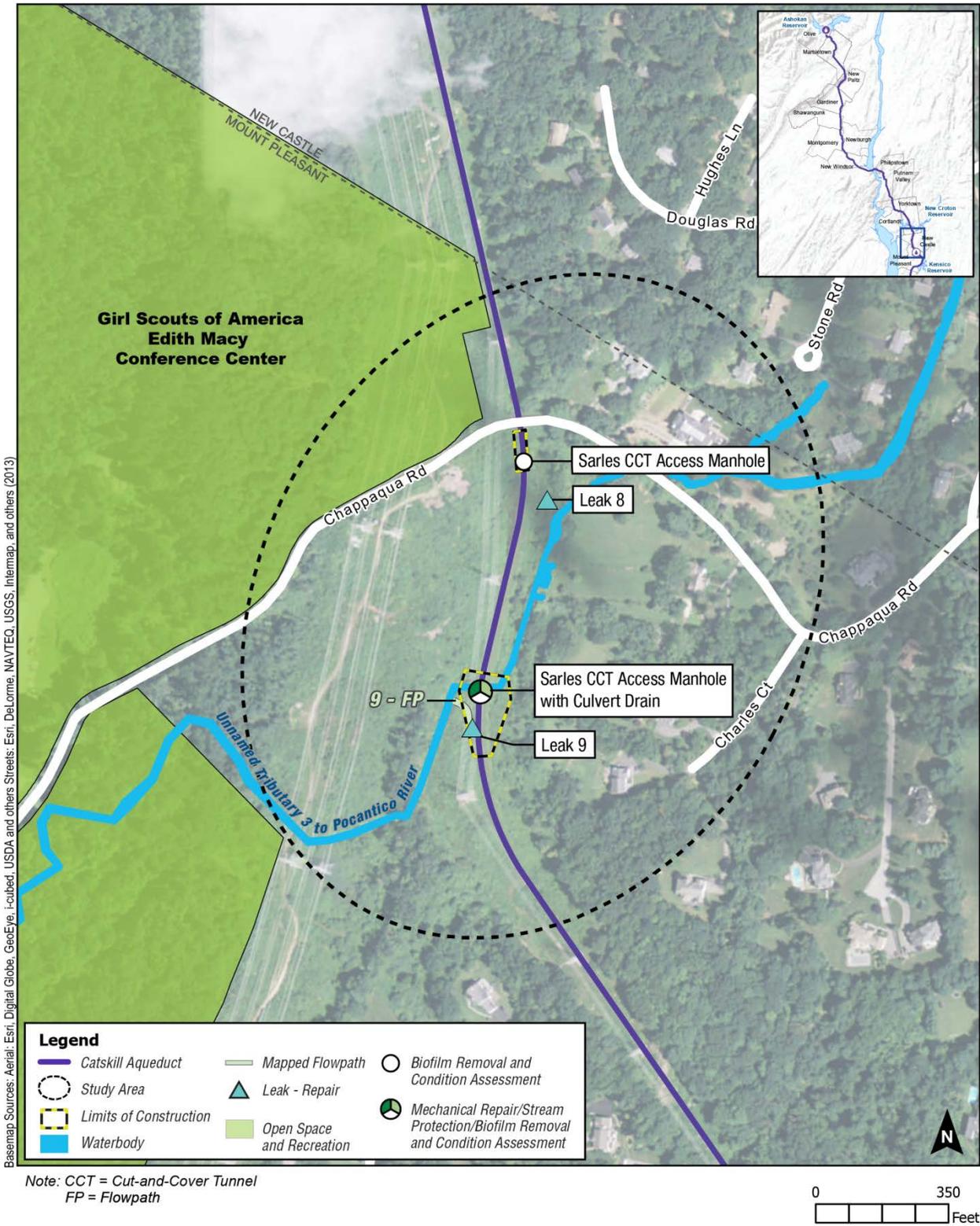


Figure 9.16-8: Open Space and Visual Resources - Chappaqua Road Study Area



Clearing of underbrush and gravel placement along the top of the aqueduct, in-kind streambank restoration at the culvert drain sluice gate, and minor grading along the top of the aqueduct would not disrupt the use of or be visible from the Edith Macy Conference Center due to dense stands of trees that obstruct views. The repair and rehabilitation work activities would not occur within the Edith Macy Conference Center. They would not affect recreational activities associated with the center since no hiking trails or recreational facilities are located within the study area.

As discussed in Section 9.16.3.9, “Noise,” there may be temporary increases in noise levels due to the work activities within the study area. However, there are no trails or other recreational uses of the Edith Macy Conference Center within the study area. Upon completion of the repair and rehabilitation work activities, any recreational uses within the Edith Macy Conference Center would remain unaffected.

Following construction, all equipment would be removed and staging areas would be restored to baseline conditions. Following the repair and rehabilitation, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not disrupt recreational use of adjacent open spaces. The in-kind streambank protection measures and leak repair would be permanent and would remain following construction. If successful, leak repair would result in a loss of artificial flow to downstream resources. This would restore them to pre-leak conditions and would not disrupt recreational use of adjacent open space. As such, the repair and rehabilitation would not encroach upon, cause a loss of open space in, impact the use or physical character of, or disrupt views from the Edith Macy Conference Center.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Chappaqua Road Study Area.

9.16.3.5 Visual Resources

The study area for the visual resources analysis is the area within the Chappaqua Road Study Area. It may also include view corridors that extend beyond the study area based on the locations that are publicly accessible.

Visual resources were identified within the Chappaqua Road Study Area. As shown on **Figure 9.16-8**, the one locally significant resource is the Girl Scouts of America Edith Macy Conference Center. It is approximately 107 acres, and is a privately owned facility that provides recreation in the form of hiking, jogging, and swimming in addition to its purpose as a conference center. There are no views of either Leak 8 or 9, or the access manholes from the Edith Macy Conference Center.

DEP has consulted with the Towns of Mount Pleasant and New Castle and Westchester County, and it is DEP’s understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Chappaqua Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Chappaqua Road Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities within the Chappaqua Road Study Area would be short-term (totaling 13 weeks over 2.5 years; see **Table 9.16-2**). While there would be some clearing of underbrush and minor grading along the top of the aqueduct, no significant site modifications would be required. Work activities would not be visible from the Edith Macy Conference Center due to dense stands of trees that obstruct views. Upon completion of the repair and rehabilitation work activities, views from any visual resources within the Edith Macy Conference Center would remain unaffected.

Following construction, all equipment would be removed from the Chappaqua Road Study Area and staging areas would be restored to baseline conditions. The in-kind streambank protection measures and leak repair would be permanent and would remain following construction. While the repaired leaks would result in a loss of artificial flow to downstream resources, this would restore them to pre-leak conditions and would not result in changes to the future visual and aesthetic resource conditions of the views to the Edith Macy Conference Center. Following the repair and rehabilitation, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not result in changes to the future visual and aesthetic resource conditions of the views to the Edith Macy Conference Center.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Chappaqua Road Study Area.

9.16.3.6 Natural Resources

As shown on **Figure 9.16-9**, the study area for the natural resources analysis is the area surrounding the limits of construction, including Leaks 8 and 9 and two access manholes. The natural resources study area was expanded east and west of the immediate work sites to include the full extent of potential bog turtle (*Clemmys [=Glyptemys] muhlenbergii*) habitat within the study area. The natural resources study area boundary also includes downstream resources potentially influenced by the leaks.

Based on field visits conducted in April 2013, June 2014, and September 2015, the natural resources study area is primarily composed of a successional shrub land ecological community. Near Leak 8, there are smaller areas of shallow emergent marsh and shrub swamp. West of Leak 9, a forested riparian edge extends approximately 50 feet on either side of the unnamed tributary 3 to the Pocantico River as it exits the natural resources study area. It is best characterized as a successional southern hardwood forest.

These habitats have the potential to support protected water resources and wildlife species, and an analysis of the potential effects to natural resources from the repair and rehabilitation activities is presented below.

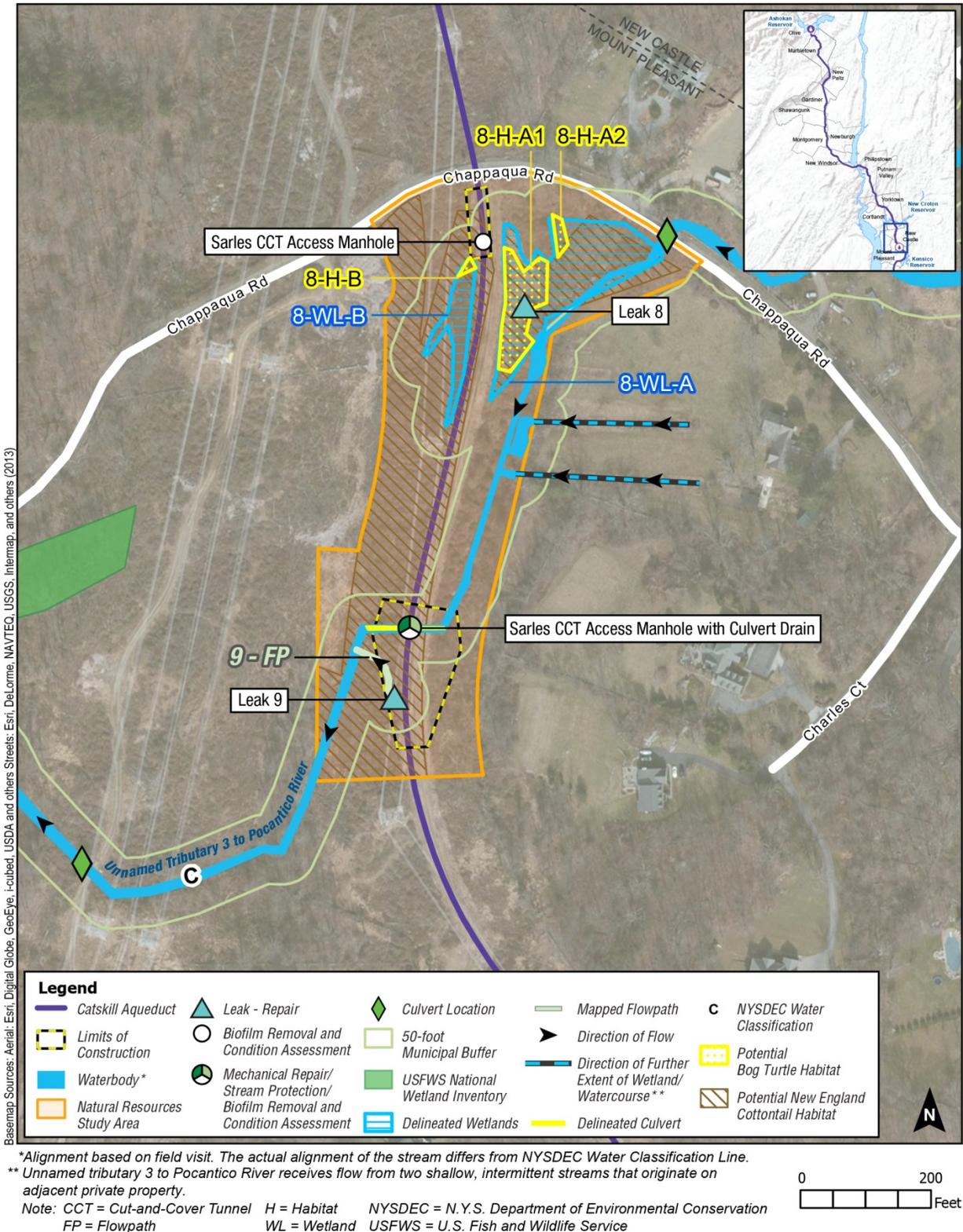


Figure 9.16-9: Natural Resources – Chappaqua Road Study Area



Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the lower Hudson watershed (hydrologic unit code [HUC] 02030101) of the Pocantico River subwatershed (HUC 020301010402).

The surface water and wetlands in the natural resources study area are subject to federal jurisdiction under Sections 401 and 404 of the Clean Water Act. As a Class C stream, the unnamed tributary 3 to Pocantico River is not subject to State Protection of Waters regulations. There are no State-regulated wetlands in the study area. In addition, the Town of Mount Pleasant regulates activities within wetlands and natural or artificial watercourses and their 50-foot buffer (Mount Pleasant Town Code Chapter 111: Freshwater Wetlands), and requires that landowners maintain free flowing watercourses (Mount Pleasant Town Code Chapter 185: Streams and Watercourses). Therefore, work activities in and along water resources are anticipated to require town review and approval.

Surface Water

Water resources were delineated in the natural resources study area in April 2013, June 2014, and September 2015.

During the field surveys, unnamed tributary 3 to Pocantico River and two wetlands (8-WL-A and 9-WL-B) were delineated. Additionally, two leaks, Leak 8 associated with Wetland 8-WL-A and Leak 9 with a flowpath 9-FP, were also identified. It was determined that these leaks may contribute to hydrology associated with the watercourses, wetlands, and flowpaths identified within the natural resources study area and are discussed with the applicable resource below. Each water resource was assigned a community classification based on the habitat descriptions in Cowardin et al. (Cowardin et al. 1979). The water resource name, length, area, and classifications are shown in **Table 9.16-3**.

Table 9.16-3: Water Resources and Classifications within the Chappaqua Road Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Unnamed Tributary 3 to Pocantico River	5,140	1,200	Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded (R2UB1H)
9-FP	220	110	Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded (R2UB1H)
8-WL-A	28,760	NA	Palustrine Emergent and Palustrine Scrub-Shrub (PEM/PSS)
8-WL-B	6,290	NA	Palustrine Emergent (PEM)
Note: NA = Not Applicable			

Unnamed Tributary 3 to Pocantico River

The unnamed tributary 3 to Pocantico River, a NYSDEC Class C waterbody, enters the natural resources study area from the northeast and flows south to the east of the aqueduct where it merges with Wetland 8-WL-A (described below). Human-induced influences such as drainage ditches and increased runoff from development influence this tributary.

South of 8-WL-A, the unnamed tributary 3 to Pocantico River receives flow from two shallow, intermittent streams that originate on adjacent private property and enter the natural resources study area from the east (see **Figure 9.16-9**). The northerly stream entering from the east flows under a stone wall marking DEP's property line, forms a small pooled area, and then flows into the unnamed tributary. There is wetland-indicative vegetation east of the stone wall fence (i.e., yellow flag [*Iris* spp.], tussock sedge [*Carex stricta*], sensitive fern [*Onoclea sensibilis*], and spotted touch-me-not [*Impatiens capensis*]), outside the natural resources study area. The southerly ditched stream enters through an arch in the stone wall and flows about 10 feet before entering the unnamed tributary 3 to Pocantico River. The combined flows of the unnamed tributary cross westward through a culvert under the aqueduct and turn south. They then receive flows from flowpath 9-FP (described below), and exit the natural resources study area (see **Figure 9.16-9**). In addition to the hydrology from the intermittent streams and Leaks 8 and 9, there are also seeps within Wetland 8-WL-A that indicate groundwater also contributes to the unnamed tributary's hydrology. Therefore, it appears that there are three sources of hydrology providing flow for the unnamed tributary 3 to Pocantico River: surface water, aqueduct water, and groundwater.

The unnamed tributary 3 to Pocantico River appears to be perennial based on flows observed during multiple field visits. However, portions of the unnamed tributary immediately west of the culvert under Chappaqua Road can become dry during extended periods of dry weather. The unnamed tributary is dominated by sandy substrate and ranges in width from approximately 3 feet to 7 feet within the natural resources study area. As listed in **Table 9.16-3**, the watercourse is best classified as a "Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded" system based on the Cowardin System (Cowardin et al. 1979).

Leak 9 Flowpath

Leak 9 flowpath 9-FP (9-FP) is located approximately 800 feet south of Chappaqua Road along the western side of the Catskill Aqueduct and approximately 100 feet downstream of the aforementioned culvert beneath the aqueduct (see **Figure 9.16-9**). Flowpath 9-FP was observed emanating from the toe-of-slope of the aqueduct berm, traveling west through an overland, undefined channel of less than 1 foot in width for approximately 70 feet before merging with the unnamed tributary 3 to the Pocantico River. This location is downstream of the unnamed tributary's confluence with Leak 8.

Flowpath 9-FP is generally less than 1 foot wide and of minimal depth. It covers an area of approximately 220 square feet. No in-stream vegetation was observed, and there were no well-defined bed and banks or high water marks associated with 9-FP. Therefore, 9-FP does not meet the definition of a watercourse under Section 404 of the Clean Water Act; however, 9-FP may be regulated by the Town of Mount Pleasant as artificial waters. As listed in **Table 9.16-3**,

9-FP is best classified as a “Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded” system based on the Cowardin System (Cowardin et al. 1979).

Hydrology for 9-FP appears to be influenced from aqueduct water associated with Leak 9; however, flow is primarily from other sources (e.g., overland flow, stormwater). Monitoring was conducted to determine the contribution of 9-FP to the hydrology of the water resources within the study area while the aqueduct was in service and out of service. An upstream drainage swale exists along the western side of the aqueduct berm. Based on flow and water quality information, overland runoff appears to influence 9-FP. Additionally, water remains in this section of the aqueduct during periods when the aqueduct is temporarily out of service due to backflows from Kensico Reservoir. Standing water in the aqueduct could influence Leak 9 flows during out-of-service periods. As a result, it was not possible to accurately measure flows from Leak 9 during monitoring.

Ultimately, the combination of runoff from the drainage swale and some continued flow from Leak 9 resulted in monitoring results which were inconclusive. The extent to which 9-FP contributes to water resources within the study area is not definitive. Therefore, an analysis of leak contributions during low flow could not be conducted for this study area. Additional studies were conducted, including a stream visual assessment and an analysis of wetland hydrology. These studies are described in more detail below.

Wetlands

Wetlands within the study area were identified through a desktop evaluation of NYSDEC freshwater wetlands maps, USFWS National Wetlands Inventory (NWI) maps, published soil survey maps, USGS topographic maps, and field delineations, as shown on **Figure 9.16-9**. The natural resources study area does not contain NWI-mapped wetlands.

Wetland delineations were conducted in April 2013 and June 2014. As shown on **Figure 9.16-9**, wetlands were identified within the natural resources study area; one on the western side (Wetland 8-WL-B) and the other on the eastern side (Wetland 8-WL-A) of the Catskill Aqueduct cut-and-cover berm. No wetlands were identified at Leak 9 (see **Figure 9.16-9**).

Wetland 8-WL-A

Wetland 8-WL-A is located along the eastern side of the Catskill Aqueduct and contains Leak 8. Based on historic topographic maps and as-built surveys of the Catskill Aqueduct, 8-WL-A has been altered over time. Construction of the aqueduct appears to have bisected the original wetland, and the raised berm altered hydrology by trapping water in the low-lying areas along the berm. Wetland hydrology is further altered by artificial flows from Leak 8.

Dominant wetland species identified within the wetland include American bur-reed (*Sparangium americanum*), tussock sedge, and wool-grass (*Scirpus cyperinus*). Dominant species observed on-site met the dominance test and prevalence index indicators for hydrophytic vegetation.

The upper 20 inches of soil within the wetland was composed of clay loam and sandy clay with low chroma and low value lacking redoximorphic features, which are color patterns that form in

soils exposed to seasonal fluctuations in the water table. Observed hydric soil indicators include stratified layers.

Primary wetland hydrology indicators include surface water and a high water table at 6 inches below ground surface. Wetland hydrology is assumed to be provided by flow from surface drainage, groundwater from the surrounding area, the delineated unnamed tributary 3 to Pocantico River that intersects 8-WL-A to the east; and, in part, from Leak 8, which is located within 8-WL-A. Seeps identified adjacent to the aqueduct berm were attributed to Leak 8, and seeps elsewhere in the wetland were attributed to groundwater inputs. There is no defined flowpath associated with Leak 8. As listed in **Table 9.16-3**, this wetland is best classified as a “Palustrine Emergent and Palustrine Scrub-Shrub” system based on the Cowardin System (Cowardin et al. 1979).

Similar to 9-FP, Leak 8 was monitored when the aqueduct was in service and out of service to determine the amount of hydrology that the leak was contributing to water resources within the study area. However, because there was no defined leak flowpath and water remains in this section of the aqueduct when the aqueduct is temporarily out of service, it was not possible to accurately measure flows from Leak 8. Ultimately, the monitoring results were inconclusive, and the extent to which Leak 8 contributes to water resources within the study area is not definitive. The analyses are described in more detail below.

Wetland 8-WL-B

Wetland 8-WL-B is by a ponded area located along the western side of the Catskill Aqueduct, south of Chappaqua Road. Wetland 8-WL-B is located in a low-lying area. Dominant species identified within the wetland include swamp smartweed (*Persicaria hydropiperoides*), water starwort (*Callitriche stagnalis*), Canadian waterweed (*Elodea canadensis*), and curly leaf pondweed (*Potamogeton crispus*). All species observed on site were obligates, which are associated with conditions of permanent inundation. Therefore, it is likely that 8-WL-B is persistent and perennial.

Soils within the wetland were not investigated because 8-WL-B was ponded with water depths between approximately 6 inches and 2 feet during field visits conducted in February, March, and April 2013. Primary indicators of wetland hydrology were present. Wetland hydrology is provided by flow from surface drainage and groundwater flow from the surrounding area. Therefore, primary indicators of wetland hydrology were present. Wetland 8-WL-B has no surface water connections to other aquatic resources, and is therefore, considered isolated. As listed in **Table 9.16-3**, this wetland is best classified as a “Palustrine Emergent” system based on the Cowardin System (Cowardin et al. 1979).

Future Without the Repair and Rehabilitation

DEP has consulted with the Towns of Mount Pleasant and New Castle and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated to occur within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the study area would be the same as baseline conditions.

Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Chappaqua Road Study Area.

Construction

Work activities related to the repair and rehabilitation would result in temporary in-water construction within the unnamed tributary 3 to Pocantico River and temporarily alter flows.

Prior to commencing the repair and rehabilitation, sediment and erosion control measures, such as silt fencing, would be installed. All staging activities would occur in upland areas along the top of the cut-and-cover berm.

During the first 10-week shutdown period, repairs to Leaks 8 and 9 would occur within the interior of the aqueduct. Once the work segment is prepared, curing compounds used for lining the tunnel would be applied. These compounds would not be forced through the cracks in the tunnel wall. Instead, these viscous compounds would be applied to the tunnel wall where they would quickly cure and there would be no potential contact with surface water or groundwater resources. Any wastewater generated during leak repair or residual water in the tunnel would be managed using barriers to prevent wastewater from migrating downstream and would be treated, as necessary.

Following leak repairs, culvert drain sluice gate repairs and associated streambank restoration and protection would be undertaken. Streambank restoration would restore the riprap aprons at the culvert to their original, as-built condition. The original riprap aprons installed at the upstream and downstream ends of the culvert during the aqueduct's original construction have deteriorated and are no longer protecting the shoreline. To complete the culvert drain sluice gate repairs and maintain a dry work area, sandbags would be installed upstream of the culvert, and surface water would be diverted to a point downstream of the culvert, which would include a turbidity curtain for sediment control. To protect the stream and its banks, and prevent sediment and other pollutants from entering the waterway, temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements. Diversion would be for the shortest possible duration. Therefore, downstream resources would not be affected.

Repairs to the culvert drain sluice gate would be conducted during the second 10-week shutdown and would be completed from the tunnel interior with no direct effects on water resources.

Anticipated temporary and permanent disturbance to water resources and regulated buffers were quantified based on the limits of construction and proposed work activities (see **Table 9.16-4**). Construction staging would occur on top of the aqueduct. Temporary stream diversion would extend into the water, resulting in approximately 560 square feet of temporary disturbance to the unnamed tributary 3 to Pocantico River and approximately 150 square feet of temporary disturbance to 9-FP adjacent to the culvert. Temporary disturbance of approximately

18,680 square feet and no permanent disturbance occur within the municipal water resource buffer. No temporary or permanent disturbance to Wetland 8-WL-A or 8-WL-B is anticipated. Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native vegetation. As described further in “Operation,” leak repair would permanently disturb approximately 220 square feet of flowpath 9-FP. Leak repair would not result in permanent disturbance to the municipal water resource buffer as the land adjacent to the flowpath would be unaffected.

Table 9.16-4: Estimated Disturbance to Water Resources within the Chappaqua Road Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Unnamed Tributary 3 to Pocantico River	5,140	560 <i>Temporary stream diversion and temporary downstream turbidity curtain, construction equipment use, and culvert drain sluice gate repairs</i>	0
9-FP	220	150 <i>Culvert drain sluice gate repairs</i>	220 <i>Internal leak repair</i>
8-WL-A	28,760	0	0
8-WL-B	6,290	0	0
Water Resource Municipal Buffer	134,440	18,680 <i>Construction staging area and construction equipment use</i>	0

Riprap aprons placed at the culvert’s inlet and outlet would provide erosion protection and would be consistent with original as-built conditions. Additionally, riprap aprons at the culvert would be sized based upon the maximum discharge capacity, even though it is unlikely flows of this magnitude would be discharged at this site.

Discharges of raw aqueduct water and groundwater could take place during a shutdown of the Catskill Aqueduct and could occur in the future during DEP’s typical operations when access to the aqueduct is required for maintenance or inspection. The aqueduct would be unwatered with temporary stream protection measures in place prior to reconstructing the culvert drain sluice gate. Unwatering events to surface water could also occur at any time following construction and therefore are described in “Operation” below.

Operation

Upon completion of the culvert drain sluice gate repairs and streambank restoration and protection, the function of the sluice gates would be restored and discharges of raw water to unnamed tributary 3 to Pocantico River could occur in the future during DEP’s typical operations. The aqueduct could be unwatered via the sluice gates to conduct maintenance or

inspection. During the aqueduct shutdowns, groundwater may infiltrate the aqueduct. Groundwater would flow by gravity to the culvert drain sluice gate and could also be discharged to the unnamed tributary. This would be a rare event.

An analysis was conducted to determine if the raw water discharge would be greater than the bankfull stream flow. Bankfull flow is the flow that just fills the channel to the top of its banks (i.e., stream capacity) and at the point in which water begins to flow onto the floodplain. Bankfull flow was predicted for unnamed tributary 3 to Pocantico River using the USGS StreamStats Program. If the discharge is greater than the bankfull flow, indirect downstream effects, such as an increase in erosion and scouring over the baseline could be reasonably expected. A maximum discharge flow of approximately 9,500 gpm is expected when the culvert drain is operated during a 1.5-year storm event. This is less than the calculated bankfull flow of unnamed tributary 3 to Pocantico River of approximately 14,700 gpm, making it similar to baseline conditions. These discharges would not result in a bankfull event. Therefore, indirect downstream impacts such as increases in erosion and scouring would be minimal.

Based on this analysis, the unnamed tributary 3 to Pocantico River would not be affected by discharges at this location. Additionally, it is unlikely this site would be used for unwatering on a routine basis because raw aqueduct water in this segment is more easily discharged to Saw Mill River at the Harlem Railroad Steel Pipe Siphon Blow-off Chambers (see Washington Avenue Study area in the Village of Pleasantville). Rather, the sluice gate may be used to discharge infiltrated groundwater during the repair and rehabilitation and future maintenance. Therefore, discharges to the unnamed tributary would be below the calculated bankfull flows, would be rare and last several hours or days in duration, depending on the length of the shutdown of the Catskill Aqueduct, and are not anticipated to contribute to erosion of the stream channel.

Anticipated temporary and permanent disturbance to water resources associated with operational activities was quantified based on the limits of construction and proposed work activities (see **Table 9.16-4**). Approximately 220 square feet of permanent disturbance would occur to 9-FP following leak repair and loss of permanent flows. It is anticipated that there would be no leak flow to 9-FP. However, since it also receives hydrology from other sources (surface water runoff), intermittent flows associated with precipitation and drainage would continue to flow through this channel. Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native vegetation. It is anticipated that the flow to the unnamed tributary 3 to Pocantico River would return to pre-leak conditions, as would Wetland 8-WL-A and 8-WL-B. No temporary or permanent disturbance to Wetland 8-WL-A or 8-WL-B is anticipated. It is anticipated that, although some immediate effects to these wetlands may result after the leak repairs (i.e., reduction in hydrology), most changes would occur over time including the transition of palustrine emergent vegetation to a scrub-shrub emergent vegetative community.

As described above, it was not possible to accurately measure leak flows at Leaks 8 and 9, and since the monitoring results were inconclusive, an analysis of leak contributions during low flow could not be conducted for this study area. To fully assess the potential effects to surface water as a result of repair and rehabilitation, and the potential for changes to hydrology which may affect water resources within the study area, two analyses were completed: (1) stream visual

assessment to assess functional changes to surface water associated with the decrease in flow; and (2) analysis of wetland hydrology to assess potential changes following leak repair. The results of the two analyses are described below.

Stream Visual Assessment

To assess the effect of leak repair on stream functions and values, a visual assessment of the unnamed tributary 3 to Pocantico River was conducted during a field visit conducted on July 11, 2015. This qualitative assessment was conducted because it was not possible to quantify the amount of hydrology that the leaks were contributing to water resources within the study area. Details on the scoring criteria and metrics of the stream visual assessment are provided in Section 9.3, “Screening Assessment and Impact Analysis Methodology.” The scores from baseline conditions were compared to estimated scores during future conditions following the repair of Leaks 8 and 9. Baseline conditions were assessed at average flow. Future conditions with the repair and rehabilitation represent conditions that would be present following leak repair and were predicted for similar flow conditions, as shown in **Table 9.16-5**. A higher score indicates good or excellent stream quality, while a lower score indicates poor or degraded stream quality.

Table 9.16-5: Stream Visual Assessment of Unnamed Tributary 3 to Pocantico River within Chappaqua Road Natural Resources Study Area

Assessment Criteria	Upstream of Leak 8		Downstream of Leak 9	
	Baseline Conditions	Future with the Repair and Rehabilitation	Baseline Conditions	Future with the Repair and Rehabilitation
Channel Condition	7	7	10	10
Hydrologic Alteration	5	8	5	8
Bank Condition	9	9	10	10
Riparian Area Quantity	10	10	9	9
Riparian Area Quality	9	9	9	9
Canopy Cover	9	9	9	9
Water Appearance	10	10	9	9
Nutrient Enrichment	9	9	9	9
Manure or Human Waste	9	9	9	9
Pools	6	6	2	1
Barriers to Fish Movement	3	3	4	3
Fish Habitat Complexity	5	5	5	5
Aquatic Invertebrate Habitat	7	7	7	7
Aquatic Invertebrate Community	5	5	5	5
Score (Total/Number of Assessment Elements)	7.4	7.6	7.3	7.4

Based on this assessment there would be subtle changes to the unnamed tributary 3 to Pocantico River from leak repairs. The results of the comparison of visual assessment scores are presented below:

- The existing stream channel of the unnamed tributary 3 to Pocantico River is braided upstream and in the vicinity of Leak 8, with a network of small, interconnecting channels that repeatedly split then rejoin. Following leak repair, the segment of the unnamed tributary located between Leaks 8 and 9 would become further braided with less flow. However, the channel downstream of the confluence with Leak 9 is not braided and would not be anticipated to change following leak repair.
- The unnamed tributary is a shallow stream and, based on field visits, frequently reaches bankfull elevation. While the leak flows contribute to the hydrology of the unnamed tributary, this is a naturally occurring stream fed by its own drainage area. Following leak repairs, flows in the unnamed tributary would decrease from their artificially elevated levels, lowering water levels. This would be expected to equilibrate over time as the stream channel adjusts to lower flows. The unnamed tributary would continue to be influenced by the drainage swale along the western side of the aqueduct berm.
- Bank condition is determined by the height of banks and their protection from erosion by plant roots. Under baseline conditions, the streambanks are densely vegetated and therefore have a high degree of stability. This should not change with reduced flow following leak repairs given that the majority of riparian vegetation consists of upland (non-wetland) species.
- Riparian area is determined by the presence of native and diverse plant species. Composition, density, and age structure are appropriate for the reaches assessed. The riparian area along the tributary corridor is at least twice its width within the natural resources study area. Riparian habitat is anticipated to remain unchanged following leak repair because there are few areas along the unnamed tributary's corridor that are directly influenced by leak flow. The riparian area is dominated by non-native vegetation which is typical of right-of-way utility corridors.
- Canopy cover is approximately 80 percent. No tree removal is proposed and leak repair is not expected to alter terrestrial resources. Therefore, canopy cover would not change due to the repair and rehabilitation.
- Water appearance would not be expected to change following leak repairs. Flowpath 9-FP has shown evidence of scouring sediment and transporting it into the main stem of the unnamed tributary. This area would continue to be influenced by runoff from the drainage swale following leak repair.
- Nutrient enrichment is determined by the level of aquatic vegetation, color of water (clear to greenish) and presence of algae. This is predominantly affected by land use changes in the watershed, which would not occur due to leak repair.
- There are very few pools within the stream reach of the unnamed tributary immediately south of Leak 8. Minor changes to pool area or depth could occur following leak repair.

- Barriers to fish movement are determined by natural and artificial barriers, including waterfalls or beaver dams, as well as man-made dams or improperly installed culverts. Due to its small size and shallowness, the unnamed tributary 3 to Pocantico River and flowpath 9-FP are not expected to support or contribute to a fish population. While no fish have been observed during multiple field visits to the site, smaller fish species, such as dace, darters, and chubs could occur. Representative species that are likely to occur are the longnose dace (*Rhinichthys cataractae*), eastern blacknose dace (*Rhinichthys atratulus*), tessellated darter (*Etheostoma olmstedii*), and creek chub (*Semotilus atromaculatus*). Dams associated with downstream impoundments are anticipated to limit upstream movement of fish from the Pocantico River to the natural resources study area. An existing culvert under Chappaqua Road north of the leaks is elevated approximately 10 inches above the stream's water surface, preventing most fish entering from upstream of the study area. The downstream reach has areas with large boulders that may make fish passage difficult after the leaks are repaired. However, given the existing man-made barrier to fish movement at the culvert, the boulders shift this impasse downstream a relatively short distance of approximately 75 feet. Leak repair would decrease water elevations, further exposing the boulders and creating a stream segment that may be difficult for fish to navigate. While flows on average would not significantly change, minor reductions following leak repair could be a barrier to fish movement within the already shallow stream.
- Fish habitat complexity is determined by the amount of cover types present. These include logs, deep pools, overhanging vegetation, boulders, undercut banks, thick root mats, dense macrophyte beds, riffles, and isolated/backwater pools. Leak repair would decrease water elevations, potentially eliminating refuge and these cover types. Because flows would not significantly change on average, only minor changes to substrate are anticipated within the streams.
- Aquatic invertebrate community is determined by the diversity of insect/invertebrates found in the habitat. While some pollution intolerant caddisflies (Order: Trichoptera) were present, they were approximately one percent of the total collection. The majority of collections in all reaches were pollution tolerant species, which are typical of suburban watersheds and expected to remain the same following leak repair.

In summary, while leak repair would decrease flow to the unnamed tributary 3 to Pocantico River, the effect on the stream's functions and values would be minor. The stream visual assessment identified few anticipated changes to in-stream habitat and stream function upstream and downstream of the stream reaches influenced by Leaks 8 and 9. The current functions and values of the unnamed tributary upstream of Leak 8 are scored as a 7.4 and is considered fair. Future functions and values of the unnamed tributary 3 to Pocantico River upstream of Leak 8 are scored as 7.6 after leak repair, which are considered good and would be an improvement over current conditions. The current functions and values of the unnamed tributary downstream of Leak 9 are scored as 7.3 and are considered fair. Functions and values of this same section of the unnamed tributary 3 to Pocantico River are scored as a 7.4 and would be considered fair. Following the repair and rehabilitation, there would be no adverse effect to the functions and values of the unnamed tributary following leak repair as shown in **Table 9.16-5**. However, it is

anticipated that there would be a slight beneficial effect to the overall functions and values of the stream.

No meaningful effects due to leak repairs are anticipated to channel condition, bank condition, riparian habitat, canopy cover, water appearance, nutrient enrichment, aquatic invertebrate habitat or community. Leak repair would return the stream to naturally occurring conditions, resulting in flows, wetted widths, and substrates that would revert to pre-leak conditions and would not be significantly different from baseline conditions.

Analysis of Wetland Hydrology

A hydrologic budget analysis was conducted to quantify the potential effects of leak flow from Leak 8 on the nearby Wetlands 8-WL-A and 8-WL-B. Hydrologic budgets are used for gauging the timing and amounts of water that can be expected at a particular site because wetlands can be defined by the number of days of saturation during the growing season. Wetland formation, persistence, size, and function are predominantly driven by water availability, which is a function of many factors. A hydrologic budget analysis accounts for water inflows (i.e., precipitation, groundwater inflow, surface water inflow) and system outflows (i.e., evapotranspiration, groundwater outflow, surface water outflow). Water storage volume represents the sum of the inputs subtracted by the sum of the outputs, and refers to the space available for water storage. Essentially, hydrologic budgets are analogous to an accounting system with inflows representing credits and outflows as debits contributing to overall water storage, or water availability, of an area.

In practice, when planning and designing constructed wetlands, a hydrologic budget is developed to establish whether a site is capable of supporting a new or expanded wetland. For the analysis of wetland hydrology in the Chappaqua Road Study Area, the hydrologic budget was used to estimate whether sufficient hydrology would exist to support the wetland in the absence of leak flow. In general, the analysis quantifies the effects, if any, of repairing Leak 8 on the adjacent wetlands. The duration and seasonality of soil saturation, soil type, and drainage characteristics exert a strong influence on the number, type, and distribution of plants and plant communities in wetlands. Therefore, to support wetland vegetation, the root zone of the wetland vegetation (generally the upper 12 inches) should not have any extended periods of drying even during the driest year in the last 50 years (Environmental Laboratory 1987).

Historic daily precipitation data recorded at Westchester County Airport for the last 30 years (see **Figure 9.16-10**) and evapotranspiration data were obtained from the Northeast Regional Climate Center for use in the hydrologic budget analysis.

The surface water inflows and outflows were calculated by delineating the watershed contributing to the wetlands. These were then used to calculate runoff. The contributing watershed to the wetlands was delineated using ArcGIS, as shown on **Figure 9.16-11**. A small section of Wetland 8-WL-A appears outside of the delineated watershed, and this occurred because the resolution of the available topography differed slightly from what was observed on site during the delineation, and does not materially affect this analysis. Field observations during the wetland and watercourse delineation and flow monitoring indicate good surface and subsurface connection between the wetlands and unnamed tributary 3 to Pocantico River.

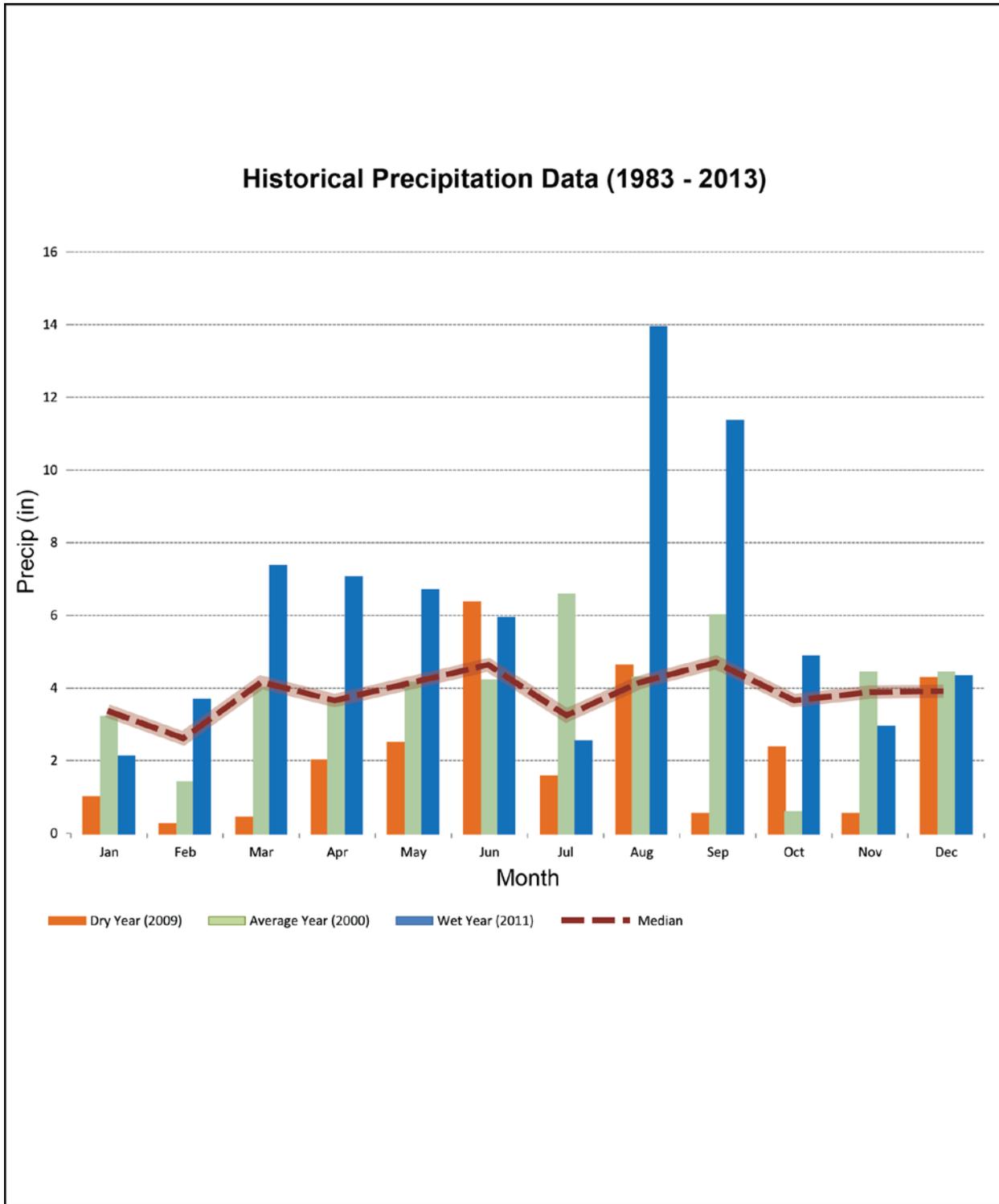


Figure 9.16-10: Historical Precipitation Data (1983 - 2013) – Chappaqua Road Study Area



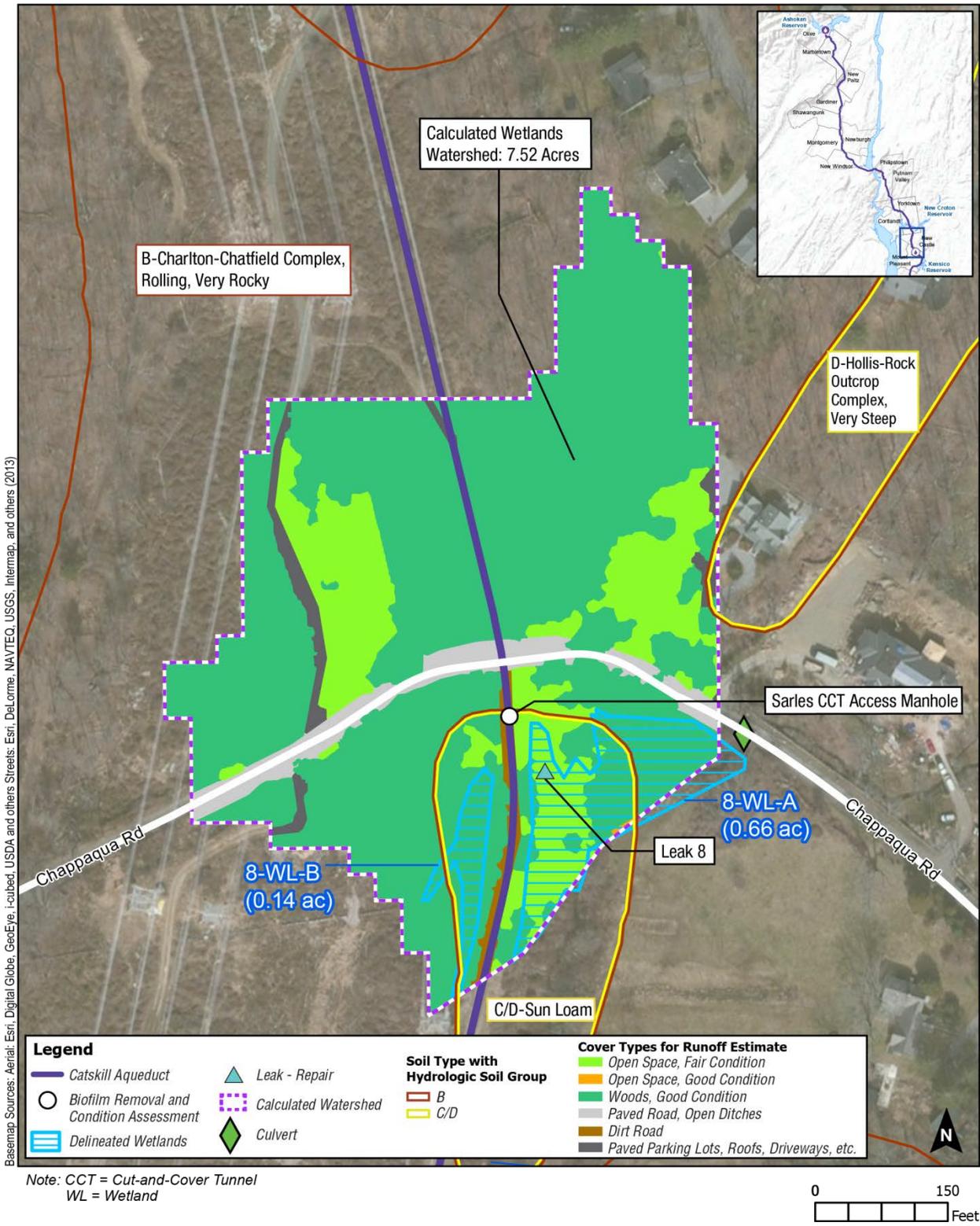


Figure 9.16-11: Wetland Watershed Delineation – Chappaqua Road Study Area



Therefore, it was assumed that the watershed supports the wetlands directly and no account was made for stream over-bank events. For the purposes of this analysis, the approximately 7.52-acre watershed was assumed to support Wetlands 8-WL-A and 8-WL-B.

Using the results from the delineated watershed, the predicted runoff input for the hydrologic budget was calculated using the TR-55, or Runoff Curve Number, method (USDA 1986). The TR-55 method was developed by the USDA and presents simplified procedures for estimating potential runoff in small urban and urbanizing watersheds, similar to the landscape found in the Chappaqua Road Study Area. This method uses the watershed area and incorporates the type of land cover, the amount of impervious surface, and the characteristics of the soils in the area to calculate how the repair of Leak 8 would impact the wetland hydrology of 8-WL-A.

First, DEP land cover data within the delineated watershed were re-categorized into the TR-55 land cover descriptions (see **Table 9.16-6** and **Figure 9.16-9**). Next, runoff was calculated by scoring the land cover type, the extent of impervious surfaces (e.g., pavement, roofs), and the soil hydrology of an area (e.g., well-drained soils, poorly drained soils). Soils were classified into four hydrologic soil groups (A, B, C, and D) according to their minimum infiltration rate, with D being the most poorly drained and A being well drained.

There were six land use/land cover types identified in the delineated watershed for the natural resources study area. The dominant land covers are woods and open space (see **Table 9.16-6**). Three soil types were mapped by Natural Resources Conservation Service across these land covers. The mapped soil types appear consistent with actual soil conditions, given that the wetlands were identified in areas mapped as sun loam with a poorly drained hydrologic soil group. Each land cover and soil combination received a curve number based on the TR-55 methodology. The curve number was weighted by area. The weighted curve number was used to estimate surface inflows and outflows in the hydrologic budget equation.

As described previously, based on field observations of a high water table and groundwater seeps, it is assumed that groundwater influences the study area. Therefore, for the purposes of this analysis, conservative assumptions typical for naturally occurring wetlands of 0 inches per day for groundwater input and -0.035 inches per day for groundwater output were used.

Finally, after the above components were computed for each day in the model year, the results were summed to obtain a representative monthly value for a dry, wet, and average year as shown in the hydrologic budget charts on **Figure 9.16-12** (Dry Year), **Figure 9.16-13** (Wet Year), and **Figure 9.16-14** (Average Year). For each figure, the top graph depicts the inflows and outflows for each month and the bottom graph identifies the calculated depth to water within the wetland watershed.

During the representative wet and average years (2011 and 2000) the wetlands experienced a water surplus where water levels were never more than an inch below the ground surface. During the representative dry year (2009) the depth to water did not fall below 2 inches from the ground surface. Based on the results of the hydrologic budget analysis, the root zone of the wetland vegetation (generally the upper 12 inches) would not have any extended periods of drying even during the driest year in the last 50 years. Therefore, 8-WL-A and 8-WL-B would have enough water to sustain a wetland community in the absence of any supplemental leak flows from the Catskill Aqueduct.

Table 9.16-6: Runoff Calculation for Delineated Watershed in Chappaqua Road Study Area

TR-55 Land Cover Description	Soil Type ¹	Hydrologic Soil Group	Curve Number (CN)	Area (Acres)	CN x Area
Woods, Good Condition	Charlton-Chatfield complex, rolling, very rocky	B	55	4.964	273
	Hollis-Rock outcrop complex, very steep	D	77	0.003	0
	Sun loam	D	77	0.600	46
Open Space, Good Condition	Charlton-Chatfield complex, rolling, very rocky	B	61	<0.001	0
	Sun loam	D	80	0.002	0
Open Space, Fair Condition	Charlton-Chatfield complex, rolling, very rocky	B	69	0.921	64
	Sun loam	D	84	0.358	30
Paved roads, ditches	Charlton-Chatfield complex, rolling, very rocky	B	89	0.358	32
Paved parking lots, etc.	Charlton-Chatfield complex, rolling, very rocky	B	98	0.169	17
	Hollis-Rock outcrop complex, very steep	D	98	0.008	1
Dirt road	Charlton-Chatfield complex, rolling, very rocky	B	82	0.013	1
	Sun loam	D	89	0.100	9
Totals				7.50	473
Weighted CN²					63
Notes:					
¹ Natural Resources Conservation Service Soil Survey.					
² (Curve Number*Area)/Area.					

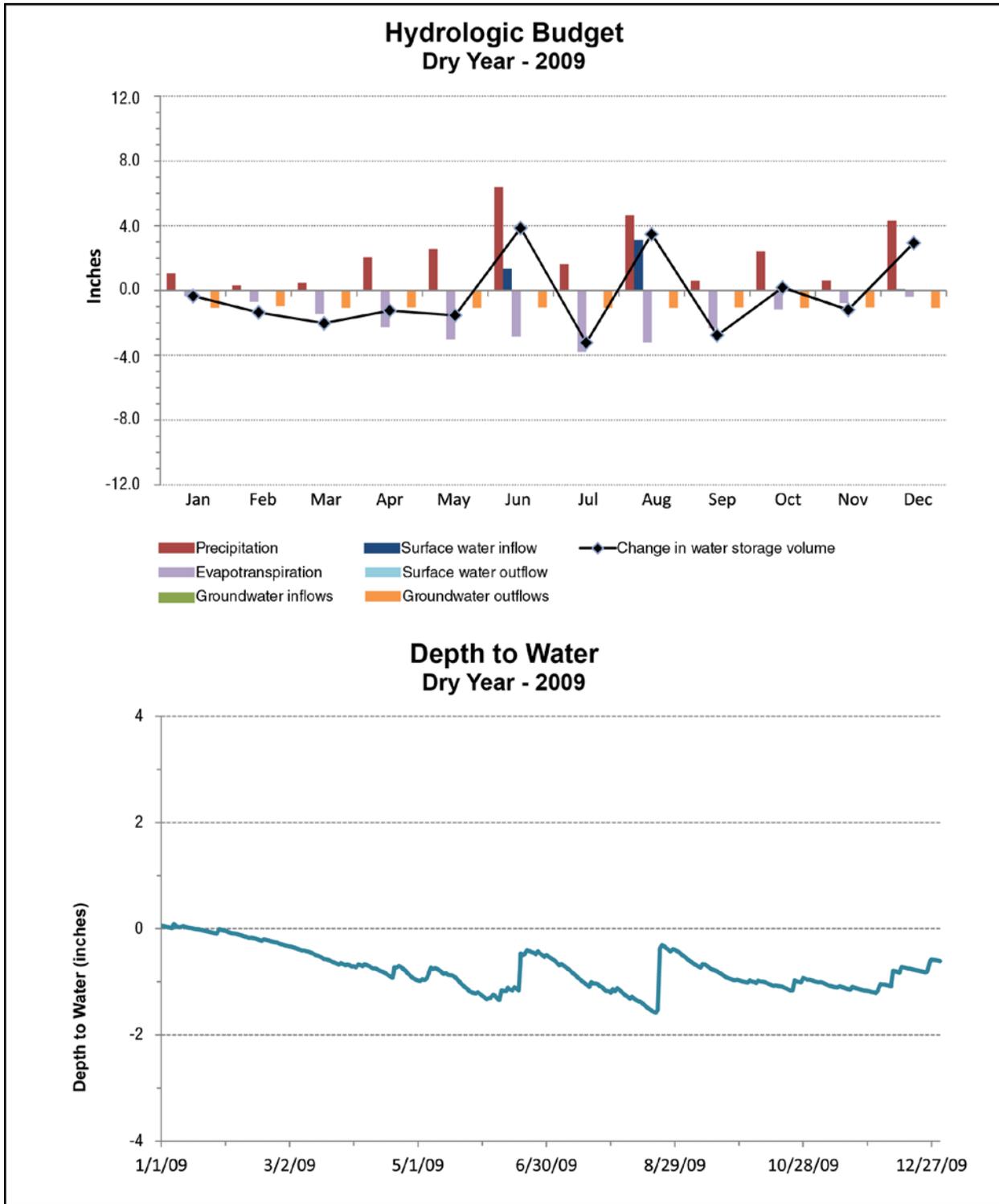


Figure 9.16-12: Hydrologic Budget and Depth to Water for the Representative Dry Year - Chappaqua Road Study Area



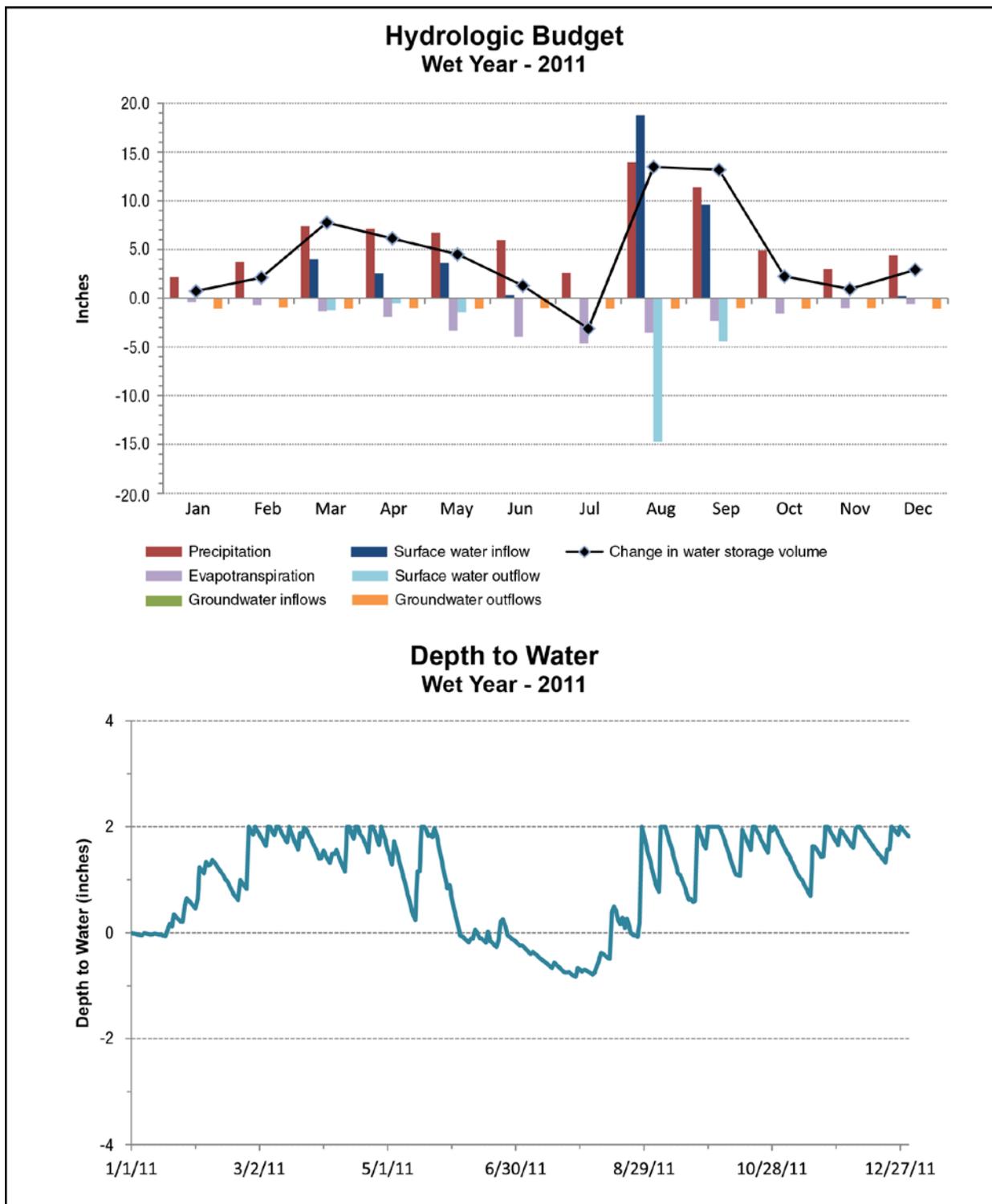


Figure 9.16-13: Hydrologic Budget and Depth to Water for the Representative Wet Year - Chappaqua Road Study Area



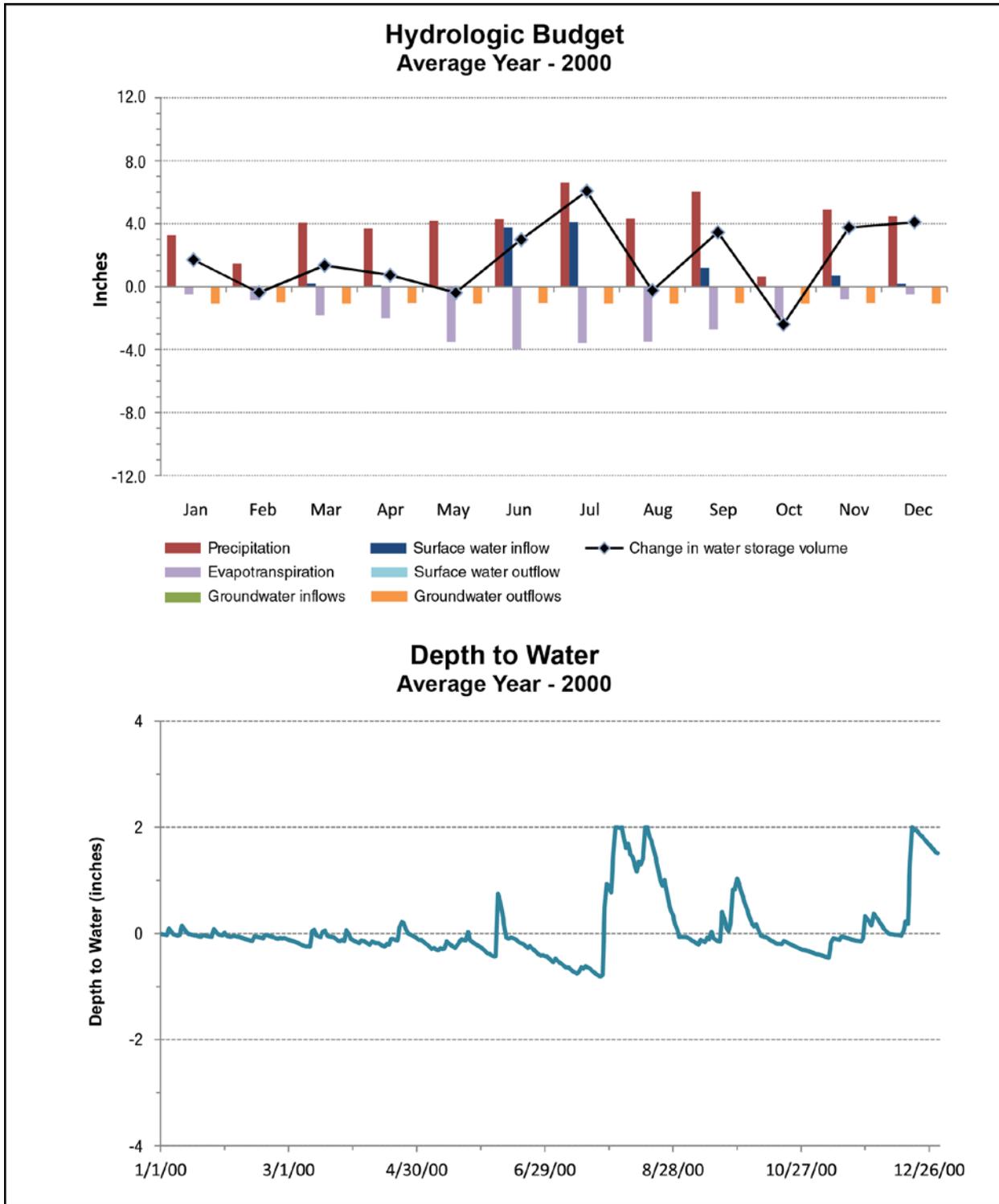


Figure 9.16-14: Hydrologic Budget and Depth to Water for the Representative Average Year - Chappaqua Road Study Area



Results of the hydrologic budget indicate that there would be no net loss in acreage of 8-WL-A and 8-WL-B following the repair of Leak 8. Surface water inflows would decrease from their artificially elevated levels due to leak repair. Immediately following leak repair, seeps from Leak 8 would be eliminated. This would result in reduced surface water inflows adjacent to the aqueduct where the leak occurs. Longer-term effects would occur on a scale of months to years, where the western portion of Wetland 8-WL-A may experience a shift in the dominant vegetative community. Wetland 8-WL-A is currently an emergent wetland and it is anticipated that with a change in hydrology, the wetland species may change over time with some areas transitioning to a palustrine scrub-shrub wetland. These minor changes to hydrology as 8-WL-A transitions to pre-leak conditions are expected to influence vegetation within this wetland. However, based on the calculated depth to water, an emergent community would continue to exist. Even though there is some uncertainty surrounding the contribution of leak flows to Wetland 8-WL-A, the analysis demonstrates that naturally occurring inputs would sustain the wetland, and over time, Wetland 8-WL-A would be restored to pre-leak conditions.

Water Resources Conclusions

Despite attempts to quantify leak flows, it was not possible to isolate artificial flows from the naturally occurring flows within the natural resources study area. As a result, a stream visual assessment and an analysis of wetland hydrology were conducted to analyze changes that would result from leak repair. Following construction, temporarily affected areas would be restored to natural conditions. Therefore, there would be no construction-related effects on water resources. Discharges would be limited to groundwater infiltration and dewatering events that are not anticipated to result in erosion and sediment control issues, and would not take place until after the riprap aprons are in-place to protect against scour.

As a result of leak repair, permanent changes to surface water and wetlands would occur as the system transitions back to pre-leak conditions. There would be no leak flow to 9-FP, though intermittent flows associated with precipitation and drainage would continue to flow through this channel. A reduction in flow to the unnamed tributary 3 to Pocantico River would occur due to the loss of leak flows contributing to this stream. While leak repair would decrease flow to the unnamed tributary, the effect would be minor. No meaningful effects due to leak repairs are anticipated to channel condition, riparian habitat, bank stability, nutrient enrichment, or canopy cover.

Additionally, Wetland 8-WL-A receives flow from Leak 8. Following repairs to Leak 8, flows to 8-WL-A would cease and the wetlands would transition back to pre-leak conditions. Some changes would occur immediately following leak repair and others would occur over the course of months or years. It is anticipated that the transition to pre-leak conditions would result in a shift in vegetative communities. Wetland 8-WL-A is currently an emergent wetland. It is anticipated that with a change in hydrology, the wetland species may change over time with some areas transitioning to a palustrine scrub-shrub wetland. However, based on the calculated depth to water, an emergent community would continue to exist. Based on the hydrologic budget, there would be no loss in wetland acreage following the repair of Leak 8.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Chappaqua Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected, species that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” eight species were identified as having the potential to be affected by the repair and rehabilitation within the natural resources study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these eight species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible effects due to changes in habitat resulting from natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.16-7**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and observations during field visits, as applicable.

Table 9.16-7: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Chappaqua Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Bog Turtle	<i>Clemmys</i> [= <i>Glyptemys</i>] <i>muhlenbergii</i>	Threatened	Endangered	A Phase I bog turtle habitat survey was conducted on April 26, 2013 and revealed potential habitat. As a result, a Phase II visual survey (May to June 2013) and Phase III trapping survey (May 2015) were conducted. Wetland communities that are potential bog turtle habitat could be affected by leak repair. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits in April 2013, June 2014, and September 2015. Potential habitat exists within the shrubland, wetland, and adjacent forested areas. Work activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, as a highly mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions and the streambank restoration measures that remain would not affect breeding, nesting, or foraging habitat. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits in April 2013, June 2014, and September 2015. Potential habitat exists within the successional shrubland and adjacent hardwood forest. However, construction activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the work sites, a variety of habitats would be available for the species' use in the vicinity during construction. Furthermore, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No

Table 9.16-7: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Chappaqua Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Spotted Turtle	<i>Clemmys guttata</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits in April 2013, June 2014, and September 2015. Potential nesting, foraging, and basking habitat exists within the successional shrubland, powerline right-of-way, and wetlands east and west of Leak 8. However, construction activities would be largely confined to previously disturbed areas. Perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Furthermore, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for spotted turtles is warranted for this study area.	No
Birds					
Cooper's Hawk	<i>Accipiter cooperii</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visits in April 2013, June 2014, and September 2015. Work activities would be largely confined to previously disturbed areas. No tree removal is proposed within the study area. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Cooper's Hawks is warranted for this study area.	No
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	No bats were incidentally observed during the field visits in April 2013, June 2014, and September 2015. NYNHP did not identify occurrences in the study area. No tree removal is proposed within the study area. There may be temporary noise that discourages bats from roosting in the immediate vicinity of the work sites. However, this work would not occur over an extended period of time and there is abundant suitable habitat in the surrounding areas within which bats could roost. Construction lighting would be used as needed during the 10-week shutdowns, and because these would occur between October and March, it would be unlikely that bats would be in the area and, therefore, no disturbance from nighttime lighting is anticipated. Upon construction completion, the stream would return to pre-leak conditions and would not adversely affect bat foraging within the study area. Therefore, there are no effects anticipated and no further analysis for Indiana bats is warranted for this study area.	No

Table 9.16-7: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Chappaqua Road Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened Unlisted	No bats were incidentally observed during the field visits in April 2013, June 2014, and September 2015. NYNHP did not identify occurrences in the study area. No tree removal is proposed within the study area. There may be temporary noise that discourages bats from roosting in the immediate vicinity of the work sites. However, this work would not occur over an extended period of time and there is abundant suitable habitat in the surrounding areas within which bats could roost. Construction lighting would be used as needed during the 10-week shutdowns, and because these would occur between October and March, it would be unlikely that bats would be in the area and, therefore, no disturbance from nighttime lighting is anticipated. Upon construction completion, the stream would return to pre-leak conditions and would not adversely affect bat foraging within the study area. Therefore, there are no effects anticipated and no further analysis for northern long-eared bats is warranted for this study area.	No
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	Three cottontails (<i>Sylvilagus</i> spp.) were observed during the habitat surveys on April 26, 2013 and July 10, 2014, but could not be identified to species as New England cottontails. Potential for noise-related effects that may temporarily deter the New England cottontail and other species from utilizing the utility right-of-way west of the natural resources study area during construction. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
<p>Note: MBTA: Migratory Bird Treaty Act</p>					

Bog Turtle (Clemmys [=Glyptemys] muhlenbergii)

No wetlands were identified near Leak 9 within the natural resources study area. Wetlands in the study area were identified near Leak 8. The wetlands identified near Leak 8 were evaluated for potential bog turtle habitat through a desktop analysis and a Phase I bog turtle survey, which was conducted on April 26, 2013. Results from the Phase I bog turtle survey indicated that small areas of potential bog turtle habitat are present at Wetlands 8-WL-A and 8-WL-B. Therefore, Phase II Bog Turtle Visual Surveys were conducted. No bog turtles were observed during the Phase II Bog Turtle Visual Surveys conducted in May through June 2013 within the areas of Wetlands 8-WL-A and 8-WL-B identified as potential bog habitat (see **Figure 9.16-9**). Due to the potential change in wetland hydrology associated with the repair of Leak 8, a Phase III bog turtle trapping survey was conducted for 20 consecutive days in May 2015; no bog turtles were observed during this survey. The Phase III survey supported the Phase II findings and the conclusion that neither wetland in proximity to Leak 8 within the natural resources study area supports a bog turtle population.

Repair and rehabilitation work activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct and would be localized and confined to the cut-and-cover tunnel in the immediate vicinity of Leaks 8 and 9. Leak repairs would be conducted during the first 10-week shutdown of the Catskill Aqueduct, during which time leak flows would cease. Leak 8 contributes to 8-WL-A, which contains potential bog turtle habitat. Following leak repair, this wetland is anticipated to experience a shift in the dominant vegetative community, potentially resulting in decreased acreage of potential bog turtle habitat. However, based on the calculated depth to water an emergent community would continue to exist. The wetland communities at the study area would remain because wetland vegetation would not be exposed to periods of drying or desiccation following leak repair, and any changes would represent a shift back to pre-leak conditions. Additionally, because wetlands in the natural resources study area do not support a bog turtle population, changes to these wetlands resulting from the repair and rehabilitation would not result in a take of bog turtles. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, bog turtles in this study area.

New England Cottontail (Sylvilagus transitionalis)

On April 26, 2013, a habitat assessment was conducted in the vicinity of Leak 8. The dominant vegetation community identified within the natural resources study area is a highly disturbed successional shrub community greater than 12 acres in size, which extends to the north and west of the study area. Dominant woody species include multiflora rose (*Rosa multiflora*), tatarian honeysuckle (*Lonicera tatarica*), and privet (*Ligustrum* spp.); dominant herbaceous species include goldenrod (*Solidago* spp.), bedstraw (*Galium* spp.), garlic mustard (*Alliaria petiolata*), and Japanese stiltgrass (*Microstegium vimineum*). The shrub community is very thick and nearly impassable, with twig densities greater than 20,000 per acre. Woody stem counts were about 46 stems in a 10-foot square area. No scat or signs of browsing were observed within the habitat. However, the twig density indicates the area would be good potential habitat for the species. The habitat value is reduced slightly due to the dominance of non-native vegetation. However, species composition is less critical for the New England cottontail (*Sylvilagus transitionalis*) than twig density.

On July 10, 2014, a habitat assessment was conducted in the vicinity of Leak 9. Numerous grass and sedge species (*Carex* spp.) are present along the berm. There is also milkweed (*Asclepias syriaca*), butterfly weed (*Asclepias tuberosa*), joe pye weed (*Eutrochium maculatum*), purple coneflower (*Echinacea purpurea*), black-eyed Susan (*Rudbeckia hirta*), and New England aster (*Aster novae-angliae*). The vast majority of the site was dense shrub, although there were sporadically placed areas without dense shrub cover on the aqueduct berm. The shrub community is very thick with twig densities greater than 20,000 per acre. Woody stem counts exceed 60 stems in a 10-foot square area. One instance of potential browsing was observed on a *Rubus* spp. The browse did not appear to be recent. Three cottontail individuals were visually observed during the July 2014 habitat assessment. However, identification of these individuals to the species level was not possible due to the subtle differences between the New England cottontail and eastern cottontail (*Sylvilagus floridanus*), which is also found east of the Hudson River (Arbuthnot 2008).

In the future with the repair and rehabilitation, work activities within the study area would be short-term (totaling 13 weeks over 2.5 years). While there would be some clearing of underbrush and minor grading along the top of the aqueduct, no substantial site modifications to potential habitat would be required. There would be minor temporary disturbance within the limit of construction. However, most of the approximately 109,150 square feet of potential habitat is outside of the limit of construction and would not be affected. Disturbance associated with the work activities would not deter individuals from utilizing surrounding suitable off-site habitats. Any individuals temporarily displaced by construction activities are anticipated to quickly return to the habitat at the completion of construction. Once construction is completed, the construction staging area would be restored to natural conditions. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, New England cottontails in this study area.

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), spotted turtles (*Clemmys guttata*), Cooper's Hawks (*Accipiter cooperii*), Indiana bats (*Myotis sodalis*) or northern long-eared bats (*Myotis septentrionalis*) associated with the repair and rehabilitation. Repair and rehabilitation may affect, but not likely to adversely affect, bog turtles and New England cottontails.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Chappaqua Road Study Area.

9.16.3.7 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Chappaqua Road Study Area, a Phase I Environmental Site Assessment (ESA) was conducted in general conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Practice E 1527-13 and City Environmental Quality Review (CEQR) requirements to identify Recognized Environmental Condition (RECs). The Phase I ESA included site reconnaissance,

research on current/historical use, and review of federal and State regulatory listings for both the site itself and for its neighboring properties within the appropriate search distance defined in the ASTM standard.

Based on the Phase I ESA investigations at sites within this study area, there was no indication of an environmental impact that would constitute a REC as defined by the ASTM standard that would affect activities in the study area. Additionally, there is no history of contamination at or in the vicinity of Chappaqua Road Study Area where repair and rehabilitation work activities would occur. No passive dechlorination systems would be installed and no excavation of soil would be conducted. No above-ground structures are located within this study area.

DEP has consulted with the Towns of Mount Pleasant and New Castle and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Chappaqua Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Chappaqua Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential temporary storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements.

Leak repair would consist of lining the leaking and cracked areas with carbon fiber material, which is inert, quick-curing, and suitable for use in drinking water supply systems. The repair and rehabilitation work activities in this study area are minor and short-term (totaling 13 weeks over 2.5 years). Following the repair and rehabilitation, all structures and equipment would be removed from the Chappaqua Road Study Area. The staging areas would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Chappaqua Road Study Area.

9.16.3.8 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Chappaqua Road Study Area.

Access to the repair and rehabilitation limits of construction for the work sites within the Chappaqua Road Study Area would be via Chappaqua Road (see **Figure 9.16-2**). Chappaqua Road is a two-way, two-lane urban roadway, designated as a minor arterial roadway west of the Taconic State Parkway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Chappaqua Road Study Area. There is no

public transportation and little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the site. However, there are no DEP employees who work at or visit the study area on a daily basis, and the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Towns of Mount Pleasant and New Castle and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Chappaqua Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Chappaqua Road Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be the basis of this transportation analysis. Of these activities, internal leak repair at Leaks 8 and 9 would generate the most vehicle trips. Internal leak repair would occur in fall ~~2018~~2017 for 24 hours per day, 7 days a week for approximately 4 weeks during the first 10-week shutdown.

In the future with the repair and rehabilitation, construction vehicles would travel along Chappaqua Road to the study area. The estimated number of peak-day one-way vehicle trips associated with the leak repair is 32 vehicles, or approximately 64 peak-day vehicle round trips that would travel to and from the study area. The majority of the peak daily vehicle round trips, approximately 40 vehicle round trips or 40 Passenger Car Equivalents (PCEs), would be workers traveling directly to and from the staging area, with an additional 8 daily shuttle trips between the study area and the staging area. The remaining approximately 16 peak-day vehicle round trips (22 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with internal leak repair is approximately 32 peak-hour vehicle trip ends (36 PCEs). This includes approximately 20 vehicle trip ends (20 PCEs) from workers traveling directly to and from the staging area, approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 8 vehicle trip ends (12 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming two, 12-hour shifts, this would be during the 6 AM to 7 AM and 6 PM to 7 PM hours, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 36 peak-hour PCEs along Chappaqua Road, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, "Transportation." The work activities at the Chappaqua Road Study Area would be short-term (totaling 13 weeks over 2.5 years; see **Table 9.16-2**) and would not generate public parking or transportation demands or pedestrian activity within the Chappaqua Road Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Chappaqua Road Study Area.

9.16.3.9 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation within the Chappaqua Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation activities, as shown in **Figure 9.16-15**. This encompasses areas within the Towns of New Castle and Mount Pleasant.

The Chappaqua Road Noise Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise codes. The repair and rehabilitation is subject to the Towns of Mount Pleasant and New Castle Noise Control Laws. The Town of Mount Pleasant Noise Control Law (§139-18) prohibits noise levels from construction sites from exceeding an L_{10} of 70 dBA during the hours of 8 AM to 6 PM, and an L_{10} of 55 dBA during the hours of 6 PM to 8 AM when measured at a distance of 400 feet from the construction site in residentially zoned districts. In addition, work activities are prohibited between the hours of 5 PM and 8 AM in all zoning districts, except in the event of urgent necessity or in the interest of safety, in which case the Building Inspector may issue a permit. The Town of New Castle’s Noise Control Law (§90-6(B)) only allows audible construction noise between 7:30 AM and 8 PM, Monday through Friday, and 10 AM and 5 PM, weekends and holidays.

Existing ambient noise levels within the Chappaqua Road Study Area are influenced by vehicular traffic traveling on Chappaqua Road and other local roadways. The existing noise levels within the study area are comparable to a quiet suburban residential environment based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Towns of Mount Pleasant and New Castle and Westchester County, and it is DEP’s understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels are anticipated within the Chappaqua Road Study Area within the timeframe of the impact analysis.

Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Chappaqua Road Study Area would be similar to baseline conditions.

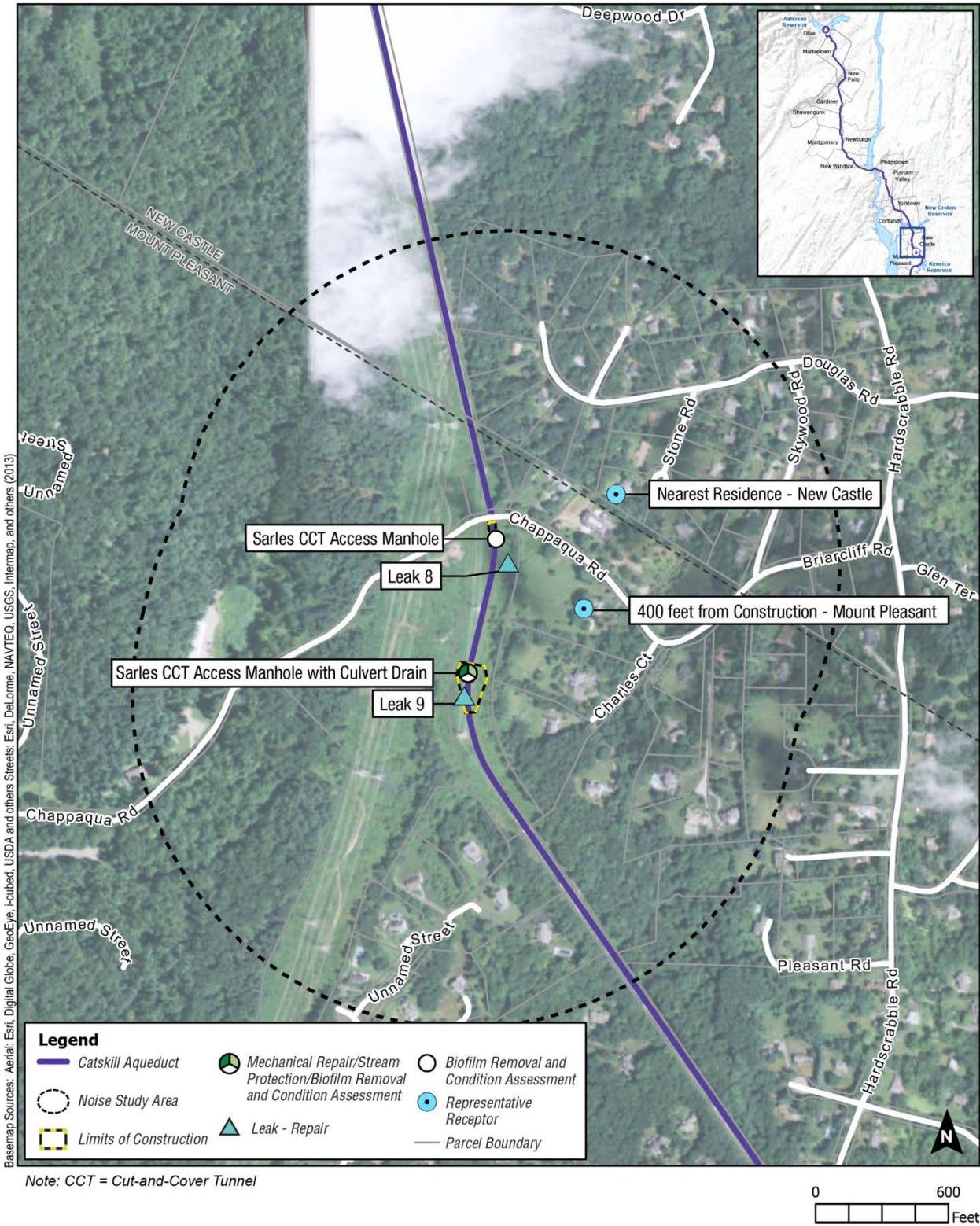


Figure 9.16-15: Noise - Chappaqua Road Study Area



In the future with the repair and rehabilitation, stationary noise-producing work activities within the Chappaqua Road Study Area would occur at two sites. The stationary noise-generating equipment that would be used within the Chappaqua Road Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with leak repair would emit the most noise. Internal leak repair would occur at Leaks 8 and 9 in fall ~~2018~~2017.

Work would occur up to 24 hours per day, 7 days a week for approximately 4 weeks during the first 10-week shutdown (see **Table 9.16-2**).

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the leak repair. Associated equipment reference noise levels are shown in **Table 9.16-8**. The Town of Mount Pleasant Code defines allowable noise levels using the L₁₀ metric, which represents the sound level exceeded 10 percent of the time. The Town of New Castle does not specify a metric, so the equivalent average sound level (L_{eq}) was used. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.16-8: Stationary Source Construction Equipment Modeled at the Chappaqua Road Study Area - Noise Analysis and Reference Noise Levels (L_{eq} and L₁₀)

Equipment Type	Reference Sound Pressure Noise Level (L ₁₀) at 50 feet (dBA)	Reference Noise Level (L _{eq}) at 50 feet (dBA)
Ventilation Fan	85	85
Backhoe	79	76
Generator	82	82
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.		

Table 9.16-9 shows the results of the stationary construction noise analysis. The Town of Mount Pleasant Code defines allowable noise levels at a distance of 400 feet from a construction site. Therefore, noise levels at a distance of 400 feet were calculated for comparison with the local noise ordinance. The nearest residence in the Town of Mount Pleasant is also located approximately 400 feet from leak repair activities. Leak repair would occur up to 24 hours per day for approximately 4 weeks and would produce a noise level of up to 69 dBA at the nearest residence 400 feet from leak repair activities. In addition, leak repair within the Chappaqua Road Study Area would emit a noise level (L_{eq}) of approximately 66 dBA at the nearest residence in the Town of New Castle. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities. However, this equipment would not be expected to be louder than those associated with leak repair. Repair and rehabilitation within the Chappaqua Road Study Area could emit noise levels greater than allowed by the Town of Mount Pleasant noise code. Additionally, work activities have the potential to occur outside of the allowable hours defined by the Towns of Mount Pleasant and New Castle. Therefore, DEP would work with the Towns of Mount Pleasant and New Castle as appropriate.

Table 9.16-9: Stationary Noise Analysis Results (L_{eq} and L_{10}) at the Nearest Noise-Sensitive Receptors within the Chappaqua Road Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level at Noise-Sensitive Receptor (dBA)	Town of Mount Pleasant Noise Limit (dBA)	Town of New Castle Noise Limit (dBA)	Potential for Exceedance (Yes or No)
400 feet from Construction / Nearest Residence - Mount Pleasant	400	69 ¹	70 ³ /55 ⁴	NA	Yes ⁵
Nearest Residence - New Castle	588	66 ²	NA	NA	Yes ⁶
Notes: NA = Not Applicable ¹ Noise level that would be exceeded 10% of the time (L_{10}). ² Metric for noise level is the hourly equivalent average noise level (L_{eq}). ³ Noise limit is applicable between the hours of 8 AM and 6 PM. ⁴ Noise limit is applicable between the hours of 6 PM and 8 AM. ⁵ Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Town of Mount Pleasant. ⁶ Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Town of New Castle.					

Although there would be an increase in stationary noise levels, work would primarily occur in the fall and winter months when residents typically have windows closed. Noise levels inside would be further reduced to an interior noise level (L_{eq}) of approximately 45 dBA at the nearest residence in the Town of Mount Pleasant and approximately 42 dBA in the Town of New Castle. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Chappaqua Road Study Area. The repair and rehabilitation work activities would be temporary in nature with peak work activities occurring during leak repair in fall ~~2018~~2017 for limited periods (e.g., up to 4 weeks).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Chappaqua Road Study Area.

9.16.3.10 Neighborhood Character

The character of the Chappaqua Road Study Area is largely defined by a mix of residential, open space and recreation, and public service land uses and its physical setting within a rural location (see **Figure 9.16-3**). The Catskill Aqueduct traverses the study area in a general north to south direction. Chappaqua Road crosses the northern portion of the study area from east to west, and Charles Court is located along its southeastern border. The limits of construction for the work sites and the associated access route are located entirely in a public services corridor with grassy cover, which is owned and maintained by DEP.

DEP has consulted with the Towns of Mount Pleasant and New Castle, and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Chappaqua Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; and historic and cultural resources, an impact analysis for the Chappaqua Road Study Area was not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," Section 9.3.4, "Socioeconomic Conditions," and Section 9.3.7, "Historic and Cultural Resources," respectively. As described in Section 9.16.3.4, "Open Space and Recreation," and Section 9.16.3.5, "Visual Resources," the work activities would not affect open space and recreation and visual resources in the Chappaqua Road Study Area. Furthermore, the public policy impact analysis provided in Section 9.16.2, "Town of Mount Pleasant Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.16.3.8, "Transportation," and 9.16.3.9, "Noise," during construction, the work activities in the Chappaqua Road Study Area would be short-term (totaling 13 weeks over 2.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Chappaqua Road Study Area.

9.16.4 NANNY HAGEN ROAD STUDY AREA IMPACT ANALYSIS

Within the Nanny Hagen Road Study Area, the aqueduct transitions from the Pleasantville Cut-and-Cover Tunnel to the Catskill Kensico Bypass. This transition occurs at the Catskill Inflow Chamber, from which aqueduct water discharges into Kensico Reservoir (see **Figure 9.16-16**).

Work activities within the Nanny Hagen Road Study Area would include: staging and access improvements; establishment and use of a primary staging area; concrete repair; boathole preparation and installation; biofilm removal and condition assessment; large-scale wash water treatment; and sediment removal.

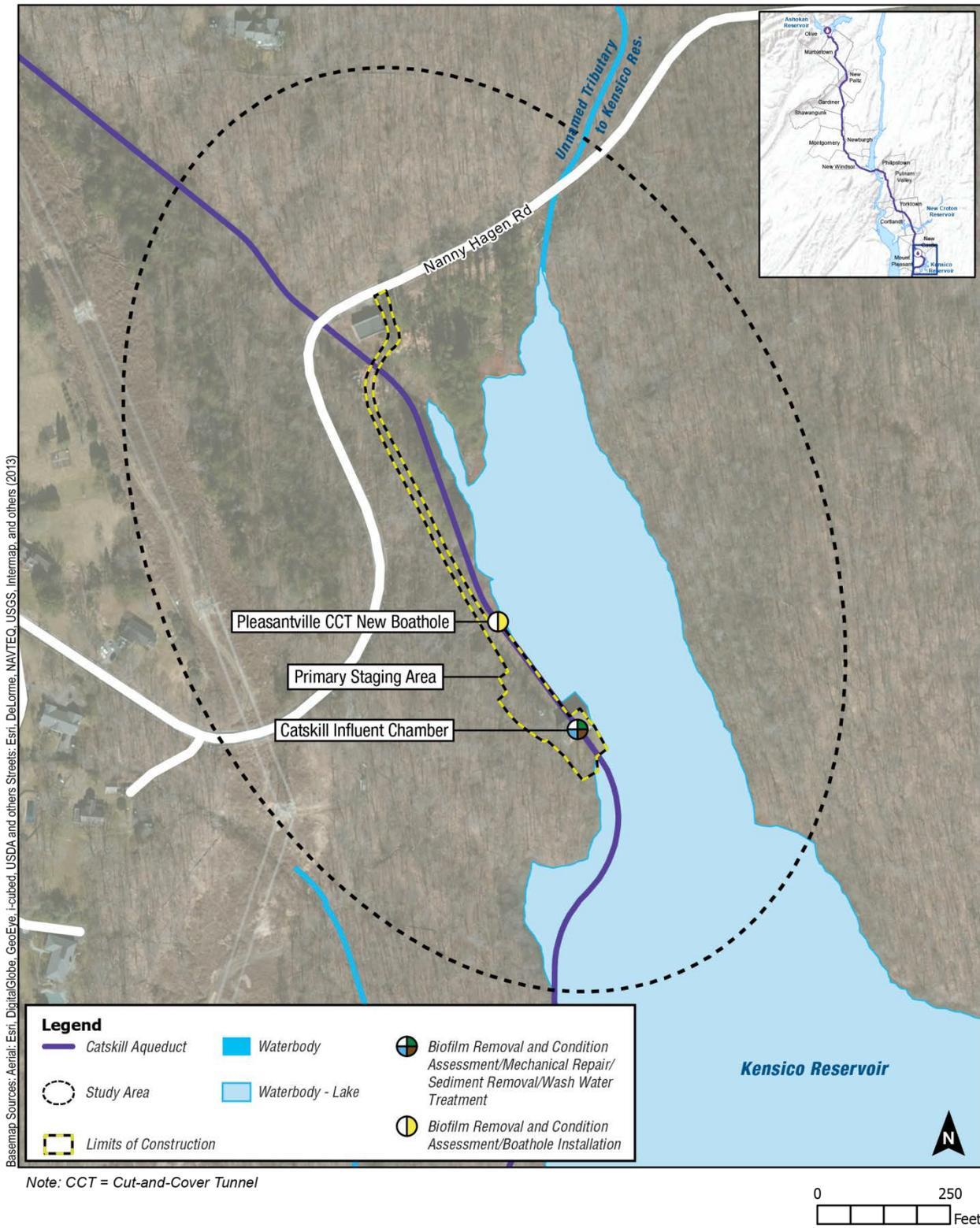


Figure 9.16-16: Study Area – Nanny Hagen Road



9.16.4.1 Study Area Location and Description

The Nanny Hagen Road Study Area is located along the upper Catskill Aqueduct in the Town of Mount Pleasant. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. Nanny Hagen Road crosses the study area from southwest to northeast, and an inlet of Kensico Reservoir extends from the south into the center of the study area. The proposed work site within the study area is located at the Catskill Influent Chamber, accessible by a DEP access road that connects to Nanny Hagen Road. The study area boundary is located approximately 400 feet beyond the outermost area of disturbance related to the work site and associated access route. **Figure 9.16-16** shows an aerial photograph of the study area, including the path of the aqueduct, limits of construction for the work site, and the proposed access route. **Figure 9.16-17** shows photographs of the study area.

The study area is generally wooded and consists primarily of public services land uses, with a small amount of residential and vacant land on the edges of the northern and western boundaries. The limits of construction for the work site and associated access route are located within a public services corridor which is owned and maintained by DEP. **Figure 9.16-18** shows a map of the land uses in the study area and surroundings.

Zoning in the study area is single-family residential (R-40), as designated by the Town of Mount Pleasant Zoning Code (see **Figure 9.16-19**). The Catskill Aqueduct is a permitted use as a water supply facility within the single-family residential (R-40) zoning district. There are no federal, State, or local designated landmarks, historic districts, or archeological resources within the study area.

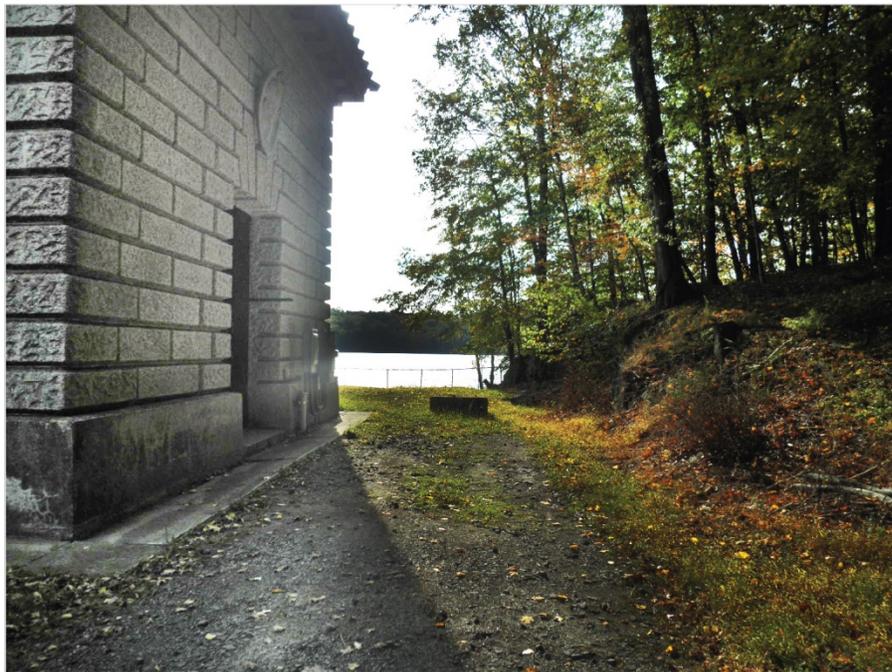
9.16.4.2 Proposed Activities within the Nanny Hagen Road Study Area

To support activities within the study area, equipment and materials would be staged at the Catskill Influent Chamber. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work site as needed. The staging area would also serve as a primary staging area for contractor trailers and parking to support repair and rehabilitation construction activities along the final 5.6 miles of the upper Catskill Aqueduct. A site plan showing a layout of the limits of construction for the work site, which would occupy a total of approximately 0.8 acre, is shown on **Figure 9.16-20**. The schedule for work within the study area is shown in **Table 9.16-10**. The duration of active construction within the Nanny Hagen Road Study Area would total approximately 9 weeks over 3 years, with some overlapping activities.

Work in the study area would begin in ~~2018~~2017 with staging and access improvements for the primary staging area. These would include the removal of up to two trees and modification of the curb at the entrance to the access road. It would also include underbrush clearing and gravel placement for leveling and erosion control. For this and all work activities, erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work site as needed. Once established, the primary staging area would be available for the duration of repair and rehabilitation. Temporary in-stream disturbance would cover a total area of approximately 5,870 square feet. Temporary wetland disturbance would cover a total area of approximately 60 square feet, and permanent wetland disturbance would cover a total area of approximately 80 square feet.



Photograph 1: Existing access road to Catskill Inflow Chamber (looking north).



Photograph 2: Staging area adjacent to Catskill Inflow Chamber (looking south).

Figure 9.16-17: Photographs – Nanny Hagen Road Study Area



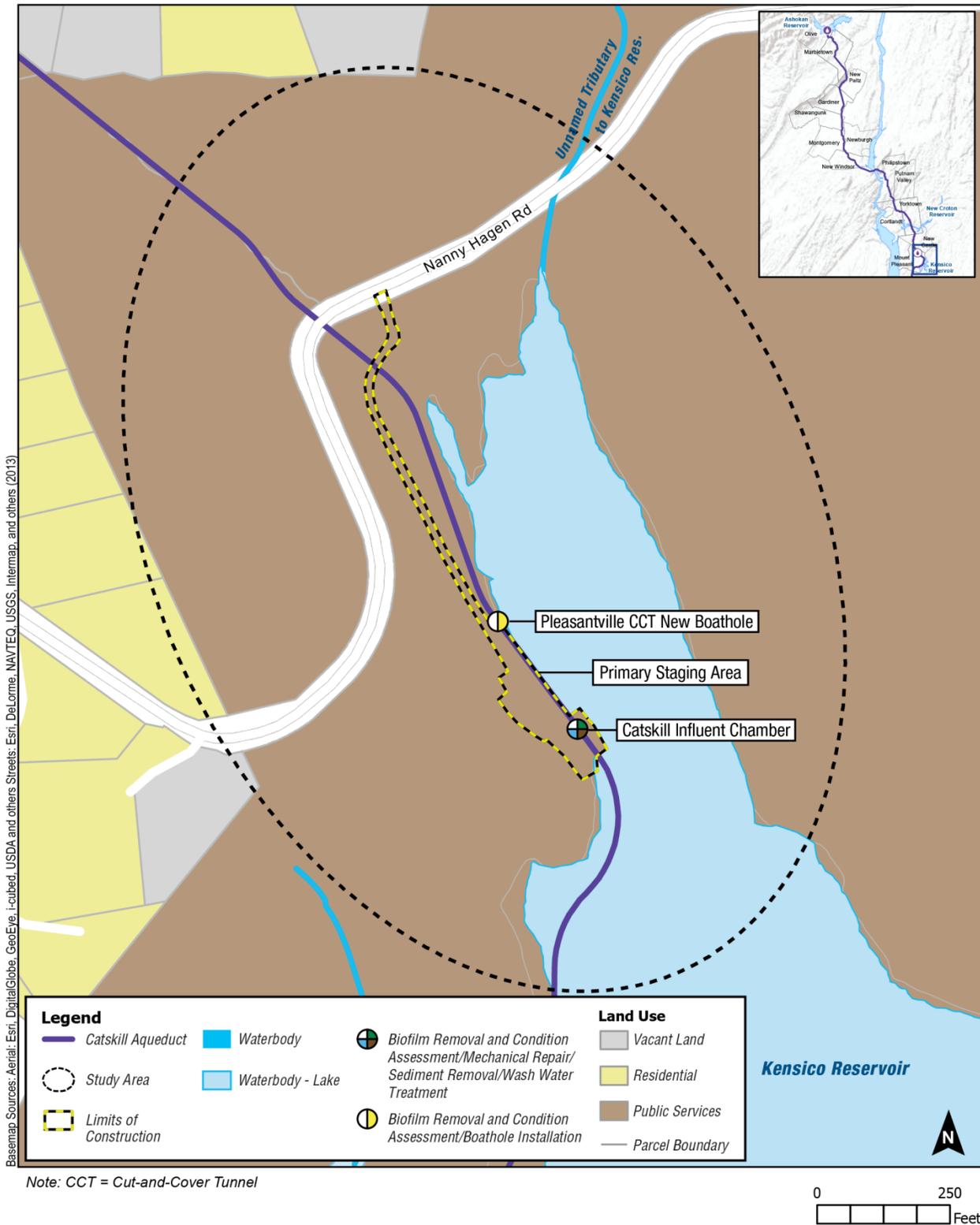


Figure 9.16-18: Land Use – Nanny Hagen Road Study Area



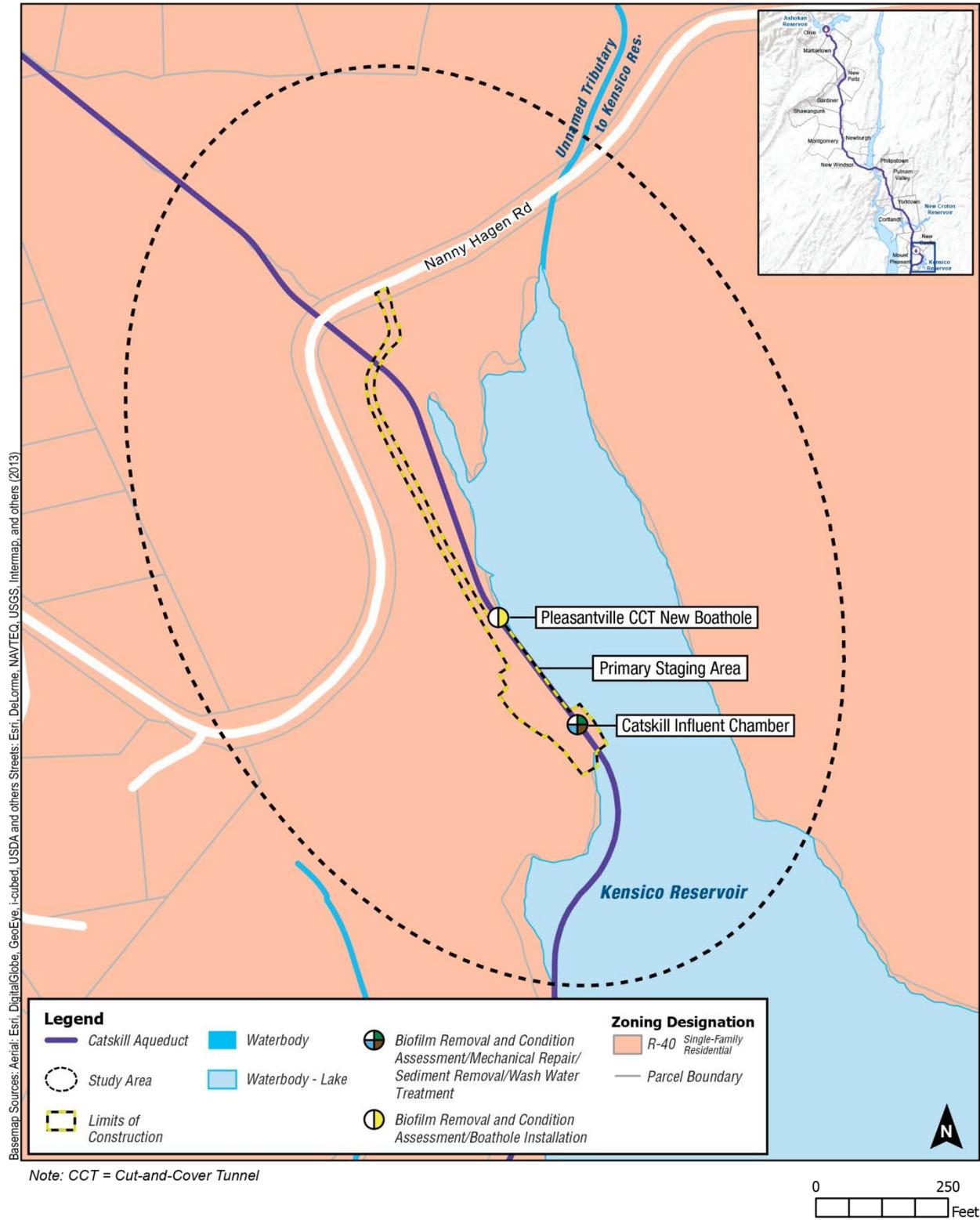


Figure 9.16-19: Zoning – Nanny Hagen Road Study Area



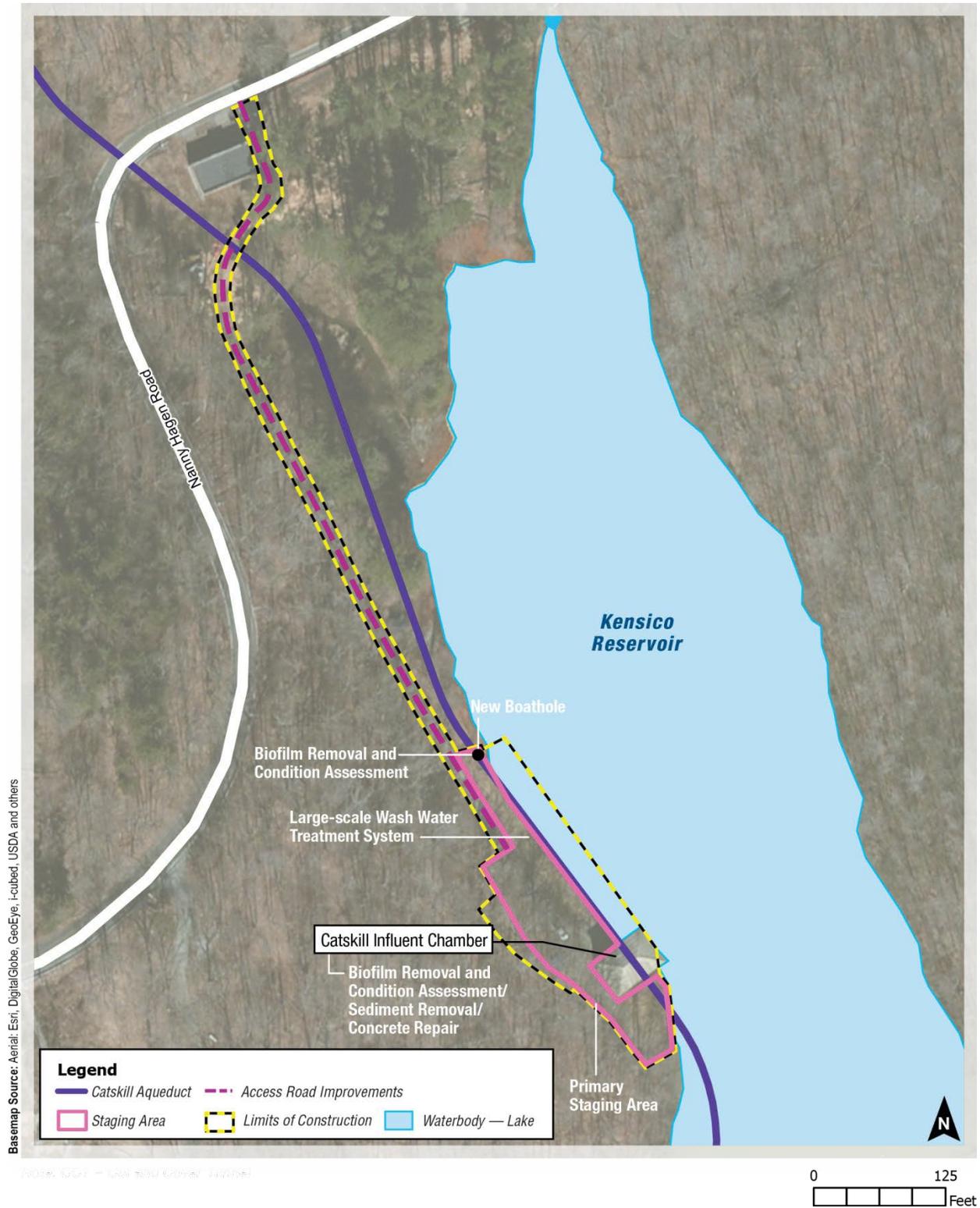


Figure 9.16-20: Site Plan – Nanny Hagen Road Study Area



Table 9.16-10: Schedule of Work Activities within the Nanny Hagen Road Study Area

Work Activity ¹	Dates	Duration	Work Hours	Crew Size ²
Staging and Access Improvements ³	2018 2017	2 weeks	Monday to Friday, 7 AM to 5 PM	8
Primary Staging Area Management	2018 2017 – 2020	Less than 2 continuous years	7 days a week, 24 hours per day (shutdowns) Monday to Friday, 7 AM to 5 PM (all other times)	12
Concrete Repair	Fall 2018 2017 (First 10-week shutdown)	2 weeks	7 days a week, 24 hours per day	12
Boathole Preparation	Summer 2019 2018	3 weeks	Monday to Friday, 7 AM to 5 PM	10
Boathole Installation	Fall 2019 2018 (Second 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	8
Biofilm Removal and Condition Assessment	Fall 2020 2019 (Third 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	21
Large-scale Wash Water Treatment	Fall 2020 2019 (Third 10-week shutdown)	10 weeks	7 days a week, 24 hours per day	7
Sediment Removal	Fall 2020 2019 (Third 10-week shutdown)	5 weeks	7 days a week, 24 hours per day	12

Notes:

¹ Overlapping activities are estimated to total 94 weeks. All work activities overlap with primary staging area management.

² Crew size refers to the number of people anticipated at the work site(s).

³ Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*).

Concrete repair would occur during the first 10-week shutdown in fall ~~2018~~2017. Work would involve preparation of the walls adjacent to the weir within the Catskill Influent Chamber for the installation of flashboards and a temporary bulkhead. This installation of the bulkhead would be necessary to prevent the backflow of reservoir water and allow unwatering of the aqueduct south of the Croton Lake Pressure Tunnel Uptake Chamber (within the Croton Dam Road Study Area in the Town of Mount Pleasant). Flashboards are removable vertical boards that would be fabricated off site and installed into grooves in the weir structure. The work would be done using divers to inspect and repair the weir and take measurements for flashboard fabrication (see Section 9.2, “Project Description”). A turbidity curtain would be installed downstream of the weir to trap any dislodged particles or sediment entering Kensico Reservoir, and this would remain in place during the repair and rehabilitation. Once the flashboards are fabricated, they would be installed on the weir during subsequent shutdowns.

Preparation of the new boathole upstream of the Catskill Influent Chamber would take place in summer ~~2019~~2018. The work would consist of the excavation of approximately 45 cubic yards of soil and construction of a cast-in-place concrete collar. Boathole installation, which requires unwatering of the aqueduct to tie into the crown of the cut-and-cover tunnel, would take place during the second 10-week shutdown in fall ~~2019~~2018.

Biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019. Access into the aqueduct would be provided by the new boathole and the Catskill Influent Chamber. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to the large-scale wash water treatment system that would be established at the new boathole. There it would be treated to meet water quality standards for discharge back into the aqueduct or to Kensico Reservoir (see Section 9.2, “Project Description”). The temporary wash water treatment system would require 24-hour operation to process the anticipated volume of wash water.

Sediment removal would also occur during the third 10-week shutdown in fall ~~2020~~2019. Accumulated sediment within the Catskill Influent Chamber would be excavated and extracted, and accumulated sediment within the Catskill Kensico Bypass would be excavated and transported to an extraction point at either the Catskill Influent Chamber or the Kensico Upper Effluent Chamber (within the Westlake Drive Study Area in the Town of Mount Pleasant). Vacuum trucks at the surface would suction the sediment from these sites to be disposed of at a registered, permitted, or otherwise authorized facility. An estimated volume of 885 cubic yards would be removed. Following sediment removal, a detailed condition assessment of the bypass tunnel interior would be conducted. Any defects identified would be repaired during a shutdown period.

Upon completion of repair and rehabilitation in 2020, all trailers, equipment, and materials associated with the primary staging area would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions. Improvements to the access road and staging area would remain in place following construction so this area can continue to be utilized by DEP for future operations and maintenance activities. Temporary chlorination of the aqueduct would begin in ~~2020~~2019 and would continue until the RWBT bypass tunnel connection is complete in 2023. During this time, aqueduct water into Kensico Reservoir would be monitored for chlorine residual downstream of the dechlorination facility at the Pleasantville Alum Plant, as described in Section 9.2, “Project Description,” and as further analyzed in Section 9.19, “Project-wide Impact Analysis.”

Impact categories analyzed for the Nanny Hagen Road Study Area are presented in Section 9.16.4.3, “Open Space and Recreation,” through Section 9.16.4.9, “Neighborhood Character,” and include open space and recreation; visual resources; natural resources including water resources, aquatic and benthic resources, terrestrial resources, federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation, stationary noise; and neighborhood character. Additionally, the study area’s compatibility with

applicable public policies was analyzed on a town-wide basis in Section 9.16.2, “Town of Mount Pleasant Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” impact analyses related to land use and zoning; socioeconomic conditions; community facilities and services; historic and cultural resources; the remaining natural resources subcategories, including geology and soils, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area are not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.16.4.3 Open Space and Recreation

As shown on **Figure 9.16-21**, one open space and recreation resource exists within the Nanny Hagen Road Study Area: Kensico Reservoir, with its surrounding watershed lands. Approximately 10 acres of the 1,254-acre Kensico Reservoir lay within the central portion of the study area and is publically used for recreational shoreline fishing and non-motorized boat fishing with a DEP watershed access permit and fishing license. However, DEP Recreation Rules restrict access within 500 feet of any dikes, dams, tunnel outlets, spillways, buildings and other significant water supply structures (Watershed Rules and Regulations Part 16-15(b)(1)). There are no fishing access points within the study area.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP’s understanding that no plans to expand or create new open space or recreational resources are anticipated within the Nanny Hagen Road Study Area in the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open spaces is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Nanny Hagen Road Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities within the Nanny Hagen Road Study Area would be short-term (totaling 94 weeks over 3 years; see **Table 9.16-10**). The work area, which would occupy approximately 0.9 acre, would be located on the western shore of a cove within the northern portion of Kensico Reservoir and includes the Catskill Inflow Chamber. Work would include minor clearing of trees and shrubs. The proposed staging and work activities would not disrupt the recreational use of Kensico Reservoir. Concrete repairs would be completed within the Catskill Inflow Chamber building and on the reservoir side of the weir. There is limited shoreline access surrounding the Catskill Inflow Chamber due to the connection of the Catskill Aqueduct. As DEP Recreation Rules state, no access is permitted within 500 feet of any dikes, dams, tunnel outlets, spillways, buildings and other significant water supply structures (Watershed Rules and Regulations Part 16-15(b)(1)).

As discussed in Section 9.16.4.8, “Noise,” the repair and rehabilitation work activities would temporarily increase noise levels that may discourage fishing or other recreational uses of Kensico Reservoir. However, given the restricted area around the Catskill Inflow Chamber, the construction noises audible to recreational users would be diminished. Kensico Reservoir and its

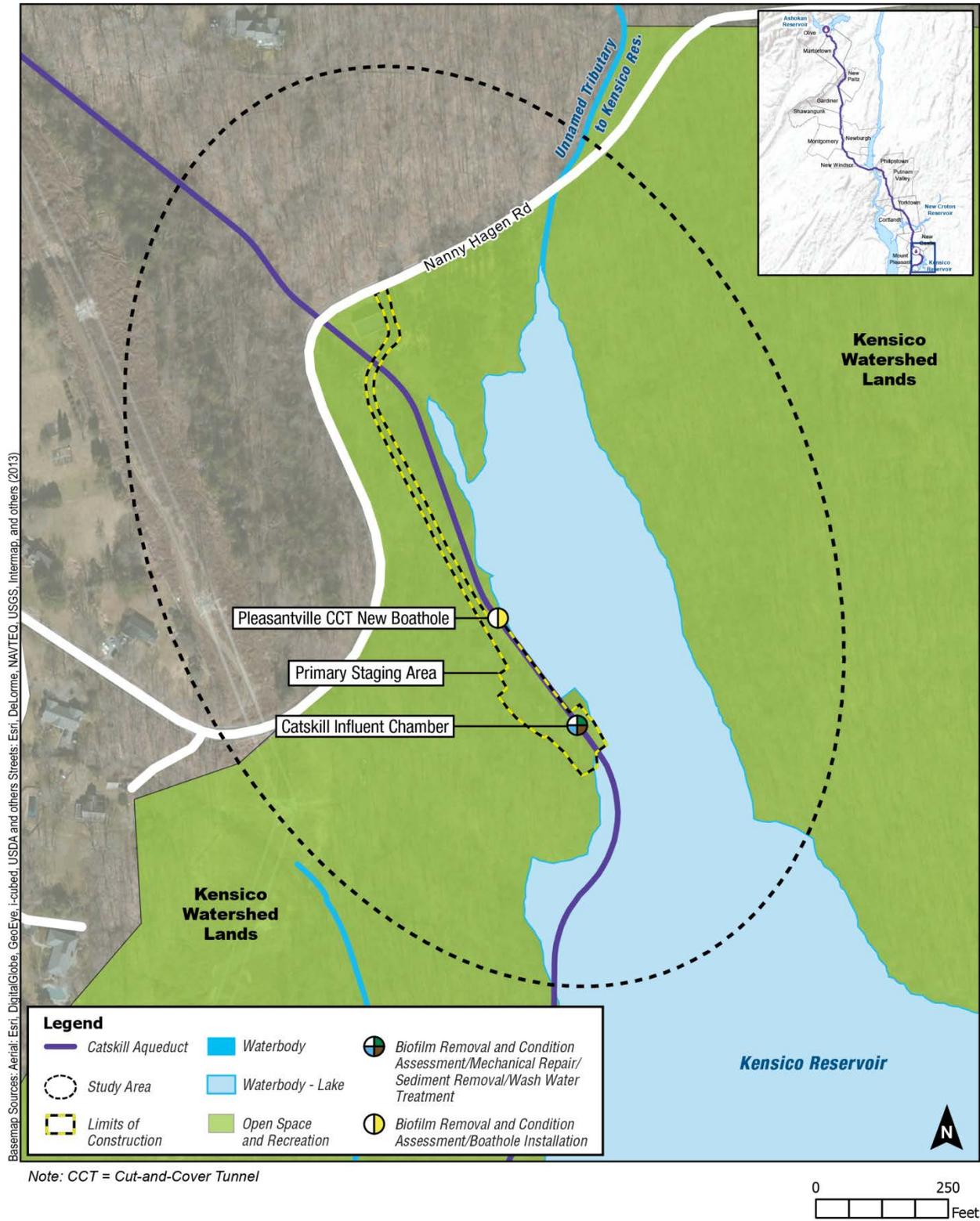


Figure 9.16-21: Open Space and Visual Resources – Nanny Hagen Road Study Area



watershed lands do not contain noise-sensitive receptors, as there are no maintained formal trails. Furthermore, the majority of construction would take place during the three, 10-week shutdowns in the fall. This would have minimal overlap with the peak fishing and boating activities during summer months.

Following repair and rehabilitation, all equipment would be removed from the Nanny Hagen Road Study Area. The staging area would be restored to baseline conditions. The new boathole at the Catskill Influent Chamber is a permanent structure that would remain. Following the repair and rehabilitation, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not disrupt recreational use of adjacent open spaces.

As such, the repair and rehabilitation would not encroach upon, cause a loss of open space, or impact the use or physical character of Kensico Reservoir.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Nanny Hagen Road Study Area.

9.16.4.4 Visual Resources

The study area for the visual resources analysis is the area within the Nanny Hagen Road Study Area. It also includes view corridors that extend beyond the study area based on the locations that are publicly accessible, as required.

As shown on **Figure 9.16-21**, Kensico Reservoir and its surrounding watershed lands, a locally significant visual resource, was identified within the Nanny Hagen Road Study Area.

As noted above, Kensico Reservoir provides recreational shoreline fishing and non-motorized boat fishing to the public, with a DEP watershed access permit and fishing license. Kensico Reservoir is almost completely surrounded by heavily forested watershed lands. The Catskill Influent Chamber is located within a cove in the northern portion of the reservoir. Views towards the Catskill Influent Chamber are largely blocked by the dense vegetation from the main part of the reservoir. Views of the Catskill Influent Chamber exist only within the cove. The cove is not located within deep water or identified areas of fish concentration that would draw recreational fishing, nor is it accessible to the public. There is limited shoreline access surrounding the Catskill Influent Chamber due to the connection of the Catskill Aqueduct and DEP Recreation Rules.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Nanny Hagen Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Nanny Hagen Road Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities would be short-term (totaling 94 weeks over 3 years; see **Table 9.16-10**). While some tree removal is required for the access

road, this would not greatly detract from the aesthetics of the area because the staging area would be adjacent to the existing Catskill Influent Chamber. Concrete repairs would be completed within the chamber building and on the reservoir side of the weir. Given the security restrictions at the site, there would be limited views of these work activities at the Catskill Influent Chamber from the nearest vantage point within the reservoir.

Following construction, all equipment would be removed from the Nanny Hagen Road Study Area. The boathole at the Catskill Influent Chamber is a permanent structure that would remain. Following the repair and rehabilitation work activities within the Nanny Hagen Road Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions. It would not result in changes to the future visual and aesthetic resource conditions of the views to Kensico Reservoir.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Nanny Hagen Road Study Area.

9.16.4.5 Natural Resources

The study area for the natural resources analysis is the area surrounding the limits of construction, including the Catskill Influent Chamber (see **Figure 9.16-22**). The natural resources study area includes a small portion of Kensico Reservoir because concrete repairs would occur on the reservoir side of the weir. The general ecology of the natural resources study areas was analyzed based on field visits conducted on October 7, 2014 and August 17, 2015. Habitat in the natural resources study area consists of an unpaved road/path with adjacent Appalachian oak-hickory forest.

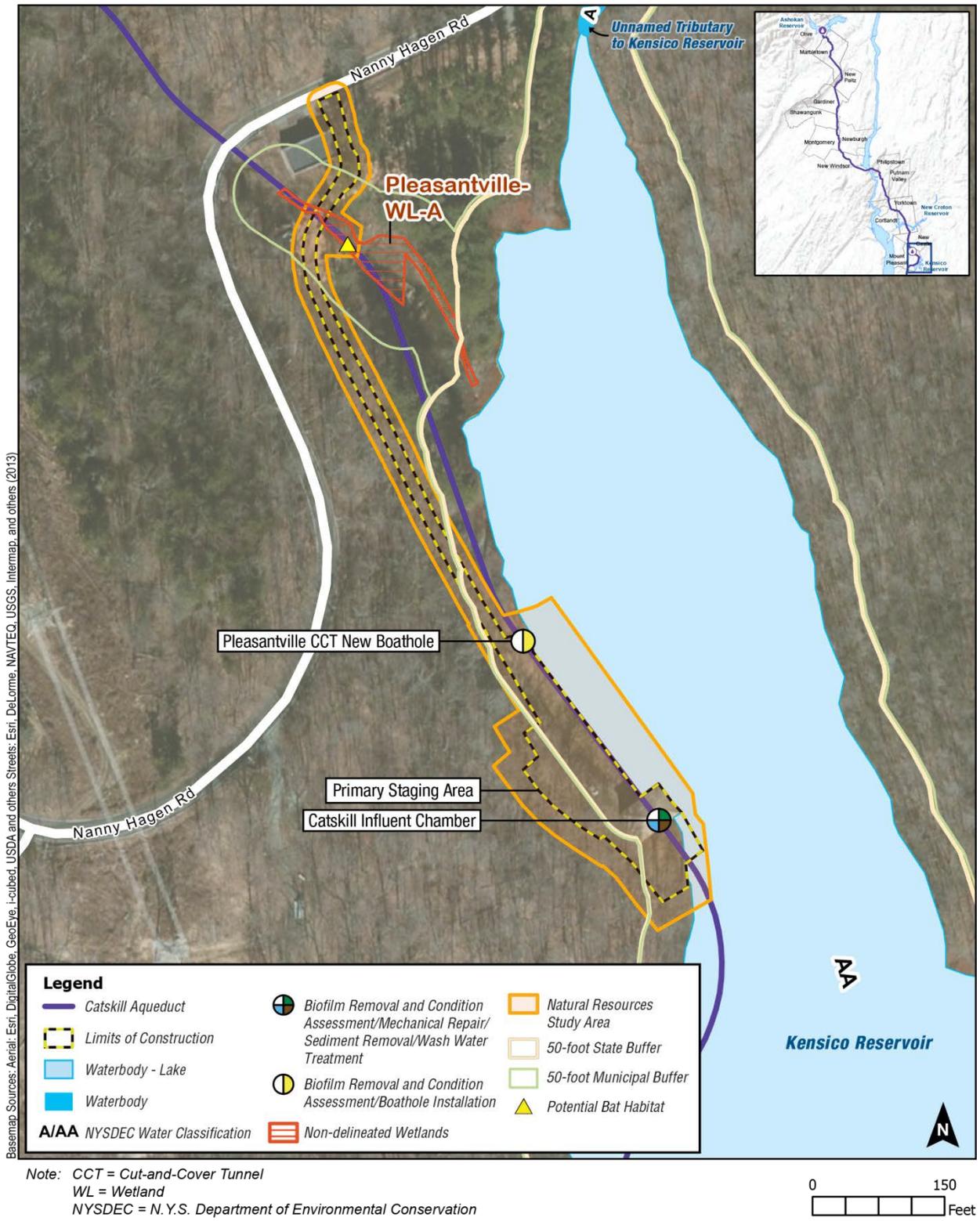
Small communities of red maple swamp and shallow emergent marsh intersect the natural resources study area.

These habitats have the potential to support protected water resources, terrestrial resources, and aquatic and benthic resources, and an analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the Kensico Reservoir subwatershed (HUC 020301020101) of the Bronx watershed (HUC 02030102).

Kensico Reservoir and on-site wetlands are subject to federal jurisdiction under Sections 401 and 404 of the Clean Water Act. As a Class AA waterbody, Kensico Reservoir is also subject to State Protection of Waters regulations with a regulated 50-foot buffer. In addition, the Town of Mount Pleasant regulates activities within wetlands and waters with a regulated 50-foot buffer (Mount Pleasant Town Code Chapter 111: Freshwater Wetlands), and has jurisdiction over activities within floodplains (Mount Pleasant Town Code Chapter 108: Flood Damage Prevention). Reservoirs are defined as watercourses under the Freshwater Wetlands town code. Therefore, work activities in and along the on-site wetland, Kensico Reservoir, and its floodplain



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.16-22: Natural Resources - Nanny Hagen Road Study Area



are anticipated to require town review and approval. Because reservoirs do not have flowing water, the “Streams and Watercourses” town code would not be applicable (Mount Pleasant Town Code Chapter 185).

Surface Water

Water resources were delineated on August 17, 2015. The water resource name, area, length, and classification are shown in **Table 9.16-11**.

Table 9.16-11: Water Resources and Classifications within the Nanny Hagen Road Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Kensico Reservoir	16,080	460	Lacustrine, Littoral, Unconsolidated Shoreline, Sand (L2US2)
Pleasantville-WL-A	1,130	NA	Palustrine Emergent Marsh (PEM1)

Kensico Reservoir

Kensico Reservoir is part of the City’s Public Water Supply system. Kensico Reservoir is approximately 2,145 acres in size with a maximum depth of 144 feet. The study area borders the northwestern shore of Kensico Reservoir (see **Figure 9.16-22**). A narrow cove of Kensico Reservoir abuts and is partially included in the natural resources study area on its eastern side. The weir of the Catskill Influent Chamber represents a hardened shoreline in the eastern portion of the natural resources study area. As listed in **Table 9.16-11**, the reservoir is best classified as a “Lacustrine, Littoral, Unconsolidated Shoreline, Sand” system based on the Cowardin System (Cowardin et al. 1979).

Wetlands

Wetlands were assessed on August 17, 2015, but not delineated.

Pleasantville-WL-A

There are no NWI or NYSDEC-mapped wetlands in the vicinity of the study area. However, a small, predominantly shallow emergent marsh was identified bisecting the access road in the natural resources study area, at the bottom of a steep slope formed at the s-curve of Nanny Hagen Road. The wetland is dominated with non-native species such as reed canary grass (*Phalaris arundinacea*), and there are small pockets of native species such as spotted touch-me-not (*Impatiens capensis*), sensitive fern, and sedges.

As listed in **Table 9.16-11**, the non-delineated wetland is best classified as a “Palustrine Emergent Marsh” system based on the Cowardin System (Cowardin et al. 1979).

Floodplains

The FEMA Federal Insurance Rate Map (FIRM) number 36119C0276F, September 28, 2007, was reviewed. As shown on **Figure 9.16-23**, a FEMA designated 100-year floodplain (Zone A)

is present around Kensico Reservoir, which depicts areas subject to inundation by the one percent Annual Chance Flood. Zone A Special Flood Hazard Areas are generally determined using approximate methods. Areas within Zone A are within the Special Flood Hazard Area and are subject to local floodplain management regulations. There are no FEMA designated floodways in this study area.

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no projects or developments are anticipated within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that future conditions of water resources within the study area would be the same as baseline conditions.

Analysis of Potential Effect

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Nanny Hagen Road Study Area.

Construction

Work activities related to the repair and rehabilitation would take place within Kensico Reservoir and the regulated buffer for surface water and wetlands. Construction would be conducted in accordance with applicable in-water work windows, which are anticipated to prohibit in-water work from September 15 through June 30, or as otherwise authorized. Appropriate protective measures including, but not limited to temporary sediment and erosion control measures, a turbidity curtain or other controls, that would be installed and maintained during construction.

Prior to commencing the repair and rehabilitation, an existing fish barrier would be inspected prior to any in-water work and would remain in place during construction. Additionally, a temporary turbidity curtain would be installed around the in-water construction area. To prevent sediment and other pollutants from entering the waterbody, temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements.

Work activities related to the repair and rehabilitation would encroach upon the Special Flood Hazard Area of Kensico Reservoir. These activities would include temporary construction staging activities. The boathole installation would require minor soil excavation, subsurface work, and the placement of a concrete cap, which would have minor encroachment on the Special Flood Hazard Area and would not change base flood elevations. The access improvements at Nanny Hagen Road, however, may require tree removal and would be conducted outside the Special Flood Hazard Area. DEP would coordinate with the Town of Mount Pleasant and FEMA, as necessary, to comply with all floodplain management requirements.

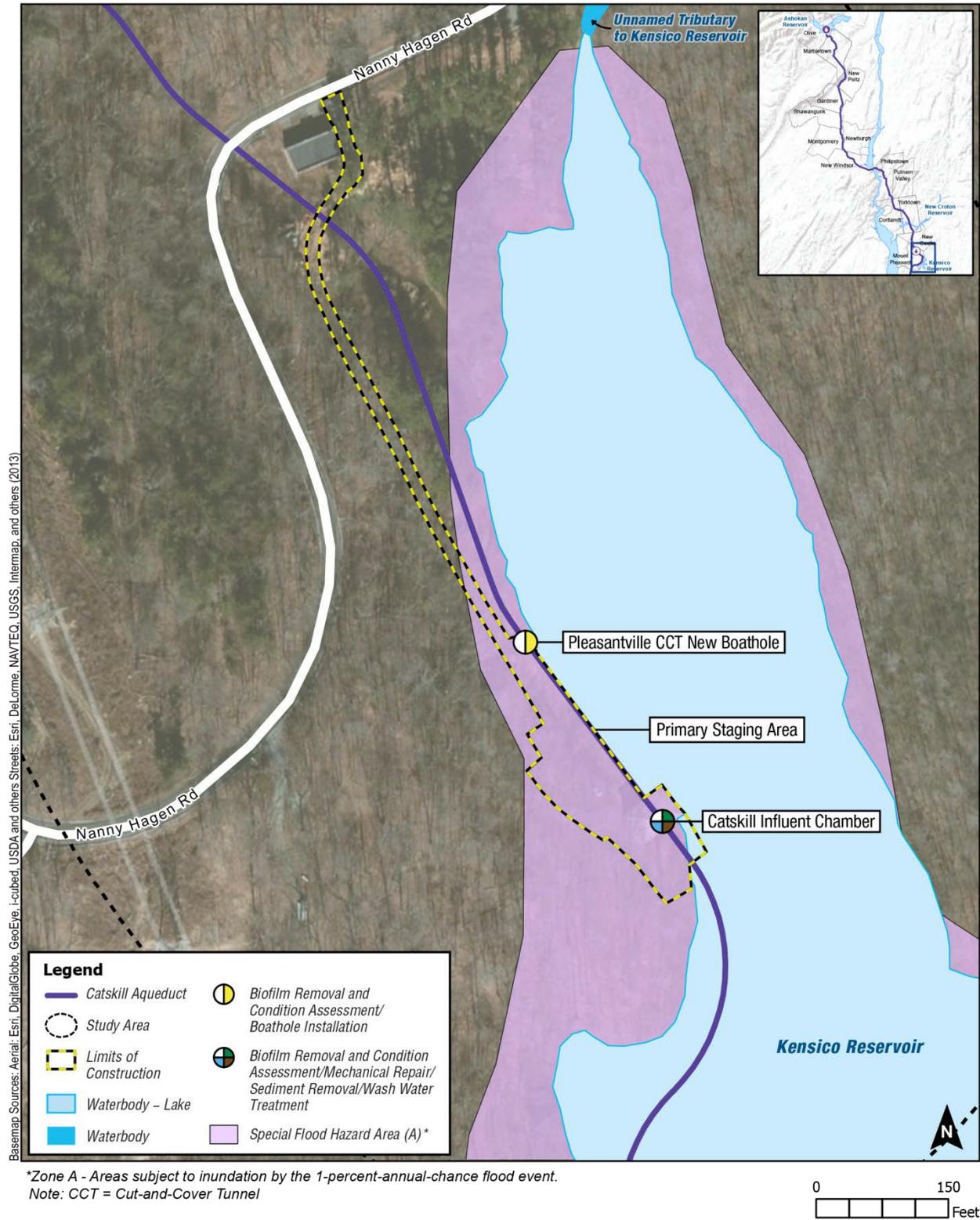


Figure 9.16-23: Floodplain – Nanny Hagen Road Study Area



Concrete repairs in the Catskill Influent Chamber would be conducted when the aqueduct is unwatered. During the first 10-week shutdown, water would remain in this section of the aqueduct and barriers with bypass pumping would be employed to create a dry work segment. A temporary drawdown of Kensico Reservoir could occur during fall ~~2018~~2017 to assist in facilitating repairs and rehabilitation of the weir and the Catskill Influent Chamber. The temporary drawdown would lower the reservoir to approximately 353 feet (North American Vertical Datum of 1988 [NAVD 88]) and last approximately 30 days. The drawdown would be within the normal operating range of water surface elevations within the reservoir. Should a drawdown not be feasible during construction, divers would conduct all in-water work with the appropriate protection measures in place.

Anticipated temporary and permanent disturbance to water resources and regulated buffers were quantified (see **Table 9.16-12**). In-water work to complete concrete repairs would temporarily disturb 5,870 square feet within Kensico Reservoir. No permanent disturbance to Kensico Reservoir would occur. Approximately 16,550 square feet of temporary disturbance and 1,840 square feet of permanent disturbance would occur within the 50-foot buffer for State Protection of Waters. Additionally, 17,260 square feet would be temporarily disturbed, and 2,950 square feet would be permanently disturbed within the municipal water resources buffer. Work activities would also result in 60 square feet of temporary effects along the access road and up to 80 square feet of permanent disturbance to Wetland Pleasantville-WL-A due to access road improvements. Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native vegetation. Permanent disturbance is further analyzed in Section 9.19, “Project-wide Impact Analysis.”

The Catskill Influent Chamber has been identified as a potential discharge point for treated wash water. No biofilm would be discharged to the surface water. Treated wash water would be discharged in accordance with applicable regulatory requirements. In the event alum is added as part of the treatment process, flocculated particles would primarily settle prior to treated wash water being discharged to the reservoir. Given the short-term, temporary nature of the discharges (approximately 10 weeks), discharges to Kensico Reservoir are not anticipated to cause significant adverse impacts to surface water from the collection and discharge of treated wash water.

Temporary Chlorination

Following construction, temporary chlorination of the Catskill Aqueduct would occur from 2019 through 2023. Aqueduct water would be treated at the dechlorination facility at Pleasantville Alum Plant to remove chlorine residuals (see Pleasantville Alum Plant Study Area in the Village of Pleasantville) and discharged to Kensico Reservoir in accordance with applicable regulatory requirements.

Table 9.16-12: Estimated Disturbance to Water Resources within the Nanny Hagen Road Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Kensico Reservoir	16,080	5,870 <i>Concrete repairs</i>	0
Pleasantville-WL-A	1,130	60 <i>Construction equipment use</i>	80 <i>Access road improvements</i>
50-foot State Protection of Waters Buffer	23,940	16,550 <i>Construction staging area and construction equipment use</i>	1,840 <i>Access road improvements</i>
Water Resource Municipal Buffer	29,430	17,260 <i>Construction staging area and construction equipment use</i>	2,950 <i>Access road improvements</i>

Operation

Once the Catskill Aqueduct returns to typical operations in 2023, discharges of dechlorinated water to Kensico Reservoir would cease and aqueduct flow to Kensico Reservoir in the study area would be consistent with baseline conditions.

Water Resources Conclusions

Repair and rehabilitation would result in temporary disturbance to Kensico Reservoir and adjacent wetlands. Minor grading and some clearing within the regulated buffer of Kensico Reservoir and the adjacent wetland may be needed, but this area is minor in comparison to the total area of Kensico Reservoir. While the majority of work activities would result in temporary disturbance, minor permanent disturbance would occur as part of work activities. DEP would coordinate with the Town of Mount Pleasant and FEMA, as necessary, to comply with all floodplain management requirements. Discharges of treated biofilm wash water would be limited to approximately 10 weeks in ~~2020~~2019 during the third 10-week shutdown. Following construction, temporarily disturbed areas would be restored to natural conditions.

The dechlorination facility at the Pleasantville Alum Plant Study Area would treat the full flow of the aqueduct so that chlorine residuals are undetectable, and all discharges to Kensico Reservoir would meet regulatory requirements. Once the Catskill Aqueduct returns to typical operations in 2023, the chlorination facility at the Ashokan Screen Chamber would not be operated, and accordingly, operation of the dechlorination facility would no longer be needed. Discharges of dechlorinated water to Kensico Reservoir would cease and aqueduct flow to Kensico Reservoir in the study area would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Nanny Hagen Road Study Area.

Aquatic and Benthic Resources

Aquatic and benthic resources within Kensico Reservoir are similar to those found in lakes and reservoirs across the State. There is marginal aquatic habitat within the natural resources study area due to the hardened shoreline at the Catskill Influent Chamber weir.

The NYSDEC conducted gill net surveys on Kensico Reservoir between 1990 and 2010 (NYSDEC 2009), and DEP conducted electrofishing surveys in 1995 at Whipoorwill Brook, a tributary to Kensico Reservoir east of the natural resources study area. DEP also collected benthic macroinvertebrates from Kensico Reservoir in the vicinity of the natural resources study area in 2007 and 2014. The results of these surveys are provided below, along with an analysis of how these communities could change in the future with and without the repair and rehabilitation activities.

Alewife (*Alosa pseudoharengus*) was the most abundant species collected from Kensico Reservoir during the 1990 to 2010 NYSDEC gill net surveys, followed by yellow perch (*Perca flavescens*), lake trout (*Salvelinus namaycush*), smallmouth bass (*Micropterus dolomieu*), and brown trout (*Salmo trutta*). These comprise the five most abundant species collected (see **Table 9.16-13**).

Table 9.16-13: Relative Fish Species Abundance in Kensico Reservoir

Common Name	Scientific Name	Abundance Ranking ¹
Alewife	<i>Alosa pseudoharengus</i>	1
Yellow Perch	<i>Perca flavescens</i>	2
Lake Trout	<i>Salvelinus namaycush</i>	3
Smallmouth Bass	<i>Micropterus dolomieu</i>	4
Brown Trout	<i>Salmo trutta</i>	5
Largemouth Bass	<i>Micropterus salmoides</i>	6
Rock Bass	<i>Ambloplites rupestris</i>	7
Yellow Bullhead	<i>Ameiurus natalis</i>	8
Rainbow Trout	<i>Oncorhynchus mykiss</i>	9
Redbreast Sunfish	<i>Lepomis auritus</i>	10
Note: ¹ Ranking of 1 denotes most abundant species, and 10 denotes the 10 th most abundant species. Source: NYSDEC Fisheries Files; May 1990 to September 2010. Based on 7 sampling events.		

Electrofishing sampling conducted by DEP in 1995 in Whipoorwill Brook, which is north and south of the Nanny Hagen Road culvert, yielded a fish community assemblage more typical of a warmwater stream. Small schooling fish such as eastern blacknose dace (*Rhinichthys atratulus*) as well as crayfish and other macroinvertebrate species were collected or observed, indicating the stream provides habitat to aquatic biota. The most abundant species collected was eastern blacknose dace with brown trout being the second most common species collected (see **Table 9.16-14**). The brown trout likely originate from the reservoir and swim upstream in an attempt to spawn, forage, or find cooler waters.

Table 9.16-14: Fish Collected in 1995 Whipoorwill Brook Electrofishing Survey

Common Name	Scientific Name	Number Collected
North of Nanny Hagen Road		
Eastern blacknose dace	<i>Rhinichthys atratulus</i>	24
Bluegill	<i>Lepomis macrochirus</i>	1
Brown bullhead	<i>Ameiurus nebulosus</i>	1
Brown trout	<i>Salmo trutta</i>	12
Creek chub	<i>Semotilus atromaculatus</i>	2
Johnny darter	<i>Etheostoma nigrum</i>	2
South of Nanny Hagen Road		
Eastern blacknose dace	<i>Rhinichthys atratulus</i>	2
Bluegill	<i>Lepomis macrochirus</i>	2
Brown bullhead	<i>Ameiurus nebulosus</i>	2
Brown trout	<i>Salmo trutta</i>	3
Golden shiner	<i>Notemigonus crysoleucas</i>	1
Source: DEP Electrofishing Survey, 2009		

DEP also collected macroinvertebrate ponar grab sampling from the cove adjacent to the natural resources study area in April and July 2007, and July 2014, between water depths of 5 and 10 feet. Overall, the results of the 2007 and 2014 benthic sampling demonstrated a diverse community that is relatively similar to other large, soft-bottom lakes and reservoirs in the region. Organisms included chironomids, the amphipod genera *Gammarus* and *Diporeia*, as well as oligochaetes and fingernail clams from the family Pisidiidae.

Based on available datasets, the communities within and near the natural resources study area support a warmwater fishery with a diverse macroinvertebrate community.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated within the natural resources study area within the timeframe of the impact analysis. Changes to fish and benthic invertebrate communities due to normal population fluctuations and seasonal habitat are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that aquatic and benthic resources within the Nanny Hagen Road Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities associated with the concrete repairs would take place within Kensico Reservoir. They may include a temporary drawdown of the reservoir to facilitate these repairs. Construction would be conducted in accordance with applicable in-water work windows or as otherwise authorized for Kensico Reservoir, which is designated as supporting trout, trout spawning, and a warmwater fishery. As a result of these designations, in-water work could be prohibited from September 15 through June 30. Concrete repairs at this site would require access to the aqueduct’s interior and in-water work while the aqueduct is shut down. However, due to DEP’s water supply restrictions, the shutdown of the

Catskill Aqueduct and completion of these work activities may need to occur within the restricted period. Therefore, appropriate protective measures, including a turbidity curtain, would be installed prior to the start of the in-water prohibition period. All protective measures would be maintained during construction.

The existing fish barrier at the Catskill Influent Weir would remain in place during construction and a temporary turbidity curtain would be installed around the construction area. Fish would be excluded from the work area during construction by these barriers. Because the concrete repairs would take place when the aqueduct is shut down, there would be little to no flow at the work site and no turbidity is anticipated to be generated that could affect aquatic and benthic resources.

Work activities in the natural resources study area may require a temporary drawdown of Kensico Reservoir approximately 2 feet lower than the maximum water surface elevation of 355 feet, to an elevation of 353 feet (NAVD 88). The temporary drawdown would be within the typical operating range for the reservoir, and would last approximately one month during fall ~~2020~~2019. The 2-foot drawdown would briefly expose the Catskill Influent Chamber weir to facilitate the concrete repairs and facilitate the manhole abandonment at the Westlake Drive Study Area. The lowered water levels would be experienced at the Catskill Influent Chamber and along the reservoir's perimeter, and would temporarily expose substrate. However, the drawdown would occur during the period of lowest water supply demand (October through March). Due to this timing, there would be no impact to fish spawning since shoreline-spawning species such as bass and sunfish spawn earlier in the year (May through July).

Kensico Reservoir's water surface elevation remains relatively constant year-round. Seasonal fluctuations in the surface water elevations typically range between 353 and 355 feet. Because the temporary drawdown during construction would be within the normal operating range of water surface elevations at Kensico Reservoir, any effects on fish and benthic communities would be consistent with baseline conditions. Effects are expected to be localized, short-term, and minimal, with full recovery expected for both fish and invertebrates. Fish and mobile invertebrates would be expected to move to deeper waters as water levels gradually lower. Some loss of sessile invertebrates could occur as these immobile communities become stranded along the exposed shoreline. However, the reservoir populations would not be adversely affected, as these communities would be expected to fully recover by the following spring. Due to the relatively short duration of the drawdown, any loss of the benthic community would be minimal. It would be unlikely that fish would be stranded in isolated pools as a result of the drawdown because the rate of the drawdown would be very gradual over the course of a few days. Once the work is complete, fish would move back into shallow areas immediately and invertebrates would repopulate the substrate within a few months.

Should a temporary drawdown not be feasible during construction, divers would conduct all in-water work with the appropriate protection measures in place. These potential impacts to aquatic and benthic resources would not exist.

Additionally, the Catskill Influent Chamber has been identified as a potential wash water treatment point for the repair and rehabilitation. Biofilm wash water would be treated to meet acceptable water quality standards for reuse in the treatment removal or for discharge to Kensico Reservoir. No biofilm would be discharged to the surface water. Due to the low flow and

short-term, temporary nature of the discharges (approximately 10 weeks), discharges to Kensico Reservoir are not anticipated to cause turbidity, affect water temperatures, or affect reservoir substrate.

Following construction, temporary chlorination of the Catskill Aqueduct would occur from 2019 through 2023. Dechlorinated aqueduct water that would be temporarily discharged to the Kensico Reservoir would be conducted in accordance with applicable regulatory requirements. Once the Catskill Aqueduct returns to typical operations in 2023, discharges of dechlorinated water to Kensico Reservoir would cease and aqueduct flows to Kensico Reservoir in the study area would be consistent with baseline conditions.

Appropriate protective measures would be in place and maintained while undertaking all in-water work. The aqueduct shutdowns and work activities that may need to occur within the restricted in-water work window would be balanced with measures to protect these aquatic resources. This, in conjunction with the flexibility to conduct work during the in-water work window as needed, would allow the construction of the repair and rehabilitation to be completed prior to the RWBT temporary shutdown and would reduce the overall timeframe for in-water work.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to aquatic and benthic resources within the Nanny Hagen Road Study Area.

Terrestrial Resources

The natural resources study area contains an unpaved road/path with an adjacent Appalachian oak-hickory forest community. The oak-hickory forest community consists of pignut hickory (*Carya glabra*), sugar maple (*Acer saccharum*), black cherry (*Prunus serotina*), black oak (*Quercus velutina*), shagbark hickory (*Carya ovata*), and black locust (*Robinia pseudoacacia*). Minor tree removal may be necessary as part of access road improvements. The Town of Mount Pleasant regulates removal of trees at least 4 inches in dbh (Mount Pleasant Town Code Chapter 201: Trees). Therefore, the repair and rehabilitation may be subject to town review and approval.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Nanny Hagen Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the study area would be the same as baseline conditions.

Work activities associated with the repair and rehabilitation would include minor tree clearing and shrub removal for the purpose of improving site access. At the Nanny Hagen Road Study Area, two trees, a shagbark hickory with a dbh of 5.5 inches and a black locust with a dbh of 8.5 inches may be removed. Tree removal would be limited to a few select trees, and would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Additionally, tree removal would be conducted on DEP property and in accordance with applicable requirements set forth by the Town of Mount Pleasant. These trees are located adjacent to the existing Catskill Aqueduct, and

represent minor tree removal that would not dramatically change the character of the area or affect surrounded trees. Given the density of the surrounding forest community, no tree replacement is warranted. Maintaining this access road would facilitate access to the aqueduct for future maintenance and minimize the risk of root infiltration to the adjacent aqueduct tunnel.

Following construction, all equipment would be removed from the study area, and the staging area would be restored to natural conditions. Vegetated areas temporarily cleared during construction are anticipated to grow back with similar conditions. Following the repair and rehabilitation, operation of the Catskill Aqueduct would be consistent with baseline conditions, and natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Nanny Hagen Road Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected within the study area, species that could occur up to 0.25 mile from the work site were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” eight species were identified to have the potential to be affected by the repair and rehabilitation within the natural resources study areas. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these eight species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.16-15**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and observations during field visits, as applicable.

Table 9.16-15: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Nanny Hagen Road Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Bog Turtle	<i>Clemmys</i> [= <i>Glyptemys</i>] <i>muhlenbergii</i>	Threatened	Endangered	During an initial field visit it was determined that a Phase I habitat assessment was not warranted. Bog turtle habitat does not occur within the study area. The site is lower gradient, but is not consistent with habitat requirements for bog turtles. Although this site contains larger, more complex wetlands, they do not originate in springs or occur in level pockets with the deep muck substrate preferred by bog turtles. Kensico Reservoir has very limited vegetated shallows and/or littoral zone and would not be conducive as bog turtle habitat. Therefore, there are no effects anticipated and no further analysis for bog turtles is warranted for this study area.	No
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and August 17, 2015. Work activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, as a highly mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work site during construction. Finally, upon construction completion, the staging area would be restored to natural conditions and the new boathole that remains would not affect breeding, nesting, or foraging habitat. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Marbled Salamander	<i>Ambystoma opacum</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and August 17, 2015. Potential habitat exists within the wetland area. However, no disturbance to wetlands would occur. Upon construction completion, the staging areas would be restored to natural conditions and the new boathole that remains would not affect salamander habitat. Therefore, there are no effects anticipated and no further analysis for marbled salamanders is warranted for this study area.	No

Table 9.16-15: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Nanny Hagen Road Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Birds					
Bald Eagle	<i>Haliaeetus leucocephalus</i>	BGPA/ MBTA	Threatened	No individuals were incidentally observed during the field visits on October 7, 2014 and August 17, 2015. Potential roosting and foraging habitat exists in and adjacent to study area along Kensico Reservoir. Nest attempts were established along Kensico Reservoir (more than 10,500 feet [2 miles] southeast of the work site) in 2014 and 2015. However, recommended buffer restrictions of 330 and 660 feet, for USFWS and DEP, are not applicable since these are not active nests. Temporary noise could discourage Bald Eagles from nesting in the immediate vicinity of the work site; however, this work would not occur over an extended period of time and there is abundant suitable habitat in the surrounding areas. Prior to construction, the areas adjacent to the work site would be checked for nesting eagles. Therefore, there are no effects anticipated and no further analysis for Bald Eagles is warranted for this study area.	No
Osprey	<i>Pandion haliaetus</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and August 17, 2015. Potential foraging and roosting habitat includes Kensico Reservoir but Osprey foraging covers large areas and they likely use the entire reservoir and shoreline as well as more distant waterbodies. Ospreys are not known to nest in or near the study area. Therefore, there are no effects anticipated and no further analysis for Ospreys is warranted for this study area.	No
Sharp-shinned Hawk	<i>Accipiter striatus</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and August 17, 2015. Potential nesting and foraging habitat and potential stop over habitat (resting and foraging) for migrating Sharp-shinned Hawks exists in the study area; however, construction activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the work site, a variety of habitats would be available for the species' use in the vicinity during construction. Therefore, there are no effects anticipated and no further analysis for Sharp-shinned Hawks is warranted for this study area.	No

Table 9.16-15: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Nanny Hagen Road Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	A tree survey, conducted on August 17, 2015, identified a potential bat roosting tree. The presence of adjacent forest areas and a potential roost tree within the survey area indicate potential summer habitat within the forested areas of the study area. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened Unlisted	A tree survey, conducted on August 17, 2015, identified a potential bat roosting tree. The presence of adjacent forest areas and a potential roost tree within the survey area indicate potential summer habitat within the forested areas of the study area. The Catskill Influent Chamber building may also provide suitable roosting habitat. Therefore, further analysis is warranted for this study area.	Yes. See further analysis below.
Notes: BGPA: Bald and Golden Eagle Protection Act MBTA: Migratory Bird Treaty Act					

Indiana Bat (Myotis sodalis)

A tree survey was conducted in the study area on August 17, 2015. One potential bat roosting tree, a shagbark hickory, was identified. The presence of adjacent forested areas and a potential roost tree within the survey area indicate that potential summer habitat exists within the forested areas of the study area.

Repair and rehabilitation work activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct and would be localized and confined to the immediate vicinity of the Catskill Influent Chamber. Repair and rehabilitation requires tree removal, which would be conducted from November 1 through March 31 to avoid impacts to Indiana bats. Repair and rehabilitation would not result in significant loss or modification of forested habitat for roosting Indiana bats. Potential effects to wetlands and Kensico Reservoir would be avoided to the extent possible, and foraging habitat would continue to be available in the canopy within the study area and in adjacent forested areas. There may be temporary noise that discourages Indiana bats from roosting in the immediate vicinity of the work site. However, there is abundant suitable habitat in the surrounding areas within which Indiana bats could roost. Construction lighting would be used as needed during the 10-week shutdowns, and because these would occur between October and March, it would be unlikely that bats would be in the area and, therefore, no disturbance from nighttime lighting is anticipated. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect Indiana bats in this study area.

Northern Long-eared Bat (Myotis septentrionalis)

The Catskill Influent Chamber is a man-made structure located at the southern extent of the natural resources study area that could be used by as a roosting site by northern long-eared bats. Northern long-eared bats are more commonly known to roost in trees (see the potential roosting habitat results for Indiana bats, above).

Repair and rehabilitation work activities would predominantly occur on previously disturbed areas along the Catskill Aqueduct and would be localized and confined to the immediate vicinity of Catskill Influent Chamber. Repair and rehabilitation requires minor tree removal, which would be conducted from November 1 through March 31 to avoid impacts to northern long-eared bats. Repair and rehabilitation would not result in significant loss or modification of forested habitat for roosting northern long-eared bats. The chamber building would be used for access to the aqueduct during the repairs and aqueduct shutdowns, similar to baseline conditions, and would not be structurally altered. Should any bats or their guano be observed within these structures during work activities, USFWS and NYSDEC would be contacted immediately to determine the best course of action. Potential effects to wetlands and the Kensico Reservoir would be avoided to the extent possible, and foraging habitat would continue to be available in the canopy within the study area and in adjacent forested areas. There may be temporary noise that discourages northern long-eared bats from roosting in the immediate vicinity of the work site; however, there is abundant suitable habitat in the surrounding areas within which northern long-eared bats could roost. Construction lighting would be used as needed during the 10-week shutdowns, and because these would occur between October and March, it would be unlikely that bats would be in the area and, therefore, no disturbance from nighttime lighting is

anticipated. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect northern long-eared bats in this study area.

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to bog turtles (*Clemmys [=Glyptemys] muhlenbergii*), eastern box turtles (*Terrapene carolina*), marbled salamanders (*Ambystoma opacum*), Bald Eagles (*Haliaeetus leucocephalus*), Ospreys (*Pandion haliaetus*), or Sharp-skinned Hawks (*Accipiter striatus*) associated with the repair and rehabilitation. Repair and rehabilitation may affect, but is not likely to adversely affect, Indiana bats and northern long-eared bats.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Nanny Hagen Road Study Area.

9.16.4.6 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Nanny Hagen Road Study Area, a Phase I ESA was conducted in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify RECs. The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work site, including an environmental health and safety sampling, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Based on the Phase I ESA investigation within this study area, there was no indication of an environmental impact that would constitute a REC as defined by the ASTM standard that would affect activities in the study area. Additionally, there is no history of contamination at or in the vicinity of the Nanny Hagen Road Study Area where repair and rehabilitation work activities would be located.

Sampling activities were also undertaken of items suspected of containing asbestos and lead in the study area that would be affected as part of the repair and rehabilitation. The legacy data revealed that asbestos-containing materials are presumed to be present on the ceiling beams of the Catskill Influent Chamber building. Additionally, lead-containing paint was found to be present on the metal gates, ladder, and hoist in the Catskill Influent Chamber building. Materials sampled did not identify polychlorinated biphenyls containing paint or mercury-containing paint. Given the findings of previous subsurface investigation along similar portions of the Catskill Aqueduct corridor, no subsurface ground contamination is anticipated.

The legacy data also revealed that the Catskill Kensico Bypass Tunnel contains sediment with high levels of alum flocculent that has accumulated on the bypass tunnel invert between the Catskill Influent Chamber and the Kensico Upper Effluent Chamber.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Nanny Hagen Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Nanny Hagen Road Study Area would be the same as baseline conditions.

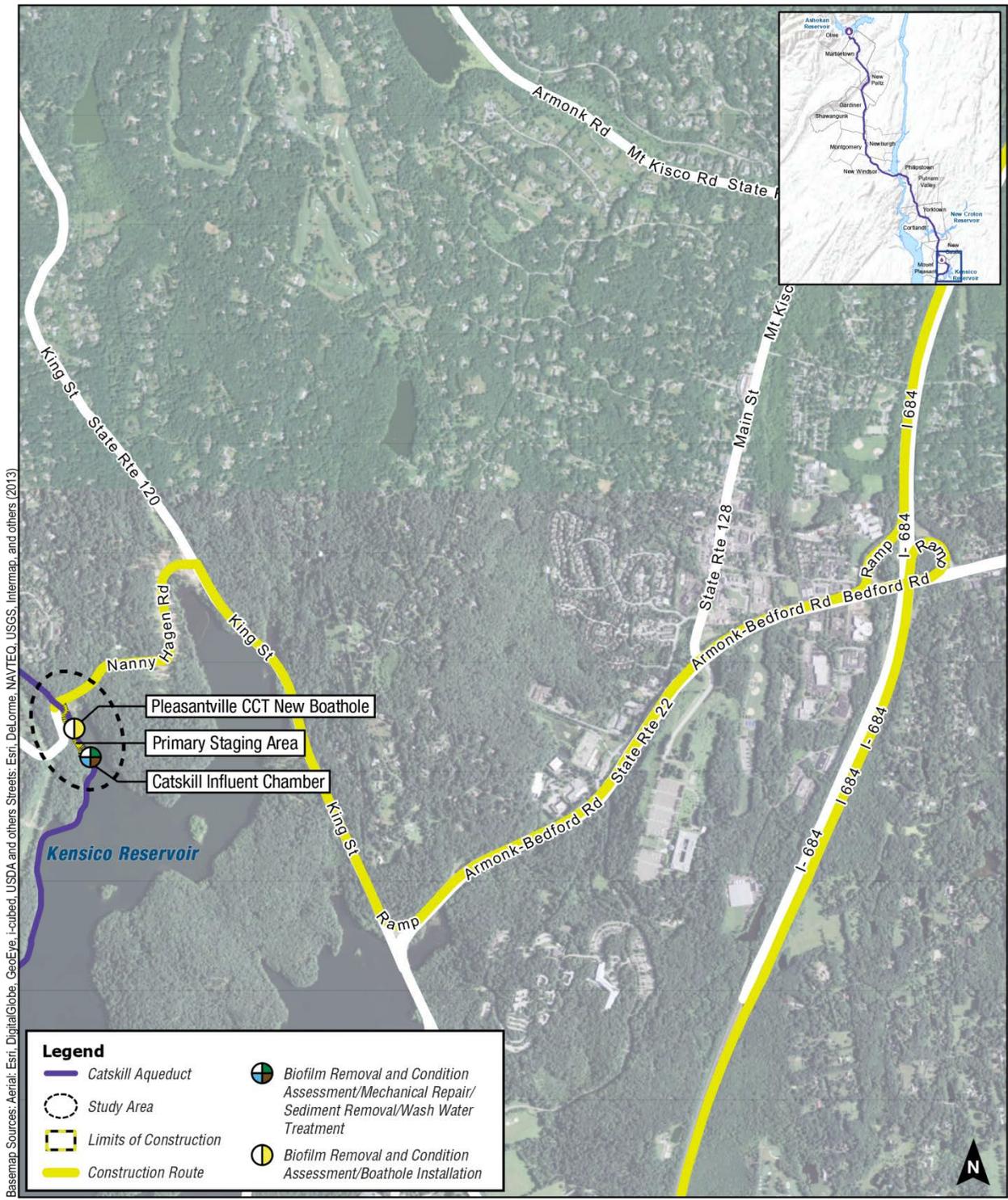
In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals. Additionally, wash water treatment would occur in the study area. DEP would handle all materials in accordance with applicable federal, State, and local regulations and guidelines. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, excavation associated with the work activities for installation of a new boathole would occur on previously disturbed soils. Sediment and accumulated alum flocculent removed from the bypass tunnel would be handled and disposed of at an appropriate off-site facility in accordance with applicable federal, State, and local regulations and guidelines. Following the repair and rehabilitation, all structures and equipment would be removed from the Nanny Hagen Road Study Area. The staging areas would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Nanny Hagen Road Study Area.

9.16.4.7 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Nanny Hagen Road Study Area.

The construction route is shown in yellow on **Figure 9.16-24**. Access to the repair and rehabilitation limits of construction for the work site would be via I-684, State Route 22, State Route 120, and Nanny Hagen Road directly to DEP property. Nanny Hagen Road is a two-lane, two-way urban major collector roadway and carries approximately 3,840 vehicles per day, based on 2009 traffic counts (NYSDOT Traffic Data Viewer). Under baseline conditions, there are approximately 460 vehicles in the morning peak hour and 460 vehicles in the afternoon peak hour along this road. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Nanny Hagen Road Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area, and there is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the sites. However, there are no DEP employees who work at or visit the study area on a daily basis, and the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.



Note: CCT = Cut-and-Cover Tunnel

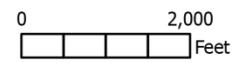


Figure 9.16-24: Transportation – Nanny Hagen Road Study Area



DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Nanny Hagen Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

In the future with the repair and rehabilitation, the Nanny Hagen Road Study Area would be used as a primary staging area to support work activities at the Nanny Hagen Road, Westlake Drive, Washington Avenue, Pleasantville Alum Plant, and Willow Street study areas. The primary staging area would be used for contractor's office trailers and equipment storage. However, it would only be accessed for short periods (i.e., several weeks coinciding with spring/summer construction and the 10-week shutdowns) for parking, deliveries, and other activities. All construction workers for these study areas would drive to the Nanny Hagen Road primary staging area and would then be shuttled to the study area work sites. Shuttle capacity is based on an average occupancy of six construction workers per shuttle vehicle.

Repair and rehabilitation work activities within the Nanny Hagen Road Study Area were evaluated to determine which activities would have the potential to generate the most vehicle trips and form the basis of this transportation analysis. Of these activities, use of the primary staging area within the study area during the third 10-week shutdown would generate the most vehicle trips. Therefore, peak day and peak-hour calculations were conducted for vehicles that would travel to and from the primary staging area during this peak period.

Project-generated vehicles for the primary staging area would converge on Nanny Hagen Road on a peak day. The estimated number of peak-day one-way vehicle trips associated with the Nanny Hagen Road Study Area is 118 vehicles, or approximately 236 peak-day vehicle round trips that would travel to and from the Nanny Hagen Road Study Area. Approximately 90 vehicle round trips or 90 PCEs would be workers traveling to and from the Nanny Hagen Road Study Area. The remaining 146 peak-day vehicle round trips (177 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with the Nanny Hagen Road Study Area is approximately 171 peak-hour vehicle trip ends (187 PCEs). This includes approximately 112 vehicle trip ends (112 PCEs) from workers and approximately 59 vehicle trip ends (75 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming two 12-hour shifts, this would be during the 6 AM to 7 AM and 6 PM to 7 PM hours, and would be unlikely to coincide with the peak hour for non-project-related traffic.

The repair and rehabilitation work activities would result in approximately 187 peak-hour PCEs along Nanny Hagen Road during the third 10-week shutdown, which is above the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, "Transportation." While use of this study area as a primary staging area would span the duration of construction (~~2018~~2017 through 2020), concentrated activities would occur during the three 10-week shutdowns (see **Table 9.16-10**). Construction would not generate public parking, transportation demands, or pedestrian activity within the Nanny Hagen Road Study Area.

Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Nanny Hagen Road Study Area.

9.16.4.8 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation within the Nanny Hagen Road Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation work activities as shown on **Figure 9.16-25**. The Nanny Hagen Road Noise Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work site that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Town of Mount Pleasant Noise Control Law (§139-18) which prohibits noise levels from construction sites from exceeding an L_{10} of 70 dBA during the hours of 8 AM to 6 PM and an L_{10} of 55 dBA during the hours of 6 PM to 8 AM when measured at a distance of 400 feet from the construction site in residentially zoned districts. In addition, work activities are prohibited between the hours of 5 PM and 8 AM in all zoning districts, except in the event of urgent necessity or in the interest of safety, in which case the Building Inspector may issue a permit.

Existing ambient noise levels within the Nanny Hagen Road Study Area are influenced by vehicular traffic traveling on the Nanny Hagen Road and other nearby local roads. The existing noise levels within the study area are comparable to a quiet suburban residential environment based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP’s understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Nanny Hagen Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Nanny Hagen Road Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Nanny Hagen Road Study Area would occur at one site. The stationary noise-generating equipment that would be used within the Nanny Hagen Road Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with concrete repair would emit the most noise. Concrete repair would occur in fall ~~2018~~2017 for up to 24 hours per day, 7 days a week for approximately 2 weeks during the first 10-week shutdown (see **Table 9.16-10**).

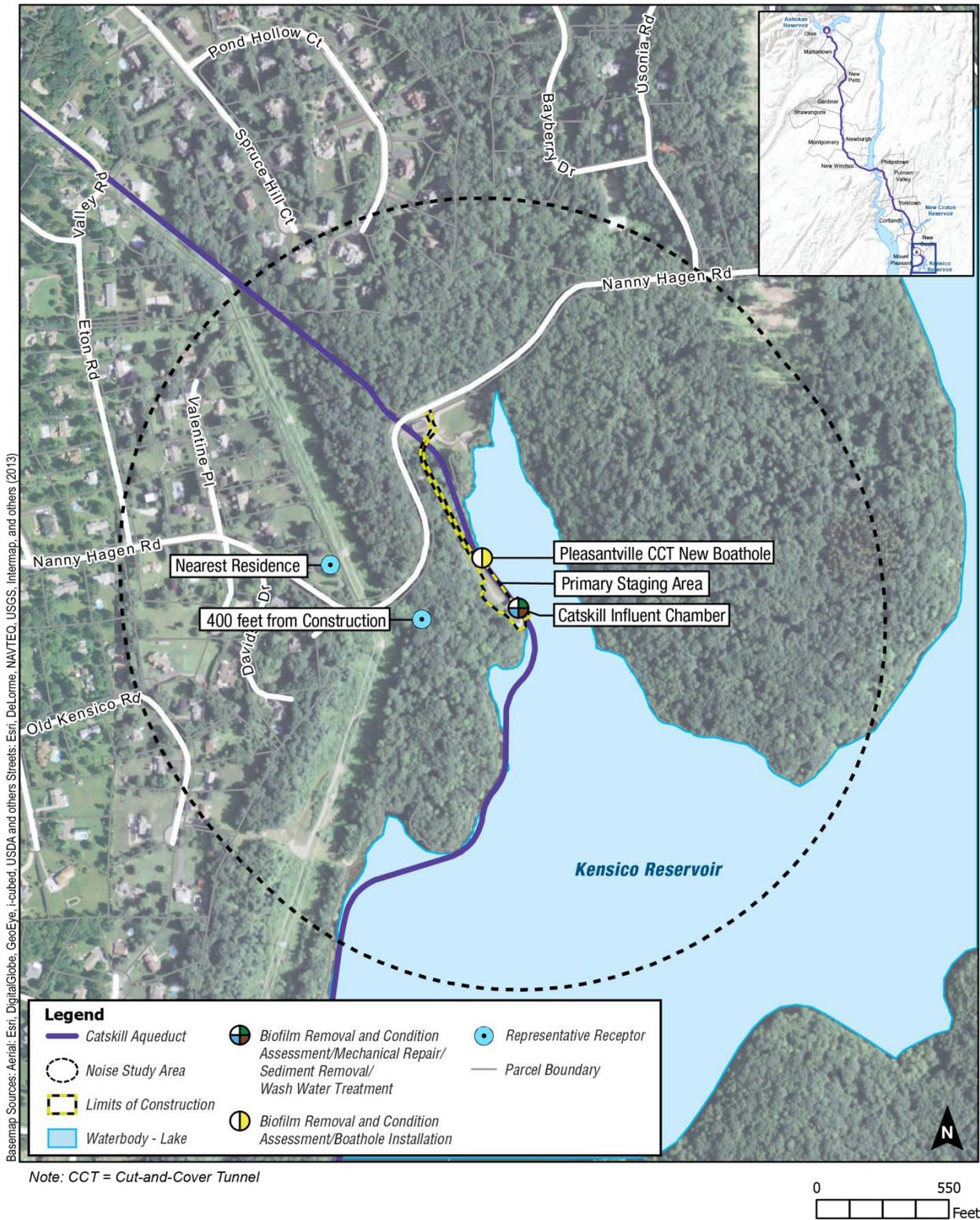


Figure 9.16-25: Noise – Nanny Hagen Road Study Area

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for concrete repair. Associated equipment reference noise levels are shown in **Table 9.16-16**. The Town of Mount Pleasant Code defines allowable construction noise levels using the L₁₀ metric, which represents the sound level exceeded 10 percent of the time. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.16-16: Stationary Source Construction Equipment Modeled at the Nanny Hagen Road Study Area - Noise Analysis and Reference Noise Levels (L₁₀)

Equipment Type	Reference Noise Level (L ₁₀) at 50 feet (dBA) ¹
Concrete Repair (on-site power source)²	
Ventilation Fan	85
Concrete Mixer Truck	84
Backhoe	79
Notes:	
¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	
² The Catskill Influent Chamber has an on-site power source, so generators are not needed at that site.	

Table 9.16-17 shows the results of the stationary construction noise analysis.

The Town of Mount Pleasant Code defines allowable noise levels at a distance of 400 feet from the construction site. Therefore, noise levels were calculated at a distance of 400 feet for comparison with the local noise ordinance. However, all noise-sensitive receptors are located more than 400 feet from the construction work area. Concrete repair within the Nanny Hagen Road Study Area during the repair and rehabilitation would emit a noise level (L₁₀) of approximately 64 dBA at the nearest residence during daytime and nighttime hours. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities; however, this equipment would not be expected to be louder than those associated with concrete repair.

Table 9.16-17: Stationary Noise Analysis Results (L₁₀) at the Nearest Noise-Sensitive Receptors within the Nanny Hagen Road Study Area

Location	Distance from Site (Feet)	Predicted Stationary Noise Level at Noise-Sensitive Receptor (L ₁₀)(dBA)	Town of Mount Pleasant Noise Limit (dBA)	Potential for Exceedance (Yes or No)
400 feet from Construction	400	70	70 ¹ /55 ²	Yes ³
Nearest Residence	799	64	NA	NA
Notes:				
NA = Not Applicable				
¹ Noise limit is applicable between the hours of 8 AM and 6 PM.				
² Noise limit is applicable between the hours of 6 PM and 8 AM.				
³ Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Town of Mount Pleasant.				

Although there would be an increase in stationary noise levels, work would primarily occur in the fall and winter months when residents typically have windows closed, and noise levels inside would be further reduced to an interior noise level (L_{10}) of approximately 40 dBA. Repair and rehabilitation work activities within the Nanny Hagen Road Study Area could emit noise levels greater than allowed by the Town of Mount Pleasant noise code. Additionally, work activities have the potential to occur outside of the allowable hours defined by the Town of Mount Pleasant. DEP would work with the Town of Mount Pleasant, as appropriate.

Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Nanny Hagen Road Study Area. The repair and rehabilitation would be temporary in nature with peak work activities occurring during concrete repair in fall ~~2018~~²⁰¹⁷ for a limited period (e.g., 2 weeks).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Nanny Hagen Road Study Area.

9.16.4.9 Neighborhood Character

The character of the Nanny Hagen Road Study Area is largely wooded and consists primarily of public services land uses and its physical setting within a rural location (see **Figure 9.16-18**). The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. Nanny Hagen Road crosses the study area from southwest to northeast, and an inlet of Kensico Reservoir extends from the south into the center of the study area. The limits of construction for the work site and associated access route are located within a public services corridor which is owned and maintained by DEP.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Nanny Hagen Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; and historic and cultural resources, an impact analysis for the Nanny Hagen Road Study Area was not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," Section 9.3.4, "Socioeconomic Conditions," and Section 9.3.7, "Historic and Cultural Resources," respectively. As described in Section 9.16.4.3, "Open Space and Recreation," and Section 9.16.4.4, "Visual Resources," the work activities would not affect open space and recreation and visual resources in the Nanny Hagen Road Study Area. Furthermore, the public policy impact analysis provided in Section 9.16.2, "Town of Mount Pleasant Impact" concluded the work activities were consistent with applicable plans.

As described in Sections 9.16.4.7, "Transportation," and 9.16.4.8, "Noise," during construction, the work activities in the Nanny Hagen Road Study Area would be short-term. While use of this

study area as a primary staging area would span the duration of construction (2018~~2017~~ through 2020), concentrated activities would occur during the three 10-week shutdowns, resulting in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Nanny Hagen Road Study Area.

9.16.5 WESTLAKE DRIVE STUDY AREA IMPACT ANALYSIS

Within the Westlake Drive Study Area, the aqueduct consists of the Catskill Kensico Bypass, transitioning to the Kensico Cut-and-Cover Tunnel at the Kensico Upper Effluent Chamber. Along the Catskill Kensico Bypass, an access manhole, located 15 feet off-shore as a result of erosion of the reservoir bank, is filled with sediment and is leaking water from Kensico Reservoir into the tunnel (see **Figure 9.16-26**).

Work activities within the Westlake Drive Study Area would include: staging and access improvements; sediment removal; and manhole abandonment.

9.16.5.1 Study Area Location and Description

The Westlake Drive Study Area is located along the upper Catskill Aqueduct within the Town of Mount Pleasant, Westchester County. The Catskill Aqueduct traverses the study area in a general northeast to southwest direction. The study area includes parts of Kensico Reservoir and a section of Westlake Drive, which meanders from the west along the northern portion of the study area. Proposed work sites within the study area include one at the existing access manhole and one at the Kensico Upper Effluent Chamber. Access to the manhole would be provided by an access road connecting to Westlake Drive for crew personnel and vehicles, and by boat for materials and equipment. Access to the Kensico Upper Effluent Chamber would be via an access road that connects to Westlake Drive. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work sites and associated access routes. **Figure 9.16-26** shows an aerial photograph of the study area, including the path of the aqueduct, the limits of construction for the work sites, and the proposed access routes. **Figure 9.16-27** shows photographs of the study area.

The study area consists of residential, community facilities, and public services land uses. Land cover is generally wooded and includes some residential development along the study area's northern boundary. The limits of construction for the work sites and associated access routes are located entirely in a public services corridor with grassy cover, which is owned and maintained

by DEP and separated from adjacent land by wooded areas. **Figure 9.16-28** shows a map of the land uses in the study area and surroundings.

Zoning in the study area is primarily single-family residential (R-40), as designated by the Town of Mount Pleasant Zoning Code; with some portions zoned single-family residential (R-10 and R-20) (see **Figure 9.16-29**). The Catskill Aqueduct is located within the single-family residential (R-40) zoning district, which provides for low-density residential development. The Catskill Aqueduct is a permitted use as a water supply facility within the single-family residential (R-40) zoning district.

There are no federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

9.16.5.2 Proposed Activities within the Westlake Drive Study Area

To support activities within the Westlake Drive Study Area, the Catskill Influent Chamber (within Nanny Hagen Road Study Area in the Town of Mount Pleasant) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas, including one each at the Kensico Upper and Lower Effluent Chambers, and one at the Kensico Screen Chamber (Kensico Reservoir Shaft 18), would provide additional parking, and equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. Site plans showing layouts of the limits of construction for the work sites, which would occupy a total of 1.3 acres, are shown on **Figure 9.16-30** and **Figure 9.16-31**. The schedule for work within the study area is shown in **Table 9.16-18**. The duration of active construction within the Westlake Drive Study Area is estimated to total 14 weeks over 1.5 years.

Work in the study area would begin with staging and access improvements in summer ~~2019~~2018. Access to the manhole would be via Westlake Drive to an existing access road approximately 350 feet north of the reservoir. Since there is currently no access from the access road to the reservoir, grading and the removal of up to 23 trees would be required to build an access road down the steep embankment to the shoreline.

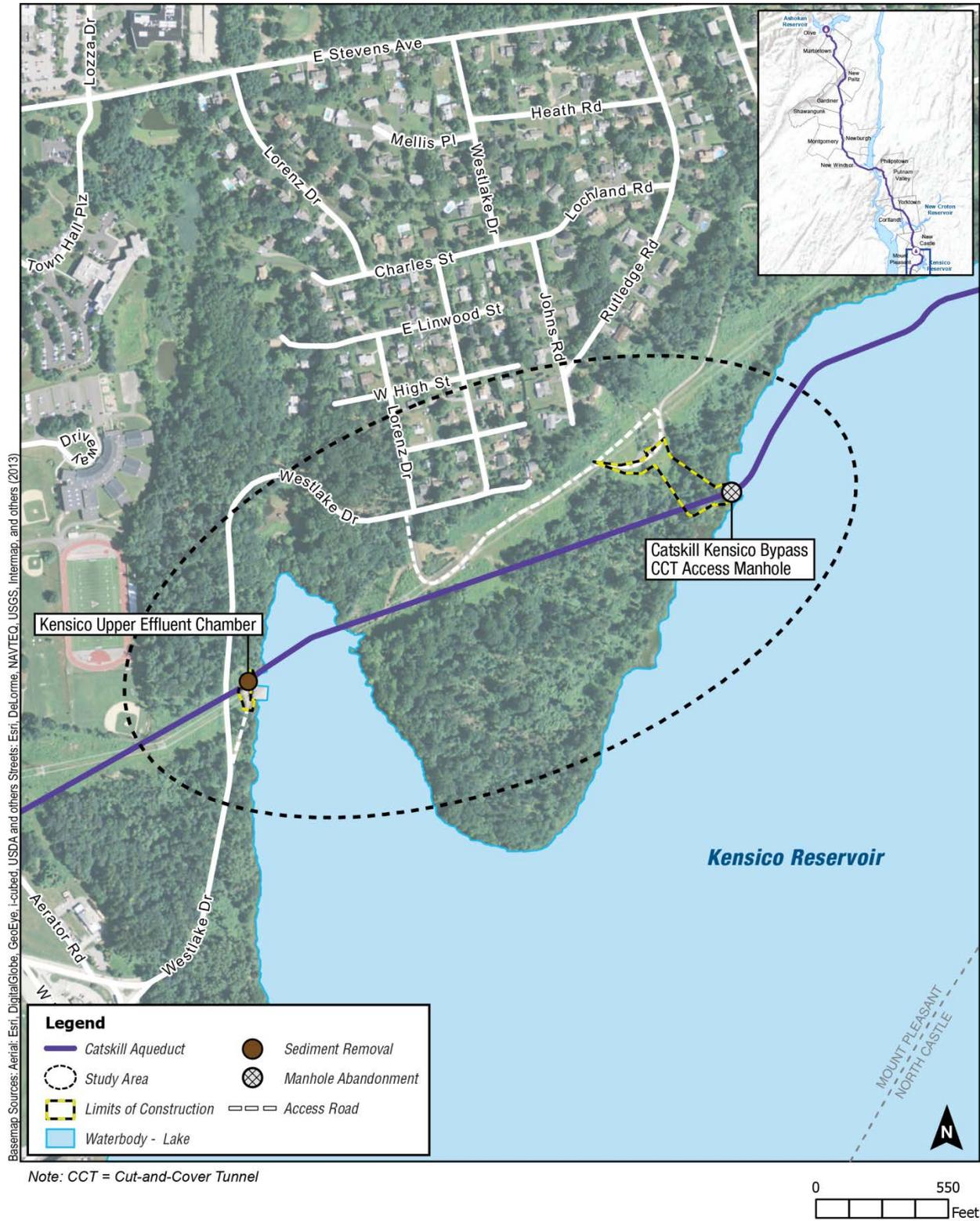
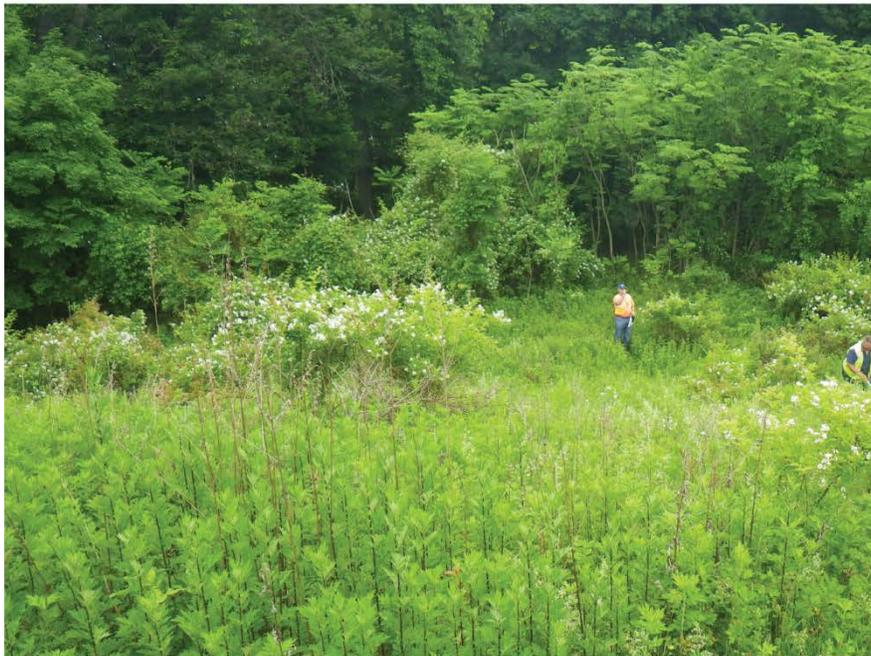


Figure 9.16-26: Study Area – Westlake Drive





Photograph 1: View of access manhole to Catskill Kensico Bypass Tunnel that is off-shore in Kensico Reservoir. The manhole would be abandoned.



Photograph 2: Location of proposed access road down the hillside to Kensico Reservoir's shoreline (looking south).

Figure 9.16-27: Photographs – Westlake Drive Study Area



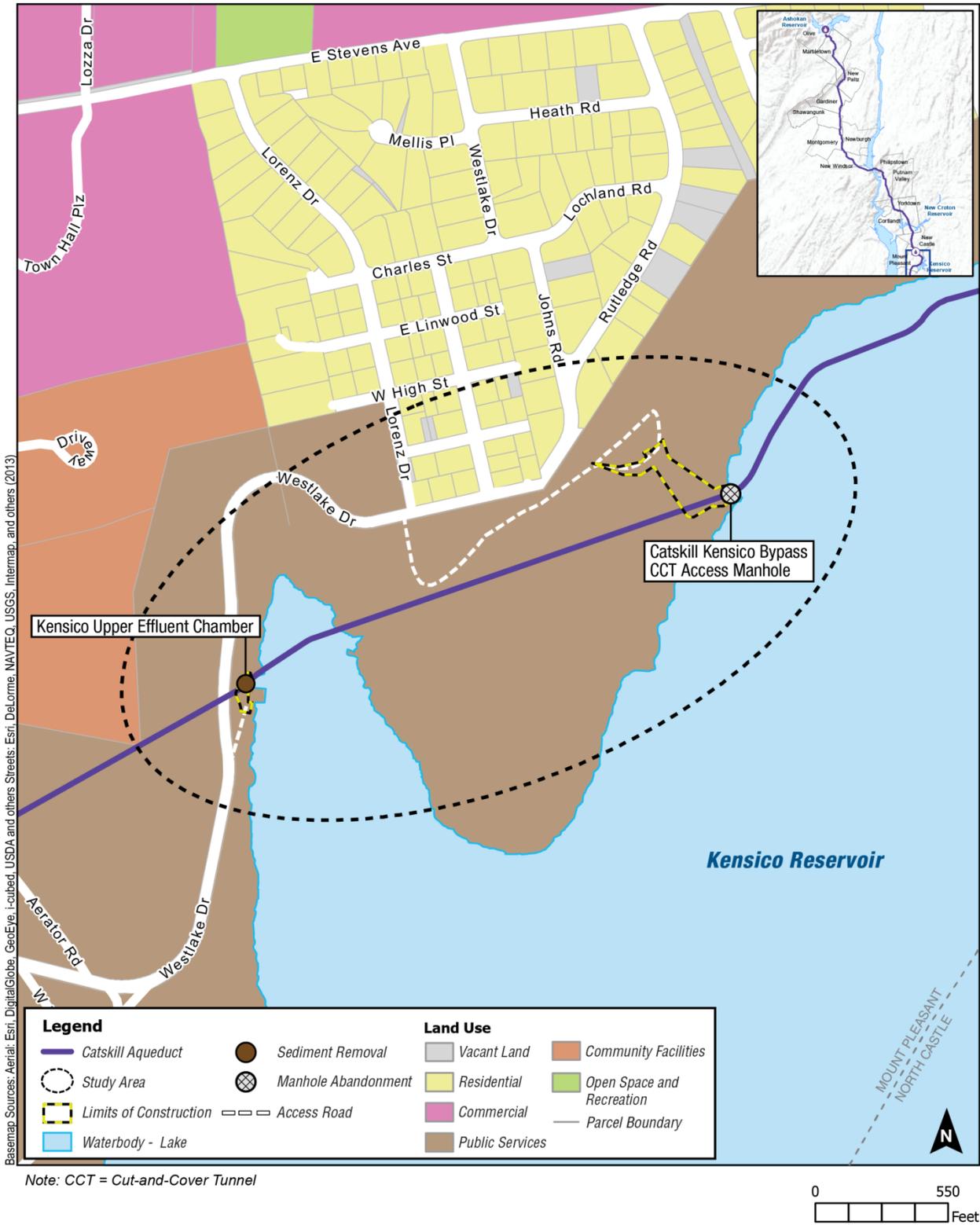


Figure 9.16-28: Land Use – Westlake Drive Study Area



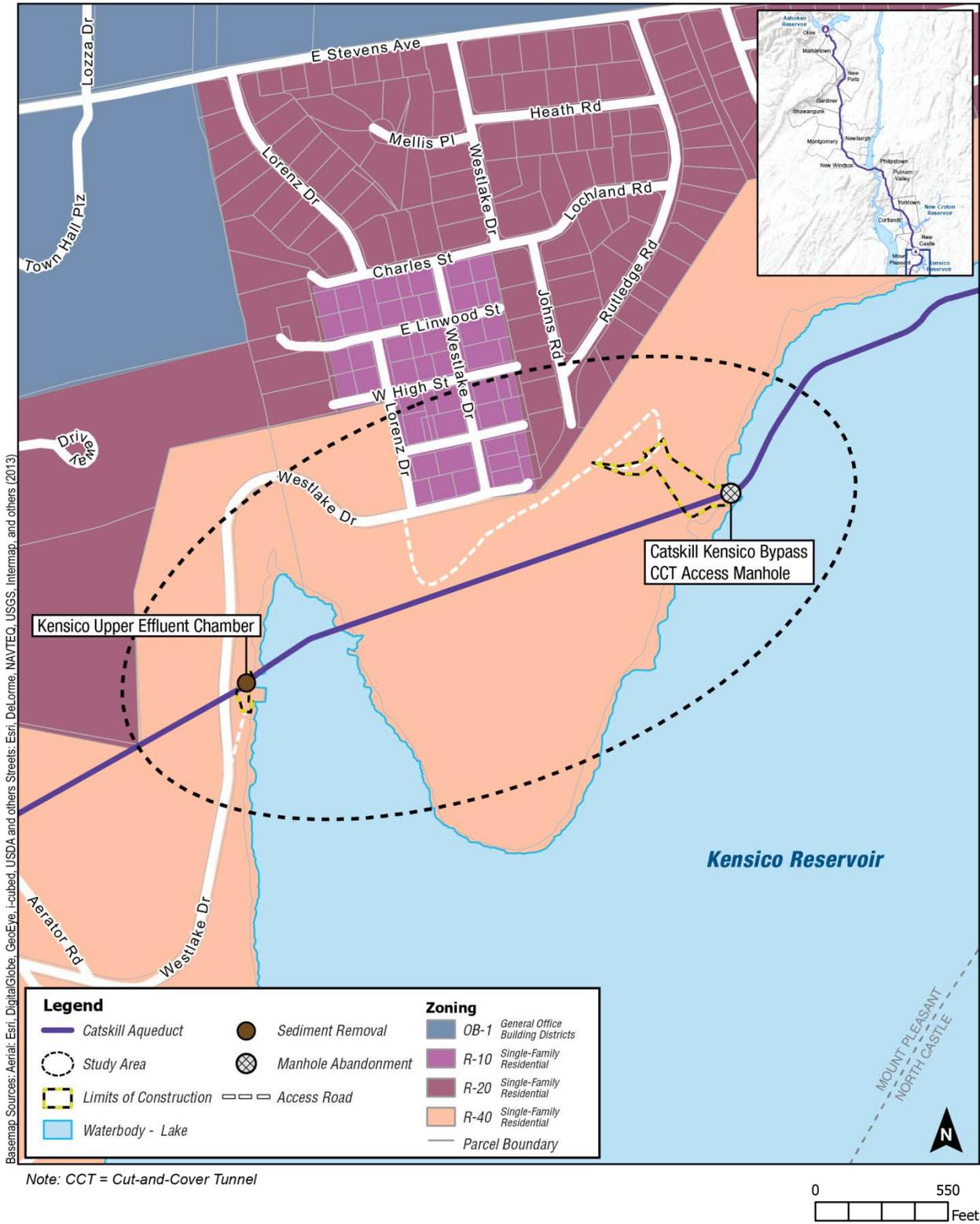


Figure 9.16-29: Zoning – Westlake Drive Study Area



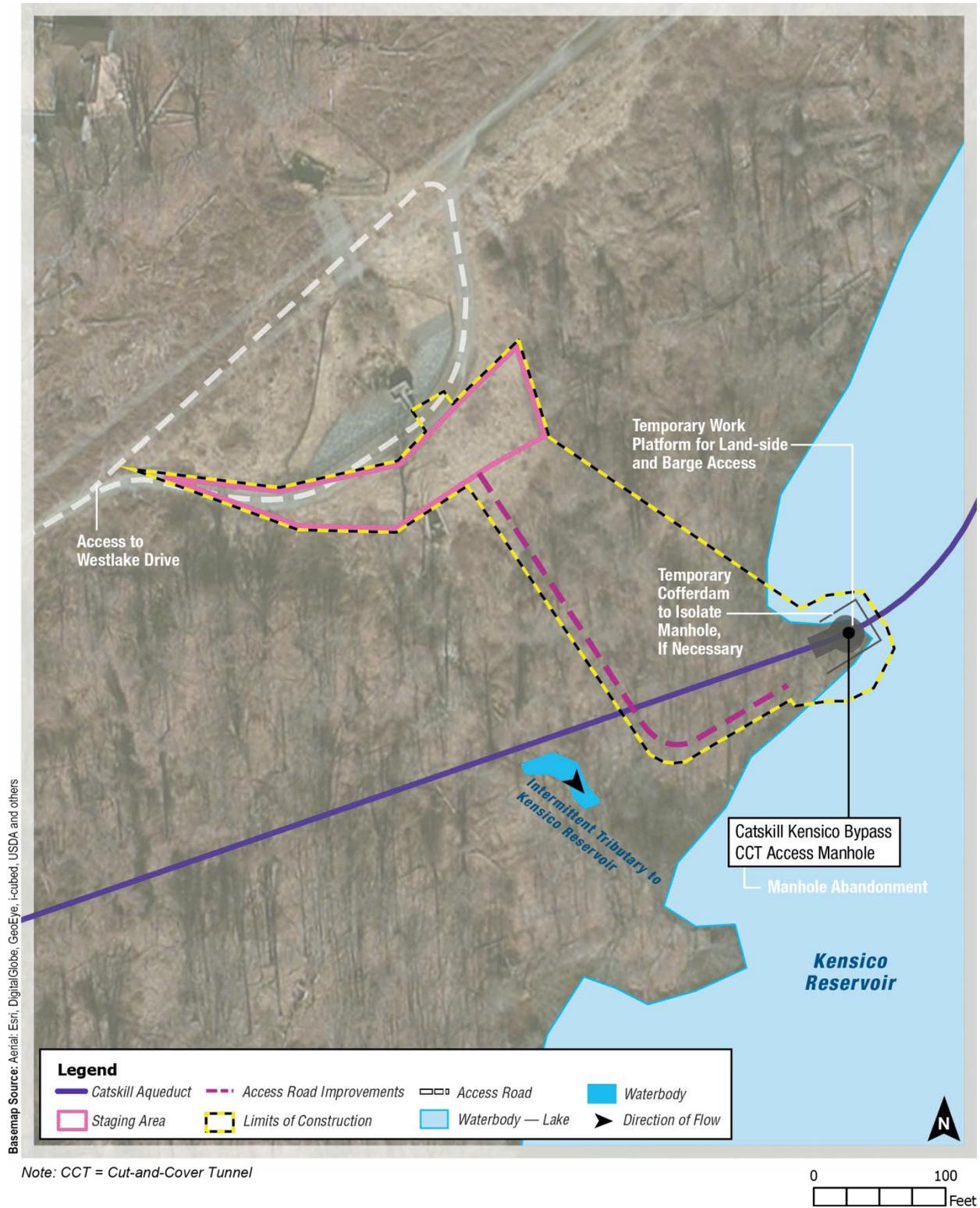


Figure 9.16-30: Site Plan for Catskill Kensico Bypass CCT Access Manhole – Westlake Drive Study Area



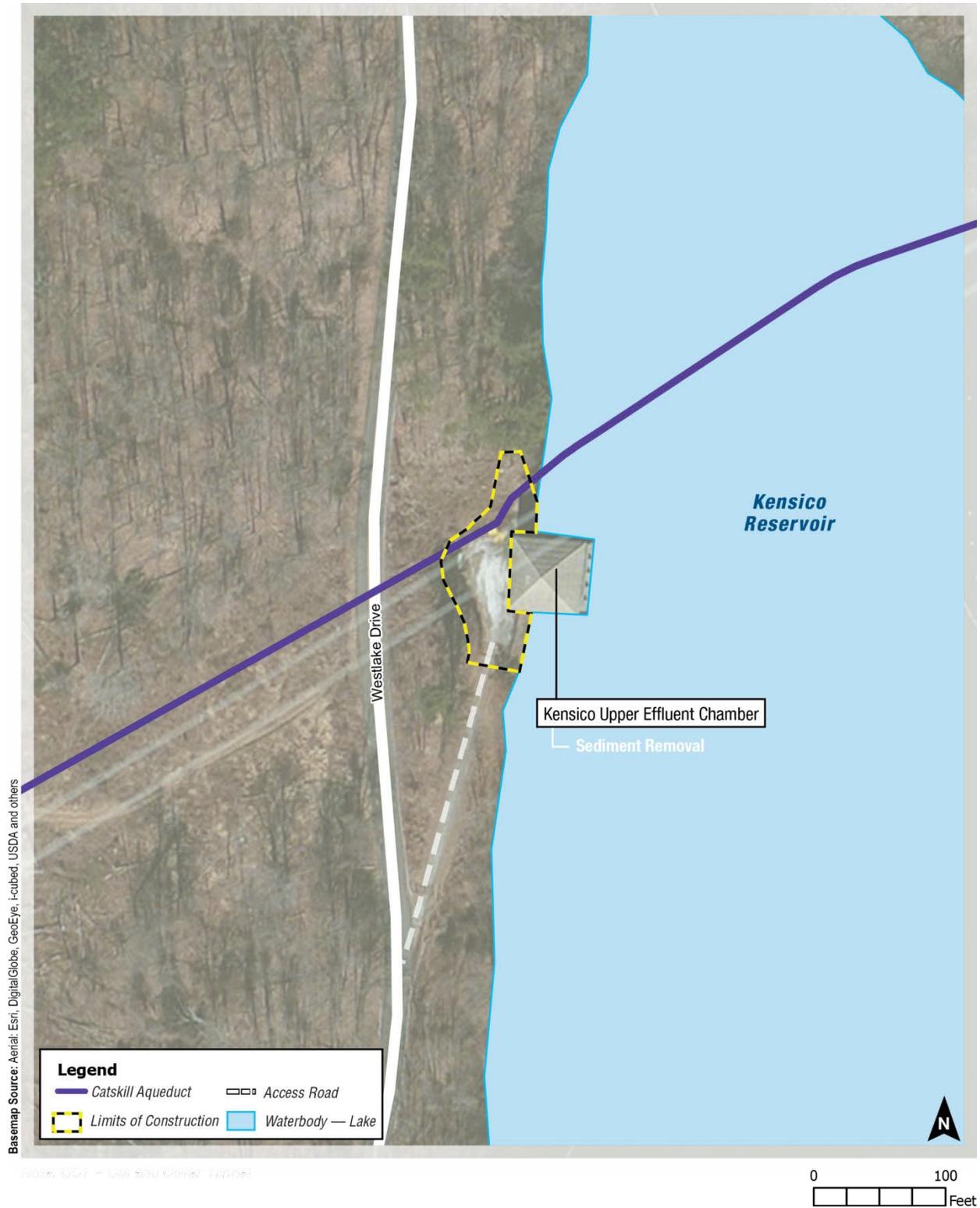


Figure 9.16-31: Site Plan for Kensico Upper Effluent Chamber – Westlake Drive Study Area



Table 9.16-18: Schedule of Work Activities within the Westlake Drive Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Staging and Access Improvements ³	Summer 2019 2018	4 weeks	Monday to Friday, 8 AM to 5 PM	8
Cofferdam installation (if necessary)	Fall 2020 2019 (prior to third 10-week shutdown)	1 week	Monday to Friday, 8 AM to 5 PM	8
Sediment Removal	Fall 2020 2019 (Third 10-week shutdown)	5 weeks	7 days a week, 24 hours per day	12
Manhole Abandonment	Fall 2020 2019 (Third 10-week shutdown)	4 weeks	7 days a week 7 AM to 7 PM	8

Notes:

¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per the Town of Mount Pleasant Noise Control Law §139-18.

² Crew size refers to the number of people anticipated at the work site(s).

³ Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*).

Sediment removal from within the Catskill Kensico Bypass would occur during the third 10-week shutdown. A timber work platform supported by a box crib foundation would be installed to provide access from the shoreline to the manhole. Accumulated sediment within the Catskill Kensico Bypass would be excavated and transported to an extraction point at either the Kensico Upper Effluent Chamber or the Catskill Inflow Chamber (within the Nanny Hagen Road Study Area in the Town of Mount Pleasant). Approximately 21 cubic yards of debris, consisting of large stones, branches and mud, has clogged the Catskill Kensico Bypass and its 45-foot deep manhole and would require removal. Material removed from the Catskill Kensico Bypass would be disposed of at a registered, permitted, or otherwise authorized facility. Since the dimensions of the top 4 to 5 feet of the manhole shaft are only 3 feet by 3 feet, it would be replaced by a short section of 4-foot diameter steel pipe, providing a larger opening for removal of the debris. Replacing this section would require lowering the reservoir by up to two feet. If that is not possible, a cofferdam of steel sheet piling would be installed around the manhole, and the water level within the sheet piling would be lowered by pumping. The timber work platform would then be extended to form a work platform from which the debris in the manhole would be loosened, hoisted, and transferred to a muck cart for transport to the shore.

Following sediment removal, a detailed condition assessment of the bypass tunnel interior would be performed. Any defects identified would be repaired during a shutdown of the Catskill Aqueduct. The manhole would then be abandoned by infilling the manhole shaft with a flowable concrete fill, and installing a bulkhead within the access portal between the manhole and the bypass tunnel. A turbidity curtain around the timber work platform would prevent dislodged particles or sediment from entering the reservoir during this work. Upon completion of manhole abandonment, the timber work platform and turbidity curtain would be removed. Temporary disturbance in the Kensico Reservoir would cover a total area of approximately 2,980 square feet. There would be no permanent disturbance in the reservoir. Upon completion of work

activities, all equipment and materials would be removed, and areas temporarily disturbed would return or be restored to baseline conditions.

Impact categories analyzed for the Westlake Drive Study Area are presented in Sections 9.16.5.2, “Open Space and Recreation,” through 9.16.5.9, “Neighborhood Character,” and include open space and recreation; visual resources; natural resources including water resources, aquatic and benthic resources, terrestrial resources, federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.16.2, “Town of Mount Pleasant Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” impact analyses related to land use and zoning; socioeconomic conditions; community facilities and services; historic and cultural resources; the remaining natural resources subcategories, including geology and soils, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area are not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.16.5.3 Open Space and Recreation

As shown on **Figure 9.16-32**, one open space and recreation resource, Kensico Reservoir with its surrounding watershed lands, exists within the Westlake Drive Study Area. Approximately 0.5 acre of the 1,254-acre Kensico Reservoir lies within the central portion of the study area and is publically used for recreational shoreline fishing and non-motorized boat fishing with a DEP watershed access permit and fishing license. However, DEP Recreation Rules restrict access within 500 feet of any dikes, dams, tunnel outlets, spillways, buildings and other significant water supply structures (Watershed Rules and Regulations Part 16-15(b)(1)). There are no fishing access points within the study area.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP’s understanding that no plans to expand or create new open space or recreational resources are anticipated within the Westlake Drive Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open spaces is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Westlake Drive Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities within the Westlake Drive Study Area would be short-term (intermittently over 1.5 years; see **Table 9.16-18**). The limits of construction at Catskill Kensico Bypass and Kensico Upper Effluent Chamber would occupy a total of 1.3 acres, related to the sediment removal, assessment of the aqueduct, manhole repair, and staging. The work sites are located in the western portion of Kensico Reservoir. Work activities would include minor clearing of trees and shrubs at the existing access manhole. The manhole repairs would not disrupt the use of Kensico Reservoir. Given the security restrictions at the site, there would be limited views of these work activities at the manhole at Catskill Kensico Bypass and Kensico Upper Effluent Chamber from the nearest area used for recreation.

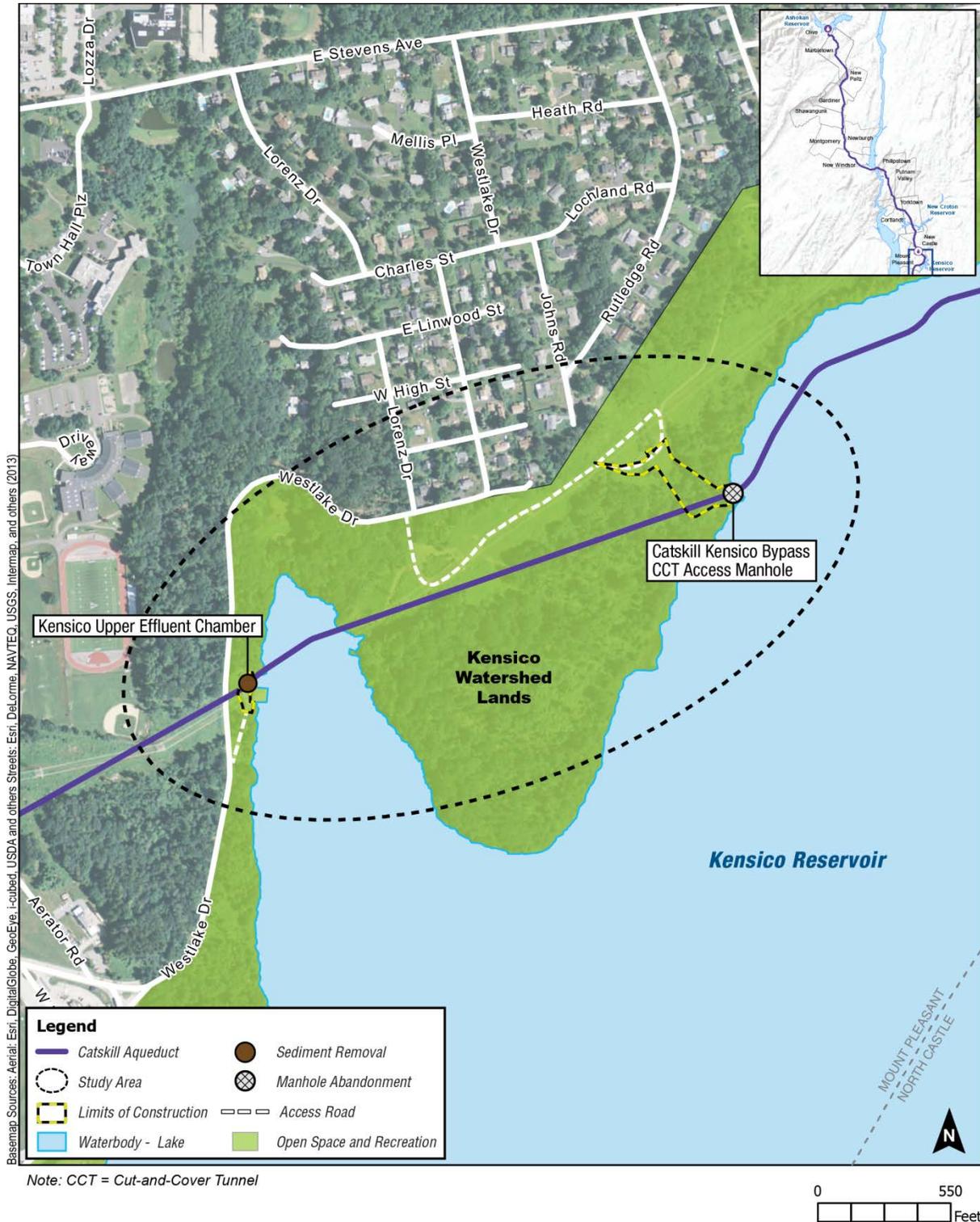


Figure 9.16-32: Open Space and Visual Resources – Westlake Drive Study Area



As discussed in Section 9.16.5.8, “Noise,” the repair and rehabilitation work activities would temporarily increase noise levels that may discourage fishing or other recreational uses of Kensico Reservoir. However, given the restricted area around the manhole at Catskill Kensico Bypass and Kensico Upper Effluent Chamber, the construction noises audible to recreational users would be diminished. Kensico Reservoir does not contain noise-sensitive receptors, as there are no maintained formal trails. Upon completion of the repair and rehabilitation work activities, the recreational uses within Kensico Reservoir would be unaffected.

Following construction, all equipment would be removed from the Westlake Drive Study Area and the staging area would be restored to baseline conditions. The access road improvements are permanent. However, this would not disrupt recreational use of Kensico Reservoir. Following the repair and rehabilitation, operation of the Catskill Aqueduct would be consistent with baseline conditions and DEP would revegetate the area near the access manhole in the floodplain (see the “Floodplains” section of Section 9.16.5.5, “Natural Resources”).

As such, the repair and rehabilitation would not encroach upon, cause a loss of open space, or impact the use or physical character of Kensico Reservoir.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Westlake Drive Study Area.

9.16.5.4 Visual Resources

The study area for the visual resources analysis is the area within the Westlake Drive Study Area. It also includes view corridors that extend beyond the study area based on the locations that are publicly accessible.

As shown on **Figure 9.16-32**, one locally significant visual resource was identified within the Westlake Drive Study Area, Kensico Reservoir, with its surrounding watershed lands.

As noted above, Kensico Reservoir is a local visual resource that provides recreational shoreline fishing and non-motorized boat fishing to the public, with a DEP watershed access permit and fishing license. Kensico Reservoir is almost completely surrounded by heavily forested watershed lands. The Kensico Upper Effluent Chamber is located within a cove in the western portion of the reservoir. The access manhole is located along the shore of the western portion of the reservoir. Views towards the Kensico Upper Effluent Chamber are largely blocked by the dense vegetation from the main part of the reservoir. Views of the Kensico Upper Effluent Chamber exist only within the cove and the adjacent open portion of the reservoir. The cove is not located within deep water, but includes identified areas of fish concentration that could draw recreational fishing. The access manhole at Catskill Kensico Bypass is located along a forested portion of shoreline. However, there is limited shoreline access surrounding the manhole at Catskill Kensico Bypass and Kensico Upper Effluent Chamber due to the connection of the Catskill Aqueduct. DEP Recreation Rules state no access is permitted within 500 feet of any dikes, dams, tunnel outlets, spillways, buildings and other significant water supply structures (Part 16-15(b)(1)).

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Westlake Drive Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Westlake Drive Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would be short-term (intermittently over 1.5 years; see **Table 9.16-18**). While some tree removal is required for the access road, this would not greatly detract from the aesthetics of the area because the staging area would be adjacent to the existing manhole. While the manhole is to be abandoned, the area would not look significantly different. Given the security restrictions at the site, there would be limited views of these work activities at the Catskill Influent Chamber and from within the reservoir at the nearest vantage point. Following construction, all equipment would be removed from the Westlake Drive Study Area. The access road improvements are permanent. However, this would not disrupt views from Kensico Reservoir. Following the repair and rehabilitation operation of the Catskill Aqueduct would be consistent with baseline conditions. DEP would revegetate the area near the access manhole in the floodplain (see the "Terrestrial Resources" section of Section 9.16.5.5, "Natural Resources"), and this would not result in changes to the future visual and aesthetic resource conditions of the views to Kensico Reservoir.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Westlake Drive Study Area.

9.16.5.5 Natural Resources

The study area for the natural resources analysis is represented by the immediate areas surrounding the limits of construction, including the manhole to the Catskill Kensico Bypass (see **Figure 9.16-33**) and the Kensico Upper Effluent Chamber (see **Figure 9.16-31**). These two sections are collectively referred to as the natural resources study area.

The general ecology of the natural resources study area was analyzed based on a field visit conducted on September 22, 2015. The natural resources study area is composed of four ecological community types. Along the roadway, there are areas of mowed roadside/pathway dominated by grasses and herbaceous weeds. The majority, including the shoreline with Kensico Reservoir, is best characterized as a beech/maple mesic forest. Kensico Reservoir itself is best characterized as a reservoir-artificial impoundment community. An intermittent tributary to Kensico Reservoir is a man-made ditch in the southern portion of the natural resources study area, which originates at an up-gradient stormwater outfall. The intermittent tributary is best characterized as a ditch/artificial intermittent stream channel. There was no direct surface water connection between the intermittent tributary and Kensico Reservoir. No wetlands were observed within the study area.



Figure 9.16-33: Natural Resources – Westlake Drive Study Area



These habitats have the potential to support protected water resources, terrestrial resources, and aquatic and benthic resources. An analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the Kensico Reservoir subwatershed (HUC 020301020101) of the Bronx watershed (HUC 02030102).

Kensico Reservoir is jurisdictional under Sections 401 and 404 of the Clean Water Act. As a Class AA waterbody, it is also subject to State Protection of Waters regulations with a regulated 50-foot buffer. In addition, the Town of Mount Pleasant regulates activities within natural or artificial waters and a regulated 50-foot buffer (Mount Pleasant Town Code Chapter 111: Freshwater Wetlands) and has jurisdiction over activities within floodplains (Mount Pleasant Town Code Chapter 108: Flood Damage Prevention). Reservoirs are defined as watercourses under the Freshwater Wetlands town code. Therefore, work activities in and along water resources and their floodplains are anticipated to require town review and approval. However, because reservoirs do not have flowing water, the “Streams and Watercourses” town code is not applicable (Mount Pleasant Town Code Chapter 185).

Surface Water

Surface water was assessed on September 22, 2015. Each watercourse was assigned a community classification based on the habitat descriptions in Cowardin et al. (Cowardin et al. 1979). The water resource name, length, area, and classifications are shown in **Table 9.16-19**.

Table 9.16-19: Water Resources and Classifications within the Westlake Drive Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Intermittent Tributary to Kensico Reservoir	670	80	Riverine, Intermittent, Streambed, Sand (R4SB4)
Kensico Reservoir	17,620	NA	Lacustrine, Littoral, Unconsolidated Shoreline, Sand (L2US2)
Note: NA = Not Applicable			

Intermittent Tributary to Kensico Reservoir

An intermittent tributary enters Kensico Reservoir southwest of the access manhole. This tributary is a seasonally flowing stormwater drainage ditch that runs down a steep slope from a stormwater detention basin approximately 300 feet from where the tributary terminates into Kensico Reservoir (see **Figure 9.16-33**). The intermittent tributary consists of a dry channel leading to an up-gradient stormwater outfall that is scoured with deposits of gravel and branches on the banks. Substrate was observed to be cobble and sand and there was evidence of debris

piles and bank scouring. As listed in **Table 9.16-19**, the tributary is best classified as a “Riverine, Intermittent, Streambed, Sand” system based on the Cowardin System (Cowardin et al. 1979)..

Kensico Reservoir

Kensico Reservoir is part of the City’s Public Water Supply System. Kensico Reservoir is approximately 2,145 acres in size with a maximum depth of 144 feet. The natural resources study area includes a portion of the northwestern shore of Kensico Reservoir (see **Figure 9.16-33**). At this location, Kensico Reservoir itself features a steep shoreline with no rooted aquatic vegetation and a sand/cobble substrate. It is likely very steep due to persistent wind-induced erosion across the reservoir. As listed in **Table 9.16-19**, the reservoir is best classified as a “Lacustrine, Littoral, Unconsolidated Shoreline, Sand” system based on the Cowardin System (Cowardin et al. 1979)..

Floodplains

FEMA’s FIRM number 36119C0259F, September 28, 2007, and FIRM number 36119C0257F, September 28, 2007, were reviewed. As shown on **Figure 9.16-34**, a FEMA designated 100-year floodplain (Zone A) is present around Kensico Reservoir, which depicts areas subject to inundation by the one percent Annual Chance Flood. Zone A Special Flood Hazard Areas are generally determined using approximate methods.

Areas within Zone A are within the Special Flood Hazard Area and are subject to local floodplain management regulations. There are no FEMA designated floodways in this study area.

Future Without the Repair and Rehabilitation

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the Westlake Drive Study Area would be the same as baseline conditions.

Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Westlake Drive Study Area.

Construction

Work activities related to the repair and rehabilitation would involve temporary fill in surface water and floodplains. Construction would be conducted in accordance with applicable in-water work windows, which are anticipated to prohibit in-water work from September 15 through June 30, or as otherwise authorized. Appropriate protective measures including, but not limited to, temporary sediment and erosion control measures, a turbidity curtain, or other controls, that would be installed and maintained during construction. To ensure that the reservoir is protected

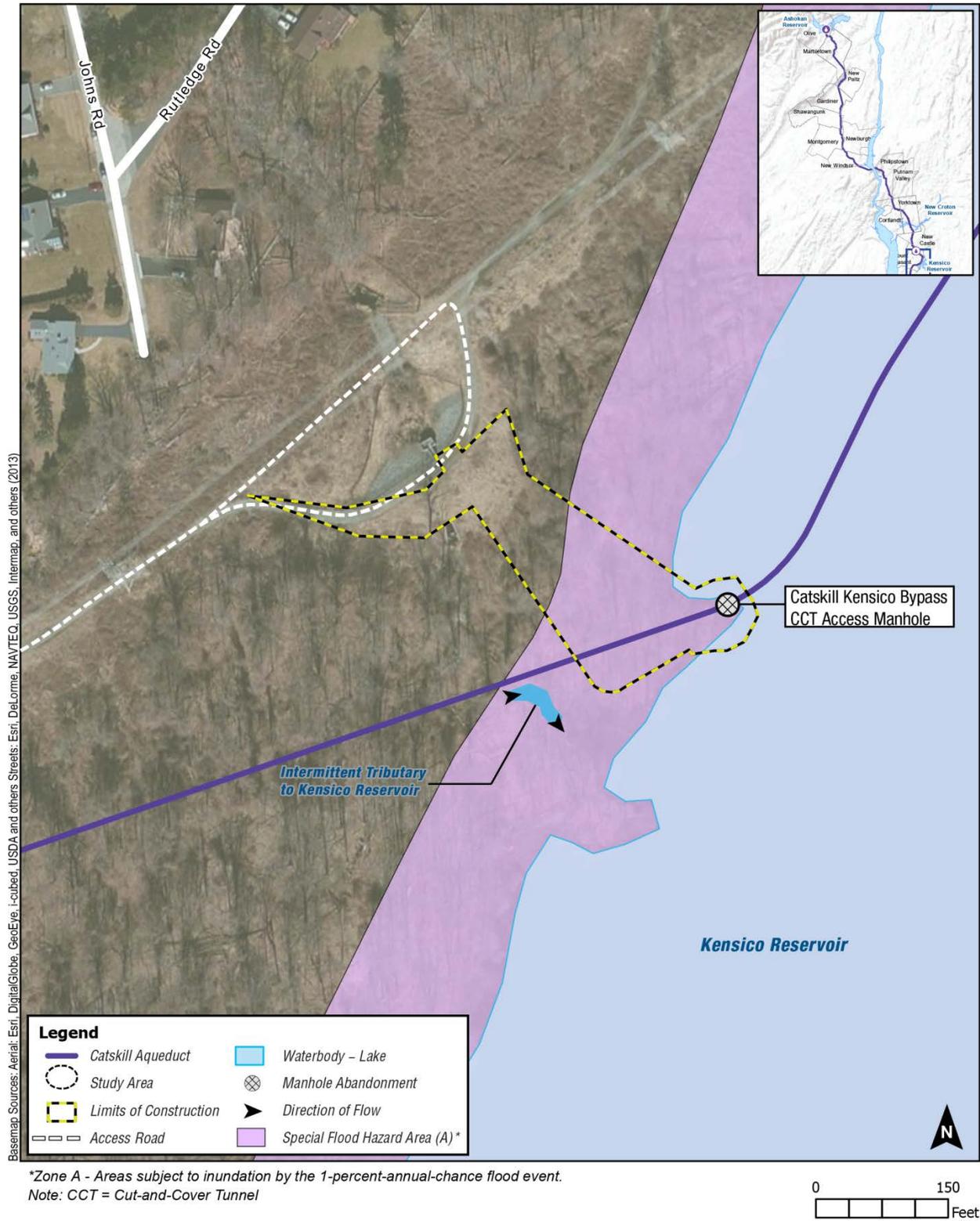


Figure 9.16-34: Floodplain – Westlake Drive Study Area



and sediment and other pollutants are prevented from entering the waterway, temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements.

Improvements to the access road would allow permanent access to occur in upland areas. However, due to steep slopes leading down to the reservoir, some equipment may be delivered to the work site by barge and unloaded onto the shoreline. A gangway or other means of transporting equipment without damaging the shoreline would be used.

A temporary timber work platform would be installed to access the manhole. The platform would be anchored to solid substrate and would require in-water excavation of approximately 4 cubic yards of sediment within the limits of construction to ensure the platform is anchored to solid substrate. Excavation is anticipated to be completed either hydraulically from a barge or from the shoreline using a backhoe/excavation bucket and all materials would be managed in accordance with applicable regulations. Therefore, resuspension of material in the water column would be minimal. Additionally, the sediment removal and manhole abandonment operation would occur from the work platform within the turbidity curtain and would not affect water resources.

If possible, work activities would be completed during a temporary drawdown of the reservoir. Given that the water levels would be within the normal operating range of water surface elevations for Kensico Reservoir and any drawdown would be for a short duration (approximately one month), the temporary drawdown would not affect water resources. If temporarily lowering the reservoir is not feasible, a temporary cofferdam may be installed to create a dry work area between the shoreline and the manhole. The water level within the temporary cofferdam would be lowered by pumping to the reservoir.

Anticipated temporary and permanent disturbance to water resources and regulated buffers were quantified based on the limits of construction and proposed work activities (see **Table 9.16-20**). Construction staging and work activities would avoid the intermittent tributary to Kensico Reservoir. Approximately 2,980 square feet of Kensico Reservoir would be temporarily disturbed. Temporary disturbance of approximately 14,130 square feet and permanent disturbance of approximately 1,060 square feet would occur within both the State and municipal buffer. Following construction, temporarily disturbed upland areas would be restored to natural conditions and planted with native riparian vegetation. Permanent disturbance is further analyzed in Section 9.19, "Project-wide Impact Analysis."

Upon completion of construction activities, the timberwork platform, cofferdam, and other equipment would be removed. It is anticipated that use of the turbidity curtain would result in no adverse effect to water resources within the reservoir during deployment and retrieval.

The southeastern extent of the study area is within the Special Flood Hazard Area of Kensico Reservoir. As such, permanent access road improvements and the temporary work platform near the manhole would be located in the Special Flood Hazard Area of Kensico Reservoir. Furthermore, staging and access road improvements would require tree removal within the Special Flood Hazard Area. However, all activities would be minor and there are no new

permanent structures or proposed changes to baseline elevations that would affect the cross-sectional area of Kensico Reservoir. DEP would coordinate with the Town of Mount Pleasant and FEMA, as necessary, to comply with all floodplain management requirements.

Table 9.16-20: Estimated Disturbance to Water Resources within the Westlake Drive Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Intermittent Tributary to Kensico Reservoir	670	0	0
Kensico Reservoir	17,620	2,980 <i>Temporary turbidity curtain, in-water excavation, timber work platform, and cofferdam (if necessary)</i>	0
50-foot State Protection of Waters Buffer	22,100	14,130 <i>Construction staging area and construction equipment use</i>	1,060 <i>Access road improvements</i>
Water Resource Municipal Buffer	36,060	14,130 <i>Construction staging area and construction equipment use</i>	1,060 <i>Access road improvements</i>

Operation

Following the repair and rehabilitation, operation of the Catskill Aqueduct within the study area would be consistent with baseline conditions. Water resources would persist and be unaffected by maintenance activities. Native vegetation planted in temporarily disturbed areas within the 50-foot State and municipal water resource buffers would become established and surrounding vegetation would colonize the area, thereby providing a protected stream buffer consistent with baseline conditions.

Water Resources Conclusion

All in-water activities would be temporary, including disturbance to open waters of the reservoir associated with the work platform or cofferdam to access the off-shore manhole. DEP would coordinate with the Town of Mount Pleasant and FEMA, as necessary, to comply with all floodplain management requirements. Following construction, the shoreline would be restored to natural conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Westlake Drive Study Area.

Aquatic and Benthic Resources

Aquatic and benthic resources within Kensico Reservoir are similar to those found in lakes and reservoirs across the State. The aquatic habitat quality within the natural resources study area is

marginal due to the lack of rooted aquatic vegetation, shallow water depths surrounding the manhole, and persistent wind-induced erosion. As previously described, this area was at one time upland habitat.

Alewife (*Alosa pseudoharengus*) was the most abundant species collected from Kensico Reservoir during the 1990 to 2010 NYSDEC gill net surveys, followed by yellow perch (*Perca flavescens*), lake trout (*Salvelinus namaycush*), smallmouth bass (*Micropterus dolomieu*), and brown trout (*Salmo trutta*). These comprise the five most abundant species collected (see **Table 9.16-21**).

There are no known macroinvertebrate sampling efforts in the immediate vicinity of the study area. Ponar grab sampling was conducted within Kensico Reservoir in April and July of 2007 and July 2014, between water depths of 5 and 10 feet. Overall, the results demonstrated a diverse community that was relatively similar to other large, soft-bottom lakes and reservoirs in the region. Organisms included chironomids, the amphipod genera *Gammarus* and *Diporeia*, as well as oligochaetes and fingernail clams from the family Pisidiidae.

Based on available datasets, the communities in Kensico Reservoir support a diverse community with trout and trout spawning and warmwater fisheries, as well as a diverse macroinvertebrate community.

Table 9.16-21: Relative Fish Species Abundance in Kensico Reservoir

Common Name	Scientific Name	Abundance Ranking ¹
Alewife	<i>Alosa pseudoharengus</i>	1
Yellow Perch	<i>Perca flavescens</i>	2
Lake Trout	<i>Salvelinus namaycush</i>	3
Smallmouth Bass	<i>Micropterus dolomieu</i>	4
Brown Trout	<i>Salmo trutta</i>	5
Largemouth Bass	<i>Micropterus salmoides</i>	6
Rock Bass	<i>Ambloplites rupestris</i>	7
Yellow Bullhead	<i>Ameiurus natalis</i>	8
Rainbow Trout	<i>Oncorhynchus mykiss</i>	9
Redbreast Sunfish	<i>Lepomis auritus</i>	10
Note: ¹ Ranking of 1 denotes most abundant species, and 10 denotes the 10 th most abundant species. Source: NYSDEC Fisheries Files; May 1990 to September 2010; 7 sampling events		

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no projects or developments are anticipated within the natural resources study area within the timeframe of the impact analysis. Changes to fish and benthic invertebrate communities due to normal population fluctuations and seasonal changes are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that aquatic and benthic resources within the Westlake Drive Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities could result in temporary effects on aquatic habitat, as well as the aquatic and benthic organisms in the natural resources study area. Construction would be conducted in accordance with applicable in-water work windows or as otherwise authorized for Kensico Reservoir, which is designated as supporting trout, trout spawning, and a warmwater fishery. As a result of these designations, in-water work could be prohibited from September 15 through June 30. Sediment removal and manhole abandonment at this site would require access to the aqueduct's interior and in-water work while the aqueduct is shut down. However, due to DEP's water supply restrictions, the shutdown of the Catskill Aqueduct and completion of these work activities may need to occur within the restricted period. Therefore, appropriate protective measures, including a turbidity curtain, would be installed prior to the start of the in-water prohibition period. All protective measures would be maintained during construction.

Work activities associated with the sediment removal and manhole abandonment in the study area would take place within Kensico Reservoir at the one access manhole. The access manhole would be isolated by temporarily lowering the reservoir by up to 2 feet; if that is not possible, a cofferdam of steel sheet piling would be installed around the manhole, and the water level within the sheet piling would be lowered by pumping.

Once the work site is isolated, the manhole in Kensico Reservoir would be accessed by installing a timber work platform supported by a box crib foundation from the shoreline to the manhole. The timber work platform would then be extended to facilitate transportation of materials.

The turbidity curtain placed along the perimeter of the in-water work area would protect the reservoir from turbidity. Fish would be excluded from the work area during construction by these barriers. The turbidity curtain would contain debris and sediment that may be associated with the manhole repairs, and would limit potential adverse effects to surrounding aquatic habitat that may occur due to temporary and short-term resuspension of sediments or increases in turbidity.

Work activities in the study area may require a temporary drawdown of Kensico Reservoir approximately 2 feet lower than the maximum operating surface water elevation of 355 feet, to an elevation of 353 feet (North American Vertical Datum of 1988). The temporary drawdown would be within the typical operating range for the reservoir, and would last approximately one month in ~~2020~~2019, to briefly expose the manhole's infrastructure to facilitate these repairs. The lowered water levels would be experienced at the access manhole and along the reservoir's perimeter and would temporarily expose substrate. The drawdown would occur during the period of lowest water supply demand (October through March). There would be no impact to fish spawning because shoreline-spawning species such as bass and sunfish spawn earlier in the year (May through July).

Kensico Reservoir's water surface elevation remains relatively constant year-round. Seasonal fluctuations in the surface water elevation typically range between 353 and 355 feet (North American Vertical Datum of 1988). Because this drawdown would be within the typical operating range of water surface elevations at Kensico Reservoir, any effects on fish and benthic communities would be consistent with baseline conditions. Effects are expected to be localized, short-term, and minimal; full recovery would be expected for both fish and invertebrates. Fish and mobile invertebrates would be expected to move to deeper waters as water levels gradually

lower. Some loss of sessile invertebrates could occur as these immobile communities become stranded along the exposed shoreline. However, due to the relatively short duration of the drawdown and the marginal quality of the habitat, the loss of the benthic community would be minimal. It is unlikely that fish would become stranded in isolated pools as a result of the drawdown because the rate of the drawdown would be very gradual over the course of a few days. Reservoir populations would not be adversely affected, as these communities would be expected to fully recover by the following spring. Once the work is complete and the drawdown is over, fish would move back into shallow areas immediately and invertebrates would repopulate the substrate within a few months.

A temporary, timber platform would be placed in Kensico Reservoir to provide a stabilized area for crews to access the manhole. The work platform would occupy a footprint of less than 0.04 acre of surface water for up to 10 weeks. Minor disturbance to the benthic community would result from limited in-water excavation of approximately 4 cubic yards of sediment around the manhole to ensure the platform is anchored to solid substrate. Excavation would be completed either hydraulically from a barge or from the shoreline using a backhoe/excavation bucket and all materials would be managed in accordance with applicable regulations. Water depth in the in-water work area is anticipated to be very shallow following drawdown, potentially exposing the submerged land leading to the manhole. Therefore, resuspension of material in the water column would be minimal and any suspension would be contained by the turbidity curtain. Shading from the work platform is not anticipated to adversely affect fish because the turbidity curtain would exclude fish from accessing the work area. Upon completion of activities, including removal of the temporary work platform, the turbidity curtain would be removed.

As stated previously, if a drawdown is not feasible during construction, a cofferdam would be installed. The cofferdam would occupy a similar area as the work platform. Within the cofferdam at the low point, a sump pump would be installed to dewater the cofferdam of any groundwater seepage and keep the work area dry. Following construction, the cofferdam and work platform would be removed and benthic resources within the footprint would be expected to recover quickly, recolonizing from nearby areas. Fish would be excluded from the work area during construction by the turbidity curtain. Therefore, impacts from a potential cofferdam around the work site are expected to be minimal.

Only minor effects on invertebrates could occur at the manhole site from the installation (anchoring) of a temporary timber platform or a potential cofferdam. This disturbance would be minimal with the benthic community recovering completely by the following spring, if not sooner. In-water areas temporarily disturbed would return to natural conditions over time.

Appropriate protective measures would be in place and maintained while undertaking all in-water work. The aqueduct shutdowns and work activities that may need to occur within the restricted in-water work window would be balanced with measures to protect these aquatic resources. This, in conjunction with the flexibility to conduct work during the in-water work window as needed, would allow the construction of the repair and rehabilitation to be completed prior to the RWBT temporary shutdown and would reduce the overall timeframe for in-water work.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to aquatic and benthic resources within the Westlake Drive Study Area.

Terrestrial Resources

Based on field visits conducted September 22, 2015, the study area is composed of four ecological communities: mowed roadside/pathway, beech/maple mesic forest, ditch/artificial intermittent stream, and reservoir/artificial impoundment community. Several large wind-thrown trees with root masses attached were present in the forested area and on the banks of the reservoir. The trees appeared to have fallen recently, and could have been the result of strong winds during recent tropical storms (e.g., Irene and Lee in 2012, Sandy in 2014). Invasive species are present in the upland community types including Norway maple (*Acer platanoides*), winged euonymus (*Euonymus alatus*), Hercules' club (*Zanthoxylum clava-herculis*), multiflora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergii*), wineberry (*Rubus phoenicolasius*), privet (*Ligustrum* spp.), porcelain berry (*Ampelopsis brevipedunculata*), Oriental bittersweet (*Celastrus orbiculatus*), common mugwort (*Artemisia vulgaris*), common reed (*Phragmites australis*), knapweed (*Centaurea* spp.), Queen Anne's lace (*Daucus carota*), and garlic mustard (*Alliaria petiolata*). Construction access would require tree removal. The Town of Mount Pleasant regulates removal of trees at least 4 inches dbh (Mount Pleasant Town Code Chapter 201: Trees) and Town review and approval is anticipated to be required.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Westlake Drive Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the natural resources study area would be the same as baseline conditions.

Work activities associated with the repair and rehabilitation would include minor tree clearing and shrub removal for the purpose of improving site access. Within the study area, 23 trees consisting of nine species with a range of average dbh of between 5.5 and 16.4 inches may be removed. The most common species of trees to be removed include five tuliptree (*Liriodendron tulipifera*), four sweet birch (*Betula lenta*), and four red maple (*Acer rubrum*). Tree removal would be limited to a few select trees, and would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). Additionally, tree removal would be conducted on DEP property and in accordance with applicable requirements set forth by the Town of Mount Pleasant. Tree removal would occur in discrete locations along the densely forested areas north of the aqueduct, and would not dramatically change the character of area affect surrounded trees.

To enhance and stabilize the reservoir's shoreline, DEP would plant riparian vegetation following construction within the floodplain and restore shoreline habitat along Kensico Reservoir that was temporarily disturbed by the construction staging and timber work platform. While the species composition and quantity have not yet been determined, replacement plantings would be native species adapted to floodplain habitat.

Following construction, all equipment would be removed from the study area, and staging areas would be restored to natural conditions. Riparian vegetation would be planted to restore the floodplain community along Kensico Reservoir. Vegetated areas temporarily cleared during construction are anticipated to grow back with similar communities. Following the repair and rehabilitation, operation of the Catskill Aqueduct would be consistent with baseline conditions and natural reforestation and vegetative succession of the area would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Westlake Drive Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected within the study area, species that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” four species were identified to have the potential be affected by the repair and rehabilitation within the natural resources the study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these four species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible effects due to changes in habitat resulting from natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area for these species are shown in **Table 9.16-22**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and observations during field visits, as applicable.

Table 9.16-22: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Westlake Drive Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visit on September 22, 2015. Work activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, as a highly mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Birds					
Bald Eagle	<i>Haliaeetus leucocephalus</i>	BGPA/ MBTA	Threatened	No individuals were incidentally observed during the field visit on September 22, 2015. Potential roosting and foraging habitat exists in and adjacent to the study area along Kensico Reservoir. Nest attempts occurred along Kensico Reservoir (more than 10,500 feet [2 miles] southeast of the work sites) in 2014 and 2015. However, recommended buffer restrictions of 330 and 660 feet, for USFWS and DEP, are not applicable since these are not active nests. Temporary noise could discourage Bald Eagles from nesting in the immediate vicinity of the work sites. However, this work would not occur over an extended period of time and there is abundant suitable habitat in the surrounding areas. Prior to construction, the areas adjacent to the work sites would be checked for nesting eagles. Therefore, there are no effects anticipated and no further analysis for Bald Eagles is warranted for this study area.	No

Table 9.16-22: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Westlake Drive Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	During the tree survey on September 22, 2015, one potential roosting tree was observed in the study area. Therefore, further analysis is warranted for this study area.	Yes. See further analysis.
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened Unlisted	During the tree survey on September 22, 2015, one potential roosting tree was observed in the study area. The Kensico Upper Effluent Chamber building may also provide suitable roosting habitat. Therefore, further analysis is warranted for this study area.	Yes. See further analysis.
Notes: BGPA: Bald and Golden Eagle Protection Act MBTA: Migratory Bird Treaty Act					

Indiana Bat (Myotis sodalis)

A tree survey was conducted in the Westlake Drive Study Area on September 22, 2015. Twenty-three trees were tagged in the work area, principally sweet birch, red maple, tuliptree, red oak (*Quercus rubra*), and black oak (*Q. velutina*). One potential bat roosting tree, a dead white oak (*Q. alba*), was observed in the study area. The presence of adjacent forest areas and a potential roost tree within the survey area indicate potential summer habitat for bat species within the forested areas of the study area.

Repair and rehabilitation would require tree removal, which would be conducted from November 1 through March 31 to avoid impacts to Indiana bats. Repair and rehabilitation would not result in significant loss or modification of forested habitat for roosting Indiana bats. Potential effects to water resources would be avoided to the furthest extent possible, and foraging habitat would continue to be available in the canopy within the study area and in adjacent forested areas. There may be temporary noise that discourages Indiana bats from roosting in the immediate vicinity of the work sites; however, there is abundant suitable habitat in the surrounding areas within which Indiana bats could roost. Construction lighting would be used as needed during the 10-week shutdowns, and because these would occur between October and March, it would be unlikely that bats would be in the area and, therefore, no disturbance from nighttime lighting is anticipated. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect Indiana bats in this study area.

Northern Long-eared Bat (Myotis septentrionalis)

A tree survey was conducted in the Westlake Drive Study Area on September 22, 2015. See results above. The Kensico Upper Effluent Chamber building may also provide suitable roosting habitat for northern long-eared bats.

Repair and rehabilitation would require tree removal, which would be conducted from November 1 through March 31 to avoid impacts to northern long-eared bats. Repair and rehabilitation would not result in significant loss or modification of forested habitat for roosting northern long-eared bats. The chamber building would be used for access to the aqueduct during the repairs and aqueduct shutdowns, similar to baseline conditions, and would not be structurally altered. Should any bats or their guano be observed within these structures during work activities, USFWS and NYSDEC would be contacted immediately to determine the best course of action. Potential effects to water resources would be avoided to the furthest extent possible, and foraging habitat would continue to be available in the canopy within the study area and in adjacent forested areas. There may be temporary noise that discourages northern long-eared bats from roosting in the immediate vicinity of the work sites; however, there is abundant suitable habitat in the surrounding areas within which northern long-eared bats could roost. Construction lighting would be used as needed during the 10-week shutdowns, and because these would occur between October through March, it would be unlikely that bats would be in the area and, therefore, no disturbance from nighttime lighting is anticipated. Therefore, the repair and rehabilitation may affect, but is unlikely to adversely affect, northern long-eared bats in this study area.

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*) or Bald Eagles (*Haliaeetus leucocephalus*) associated with the repair and rehabilitation. Repair and rehabilitation may affect, but is not likely to adversely affect, Indiana bats, or northern long-eared bats.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Westlake Drive Study Area.

9.16.5.6 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Westlake Drive Study Area, a Phase I ESA was conducted in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify RECs. The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a Sediment Removal, Condition Assessment investigation, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Based on the Phase I ESA investigation within this study area, there was no indication of an environmental impact that would constitute a REC as defined by the ASTM standard that would affect activities in the study area.

The repair and rehabilitation work activities within this study area would include minor tree clearing and gravel placement. The proposed access road improvement would occur on a previously disturbed section along Kensico Reservoir. Additionally, with the exception of work activities that require in-water work, the repair and rehabilitation would occur in an area that is rarely inundated by Kensico Reservoir water. Given the findings of previous subsurface investigation along similar portions of the aqueduct corridor, no subsurface ground contamination is anticipated. The legacy data also revealed that the Catskill Kensico Bypass Tunnel contains sediment with high levels of alum flocculent that has accumulated on the bypass tunnel invert located between the Catskill Influent Chamber and the Kensico Upper Effluent Chamber.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Westlake Drive Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Westlake Drive Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Removal of sediment and accumulated alum flocculent from the bypass tunnel would be handled and disposed of at an appropriate off-site facility, in accordance with applicable federal, State, and local regulations and guidelines. Following the repair and rehabilitation, all structures and equipment would be removed from the Westlake Drive Study Area. The staging areas would be restored, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

Therefore, repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Westlake Drive Study Area.

9.16.5.7 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Westlake Drive Study Area.

Access to the repair and rehabilitation limits of construction for the work sites within the Westlake Drive Study Area would be via Westlake Drive directly to DEP property (see **Figure 9.16-26**). Westlake Drive is a two-lane, two-way local roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Westlake Drive Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area and there is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, no DEP employees routinely access the site. When needed, there are DEP employees who visit the study area and would access the site via Westlake Drive.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Westlake Drive Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Westlake Drive Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be the basis of this transportation analysis. Of these activities, sediment removal would generate the most vehicle trips. Sediment removal would occur in fall ~~2020~~2019 for up to 24 hours per day, 7 days a week for approximately 5 weeks during the third 10-week shutdown (including 1 week for cofferdam installation, if needed).

In the future with the repair and rehabilitation, construction vehicles would travel along Westlake Drive directly to DEP property. The estimated number of peak-day one-way vehicle trips associated with sediment removal is 60 vehicles trips, or approximately 120 peak-day vehicle round trips that would travel to and from the study area. Approximately 48 vehicle round trips or 48 PCEs, would be workers traveling directly to and from the staging area, with an additional 8 daily shuttle trips between the study area and the staging area. The remaining approximately 64 peak-day vehicle round trips (108 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with sediment removal is approximately 60 peak-hour vehicle trip ends (83 PCEs). This includes approximately 24 vehicle trip ends (24 PCEs) from workers traveling directly to and from the staging area, approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 32 vehicle trip ends (55 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming two, 12-hour shifts, this would be during the 6 AM to 7 AM and 6 PM to 7 PM hours, and would be unlikely to coincide with the peak hour for existing traffic.

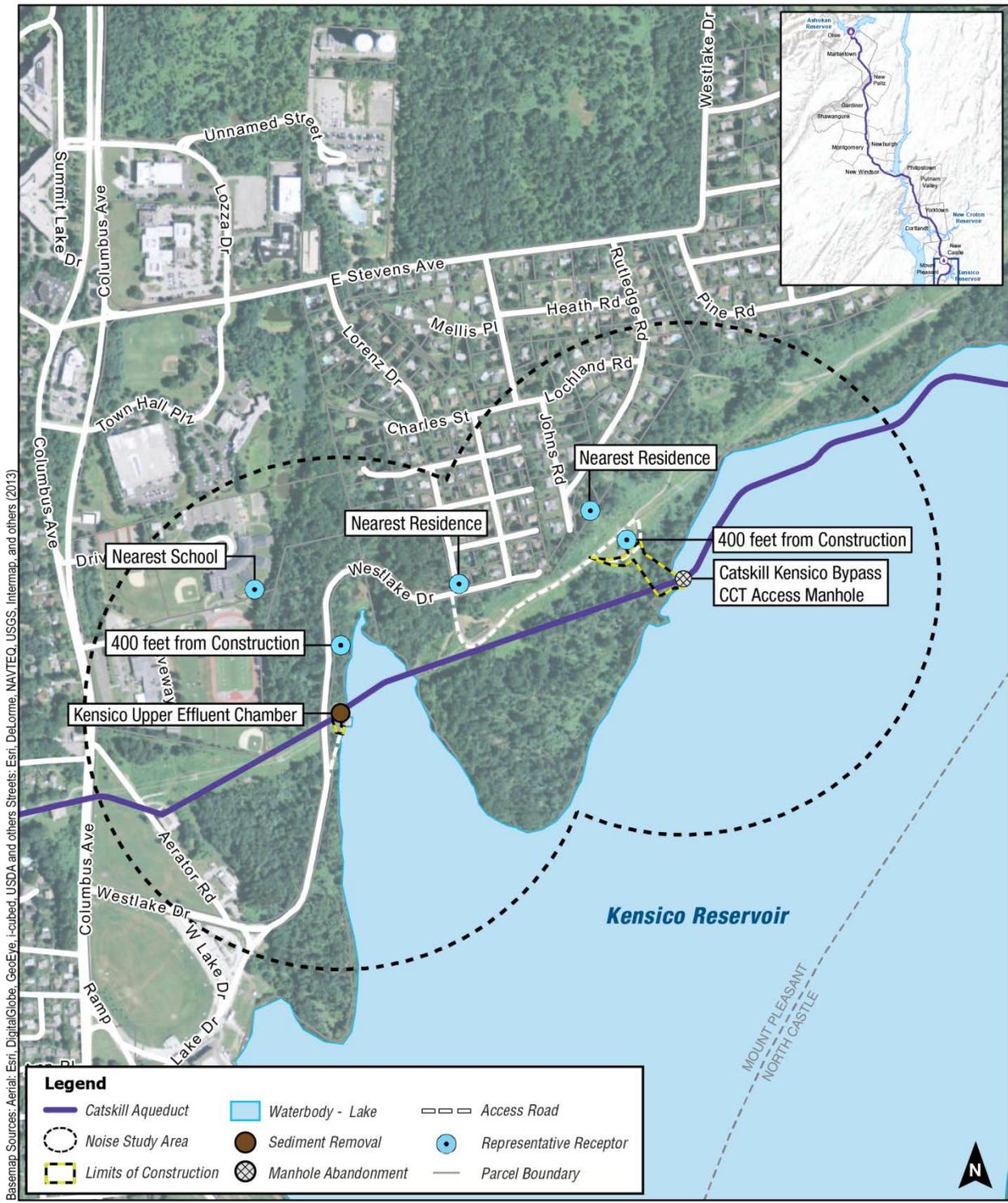
The repair and rehabilitation would result in approximately 83 peak-hour PCEs on Westlake Drive, which is above the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, “Transportation.” The work activities at the Westlake Drive Study Area would be short-term (totaling 14 weeks over 1.5 years for sediment removal; see **Table 9.16-18**) and would not generate public parking or transportation demands or pedestrian activity within the Westlake Drive Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Westlake Drive Study Area.

9.16.5.8 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation work activities within the Westlake Drive Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The study area for the noise analysis is the area within 1,500 feet of the repair and rehabilitation activities as shown on **Figure 9.16-35**. The Westlake Drive Noise Study Area includes residential parcels and two school buildings within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Town of Mount Pleasant Noise Control Law (§139-18) which prohibits noise levels from construction sites from exceeding an L_{10} of 70 dBA during the hours of 8 AM to 6 PM, and an L_{10} of 55 dBA during the hours of 6 PM to 8 AM, when measured at a distance of 400 feet from the construction site in residentially zoned districts. In addition, work activities are prohibited between the hours of 5 PM and 8 AM in all zoning districts, except in the event of urgent necessity or in the interest of safety, in which case the Building Inspector may issue a permit.



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Note: CCT = Cut-and-Cover Tunnel

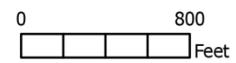


Figure 9.16-35: Noise – Westlake Drive Study Area



Existing ambient noise levels within the Westlake Drive Study Area are influenced by vehicular traffic traveling on Westlake Drive and other local roadways. The existing noise levels within the study area are comparable to a quiet suburban residential environment based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements (e.g., commercial uses). Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Westlake Drive Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Westlake Drive Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Westlake Drive Study Area would occur at two sites. The stationary noise-generating equipment that would be used within the Westlake Drive Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Two peak construction activities were evaluated in the Westlake Drive Study Area for comparison with the Town of Mount Pleasant daytime and nighttime noise limits because the overall loudest activity would only occur during the day. Of the activities, the stationary noise-generating equipment associated with the cofferdam construction would emit the most noise. Cofferdam construction would occur in summer ~~2020~~2019 between the hours of 8 AM and 5 PM, Monday through Friday for approximately 1 week prior to the third 10-week shutdown (see **Table 9.16-18**). The stationary noise-generating equipment associated with sediment removal was the basis of the stationary noise analysis for overnight hours. Sediment removal would occur in fall ~~2020~~2019 for up to 24 hours per day, 7 days a week for approximately 5 weeks during the third 10-week shutdown.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the cofferdam construction and sediment removal. Associated equipment reference noise levels are shown in **Table 9.16-23**. The Town of Mount Pleasant Code defines allowable construction noise levels using the L_{10} metric. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.16-23: Stationary Source Construction Equipment Modeled at the Westlake Drive Study Area - Noise Analysis and Reference Noise Levels (L₁₀)

Equipment Type	Reference Noise Level (L ₁₀) at 50 feet (dBA) ¹
Cofferdam Construction	
Vibratory Pile Driver	91
Excavator	84
Doze	84
Sediment Removal	
Generator	82
Man Lift	81
Front End Loader	79
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	

Table 9.16-24 shows the results of the stationary construction noise analysis. The Town of Mount Pleasant Code defines allowable noise levels at a distance of 400 feet from the construction site; therefore, noise levels at a distance of 400 feet were calculated for comparison with the local noise ordinance. However, all noise-sensitive receptors are located more than 400 feet from the construction work area. The repair and rehabilitation work activity within the Westlake Drive Study Area that is closest to the nearest residence, cofferdam construction, would produce a noise level (L₁₀) of approximately 70 dBA at the nearest residence. The repair and rehabilitation work activity within the Westlake Drive Study Area that is closest to the nearest school building, sediment removal, would produce a noise level (L₁₀) of approximately 61 dBA at the nearest school. Other noise-producing equipment would also be utilized within the study area for a limited period during work activities; however, this equipment would not be expected to be louder than those associated with cofferdam construction and sediment removal. Repair and rehabilitation work activities within the Westlake Drive Study Area could emit noise levels greater than allowed by the Town of Mount Pleasant noise code. Additionally, work activities have the potential to occur outside of the allowable hours defined by the Town of Mount Pleasant. DEP would work with the Town of Mount Pleasant, as appropriate.

Although there would be an increase in stationary noise levels during 24-hour construction periods during the aqueduct shutdowns, work would primarily occur in the fall and winter months when residents typically have windows closed, and noise levels inside would be further reduced to an interior noise level (L₁₀) of approximately 35 dBA. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Westlake Drive Study Area. The repair and rehabilitation would be temporary in nature with the peak work activities occurring during cofferdam construction and sediment removal in summer and fall ~~2020~~2019 for limited periods (e.g., up to 5 weeks per activity).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Westlake Drive Study Area.

Table 9.16-24: Stationary Noise Analysis Results (L₁₀) at the Nearest Noise-Sensitive Receptors within the Westlake Drive Study Area

Location	Distance from Site (Feet)	Predicted Stationary Noise Level at Noise-Sensitive Receptor (L ₁₀) (dBA)	Town of Mount Pleasant Noise Limit	Potential for Exceedance (Yes or No)
Cofferdam Construction (8 AM to 5 PM, Monday through Friday)				
400 feet from Construction	400	74	70 ¹ /55 ²	Yes ³
Nearest Residence	674	70	NA	NA
Sediment Removal (24 hours per day, 7 days a week)				
400 feet from Construction	400	68	70 ¹ /55 ²	Yes ³
Nearest Residence	1029	59	NA	NA
Nearest School	885	61	NA	NA
Notes: NA = Not Applicable ¹ Noise limit is applicable between the hours of 8 AM and 6 PM. ² Noise limit is applicable between the hours of 6 PM and 8 AM. ³ Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Town of Mount Pleasant.				

9.16.5.9 Neighborhood Character

The character of the Westlake Drive Study Area is largely defined by a mix of residential, community facilities, and public services land uses and its physical setting within a suburban location (see **Figure 9.16-28**). The Catskill Aqueduct traverses the study area in a general northeast to southwest direction. The study area includes parts of Kensico Reservoir and a section of Westlake Drive, which meanders from the west along the northern portion of the study area. The work sites and associated access routes are located entirely in a public services corridor with grassy cover, owned and maintained by DEP and separated from adjacent land by wooded areas.

DEP has consulted with the Town of Mount Pleasant and Westchester County, and it is DEP’s understanding that no changes in land use and no new projects or structures are anticipated within the Westlake Drive Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, “Neighborhood Character,” there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; and historic and cultural

resources, an impact analysis for the Westlake Drive Study Area was not warranted, as discussed in the following sections: Section 9.3.3, “Land Use, Zoning, and Public Policy,” Section 9.3.4, “Socioeconomic Conditions,” and Section 9.3.7, “Historic and Cultural Resources,” respectively. As described in Section 9.16.5.2, Proposed Activities within the Westlake Drive Study Area,” and Section 9.16.5.4, “Visual Resources,” the work activities would not affect open space and recreation and visual resources in the Westlake Drive Study Area. Furthermore, the public policy impact analysis provided in Section 9.16.2, “Town of Mount Pleasant Impact ” concluded the work activities were consistent with applicable plans.

As described in Sections 9.16.5.7, “Transportation,” and 9.16.5.8, “Noise,” during construction, the work activities in the Westlake Drive Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, there would be no significant adverse impacts related to neighborhood character from the repair and rehabilitation within the Westlake Drive Study Area.

9.17 VILLAGE OF PLEASANTVILLE

9.17.1 VILLAGE OF PLEASANTVILLE PROJECT DESCRIPTION

The Village of Pleasantville is located on the eastern side of the Hudson River within the Town of Mount Pleasant in Westchester County, New York. The Village of Pleasantville is approximately 1.8 square miles. General boundaries of locations where activities associated with the repair and rehabilitation would occur within the Village of Pleasantville are shown in **Figure 9.17-1**.

The Catskill Aqueduct stretches for approximately 2.3 miles in a southeasterly direction through the Village of Pleasantville. The study areas, where activities associated with the repair and rehabilitation would occur within the Village of Pleasantville, are shown on **Figure 9.17-1**. Notable sites along the aqueduct within the Village of Pleasantville that are associated with repair and rehabilitation include the Harlem Railroad Steel Pipe Siphon North Chamber, Harlem Railroad Steel Pipe Siphon South Chamber, and the proposed dechlorination facility at Pleasantville Alum Plant.

The repair and rehabilitation work activities in the Village of Pleasantville would occur within three study areas as are shown in **Table 9.17-1**. Repair and rehabilitation work activities within the Town of Mount Pleasant were assessed in Section 9.16, "Town of Mount Pleasant."

Table 9.17-1: Schedule of Work Activities within the Village of Pleasantville

Work Activity	Study Area		
	Washington Avenue	Pleasantville Alum Plant	Willow Street
Staging and Access Improvements	✓	-	✓
Blow-off Chamber Reconstruction	✓	-	-
Boathole Preparation	✓	-	✓
Boathole Installation	✓	-	✓
Streambank Restoration and Protection	✓	✓	-
Dechlorination Facility Construction	-	✓	-
Dechlorination Facility Start-up and Testing	-	✓	-
Dechlorination Facility Operation	-	✓	-
Sluice Gate Replacement	-	✓	-
Biofilm Removal and Condition Assessment	✓	✓	✓
Small-scale Wash Water Treatment	✓	-	✓
Notes:			
- = Work activity not proposed.			
✓ = Work activity proposed.			

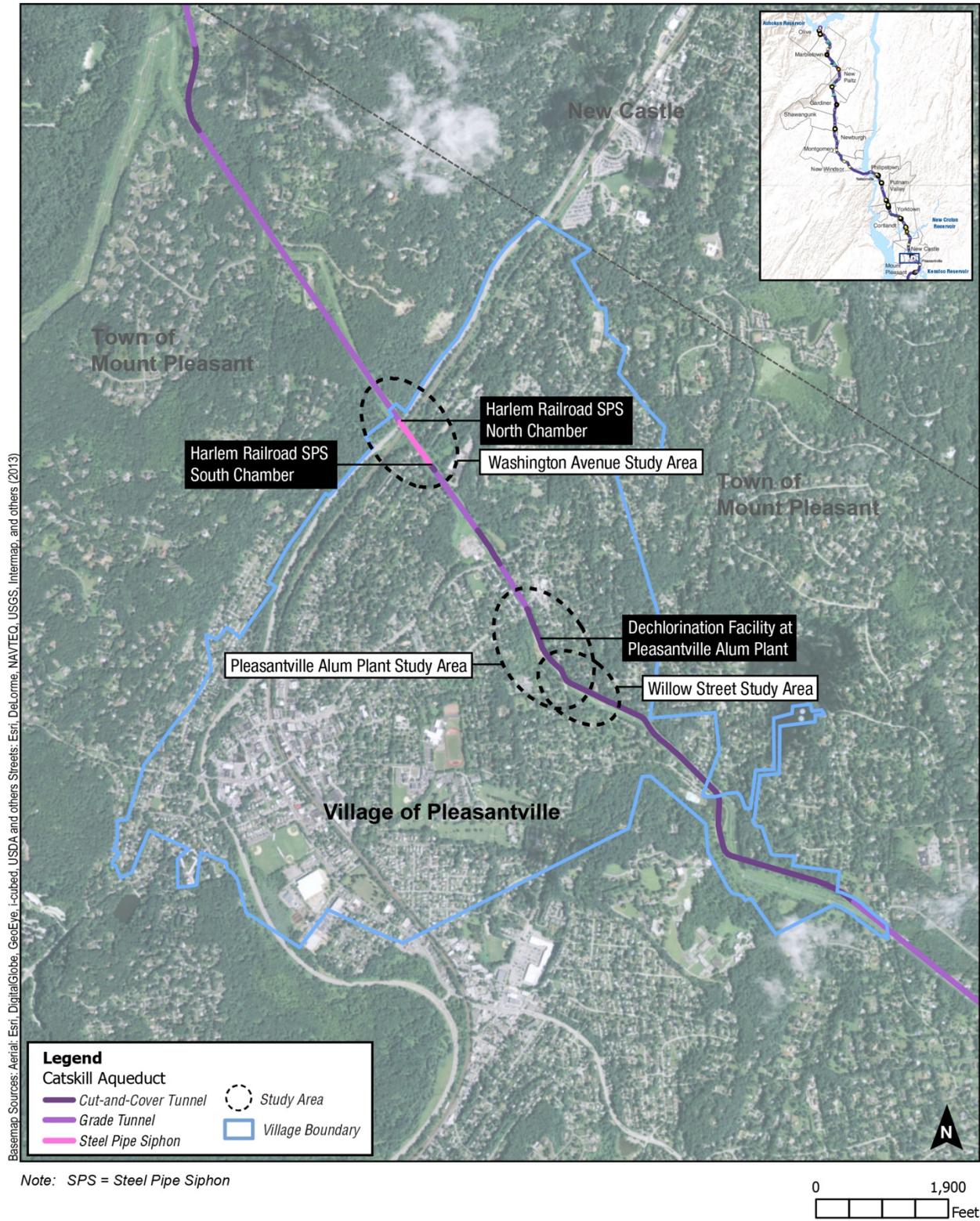


Figure 9.17-1: Village of Pleasantville Study Areas



These three study areas in the Village of Pleasantville encompass the work analyzed as part of the repair and rehabilitation in this municipality. Additional work activities in the Village of Pleasantville do not warrant further analysis. Work sites located outside the study areas include activities that would primarily be conducted within the aqueduct interior (Section 9.3, “Screening Assessment and Impact Analysis Methodology”). In the Village of Pleasantville, they include biofilm removal and condition assessment at access manholes not located in these study areas. See Section 9.2, “Project Description,” for an overall project description of the repair and rehabilitation. Section 9.17.2, “Village of Pleasantville Impact Analysis,” provides a discussion of local regulations in the Village of Pleasantville jurisdictional limits. The following sections provide a description of the study area, proposed activities, and impact analysis for the three study areas:

- Section 9.17.3 – Washington Avenue Study Area Impact Analysis
- Section 9.17.4 – Pleasantville Alum Plant Study Area Impact Analysis
- Section 9.17.5 – Willow Street Study Area Impact Analysis

9.17.2 VILLAGE OF PLEASANTVILLE IMPACT ANALYSIS

9.17.2.1 Public Policy

Because local public policies would not vary for study areas in the same town, public policies are evaluated on a town-wide basis. As discussed in Section 9.3.3, “Land Use, Zoning, and Public Policy,” the repair and rehabilitation’s consistency with the applicable policies of Westchester County’s Westchester 2025 Plan (Westchester County 2008) and Village of Pleasantville Master Plan Update (Pleasantville 1995) within the Washington Avenue, Pleasantville Alum Plant, and Willow Street study areas was analyzed as follows.

Westchester 2025 Plan (2008)

The Westchester 2025 Plan is a framework to assist the 45 municipalities within the County to develop comprehensive plans that achieve a balance between economic and environmental concerns, while serving the future needs of the local communities within Westchester County. The recommendations outlined in the Plan include those recommended by the Westchester County Planning Board to municipalities as guidance for their own decision making. Based upon a review of these recommendations, the potential effects of the repair and rehabilitation work activities within the Washington Avenue, Pleasantville Alum Plant, and Willow Street study areas are evaluated relative to compatibility with the following two applicable recommendations:

- (1) Preserve natural resources: Preserve and protect the county’s natural resources and environment, both physical and biotic. Potential impacts on water resources (water bodies, wetlands, coastal zones and groundwater), significant land resources (unique natural areas, steep slopes, ridgelines and prime agricultural land) and biotic resources (critical habitat, plant communities and biotic corridors) require careful consideration as part of land management and development review and approval.*

There are no significant land resources within the study areas in the Village of Pleasantville, and no water resources were identified in the Willow Street Study Area that could be affected by the repair and rehabilitation. Water resources and biotic resources within the Washington Avenue and Pleasantville Alum Plant study areas are discussed in detail within the respective “Natural Resources” sections. Water resources in these study areas consist of Saw Mill River and an unnamed tributary to Nanny Hagen Brook, respectively.

Under this recommendation, the Westchester 2025 Plan prioritizes the preservation of natural resources in order to balance this alongside land management and development. This recommendation was analyzed for the repair and rehabilitation, as work in the study areas would potentially impact existing natural resources directly or indirectly, depending on the study area.

As part of the work at Washington Avenue and Pleasantville Alum Plant study areas, riprap aprons would be installed at blow-off chambers and a culvert drain sluice gate. This would restore the historic stream protection measures at these sites. Unwatering of the aqueduct would be required. This may result in raw water discharges to Saw Mill River in the Washington Avenue Study Area and an unnamed tributary to Nanny Hagen Brook in the Pleasantville Alum Plant Study Area. During construction, diversion of these waters around in-stream work would be required in order to complete certain work elements. Additionally, the discharge of treated biofilm wash waters to surface water may also be required at the Washington Avenue Study Area. Finally, a dechlorination facility would be installed in the Pleasantville Alum Plant Study Area and operated during temporary chlorination of the aqueduct. Dechlorinated aqueduct water would be conveyed to Kensico Reservoir.

The repair and rehabilitation would not be expected to affect water resources for several reasons. While discharges of raw aqueduct water could take place at any time during construction or future maintenance, this would consist of uncontaminated raw water from the aqueduct. Sediment and erosion control measures would also be put in place for all construction activities. Restoring the riprap aprons to their original condition would result in minimal fill, and would be beneficial in that these would minimize future scouring when the blow-off chambers and the culvert drain sluice gate are operated. Temporary discharge of treated biofilm wash water to the Saw Mill River would be conducted in accordance with applicable regulatory requirements established as part of required discharge permits. As a result, work activities are not anticipated to result in significant increases in turbidity, scouring, or other adverse impacts to water resources.

Select tree removal on DEP property may be needed at Washington Avenue Study Area to establish better access to the proposed work sites. However, this would not permanently affect critical biotic habitat or corridors within the study area. The work sites would be located in previously disturbed areas at existing DEP facilities. Tree removal is required because access to these areas has not been needed for some time, and trees have grown in unmaintained areas along the aqueduct.

Furthermore, following construction, areas temporarily disturbed during construction would be restored to baseline conditions.

As such, the repair and rehabilitation within the Washington Avenue, Pleasantville Alum Plant, and Willow Street study areas would not affect natural resources or biotic resources and would be consistent with this recommendation.

(2) *Engage in Regional Initiatives: Work with neighboring jurisdictions in the Hudson Valley, Connecticut, New Jersey, Long Island and New York City in planning initiatives aimed at sound land use, transportation, economic development, housing and environmental policies.*

Repair and rehabilitation supports the goal of supplying clean drinking water to the City's 8 million residents and 1 million upstate residents. As described in Section 9.3, "Screening Assessment and Impact Analysis Methodology," land use and zoning and socioeconomic conditions would not be affected by the repair and rehabilitation within study areas in the Village of Pleasantville. The potential for impacts to transportation are analyzed in detail in the respective "Transportation" sections for the Washington Avenue, Pleasantville Alum Plant, and Willow Street Study Area study areas.

Under this recommendation, the Westchester 2025 Plan prioritizes the inter-agency cooperation in order to better facilitate regional initiatives. This recommendation was analyzed for repair and rehabilitation as work within the study areas would potentially impact existing land use, transportation, economic development, housing, and environmental policies directly or indirectly, depending on the study area.

On a daily basis, over one billion gallons of water are delivered from large reservoirs spanning several counties and jurisdictions within the State to these water consumers. As part of the repair and rehabilitation, DEP has coordinated with State and local jurisdictions to ensure that current and future water supplies are maintained. Throughout this coordination, the repair and rehabilitation within the Washington Avenue, Pleasantville Alum Plant and Willow Street study areas would comply with existing land use, transportation, economic development, housing and environmental policies, and would therefore be consistent with this recommendation.

Repair and rehabilitation would therefore be consistent with Westchester 2025 Plan in the Village of Pleasantville and would not result in significant adverse impacts to public policy within the Washington Avenue, Pleasantville Alum Plant, and Willow Street study areas.

Village of Pleasantville Master Plan (1995)

The Village of Pleasantville Master Plan Update was adopted in 1995 in order to re-visit and reiterate the goals established in the 1961 and 1973 Master Plans. An amendment was also adopted in 2007, which focused on the Marble Avenue Corridor Study. Updates to the Village of Pleasantville Master Plan were the result of collaboration between the Master Plan Advisory Committee, Planning Commission, Village Board, and staff. Recommended actions and implementation strategies included in the Master Plan Update are intended to address the needs and opportunities within the Village of Pleasantville and address issues such as land use, housing, and infrastructure. Based upon a review of these recommendations, the potential effects of the repair and rehabilitation work activities within the Village of Pleasantville are applicable

to the Pleasantville Alum Plant Study Area and are evaluated relative to compatibility with the following recommendation:

- *Infrastructure:*
 - Drainage

Water and sewer infrastructure resources within the Pleasantville Alum Plant Study Area are discussed in detail in Section 9.17.4.7 “Water and Sewer Infrastructure.” As discussed in Section 9.19, “Project-wide Impact Analysis,” internal repairs to the aqueduct would be completed while the aqueduct is unwatered.

Under this recommendation, the Comprehensive Plan prioritizes the preservation of the Village’s infrastructure, including roads, water supply, drainage, and sewage and solid waste disposal, in order to guarantee that conditions do not deteriorate. This recommendation was analyzed for the repair and rehabilitation, as work in the study areas has the potential to affect existing water and sewer infrastructure directly or indirectly, depending on the study area.

Unwatering the Catskill Aqueduct may result in raw water discharges to Saw Mill River in the Washington Avenue Study Area and an unnamed tributary to Nanny Hagen Brook in the Pleasantville Alum Plant Study Area. Additionally, the discharge of treated biofilm wash waters to surface water may also be required at Washington Avenue Study Area. Discharges through repaired siphon blow-off chambers and a culvert drain sluice gate would be conducted in a manner consistent with their intended use. These discharges may occur as part of the 10-week shutdowns during construction or as part of future maintenance. Measures would be taken to prevent a bankfull event when unwatering the aqueduct and would not adversely affect receiving waterbodies or surrounding drainage in the study areas. Repair and rehabilitation work activities within the Washington Avenue, Pleasantville Alum Plant, and Willow Street study areas would not result in significant adverse impacts to water and sewer infrastructure in the Village of Pleasantville. Discharges to receiving streams within the study areas would not affect the Village’s infrastructure, and would therefore be consistent with this recommendation.

Repair and rehabilitation would be consistent with the Village of Pleasantville Master Plan Update and would not result in significant adverse impacts to public policy within the Washington Avenue, Pleasantville Alum Plant and Willow Street study areas.

9.17.3 WASHINGTON AVENUE STUDY AREA IMPACT ANALYSIS

In the upper portion of the Washington Avenue Study Area, the aqueduct consists of the Sarles Grade Tunnel, transitioning to the Harlem Railroad Steel Pipe Siphon at the Harlem Railroad Steel Pipe Siphon North Chamber (North Siphon Chamber). Immediately north of Saw Mill River, the steel pipe siphon includes a set of access manholes and three under-stream blow-off chambers and associated valves within the Harlem Railroad Steel Pipe Siphon Blow-off Chambers (Blow-off Chambers). In the lower portion of the study area, the aqueduct transitions again to the Harlem Railroad Grade Tunnel at the Harlem Railroad Steel Pipe Siphon South Chamber (South Siphon Chamber) (see **Figure 9.17-2**).

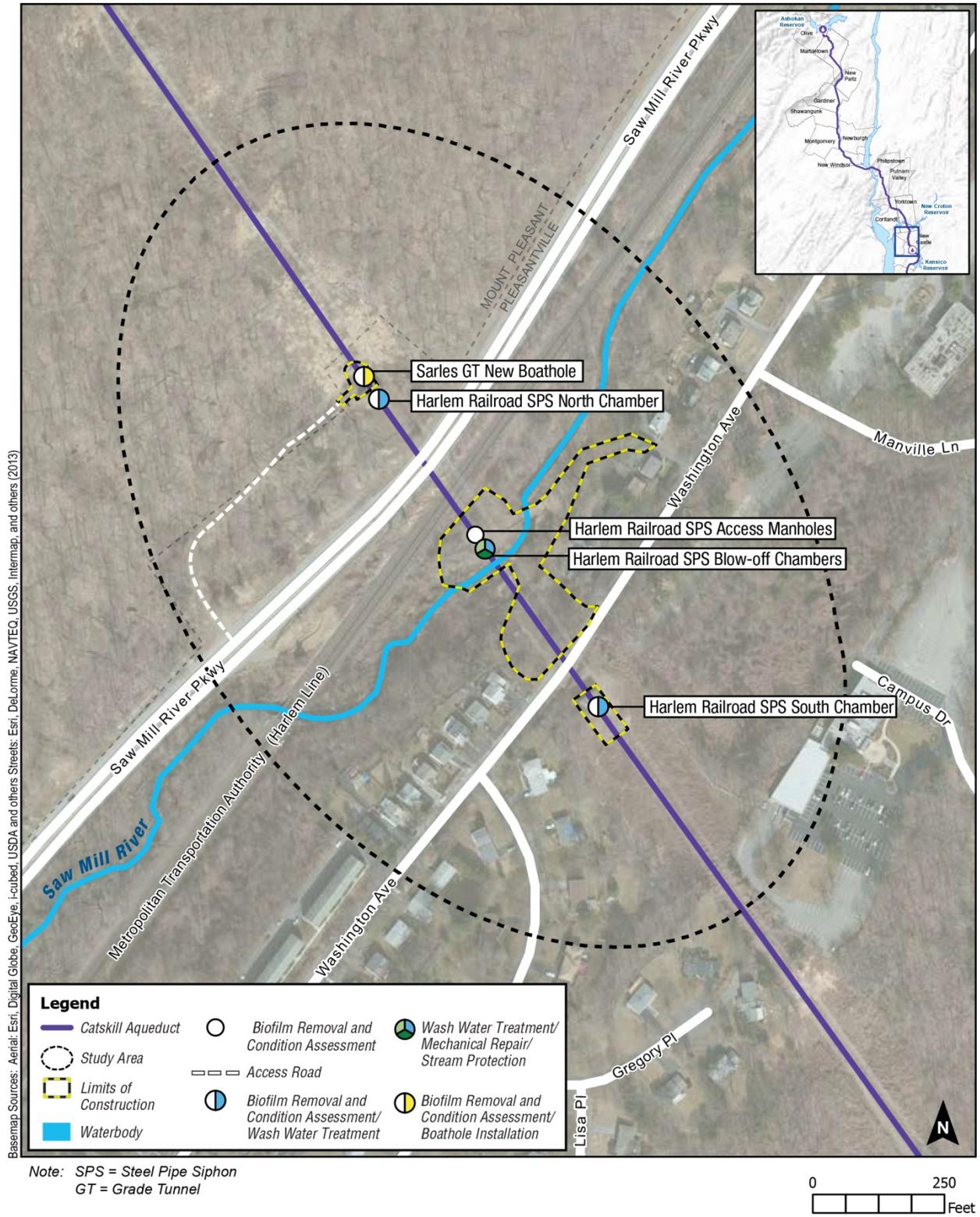


Figure 9.17-2: Study Area – Washington Avenue Study Area



Work activities within the Washington Avenue Study Area would include: staging and access improvements; streambank restoration and protection; blow-off chamber reconstruction; boathole preparation and installation; biofilm removal and condition assessment; and small-scale wash water treatment.

9.17.3.1 Study Area Location and Description

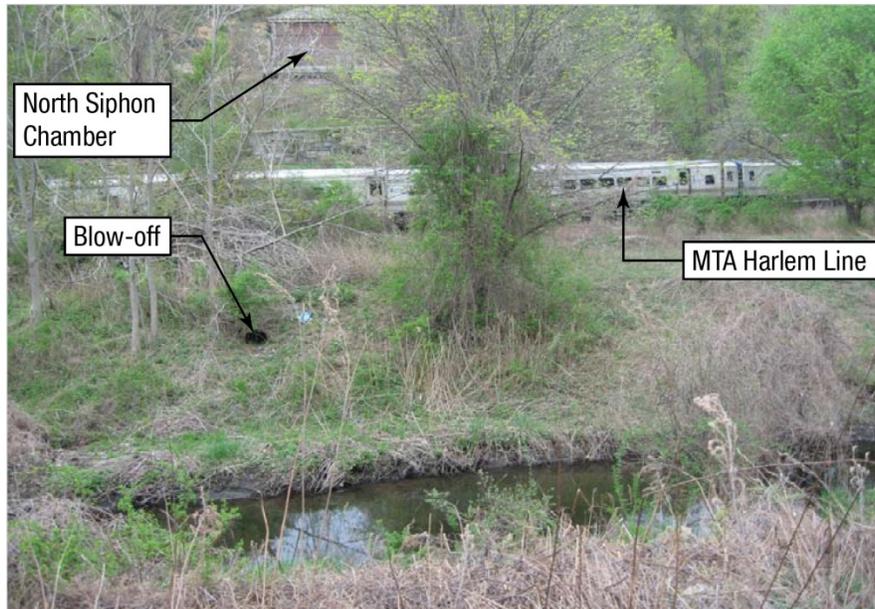
The Washington Avenue Study Area is located along the upper Catskill Aqueduct in the Town of Mount Pleasant and the Village of Pleasantville. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. Saw Mill River bisects the study area flowing to the southwest, and the Saw Mill River Parkway and Washington Avenue parallel the river to the north and south, respectively.

Proposed work sites within the study area include the North Siphon Chamber, the Blow-off Chambers, and the South Siphon Chamber. Access to the North Siphon Chamber would be provided by a gated DEP access road that connects to the Saw Mill River Parkway. Access to the Blow-off Chambers may be provided by one of three alternatives from Washington Avenue. Access to the South Siphon Chamber would be provided by driving over the siphon from an entrance off of Washington Avenue. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work sites and associated access routes. **Figure 9.17-2** shows an aerial photograph of the study area, including the path of the aqueduct, the limits of construction for the work sites, and the proposed access routes. **Figure 9.17-3** shows two photographs of a Blow-off Chamber outlet in the study area.

There are no federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

9.17.3.2 Proposed Activities within the Washington Avenue Study Area

To support activities within the Washington Avenue Study Area, the Catskill Influent Chamber (within the Nanny Hagen Study Area in the Town of Mount Pleasant) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas would provide additional parking, and equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. A site plan showing a layout of the limits of construction for the work sites, which would occupy a total of approximately 1.6 acres, is shown on **Figure 9.17-4**. The schedule for work within the study area is shown in **Table 9.17-2**. The duration of active construction within the Washington Avenue Study Area is estimated to total 26 weeks over 1.5 years.



Photograph 1: Looking northwest along the aqueduct. Saw Mill River is in the foreground. The Harlem Railroad Steel Pipe Siphon Blow-off Chamber outlet is shown between river and railroad, and the North Siphon Chamber is in the background beyond the railroad and the Saw Mill River Parkway.

Note: MTA = Metropolitan Transportation Authority



Photograph 2: Harlem Railroad Steel Pipe Siphon Blow-off Chamber discharge pipe shown containing sediment.

Figure 9.17-3: Photographs – Washington Avenue Study Area



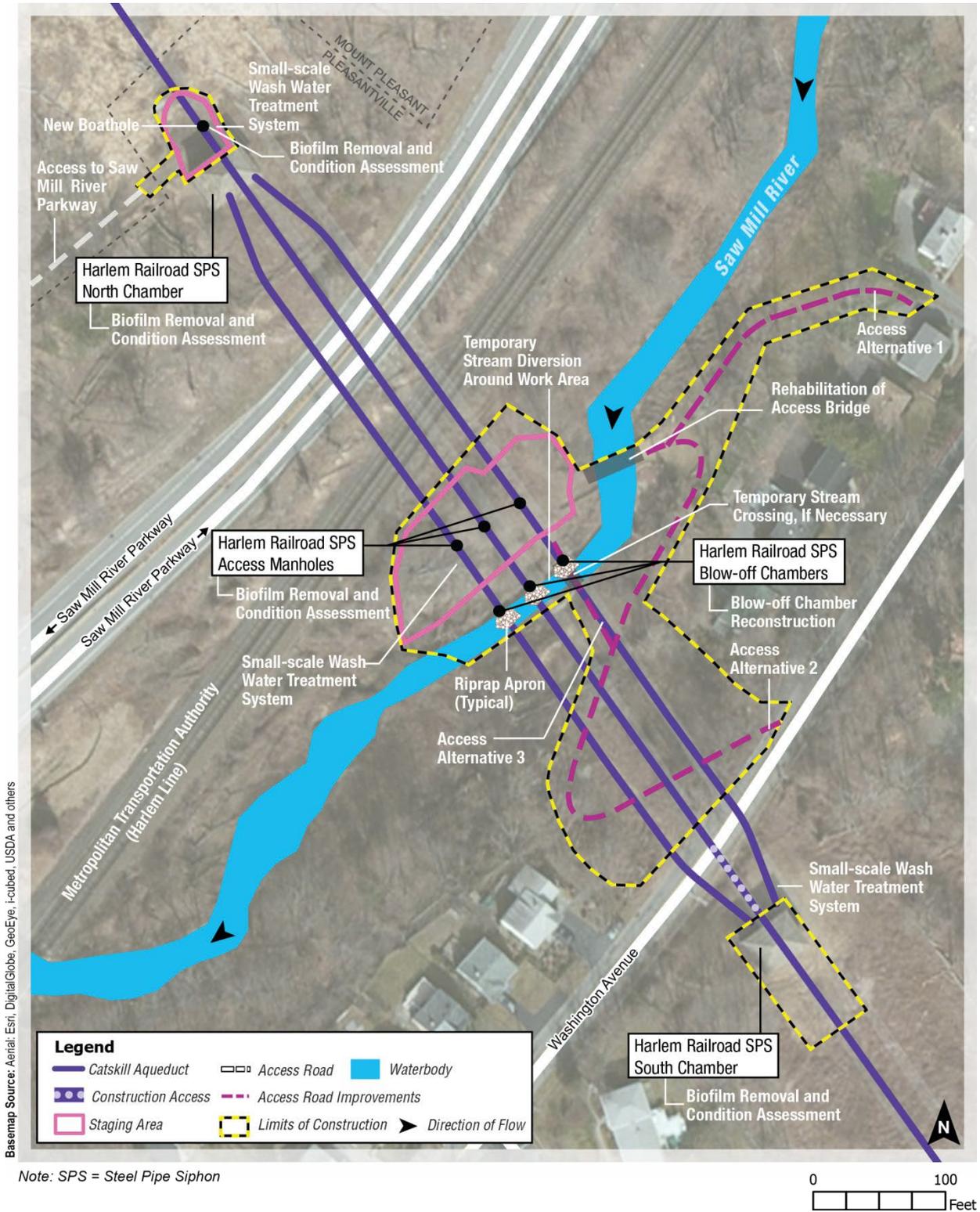


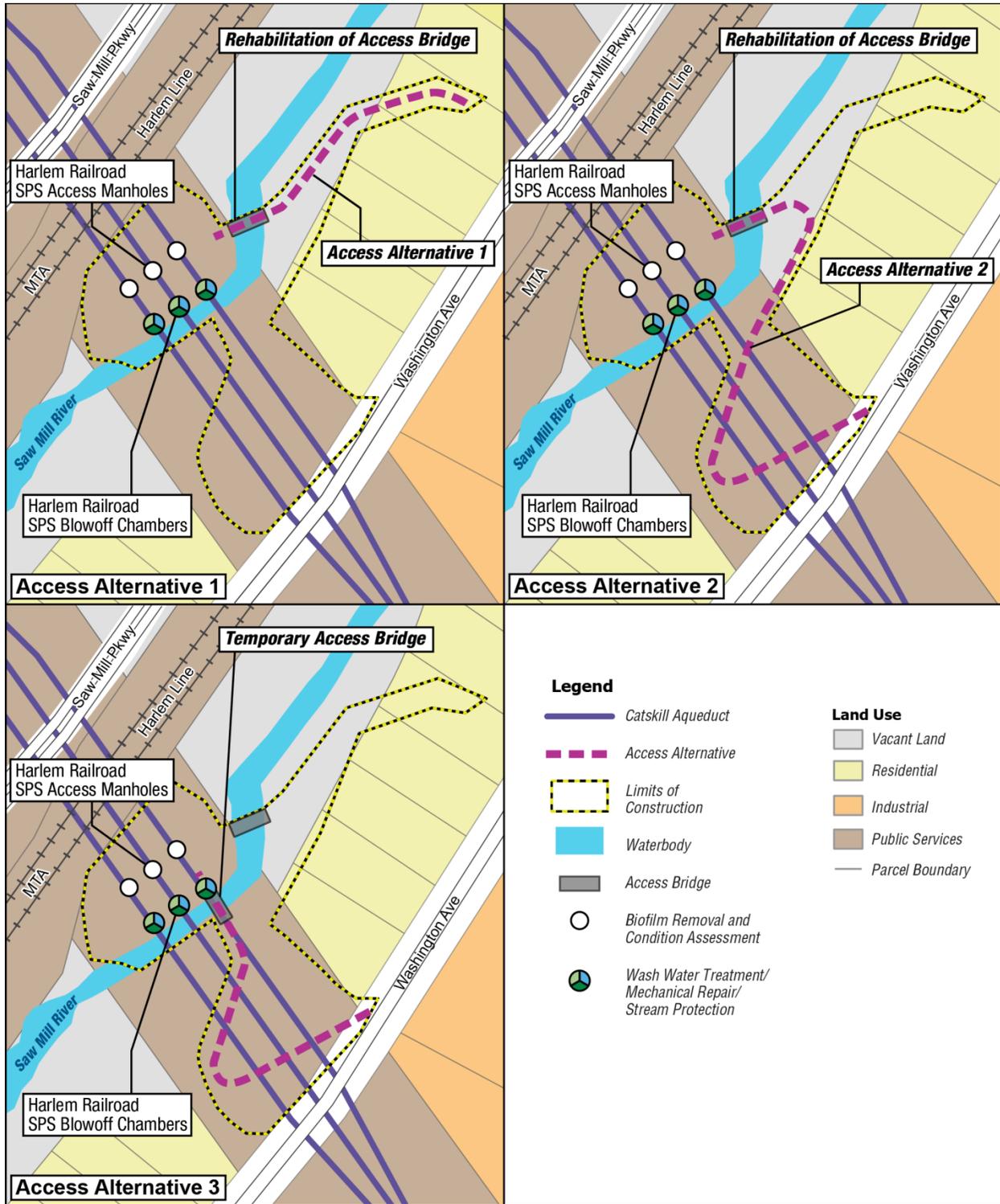
Figure 9.17-4: Site Plan – Washington Avenue Study Area



Table 9.17-2: Schedule of Work Activities within the Washington Avenue Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Staging and Access Improvements ³	Summer 2019 2018	6 weeks	Monday to Friday, 8 AM to 5 PM	8
Streambank Restoration and Protection	Summer 2019 2018	3 weeks	Monday to Friday, 8 AM to 5 PM	10
Blow-off Chamber Reconstruction	Summer 2019 2018	9 weeks	Monday to Friday, 7 AM to 5 PM	12
Boathole Preparation	Summer 2019 2018	3 weeks	Monday to Friday 7 AM to 5 PM	10
Boathole Installation	Fall 2019 2018 (Second 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	8
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	Fall 2020 2019 (Third 10-week shutdown)	3 weeks	7 days a week, 7 AM to 7 PM	21
Notes:				
¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per the Town of Mount Pleasant Noise Control Law §139-18.				
² Crew size refers to the number of people anticipated at the work site(s).				
³ Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (<i>Myotis sodalis</i>) and northern long-eared bats (<i>Myotis septentrionalis</i>).				

Work in the study area would begin in summer ~~2019~~2018 with staging and access improvements, including construction of one of the three access alternatives shown on **Figure 9.17-5**. Access Alternative 1 and Access Alternative 2 would use an existing bridge to cross the river – the first via a restored access route from a private driveway off Washington Avenue, and the second from Washington Avenue via a new access road. The new access road would include a switchback to negotiate steep grades and retaining walls on either side of the road along its lower portion. Access Alternative 3 would require a temporary stream crossing across the Saw Mill River from the new access road. Depending on the access alternative selected, grading and the construction of up to two retaining walls may be required, in addition to the removal of up to 12 trees, underbrush clearing, and gravel placement for leveling and erosion control. If Access Alternative 2 is constructed, the two retaining walls would measure approximately 80 to 100 feet in length and approximately 5 to 10 feet in height, respectively. Improvements may also include rehabilitation of the existing bridge or installation of a temporary stream crossing for access to the Blow-off Chambers. Temporary in-stream disturbance would cover a total area of approximately 3,050 square feet, and permanent in-stream disturbance would cover approximately 210 square feet.



Note: SPS = Steel Pipe Siphon
GT = Grade Tunnel
MTA = Metropolitan Transportation Authority

0 140
Feet

Figure 9.17-5: Access Road Alternatives – Washington Avenue Study Area



Following the staging and access improvements, restoration and protection of the portion of the Saw Mill River adjacent to the Blow-off Chambers would take place in summer ~~2019~~2018 (see **Figure 9.17-4**). The work would include regrading and seeding, and installing permanent riprap aprons to repair bank erosion and minimize future bank erosion at this location. To ensure a dry working environment, a temporary stream diversion would be installed, serving to partially divert the stream around the work areas. A turbidity curtain would be installed to prevent sediment from moving downstream. Blow-off chamber reconstruction, including replacement of the blow-off valves, discharge pipes, and chamber covers, repair of the concrete walls, and removal of the access ladders, would also take place in summer ~~2019~~2018. Small portions of the work that require shutdowns would be performed in spring and fall of that year. In total, the work would require the excavation of 90 cubic yards of soil and 70 cubic yards of soil for fill, for a net cut of 20 cubic yards of soil. Afterwards, the blow-off valves would be used to unwater the aqueduct for future shutdowns during the repair and rehabilitation and future maintenance.

Preparation of the new boathole upstream of the North Siphon Chamber would also occur in summer ~~2019~~2018 (see **Figure 9.17-4**). The work would consist of the excavation of approximately 45 cubic yards of soil and construction of a cast-in-place concrete collar. Boathole installation, which requires unwatering of the aqueduct to tie into the crown of the cut-and-cover tunnel, would take place during the second 10-week shutdown in fall ~~2019~~2018. Construction of the new boathole would require traffic control signage to allow entrance to the access road from the Saw Mill River Parkway, as during typical maintenance operations.

Lastly, biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019 (see **Figure 9.17-4**). Access into the aqueduct would be provided by the new boathole, the North Siphon Chamber, the South Siphon Chamber, and the set of access manholes. These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Potential treatment locations within the study area include the North Siphon Chamber, the South Siphon Chamber, and the Blow-off Chambers, at which small-scale wash water treatment systems could be established. Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Washington Avenue Study Area are presented in Section 9.17.3.3, “Land Use and Zoning” through 9.17.3.9, “Neighborhood Character,” and include: land use and zoning; socioeconomic conditions; natural resources including water resources, terrestrial resources, federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.17.2, “Village of Pleasantville Impact

Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” impact analyses related to community facilities and services; open space and recreation; historic and cultural resources; visual resources; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area are not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.17.3.3 Land Use and Zoning

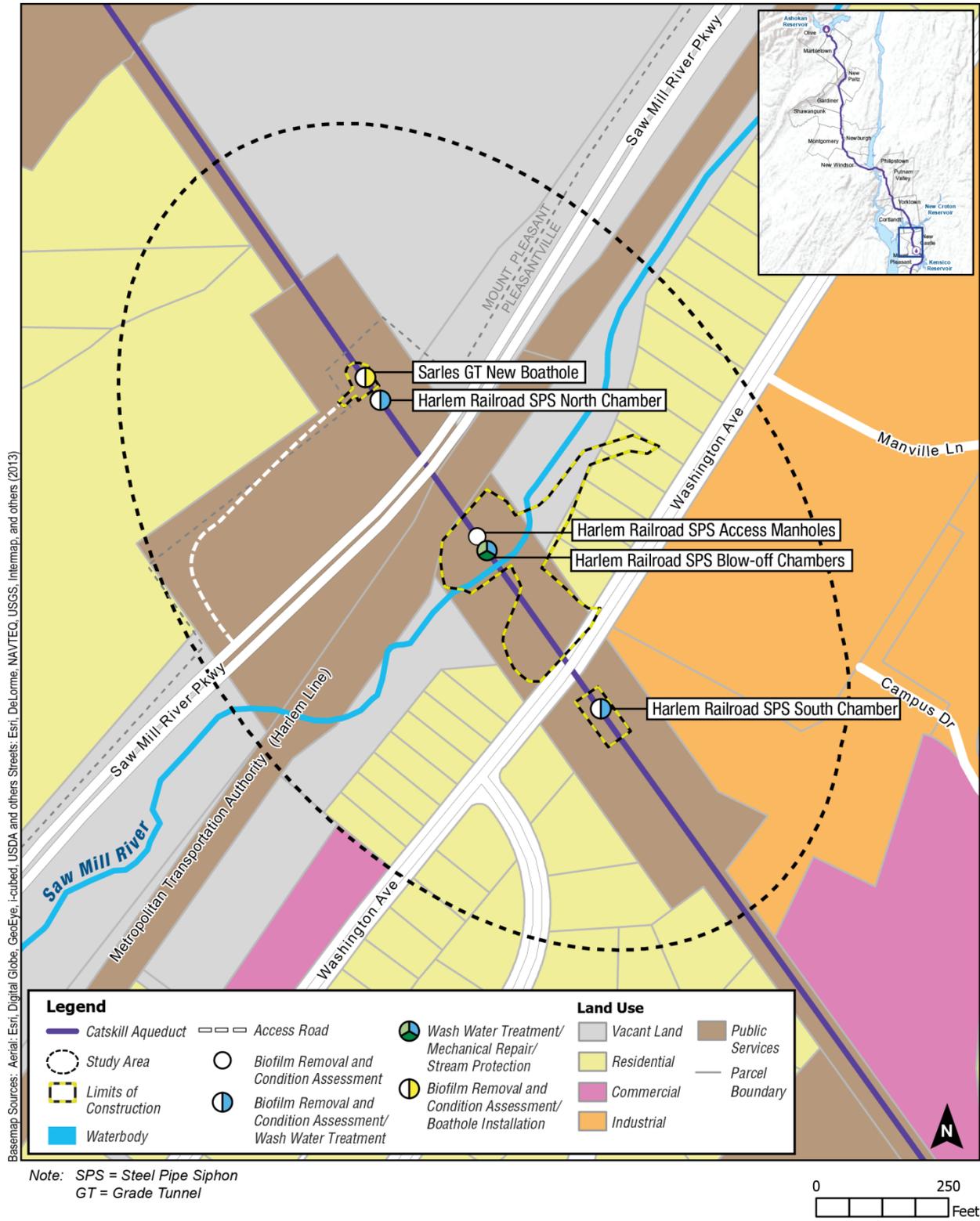
The study area consists of industrial, residential, and public services land uses, in addition to some vacant land that is mostly forested. The limits of construction for the work sites are located in a public services corridor with grassy cover, which is owned and maintained by DEP and separated from adjacent land by a forested area. Access to the Blow-off Chambers may require crossing private property with permission from the owner(s) and Westchester County.

Figure 9.17-6 presents a map of the land uses in the study area and surroundings.

Zoning in the study area is primarily single-family residential (R, R-1, and RRR) zoning districts, as designated by the Village of Pleasantville Zoning Code, and the single-family residential (R-40) zoning district, as designated by the Town of Mount Pleasant Zoning Code (see **Figure 9.17-7**). A campus office (C-O) zoning district, as designated by the Village of Pleasantville Zoning Code, is located in the southeast portion of the study area. The Catskill Aqueduct is located within the residential (R-40, R-1, and RRR) zoning districts. The Catskill Aqueduct is a permitted use as a public utility facility within these zoning districts.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP’s understanding that no major projects or programs are planned that would change land use or zoning within the Washington Avenue Study Area within the timeframe of the repair and rehabilitation. Therefore, in the future without the repair and rehabilitation, it is assumed that land use and zoning within the Washington Avenue Study Area would be similar to baseline conditions.

Access Alternative 1 involves the use of a portion of an existing driveway, and construction of a new access road along private properties within the Village of Pleasantville, including three privately owned parcels and one parcel owned by Westchester County (see **Figure 9.17-5**). While portions of this access road would be over an existing City easement, three new easements would be acquired as part of the repair and rehabilitation. The three private residential properties include Tax ID 99.14-1-8 (0.25 acre), Tax ID 99.14-1-9 (0.24 acre) and Tax ID 99.14-1-10 (0.20 acre), and the Westchester County-owned parcel is Tax ID 99.14-1-1 (2.93 acres). Land use within the three private parcels is residential and zoned residential (R-1) by the Village of Pleasantville Zoning Code. The parcel owned by Westchester County (Tax ID 99.14-1-1) is also zoned residential (R-1). Under the residential (R-1) zoning designation, the minimum lot size required for a dwelling is 7,500 square feet (0.17 acres). All the residential lots are 7,500 square feet or less in size. Therefore, no further subdivision would be allowable under the zoning regulations.



Basemap Sources: Aerial: Esri, Digital Globe, GeoEye, i-cubed, USDA, and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.17-6: Land Use – Washington Avenue Study Area



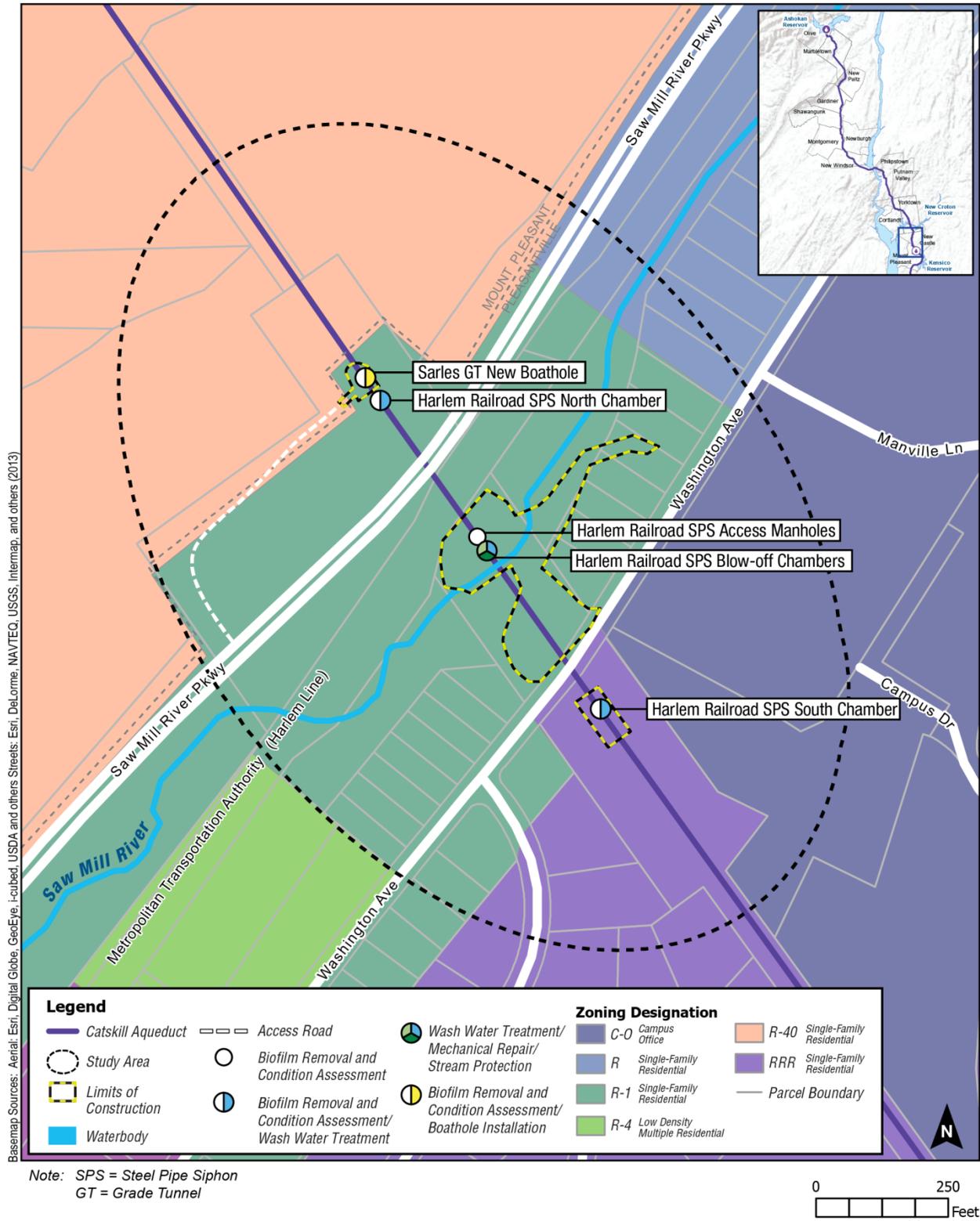


Figure 9.17-7: Zoning – Washington Avenue Study Area



Although the Westchester County parcel Tax ID 99.14-1-1 is of sufficient size to be subdivided under the current zoning regulation, it was acquired by the Westchester County Park Commission for the Saw Mill River Parkway and is unlikely to be subdivided in the future. The private residential properties are currently improved with homes, and the existing land uses on the Westchester County property are vacant and public services (i.e., utility). The new access road on Tax ID 99.14-1-8 would be over the existing paved driveway. The new access road on Tax ID 99.14-1-9 would be over the existing paved driveway, as well as over a wooded area to the rear of the lot. The new access road on Tax ID 99.14-1-10 would be over a wooded area to the rear of the lot. The new access road on Tax ID 99.14-1-1 (Westchester County parcel) would be over a flat, grassy area. The portions of the properties that would be affected by the easements do not include any existing buildings. The easements would preclude the landowners from any activity that would interfere with or is inconsistent with the rights conveyed to the City. However, they would not impose any other restrictions on the landowners' use of the existing driveways. Construction of a new road on Westchester County property would change the existing use of a portion of the property to an unpaved seasonally used road. Acquisition of the easements under Access Alternative 1 is consistent with adjacent land uses, conforms to the existing zoning regulations, and would not result in residential or business displacement.

Access Alternative 2 would involve construction of a new access road over DEP land (Tax ID: 99.14-1-14, 1.46 acres), two private residential parcels (Tax ID 99.14-1-13, 0.18 acres and Tax ID 99.14-1-1, 0.19 acres) and one parcel owned by Westchester County (Tax ID 99.14-1-1, 2.93 acres). Access Alternative 2 is shown on **Figure 9.17-5** and would require acquisition of easements on non-DEP-owned parcels. All parcels are zoned residential (R-1) by the Village of Pleasantville. All the residential lots are 7,500 square feet or less in size and, therefore, no further subdivision would be allowable under the zoning regulations. Although the Westchester County parcel is of sufficient size to be subdivided under the current zoning regulations, the property was acquired by the Westchester County Park Commission for the Saw Mill River Parkway and is unlikely to be subdivided in the future. Private properties are currently improved with homes, and the existing land uses on Tax ID 99.14-1-1 are vacant and public services. The new access road would be constructed on portions of the private properties over a wooded area to the rear of the lots. The new access road on Tax ID 99.14-1-1 would be over a flat, grassy area. The portions of the properties that would be affected by the easement do not include any existing buildings. The easements would preclude the landowners from any activity that would interfere with or is inconsistent with the rights conveyed to the City. Construction of a new road on Westchester County property would change the existing use of a portion of the property to an unpaved seasonally used road. Acquisition of the easements under Access Alternative 2 is consistent with adjacent land uses, conforms to the existing zoning regulations, and would not result in residential or business displacement.

Access Alternative 3 involves the construction of a road and temporary stream crossing over the Saw Mill River (see **Figure 9.17-5**), both of which would occur entirely on City-owned land that is zoned residential (R-1; Tax ID 99.14-1-14). No easement would be required under this access alternative. Use of City-owned property under Access Alternative 3 would be consistent with adjacent land uses, conforms to the existing zoning regulations, and would not result in residential or business displacement.

Following construction, all equipment would be removed from the Washington Avenue Study Area and staging areas would be restored to baseline conditions. Operation of the Catskill Aqueduct would be consistent with baseline conditions and would conform with adjacent land uses and zoning. The access requirements are not anticipated to result in a significant adverse land use impact to the owner. As such, the properties affected by the easements are expected to be able to continue their existing uses after the repair and rehabilitation. The permanent easements would not result in displacement of buildings and overall, the proposed change would be consistent with land use and zoning of the area.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to land use and zoning within the Washington Avenue Study Area.

9.17.3.4 Socioeconomic Conditions

The study area consists of industrial, residential, and public services land uses, in addition to some vacant land that is mostly forested (see **Figure 9.17-6**). The work sites are located in a public services corridor along a residential area, owned and maintained by DEP and separated from adjacent land by a forested area.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP's understanding that no major developments or programs are planned within the Washington Avenue Study Area within the timeframe of impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that land use, population, housing, and economic activity within the Washington Avenue Study Area would be similar to baseline conditions.

As described in Section 9.17.3.3, "Land Use and Zoning," the repair and rehabilitation would require the acquisition of easements under Access Alternatives 1 and 2, and would not require an easement under Access Alternative 3 (see **Figure 9.17-5**). The private properties under Access Alternatives 1 and 2 are currently improved with homes, and the existing land uses on the Westchester County-owned property are vacant and public services. The easement acquisition would not alter the obligation for payment of property taxes on the parcels. The landowners would continue to pay taxes on the full-assessed value of the properties, and there should be no significant impact to the tax bases. Access Alternative 3 is on City-owned land, and would not result in any changes to the tax burden. Thus, it is not anticipated that displacement of businesses or residences would occur as a result of these acquisitions.

Construction and access would occur within DEP-owned property and private properties. Following construction, all equipment would be removed and staging areas would be restored to baseline conditions. The private landowners, for the easements under Access Alternatives 1 or 2, are expected to be able to continue their existing uses after the repair and rehabilitation. Access Alternative 3 is City-owned and would not require an easement. Further, the properties under Access Alternatives 1 and 2 are not of a sufficient size to allow further subdivision under the existing zoning regulations. The Westchester County parcel is of sufficient size to be subdivided under the current zoning regulations. However, the property was acquired by the Westchester County Park Commission for the Saw Mill River Parkway and is unlikely to be subdivided in the future. The proposed easements would not preclude future development of the remaining portion

of the parcels. As a result, the repair and rehabilitation would not directly displace businesses (or employees) or residences.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to socioeconomic conditions within the Washington Avenue Study Area.

9.17.3.5 Natural Resources

The natural resources study area is the immediate area surrounding the limits of construction, including the Blow-off Chambers and South Siphon Chamber (see **Figure 9.17-8**). A second section of the study area located at the North Siphon Chamber corresponds to the limits of construction and includes the area required for staging (see **Figure 9.17-4**). These areas are collectively referred to as the natural resources study area.

The natural resources study area was analyzed based on the field visits conducted on October 7, 2014 and July 28, 2015. The natural resources study area is primarily composed of mowed lawn with trees along the aqueduct corridor from the Blow-off Chambers to the South Siphon Chamber. Additionally, successional northern hardwood forests flank the Catskill Aqueduct from the Blow-off Chambers to the South Siphon Chamber. The Saw Mill River is represented by a confined river community southeast of the Blow-off Chambers. There are no wetlands within the natural resources study area. Based on a desktop analysis, the North Siphon Chamber appears to be dominated by mowed lawn with trees, likely having a similar species composition as the surveyed portion of the study area. These habitats have the potential to support protected water resources, terrestrial resources, and wildlife species, and an analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically it is located within the Saw Mill River subwatershed (hydrologic unit code [HUC] 020301010403) of the lower Hudson Watershed (HUC 02030101).

The Saw Mill River in the natural resources study area is subject to U.S. Army Corps of Engineers and State jurisdiction under Sections 401 and 404 of the Clean Water Act. As a Class B(T) stream within the natural resources study area, the Saw Mill River may support a trout population and is afforded protection under the State Protection of Waters regulations with a regulated 50-foot buffer. In addition, the Village of Pleasantville regulates activities in wetlands and watercourses within a regulated 50-foot buffer (Village of Pleasantville Code Chapter 182: Wetlands) and has jurisdiction over activities within floodplains (Village of Pleasantville Code Chapter 104: Flood Damage Prevention). Work activities occurring within the Saw Mill River, the 50-foot buffer, and the floodway and floodplain may be subject to Village of Pleasantville review and approval.

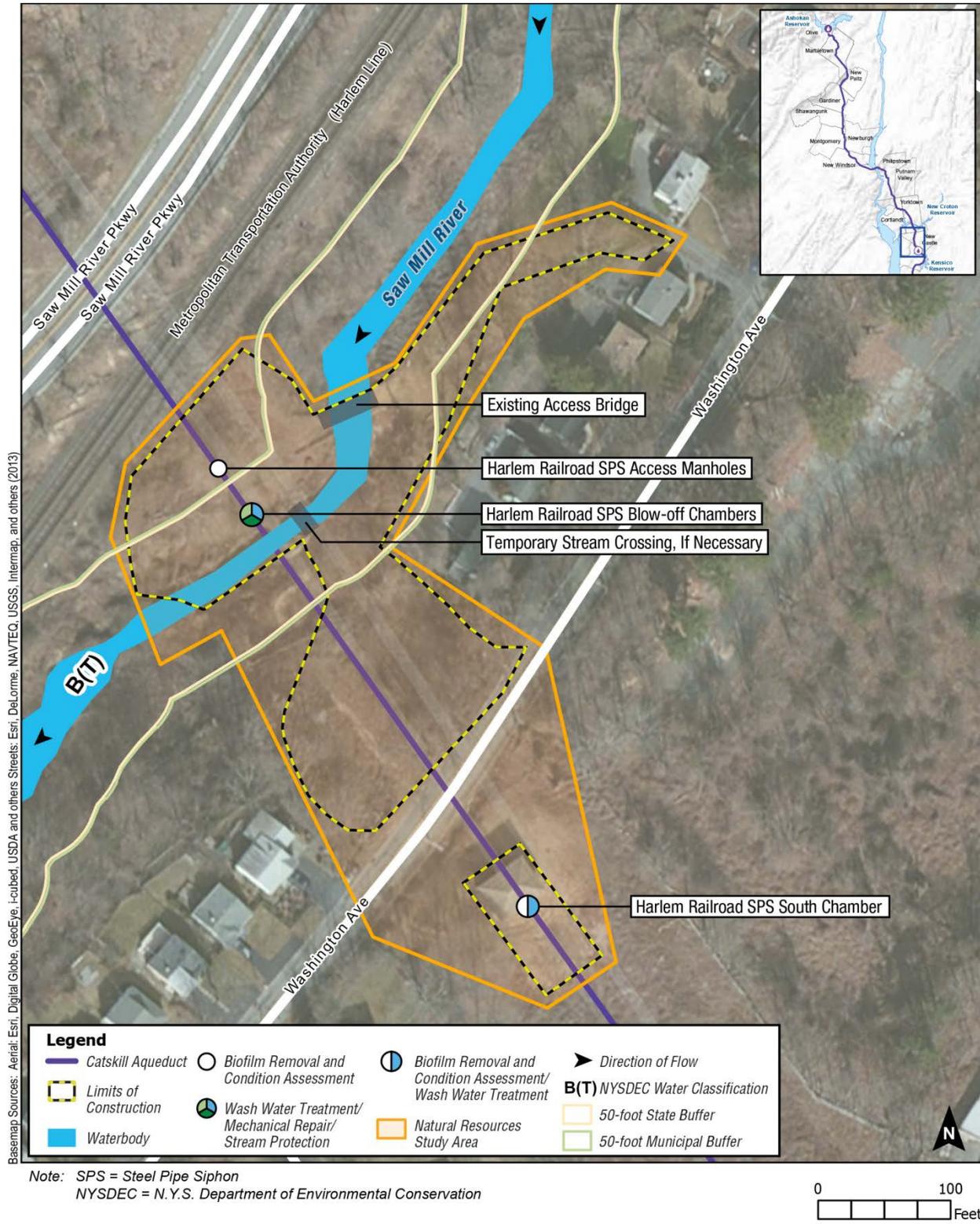


Figure 9.17-8: Natural Resources – Washington Avenue Study Area



Surface Water

The surface water delineations occurred on July 28, 2015. One surface water, the Saw Mill River, was delineated within the natural resources study area. The water resource name, area, length, and classification are shown in **Table 9.17-3**.

Table 9.17-3: Water Resources and Classifications within the Washington Avenue Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Saw Mill River	4,080	290	Riverine, Lower Perennial, Unconsolidated Bottom, Sand (R2UB2)

Saw Mill River

The Saw Mill River is a NYSDEC Class B(T) waterbody that flows from northeast to southwest through the center of the natural resources study area (see **Figure 9.17-8**). This reach of the river ranges in width from approximately 15 to 20 feet, and has variable depths of approximately 3 to 24 inches. The deeper pools are found immediately downstream (south) of the access bridge near the northwest natural resources study area boundary, where the stream turns to the south. Several concrete slabs line the streambed and southeastern bank to heights approximately 2 to 3 feet above the ordinary high water mark. Natural areas of the streambed contain sand and cobble substrate. Aquatic vegetation observed included Canadian waterweed (*Elodea canadensis*), green filamentous algae, and slender pondweed (*Potamogeton pusillus*). A snapping turtle (*Chelydra serpentina*), green frog (*Lithobates clamitans*), darters (*Percidae* spp.), damselflies (Suborder: Zygoptera), and dragonflies (Suborder: Anisoptera) were also identified during the field visit.

The watercourse is classified as a “Riverine, Lower Perennial, Unconsolidated Bottom, Sand” system based on the Cowardin System (Cowardin et al. 1979).

Floodplains

FEMA’s Federal Insurance Rate Map number 36119C0143F, effective September 28, 2007, was reviewed for the Washington Avenue Study Area. As shown on **Figure 9.17-9**, the floodway of the Saw Mill River runs through the center of the study area. The floodway is narrowly flanked by a FEMA designated 100-year floodplain (Zone AE), which depicts areas subject to inundation by the 1 percent Annual Chance Flood with base flood elevations ranging from approximately 294 to 300 feet. Areas within Zone AE are within the Special Flood Hazard Area and are subject to local floodplain management regulations.

Future Without the Repair and Rehabilitation

DEP has consulted with the Village of Pleasantville, Town of Mount Pleasant, and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated to occur within the natural resources study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the Washington Avenue Study Area would be the same as baseline conditions.

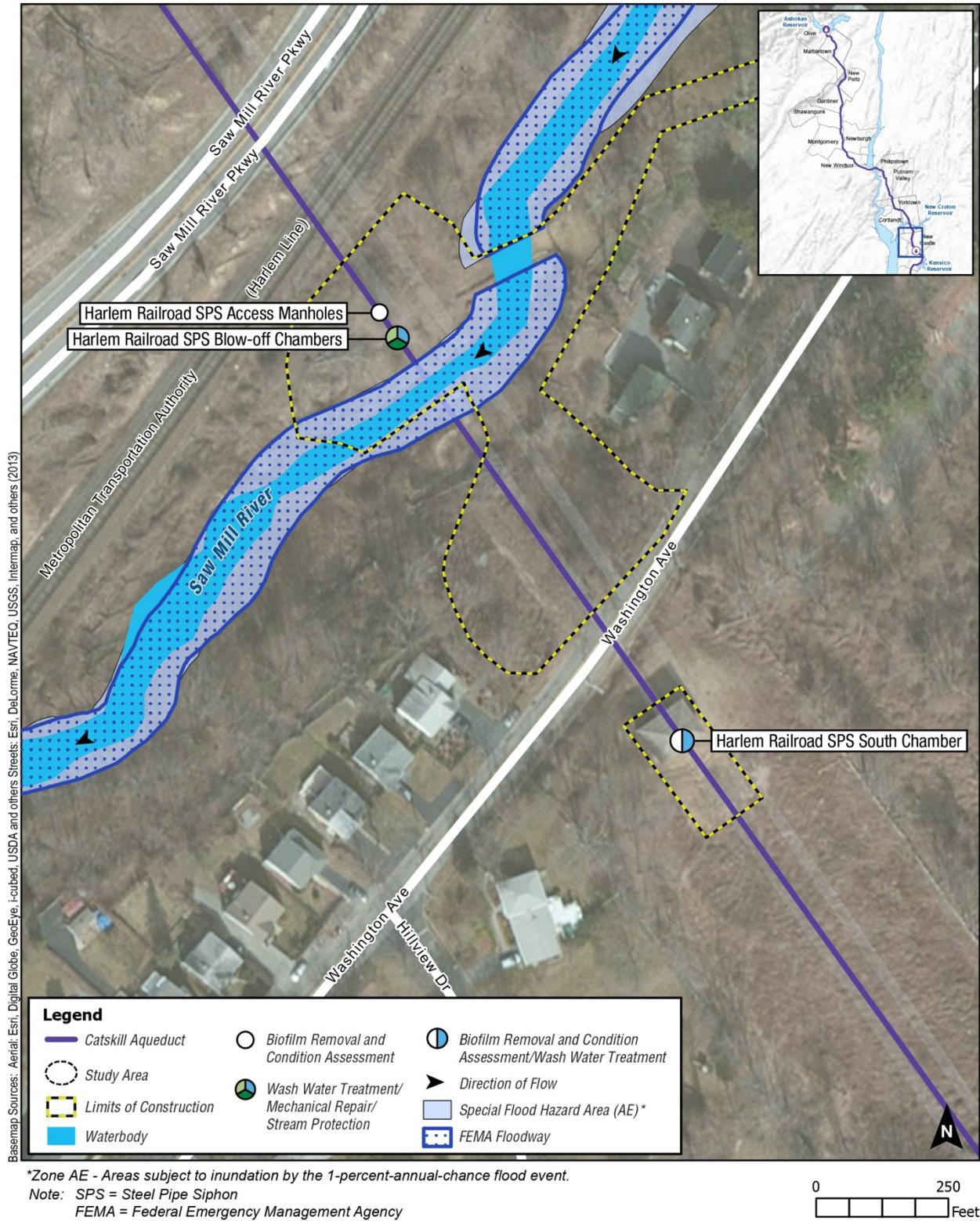


Figure 9.17-9: Floodplain – Washington Avenue Study Area



Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Washington Avenue Study Area.

Construction

Work activities related to the repair and rehabilitation would disturb surface water and vegetated riparian areas, and have the potential to alter flows in the Saw Mill River. As the Saw Mill River supports trout and can be designated as a coldwater fishery, in-water construction activities are generally prohibited from October 1 to April 30 unless authorized. DEP anticipates that the majority of in-water construction would occur during the summer months and outside of the October 1 to April 30 prohibition period. Construction activities may need to occur within the restricted period. If this is required, as presented within Section 9.19, “Project-wide Impact Analysis,” DEP would implement additional measures to limit potential adverse impacts to trout.

Prior to commencing the repair and rehabilitation, temporary sediment and erosion control measures, such as silt fences and haybales, would be installed at the perimeter of land-based construction. Within the limits of construction, localized construction dewatering (e.g., installing a barrier and pump to keep the work area dry) may be necessary to facilitate excavation for blow-off chambers and discharge pipes (see **Figure 9.17-8**). Blow-off chamber reconstruction would also require in-stream access and temporary stream protection. A temporary stream diversion and a downstream turbidity curtain would be installed to prevent sediment from entering the stream during construction. These temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements. Associated staging and improvements would occur in upland areas, and rehabilitation of the existing access bridge, if needed, is not anticipated to require in-water access.

Blow-off chamber reconstruction and adjacent streambank restoration and protection would require regrading of the streambank and installing permanent riprap aprons approximately 20 to 30 feet long (see **Figure 9.17-4**). The re-contoured streambank would not increase the extent of impervious surface and would not alter runoff to the stream. The riprap aprons would be placed to repair historical bank erosion and minimize future bank erosion in the study area. The riprap would also protect the stream while the Blow-off Chambers are operated and prevent or limit scour and turbidity.

Access to the Blow-off Chambers would be provided by one of three alternatives (see **Figure 9.17-5**). Regardless of the access route selected, clearing and grubbing would be conducted within the stream buffer to remove trees and underbrush and prepare the access road. This minor tree clearing would take place along a portion of the river corridor that currently has no continuous canopy cover, so there would be no anticipated changes to in-stream temperatures. Once access is established, the adjacent streambank restoration and protection work would entail installing permanent riprap aprons.

Anticipated temporary and permanent disturbance to water resources and regulated buffers were quantified based on the limits of construction and proposed work activities (see **Table 9.17-4**). Construction staging would occur on top of the aqueduct and the temporary stream crossing and temporary stream diversion would both occur in the river, resulting in approximately 3,050 square feet of temporary disturbance. Permanent disturbance to Saw Mill River, estimated at 210 square feet, may result from blow-off chamber reconstruction. Up to 13,290 square feet of temporary effects may occur within both the State and municipal buffers, depending on the access alternative selected. Permanent disturbance within both the State Protection of Waters and municipal buffers would be approximately 8,410 square feet, associated with access improvements and excavation and regrading needed for blow-off chamber reconstruction. Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native vegetation. Permanent disturbance is further analyzed in Section 9.19, “Project-wide Impact Analysis.”

Table 9.17-4: Estimated Disturbance to Water Resources Activities within the Washington Avenue Natural Resources Study Area

Watercourses	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Saw Mill River	4,080	3,050 <i>Temporary stream diversion, downstream turbidity curtain, rehabilitation of existing bridge</i>	210 <i>Riprap apron</i>
50-foot State Protection of Waters Buffer	29,500	13,290 <i>Access road preparation, temporary stream crossing (if installed), construction staging area</i>	8,410 <i>Site access improvements, excavation and regrading needed for blow-off chamber reconstruction</i>
50-foot Water Resource Municipal Buffer	29,500	13,290 <i>Access road preparation, temporary stream crossing (if installed), construction staging area</i>	8,410 <i>Site access improvements, excavation and regrading needed for blow-off chamber reconstruction</i>

The North and South Siphon Chambers and the Blow-off Chambers have been identified as potential discharge points for treated wash water. Any wash water generated from the siphons would be treated to meet acceptable water quality standards for reuse in the removal operation or for discharge back into the Catskill Aqueduct or to the Saw Mill River. No biofilm would be discharged to surface water. Treated wash water would be discharged to the Saw Mill River from the reconstructed blow-off chambers at low flows that would not result in scour or other physical changes to the river. In the event alum is added as part of the treatment process, flocculated particles would primarily settle prior to treated wash water being discharged to the Saw Mill River.

Work activities related to the repair and rehabilitation would occur within the floodway and Special Flood Hazard Area of the Saw Mill River (see **Figure 9.17-9**). The permanent road associated with Access Alternatives 1 and 2 would be aligned to avoid encroaching upon the 100-year floodplain and floodway to the extent possible. Additionally, the temporary stream crossing (Access Alternative 3), if constructed, would not affect base flood elevations and would

be secured to ensure it would not be carried downstream during a flood event. Excavation and regrading along the streambank as part of blow-off chamber reconstruction may increase upland contours by approximately 2 feet in certain areas, but would not affect in-stream flows. These changes combined with the new streambank elevations would not displace a substantial portion of the cross-sectional area of the stream. DEP would coordinate with the Village of Pleasantville and FEMA, as necessary, to comply with all floodplain management requirements. In addition, DEP would conduct hydrologic and hydraulic calculations as part of the design, as needed, to ensure that the permanent access road and placement of the riprap aprons would have no effect on the existing base flood elevations or floodway elevations.

This study area has also been identified as a location for discharging raw aqueduct water while unwatering the tunnel during construction and future maintenance. Reconstructing the blow-off chambers requires the siphons to be unwatered. This initial unwatering of the siphons would occur with the temporary measures in place to protect the stream from erosion. Unwatering events to surface water would also occur at any time after stream protection measures are in place during and following construction and therefore, are described in “Operation” below.

Operation

Upon completion of the blow-off chamber repairs and streambank protection, the function of the Blow-off Chambers would be restored. Discharges of raw water to Saw Mill River could occur in the future during DEP’s typical operations. The aqueduct could be unwatered via the Blow-off Chambers to conduct maintenance or inspection. This is expected to be an infrequent event.

During unwatering events, new blow-off valves would be operated to moderate discharge flows, which would result in discharges from each chamber of approximately 4,000 gpm at initial valve opening to a maximum flow of approximately 15,300 gpm. It would take less than an hour to unwater each Harlem Railroad Steel Pipe Siphon, for a total of approximately 2 hours of discharges to fully unwater. Unwatering from the Blow-off Chambers would occur once the new valves and streambank restoration and protection measures have been installed.

An analysis was conducted to determine if the discharge associated with an unwatering event is greater than the bankfull stream flow. Bankfull flow is the flow that just fills the channel to the top of its banks (i.e., stream capacity) and at the point in which water begins to flow onto the floodplain. Bankfull flow was predicted for Saw Mill River using the USGS StreamStats Program. If the discharge associated with an unwatering event is greater than the bankfull flow, indirect downstream effects, such as an increase in erosion and scouring over the baseline could be reasonably expected. The maximum discharge flows to Saw Mill River would be approximately 18,850 gpm when the Blow-off Chambers are operated during a 1.5-year storm event. This is less than the calculated bankfull flow of Saw Mill River of approximately 88,900 gpm, making it similar to baseline conditions. Therefore, indirect downstream impacts such as increases in erosion and scouring would be minimal.

Additionally, flows would be moderated by throttling the valves and would be monitored by an on-site crew to prevent the receiving stream from becoming inundated by discharges of raw water. In the event that inundation begins to occur during unwatering, the on-site crew would have the ability to cease unwatering at any time to allow streamflows to subside to baseline flows.

Water Resources Conclusions

While the majority of work activities would result in temporary disturbance, including the temporary stream crossing, minor permanent disturbance would occur as part of the access road improvements and blow-off chamber reconstruction, and associated streambank protection. Treated biofilm wash waters would be discharged over the course of 3 weeks during the third 10-week shutdown. Permanent disturbance would occur as part of the new access road that has been sited beyond the protective 50-foot buffer to the extent possible. Streambank restoration measures would provide protection from future erosion and represent upgrades to existing infrastructure that would be limited to a small portion of the streambank. DEP would coordinate with the Village of Pleasantville and FEMA, as necessary, to comply with all floodplain management requirements. There would therefore be minimal effects to water resources.

Discharges associated with raw aqueduct unwatering events would be infrequent and last several hours in duration. Restoring the historic function of the Blow-off Chambers to discharge raw aqueduct water would be a change in baseline conditions. However, based on the above analysis, there would be minimal indirect effects to water resources.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Washington Avenue Study Area.

Terrestrial Resources

The natural resources study area (see **Figure 9.17-8**) is dominated by a community characterized as mowed lawn with trees. Additionally, successional northern hardwood forests flank the Catskill Aqueduct from the Blow-off Chambers to the South Siphon Chamber. The Saw Mill River is represented by a confined river community southeast of the Blow-off Chambers. Dominant vegetation consists of common mugwort (*Artemisia vulgaris*), Oriental bittersweet (*Celastrus orbiculatus*), black locust saplings (*Robinia pseudoacacia*), pokeweed (*Phytolacca americana*), wineberry (*Rubus phoenicolasius*), and staghorn sumac (*Rhus typhina*). Tree species in the forested area are tuliptree (*Liriodendron tulipifera*), basswood (*Tilia americana*), white ash (*Fraxinus americana*), sugar maple (*Acer saccharum*), Norway maple (*Acer platanoides*), oaks (*Quercus* spp.), tree-of-heaven (*Ailanthus altissima*), black walnut (*Juglans nigra*), and cottonwood (*Populus deltoides*). The North Siphon Chamber appears to have a similar species composition. Tree removal would be needed for site access and, while the Village of Pleasantville does not regulate removal of trees associated with the repair and rehabilitation, terrestrial resources within this study area warrant an analysis.

DEP has consulted with the Village of Pleasantville, Town of Mount Pleasant, and Westchester County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the Washington Ave Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that terrestrial resources within the natural resources study area would be the same as baseline conditions, except where natural processes have changed conditions, such as a change in habitat due to vegetative succession.

Work activities would include minor tree clearing and shrub removal for the purpose of improving site access and staging areas. Up to 12 trees consisting of four species with a range of dbh of between approximately 7.4 and 16 inches may be removed for staging and access road improvements. The most common species of trees to be removed include five tree-of-heaven, three basswood, and three white ash. Tree removal would be conducted from November 1 through March 31 to avoid impacts to Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*). The trees that would be removed are located along the berm of the steel pipe siphon or former access trail and would not dramatically change the character of the area or affect surrounding trees.

Following construction, all equipment would be removed from the study area, and staging areas would be restored to natural conditions. Vegetated areas temporarily cleared during construction are anticipated to grow back with similar communities. Following the repair and rehabilitation, operation of the Catskill Aqueduct would be consistent with baseline conditions and natural reforestation and vegetative succession of aqueduct areas not routinely maintained would continue to occur over time.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to terrestrial resources within the Washington Avenue Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected within the study area, species that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” six species were identified to have the potential to be affected by the repair and rehabilitation within the natural resources study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these six species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible effects due to changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area for these species are shown in **Table 9.17-5**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and field visits, as applicable.

Table 9.17-5: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Washington Avenue Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and July 28, 2015. Potential habitat exists within the open grassy areas and adjacent hardwood forest. Work activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, as a mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated, and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and July 28, 2015. Potential habitat exists within the open grassy areas and adjacent hardwood forest. However, construction activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the work sites, a variety of habitats would be available for the species' use in the vicinity during construction. Furthermore, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No
Birds					
Cooper's Hawk	<i>Accipiter cooperii</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and July 28, 2015. Work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Cooper's Hawks is warranted for this study area.	No

Table 9.17-5: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern, and Habitat within the Washington Avenue Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	A tree survey was conducted in the study area on July 28, 2015. A total of 12 trees were tagged in the work area. No trees that may be removed during construction provide potential roosting habitat for bats. All tree removal would be conducted from November 1 through March 31 to avoid potential for impacts to bats. Furthermore, repair activities would result in minor, permanent fill along Saw Mill River. Given that this would be in-kind restoration and limited to a portion of the streambank, it would not adversely affect bat foraging within the study area. Therefore, there are no effects anticipated and no further analysis for Indiana bats is warranted for this study area.	No
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	<u>Threatened</u> <u>Unlisted</u>	A tree survey was conducted in the study area on July 28, 2015. No trees that may be removed during construction provide potential roosting habitat for bats. All tree removal would be conducted from November 1 through March 31 to avoid potential for impacts to bats. During the field visit, there was no access to the building interior of the North and South Siphon Chambers to investigate signs of roosting bats at the facilities. The existing bridge may provide roosting habitat. However, DEP would inspect the bridge prior to working to verify whether there are any roosting bats. Should any bats or their guano be observed within these during work activities, USFWS and NYSDEC would be contacted immediately to determine the best course of action. Furthermore, repair activities would result in minor, permanent fill along Saw Mill River. Given that this would be in-kind restoration and limited to a portion of the streambank, it would not adversely affect bat foraging within the study area. Therefore, there are no effects anticipated and no further analysis for northern long-eared bats is warranted for this study area.	No
New England Cottontail	<i>Sylvilagus transitionalis</i>	Unlisted	Special Concern	No potential habitat was observed in study area during the field visits on October 7, 2014 and July 28, 2015. The proposed access road alignments are through an open, maintained field, and the surrounding area is mature forest, not the young forest required by the species. Therefore, there are no effects anticipated and no further analysis for New England cottontails is warranted for this study area.	No

Note:
MBTA: Migratory Bird Treaty Act

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), Cooper's Hawks (*Accipiter cooperii*), Indiana bats, northern long-eared bats, or New England cottontails (*Sylvilagus transitionalis*) associated with the repair and rehabilitation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Washington Avenue Study Area.

9.17.3.6 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Washington Avenue Study Area (see **Figure 9.17-4**), a Phase I Environmental Site Assessment (ESA) was conducted in general conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Practice E 1527-13 and City Environmental Quality Review (CEQR) requirements to identify Recognized Environmental Condition (RECs). The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a geotechnical investigation and environmental health and safety data gap analysis and sampling, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Geotechnical environmental investigations and sampling were undertaken for contaminants of concern including asbestos, lead, volatile and semivolatile organics, polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons along the aqueduct within the study area. Several parameters were noted in the soil sampling results including total chromium and mercury. Total chromium was reported in the sample collected at the Harlem Steel Pipe North Siphon Chamber (see **Figure 9.17-4**). Chromium concentrations, however, were consistent over a widespread sampling area and are more likely associated with background concentrations. Along the Catskill Aqueduct, there are widespread occurrences of chromium, which are attributed to the existing geological formations. Likewise, mercury, was detected in one sample, but is also naturally occurring in soils and is therefore also likely to be the result of background concentrations. The legacy data also revealed that asbestos-containing materials are presumed to be present on the ceiling beams of the North Siphon Chamber building (see **Figure 9.17-4**). Additionally, lead-containing paint was found to be present on the steel door, steel gate valve, brick walls, and overhead crane in the chamber building. Materials sampled did not identify PCB-containing paint or mercury-containing paint. In addition, gasoline range organic compounds and total petroleum hydrocarbons were also detected, but at low concentrations that are not considered to be indicative of contamination that warrants remedial actions.

Based on the results of the environmental investigations completed within the Washington Avenue Study Area, no other hazardous materials are known to exist. The soil results support the

reuse of excavated materials associated with the site access improvements, new boathole, and blow-off chamber reconstruction as backfill and do not suggest the need for special management, handling or health and safety measures at this time.

DEP has consulted with the Village of Pleasantville, Town of Mount Pleasant, and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Washington Avenue Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Washington Avenue Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. DEP would handle all materials in accordance with applicable federal, State, and local regulations and guidelines. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, excavation associated with the installation of a new boathole and blow-off chamber reconstruction would occur on a combination of previously disturbed and undisturbed soils. Following construction, all construction-related structures and equipment would be removed from the construction staging areas. The staging areas would be restored and operation of the repaired and rehabilitated Catskill Aqueduct would be consistent with baseline conditions.

Therefore, repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Washington Avenue Study Area.

9.17.3.7 Transportation

The transportation study area consists of the major convergent roadways that would potentially be used by employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Washington Avenue Study Area.

Access to the North Siphon Chamber within the Washington Avenue Study Area would occur via State Route 9A (Saw Mill River Road), State Route 117 (Bedford Road and Manville Road), and Grant Street to the Saw Mill River Parkway, as shown in yellow on **Figure 9.17-10** (Construction Route 1). An existing DEP road is accessible by traveling north on the Saw Mill River Parkway to the nearest turnaround, then proceeding south. The Saw Mill River Parkway (State Route 987D) is a four-lane, two-way urban principle arterial expressway roadway for passenger cars only.

Access to the Blow-off Chambers and South Siphon Chamber within the Washington Avenue Study Area would follow a similar route via State Route 117 (Bedford Road and Manville Road) to Washington Avenue, as shown in orange on **Figure 9.17-10** (Construction Route 2). Although the Blow-off Chambers are located just southeast of the Saw Mill River Parkway, access is blocked from that route by railroad tracks owned by the Metropolitan Transportation Authority.

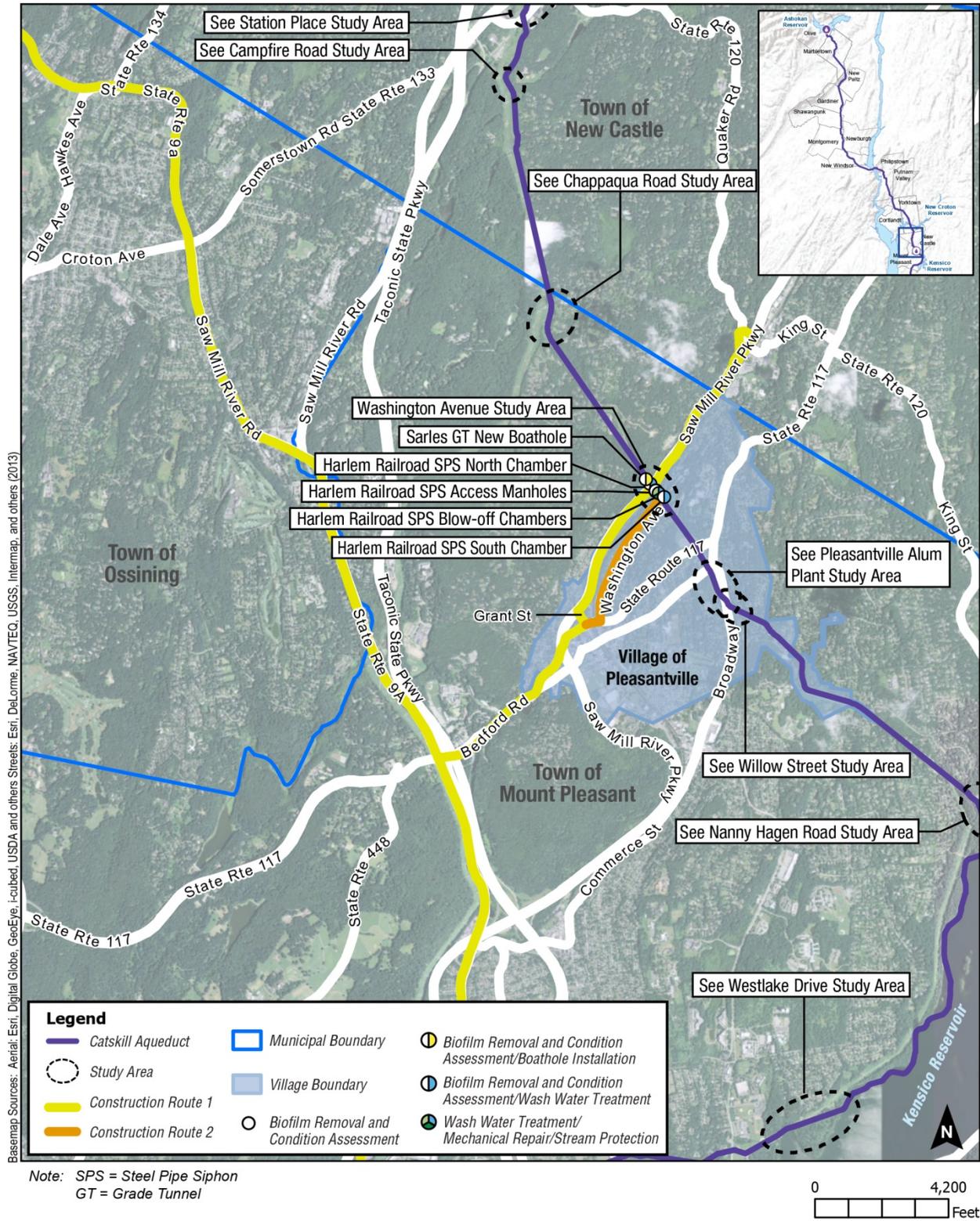


Figure 9.17-10: Transportation – Washington Avenue Study Area



To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Washington Avenue Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area and there is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the sites. However, there are no DEP employees who work at or visit the study area on a daily basis, and the low number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Village of Pleasantville, Town of Mount Pleasant, and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Washington Avenue Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Washington Avenue Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and, therefore, be the basis of this transportation analysis. Of these activities, local staging and access improvements would generate the most vehicle trips (see **Table 9.17-2**). Local staging and access improvements would occur in summer ~~2019~~2018 between the hours of 8 AM and 5 PM, Monday through Friday for approximately 6 weeks.

In the future with the repair and rehabilitation, construction vehicles would travel along Washington Avenue or the Saw Mill River Parkway to the sites. The estimated number of peak-day one-way vehicle trips associated with local staging and access improvements is 27 vehicles, or approximately 54 peak-day vehicle round trips that would travel to and from the study area. Of these, approximately 16 vehicle round trips or 16 Passenger Car Equivalents (PCEs), would be workers traveling directly to and from the staging area, with an additional 4 daily shuttle trips between the study area and the staging area. The remaining approximately 34 peak-day vehicle round trips (73 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with local staging and access improvements is approximately 27 peak-hour vehicle trip ends (48 PCEs). This includes approximately 8 vehicle trip ends (8 PCEs) from workers traveling directly to and from the staging area, approximately 2 peak-hour shuttle trips between the study area and the staging area, and approximately 17 vehicle trip ends (38 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 10-hour shift, this would be from 7 AM to 8 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 48 peak-hour PCEs along Washington Avenue and the Saw Mill River Parkway, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, "Transportation." The work activities at the Washington Avenue Study Area would be short-term (totaling 26 weeks over 1.5 years; see **Table 9.17-2**) and would not generate public parking, transportation demands, or pedestrian activity within the Washington Avenue Study

Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Washington Avenue Study Area.

9.17.3.8 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation work activities within the Washington Avenue Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The noise study area is the area within 1,500 feet of the repair and rehabilitation work activities as shown on **Figure 9.17-11**, which encompasses areas within the Town of Mount Pleasant and Village of Pleasantville.

The noise study area includes residential parcels within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise codes. The repair and rehabilitation is subject to the Village of Pleasantville and Town of Mount Pleasant Noise Control Laws. The Village of Pleasantville Noise Control Law (§123-5.C) defines the use of any tool, pile driver, pneumatic hammer, tractor, derrick, electric hoist, gasoline- or electric-powered saw, or other noise-producing equipment to be a violation of the noise code if used between the hours of 7 PM and 8 AM or anytime on Sunday. The Village of Pleasantville does not have quantitative noise limits applicable to the Washington Avenue Study Area. The Town of Mount Pleasant Noise Control Law (§139-18) prohibits noise levels from construction sites from exceeding an L_{10} of 70 dBA during the hours of 8 AM to 6 PM, and an L_{10} of 55 dBA during the hours of 6 PM to 8 AM when measured at a distance of 400 feet from the construction site in residentially zoned districts. In addition, work activities are prohibited between the hours of 5 PM and 8 AM in all zoning districts, except in the event of urgent necessity or in the interest of safety, in which case the Building Inspector may issue a permit.

Existing ambient noise levels within the Washington Avenue Study Area are influenced by vehicular traffic traveling on Saw Mill River Parkway, Washington Avenue, and other local roadways (see **Figure 9.17-11**). Existing ambient noise levels are also influenced by railroad traffic from tracks that cross through the Washington Avenue Study Area. The existing noise levels within the study area are comparable to a quiet suburban residential environment based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

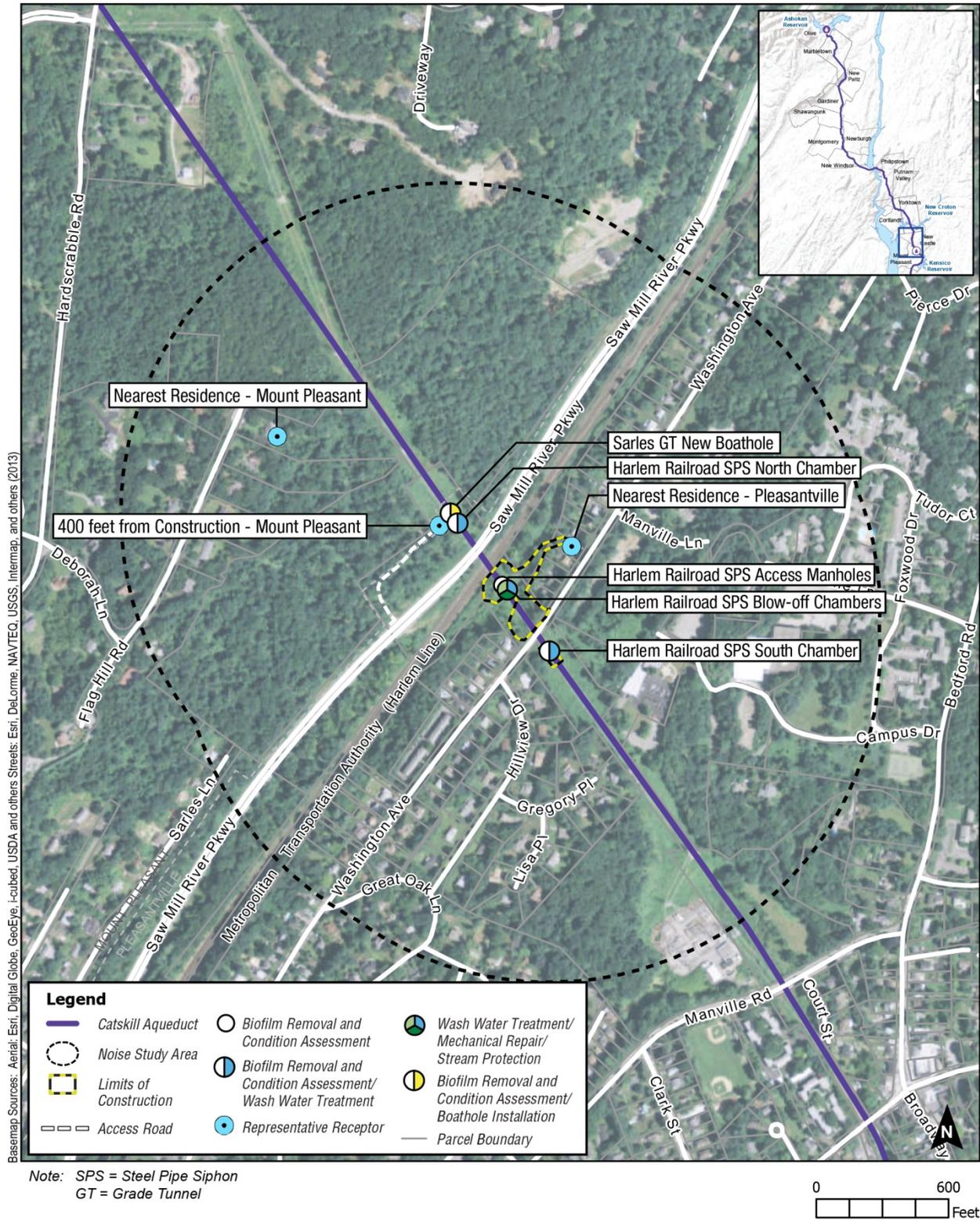


Figure 9.17-11: Noise – Washington Avenue Study Area



DEP has consulted with the Village of Pleasantville, Town of Mount Pleasant, and Westchester County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Washington Avenue Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Washington Avenue Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Washington Avenue Study Area would occur at three work sites. The stationary noise-generating equipment that would be used within the Washington Avenue Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Three peak work activities were evaluated in the Washington Avenue Study Area to account for the nearest residences in the Village of Pleasantville and the Town of Mount Pleasant, as well noise levels at a distance of 400 feet, as described in the Town of Mount Pleasant noise code.

In the Village of Pleasantville, the stationary noise-generating equipment associated with the staging and access improvements would emit the most noise. Staging and access improvements would occur in summer ~~2019~~2018 between the hours of 8 AM and 5 PM, Monday through Friday for approximately 6 weeks prior to the second 10-week shutdown (see **Table 9.17-2**).

In the Town of Mount Pleasant, the stationary noise-generating equipment associated with boathole installation would emit the most noise. Boathole installation would occur in fall ~~2019~~2018 between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the second 10-week shutdown. Finally, the stationary noise-generating equipment associated with blow-off chamber reconstruction would emit the most noise at a distance of 400 feet from a work site in the Town of Mount Pleasant. Blow-off chamber reconstruction would occur in summer ~~2019~~2018 between the hours of 7 AM and 5 PM, Monday through Friday for approximately 9 weeks prior to the second 10-week shutdown.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for staging and access improvements, blow-off chamber reconstruction, and boathole installation. Associated equipment reference noise levels are shown in **Table 9.17-6**.

The Town of Mount Pleasant Code defines allowable noise levels using the L_{10} metric, which represents the sound level exceeded 10 percent of the time. The Village of Pleasantville does not specify a metric, so the equivalent average sound level (L_{eq}) was used. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.17-6: Stationary Source Construction Equipment Modeled at the Washington Avenue Study Area - Noise Analysis and Reference Noise Levels (L_{eq}/L_{10})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA)	Reference Noise Level (L_{10}) ¹ at 50 feet (dBA)
Staging and Access Improvements		
Generator	82	NA
Dozer	81	NA
Excavator	81	NA
Blow-off Chamber Reconstruction		
Ventilation Fan	NA	85
Dozer	NA	84
Excavator	NA	84
Boathole Installation		
Crane	NA	80
Concrete Mixer Truck	NA	84
Generator	NA	82
Notes: NA = Not Applicable ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.		

Table 9.17-7 shows the results of the stationary construction noise analysis. The Town of Mount Pleasant Code defines allowable construction noise levels at a distance of 400 feet from the construction site. Therefore, noise levels at a distance of 400 feet were calculated for comparison with the local noise ordinance. However, all residences in the Town of Mount Pleasant are located more than 400 feet from the construction work sites. Boathole installation noise levels (L_{10}) at the nearest residence in the Town of Mount Pleasant are predicted to reach 62 dBA.

In the Village of Pleasantville, staging and access improvements within the Washington Avenue Study Area during the repair and rehabilitation would emit a noise level (L_{eq}) of approximately 96 dBA at the nearest residence. Other noise-producing equipment would also be utilized within the noise study area for a limited period during work activities. However, this equipment would not be expected to be louder than those associated with staging and access improvements, blow-off chamber reconstruction, and boathole installation.

The repair and rehabilitation work activities within the Washington Avenue Study Area would emit noise levels greater than allowed by the Town of Mount Pleasant noise code, and repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Village of Pleasantville. DEP would work with the Town of Mount Pleasant and the Village of Pleasantville, as appropriate.

Table 9.17-7: Stationary Noise Analysis Results (L_{eq}/L_{10}) at the Nearest Noise-Sensitive Receptors within the Washington Avenue Study Area

Location	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}/L_{10}) at Noise-Sensitive Receptor (dBA)	Village of Pleasantville Noise Limit (dBA)	Town of Mount Pleasant Noise Limit (dBA)	Potential for Exceedance (Yes or No)
Nearest Residence - Village of Pleasantville	17	96 ¹	NA	NA	Yes ³
400 feet - Mount Pleasant	400	71 ²	NA	70 ⁴ /55 ⁵	Yes
Nearest Residence - Mount Pleasant	864	62 ²	NA	NA	NA
Notes: NA = Not Applicable ¹ Metric for noise level is the hourly equivalent average hourly noise level (L_{eq}). ² L_{10} noise level per the Town of Mount Pleasant noise limit. ³ Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Village of Pleasantville. ⁴ Noise limit is applicable between the hours of 8 AM and 6 PM. ⁵ Noise limit is applicable between the hours of 6 PM and 8 AM.					

Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Washington Avenue Study Area. The repair and rehabilitation would be temporary in nature with the peak work activities occurring during staging and access improvements in summer ~~2019~~2018, blow-off chamber reconstruction in summer ~~2019~~2018, and boathole installation in fall ~~2019~~2018 for limited periods (e.g., up to 9 weeks, per activity) (see **Table 9.17-2**).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Washington Avenue Road Study Area.

9.17.3.9 Neighborhood Character

The character of the Washington Avenue Study Area is largely defined by a mix of industrial, residential, and public services land uses and its physical setting within a suburban location (see **Figure 9.17-6**). The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. Saw Mill River bisects the study area flowing to the southwest, and the Saw Mill River Parkway and Washington Avenue parallel the river to the north and south, respectively. In addition, the Metropolitan Transportation Authority railroad tracks run between the Saw Mill River Parkway and the Saw Mill River, perpendicular to the Catskill Aqueduct. The limits of construction for the work sites are located in a public services corridor with grassy cover, which is owned and maintained by DEP and separated from adjacent land by a forested area. Access to the Blow-off Chambers would be provided by one of three alternatives (see **Figure 9.17-4**).

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Washington Avenue Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for open space and recreation, historic and cultural resources, and visual resources, an impact analysis for the Washington Avenue Study Area is not warranted, as discussed in the following sections: Section 9.3.6, "Open Space and Recreation," Section 9.3.7, "Historic and Cultural Resources," and Section 9.3.8, "Visual Resources." As described in Section 9.17.3.3, "Land Use and Zoning," Section 9.17.3.4, "Socioeconomic Conditions," the work activities would not affect land use and zoning and socioeconomic conditions in the Washington Avenue Study Area. Furthermore, the public policy impact analysis provided in Section 9.17.2, "Village of Pleasantville Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.17.3.7, "Transportation," and 9.17.3.8, "Noise," during construction, the work activities in the Washington Avenue Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise. Therefore, there would be no significant adverse impacts related to neighborhood character from the repair and rehabilitation within the Washington Avenue Study Area.

9.17.4 PLEASANTVILLE ALUM PLANT STUDY AREA IMPACT ANALYSIS

Within the Pleasantville Alum Plant Study Area, the Catskill Aqueduct consists of the Pleasantville Cut-and-Cover Tunnel and the Pleasantville Alum Plant, which houses a dry alum system used to treat aqueduct flows during episodic turbidity events. An access manhole with a culvert drain sluice gate is also located within the study area (see **Figure 9.17-12**).

Work activities within the Pleasantville Alum Plant Study Area would include: construction and operation of a new dechlorination facility (which would also include a liquid alum system); streambank restoration and protection; sluice gate replacement; and biofilm removal and condition assessment.¹

¹ "Dechlorination Facility" represents the Dechlorination Facility at Pleasantville Alum Plant.

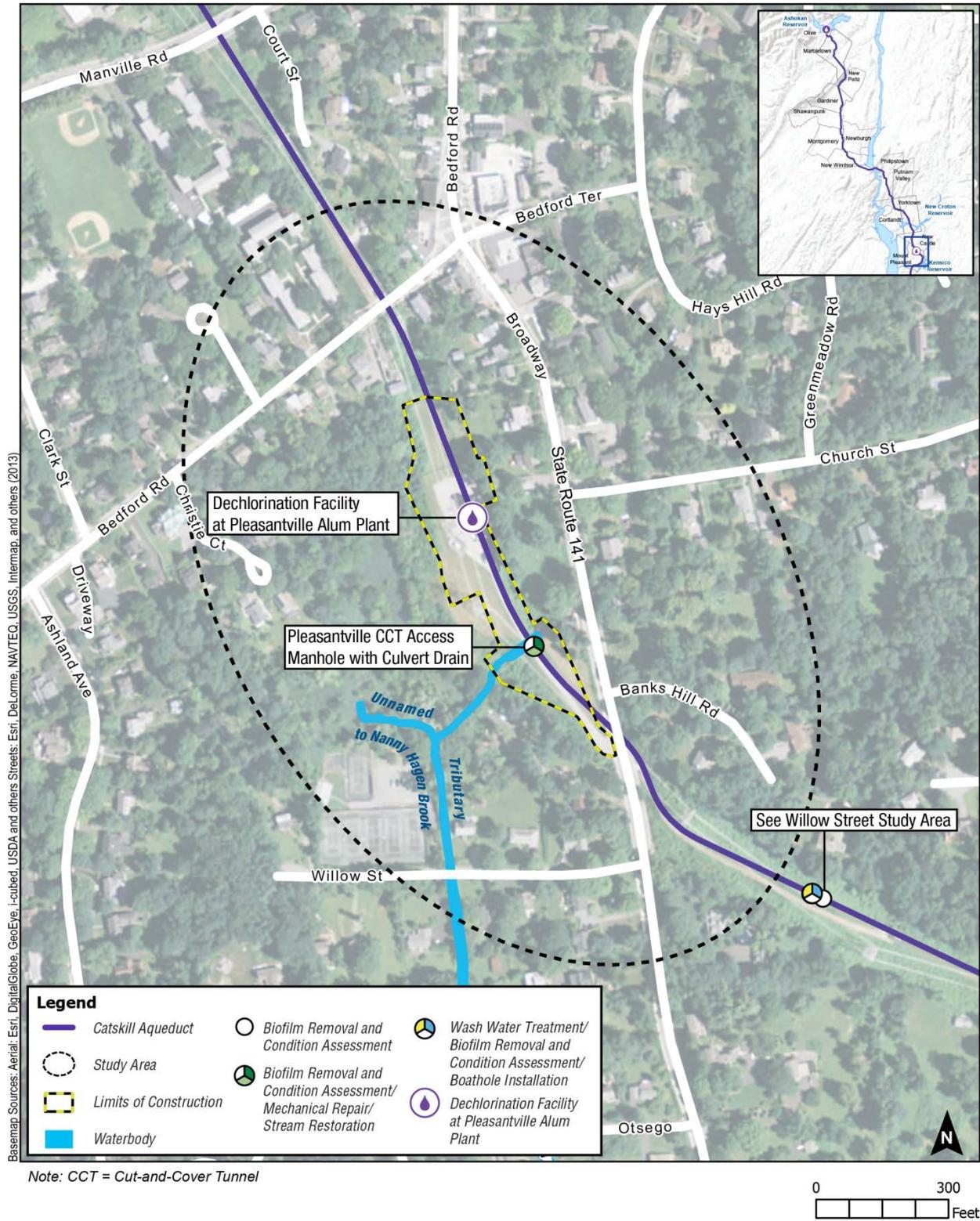


Figure 9.17-12: Study Area – Pleasantville Alum Plant Study Area



9.17.4.1 Study Area Location and Description

The Pleasantville Alum Plant Study Area is located along the upper Catskill Aqueduct in the Village of Pleasantville. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. An unnamed tributary to Nanny Hagen Brook originates in the study area and flows south. Broadway (State Route 141) traverses the study area in a general north to south direction, intersecting Willow Street and Bedford Road to the west and Banks Hill Road and Church Street to the east. Proposed work sites within the study area include the area surrounding the Pleasantville Alum Plant and the culvert drain sluice gate. Both would be accessed by an existing driveway off of Broadway. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work sites. **Figure 9.17-12** shows an aerial photograph of the study area, including the path of the aqueduct, and the limits of construction for the work sites. **Figure 9.17-13** shows two photographs of the Pleasantville Alum Plant.

The study area consists of residential, commercial, open space and recreation, public services and vacant land uses. The limits of construction for other work sites and the associated access route are located entirely in a public services corridor which is owned and maintained by DEP. **Figure 9.17-14** shows a map of the land uses in the study area and surroundings.

Zoning within the study area is a combination of single-family residential districts (R, RRR), a two-family residential district (R-2A), a low-density multiple-residential district (R-4), and a central business district (A-2), as designated by the Village of Pleasantville Zoning Code (see **Figure 9.17-15**). The Catskill Aqueduct is located within the single-family and two-family residential (R, R-2A, and RRR) zoning districts. The Catskill Aqueduct is a permitted use as a public utility facility within the single-family and two-family residential zoning districts (R, R-2A, and RRR).

There are no federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

9.17.4.2 Proposed Activities within the Pleasantville Alum Plant Study Area

For construction of the dechlorination facility, two staging areas would be established: one at the north end of the work site, and a second along the access road for contractor parking. To support repair and rehabilitation activities within the study area, the Catskill Influent Chamber (within the Nanny Hagen Road Study Area in the Town of Mount Pleasant) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas, including one at the Pleasantville Alum Plant, would provide additional parking, particularly for the crew constructing the dechlorination facility. Equipment and materials would be staged on site. No staging or access improvements would be necessary other than underbrush clearing and gravel placement. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. A site plan showing a layout of the limits of construction for the work site, which would occupy a total of 2.5 acres, is shown on **Figure 9.17-16**. The schedule for work within the study area is shown in **Table 9.17-8**. The duration of active construction within the Pleasantville Alum Plant Study Area is estimated to total 95 weeks over 2 years and 7 months, with some overlapping work activities. In addition, the dechlorination facility would be operational during temporary chlorination of the Catskill Aqueduct.



Photograph 1: Aerial view of the Pleasantville Alum Plant facing west.



Photograph 2: Location of proposed dechlorination facility adjacent to the existing Alum Plant looking southwest.

Figure 9.17-13: Photographs – Pleasantville Alum Plant Study Area



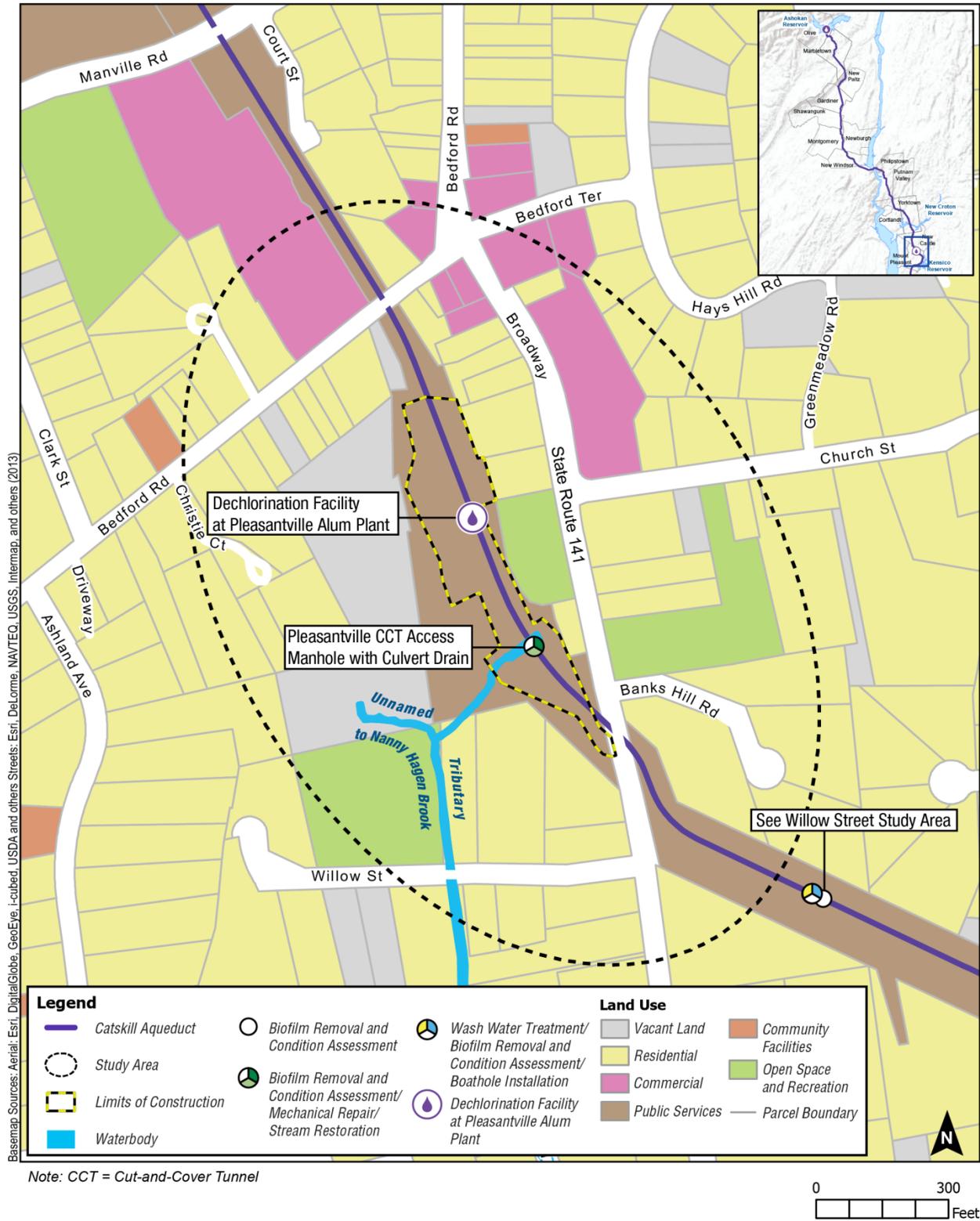


Figure 9.17-14: Land Use – Pleasantville Alum Plant Study Area



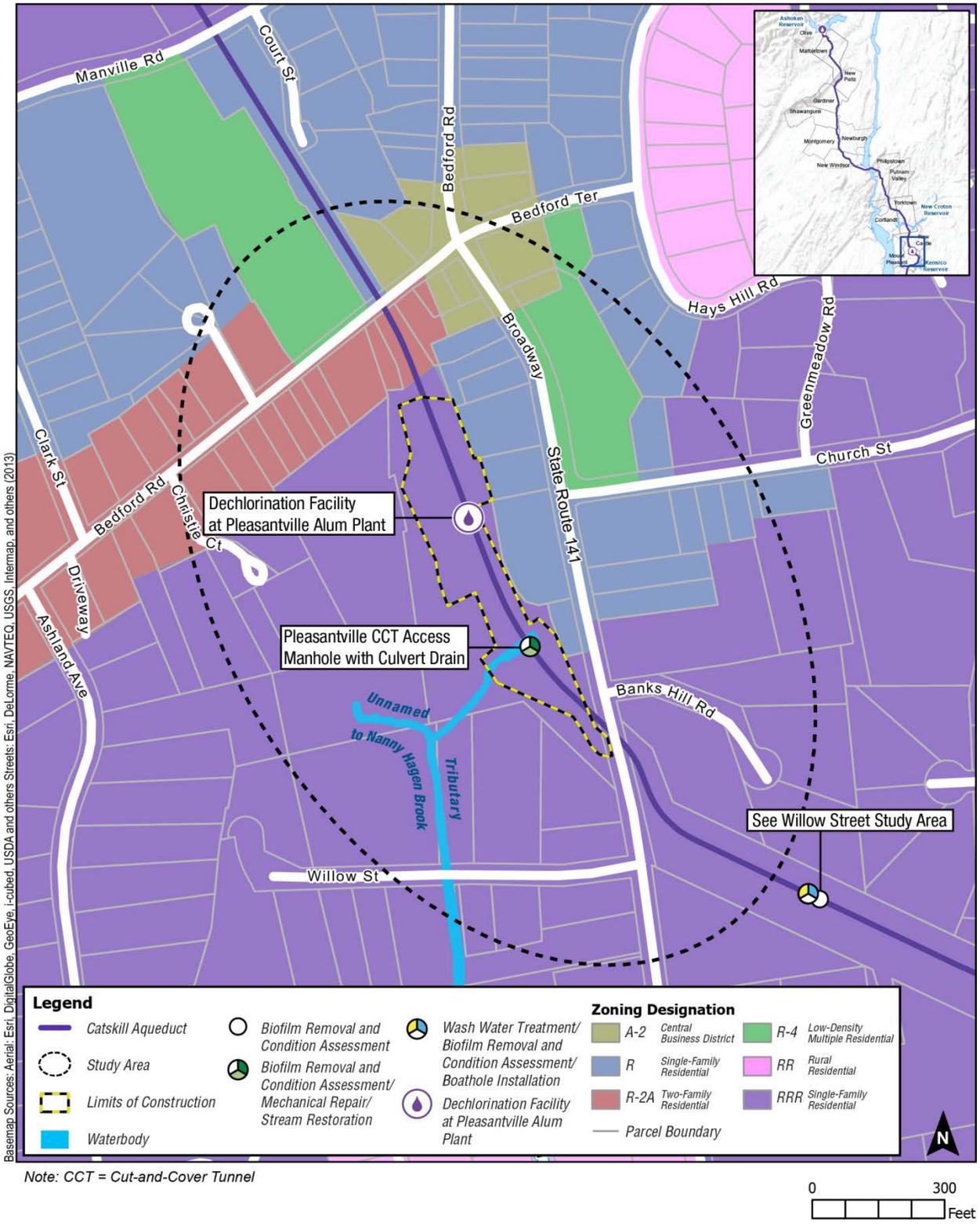


Figure 9.17-15: Zoning – Pleasantville Alum Plant Study Area



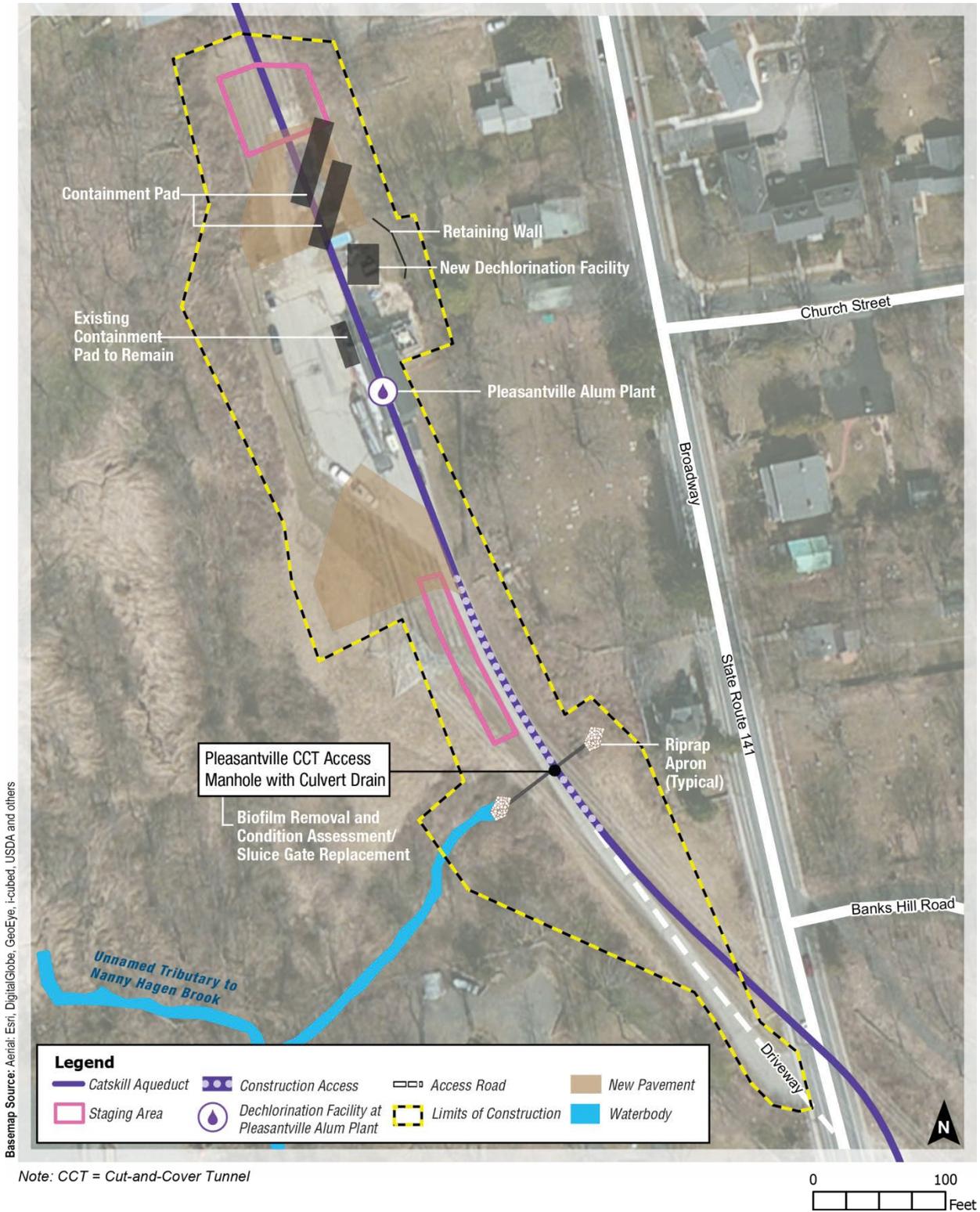


Figure 9.17-16: Site Plan – Pleasantville Alum Plant Study Area



Table 9.17-8: Schedule of Work Activities within the Pleasantville Alum Plant Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Dechlorination Facility Construction ³	2018 2017 – 2020 2019	Less than 2 continuous years	Monday to Friday, 8 AM to 6 PM	12
Streambank Restoration and Protection ³	Summer 2019 2018	3 weeks	Monday to Friday, 8 AM to 6 PM	10
Sluice Gate Replacement ³	Fall 2019 2018 (Second 10-week shutdown)	4 weeks	7 days a week 7 AM to 7 PM	12
Dechlorination Facility Start-up and Testing ³	Spring – Summer 2020 2019	Up to 4 months	7 days a week, 24 hours per day	2
Biofilm Removal and Condition Assessment ³	Fall 2020 2019 (Third 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	21
Dechlorination Facility Operation ⁴	2020 2019 – 2023	4+ years	7 days a week, 24 hours per day	2
Notes:				
¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per the Village of Pleasantville Noise Control Law (§123-5.C). ² Crew size refers to the number of people anticipated at the work site(s). ³ Overlapping activities are estimated to total 92 weeks. ⁴ Dechlorination facility would be operated by DEP staff. Operation of the dechlorination facility is not included in the estimated duration of active construction.				

Construction of the dechlorination facility would begin in ~~2018~~2017. As described in Section 9.2, “Project Description,” a sodium bisulfite chemical injection system would be installed north of the existing Pleasantville Alum Plant to remove chlorine residuals resulting from temporary chlorination of the aqueduct. The chemical injection system would be housed in a new structure, measuring up to 56 feet by 32 feet and extending 4 feet below ground. **Figure 9.2-9** in Section 9.2, “Project Description,” shows a sketch of the proposed structure. The new building would also contain a liquid alum system to augment the existing dry alum system at the Pleasantville Alum Plant and effectively treat turbid Catskill Aqueduct flows during the Rondout-West Branch Tunnel shutdown (see Chapter 10, “Water for the Future Shutdown System Operations,” for an impact analysis of this system). The proposed design would utilize on-site mobile container tanks as bulk chemical storage for the sodium bisulfite and liquid alum to the extent possible. New truck bays (containment pads) would be constructed for delivery of the chemicals. The containment pads would include inlets to routinely capture stormwater or to capture chemicals in the event of a spill.

Additional site modifications would include removal of the asphalt north of the alum plant and construction of a retaining wall to stabilize the soil adjacent to the new building and truck bays. The existing driveway would be redesigned and expanded to accommodate the turning radius requirements of delivery trucks. Upgrades to the stormwater system would include a new catch basin that would discharge to an underground infiltration unit. The improvements would require

the excavation of approximately 550 cubic yards of soil, approximately 220 cubic yards of which would be suitable for reuse on site. The remainder would be disposed of at a permitted facility.

Streambank restoration measures associated with the culvert drain access manhole would take place in summer ~~2019~~2018 (see **Figure 9.17-16**). Work would entail the restoration of riprap aprons on either end of the culvert to their original as-built conditions and the removal of accumulated debris from within the culvert. Temporary in-stream disturbance would cover a total area of approximately 1,150 square feet. No permanent in-stream disturbance would occur. Although the channel is generally dry, sandbags would be installed upstream of the culvert, and any streamflow would be diverted to a point downstream, which would include a turbidity curtain for sediment control. Replacement of the culvert drain sluice gate, which would require unwatering of the aqueduct, would occur during the second 10-week shutdown in fall ~~2019~~2018 (see **Table 9.17-8**). In conjunction with sluice gate replacement, the gate stem, manhole cover, and access ladder would be replaced, and the concrete walls of the manhole would be repaired. During the repair work, sandbags would be installed inside the aqueduct to prevent any residual water from entering the natural environment. Afterwards, the culvert drain could be used to unwater the aqueduct for future shutdowns during the repair and rehabilitation and future maintenance.

Start-up and testing of the dechlorination facility would be conducted as early as spring ~~2020~~2019 for a period of several months prior to biofilm removal (see **Table 9.17-8**). Biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019, with access into the aqueduct provided by the culvert drain access manhole. It would also serve as a collection point for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Following the third 10-week shutdown, operation of the dechlorination facility would continue (see **Table 9.17-8**). As described in Section 9.2, “Project Description,” sodium bisulfite would be added to remove residual levels of chlorine in the aqueduct water prior to discharging to Kensico Reservoir. During temporary chlorination, there would be two operating conditions for adding either sodium hypochlorite or chlorine dioxide at Ashokan Screen Chamber: a maximum dose for potentially reducing the extent of the biofilm in advance of biofilm removal; and a lower dose for maintaining the increased Catskill Aqueduct capacity after biofilm removal to limit regrowth. At the maximum dose, sodium bisulfite deliveries to the Pleasantville Alum Plant would be approximately 4 per week in 5,000-gallon tanker trucks. At the lower dose for maintaining the increased capacity, sodium bisulfite would be delivered less than once per week.

As also described in Section 9.2, “Project Description,” a liquid alum system would be constructed to supplement the existing dry alum system during turbidity events. Liquid alum

would primarily be used during the RWBT temporary shutdown. It would be delivered approximately 15 times per week in 5,000-gallon tanker trucks at the maximum dose and approximately 4 times per week at the lower dose. Following the tunnel connection in 2023, temporary chlorination of the aqueduct would no longer be required, and the dechlorination facility would no longer be operated. DEP would continue to rely on operational turbidity control measures, as needed with NYSDEC and NYSDOH approval, during water quality events.

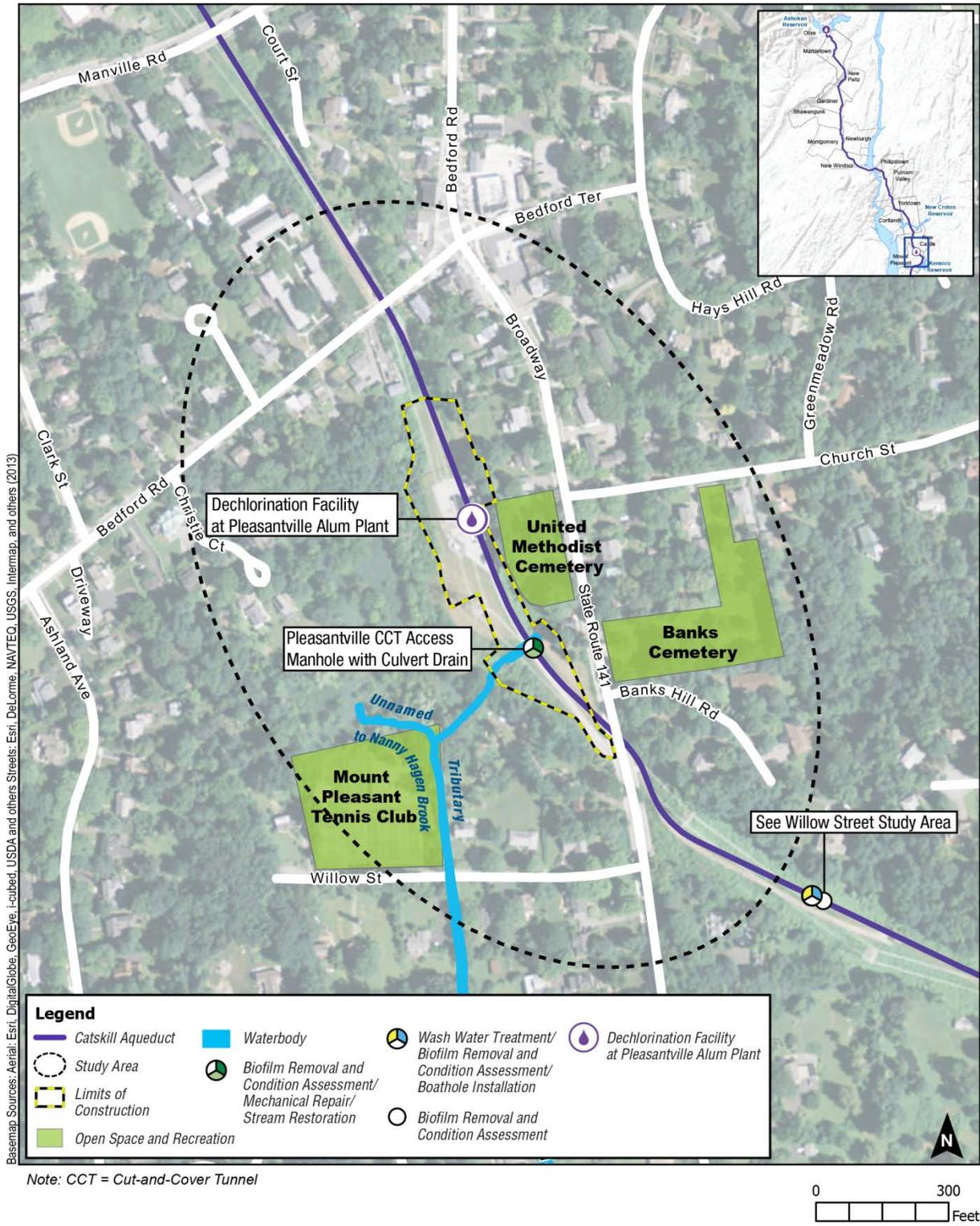
Impact categories analyzed for the Pleasantville Alum Plant Study Area are presented in Sections 9.17.4.3, “Open Space and Recreation,” through 9.17.4.10, “Neighborhood Character,” and include: open space and recreation; visual resources; natural resources including water resources, federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; water and sewer infrastructure; transportation; stationary noise; and neighborhood character. Additionally, the study area’s compatibility with applicable public policies was analyzed on a town-wide basis in Section 9.17.2, “Village of Pleasantville Impact Analysis.” As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” impact analyses related to land use and zoning; socioeconomic conditions; community facilities and services; historic and cultural resources; the remaining natural resources subcategories, including geology and soils, aquatic and benthic resources, terrestrial resources, wildlife, federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area are not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.17.4.3 Open Space and Recreation

As shown on **Figure 9.17-17**, three open space and recreation resources exist within the Pleasantville Alum Plant Study Area: Banks Cemetery, the United Methodist Cemetery, and the Mount Pleasant Tennis Club. The approximately 2-acre Banks Cemetery is located on the east side of the study area, east of Broadway, near its intersection with Banks Hill Road. The 0.75-acre United Methodist Cemetery is located directly east of the Pleasantville Alum Plant and culvert drain access manhole. A majority of the 1-acre Mount Pleasant Tennis Club is located in the southwest portion of the study area.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP’s understanding that no plans to expand or create new open space or recreational resources are anticipated within the Pleasantville Alum Plant Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open spaces is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Pleasantville Alum Plant Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities within the Pleasantville Alum Plant Study Area would be short-term (totaling 95 weeks over 3 years; see **Table 9.17-8**). Repair and rehabilitation activities would not affect use of Banks Cemetery or the Mount Pleasant Tennis Club. The United Methodist Cemetery is located directly adjacent to the work sites, which would temporarily generate noise.



Basemap Sources: Aerial: Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.17-17: Open Space and Visual Resources – Pleasantville Alum Plant Study Area



Staging would occur on DEP property, and would not disrupt the use of the open space. It may temporarily affect views looking west.

During construction, the repair and rehabilitation work activities located at the Pleasantville Alum Plant would occur approximately 300 feet from Banks Cemetery, which is separated by Broadway. They would occur approximately 40 feet from United Methodist Cemetery, which is separated by a row of trees, and approximately 500 feet from Mount Pleasant Tennis Club, which is separated by dense vegetation and trees. While construction is required for the new dechlorination facility, culvert drain work, unwatering, and permanent in-kind repairs, the construction would not disrupt the recreational use of the identified open spaces.

As discussed in Section 9.17.4.9, “Noise,” for the Pleasantville Alum Plant Study Area, there could be temporary increases in noise levels due to the work activities within the study area that may affect use of Banks Cemetery, United Methodist Cemetery, and the Mount Pleasant Tennis Club. However, upon completion of the repair and rehabilitation work activities, the use of these resources would be unaffected.

Following construction, all equipment would be removed from the Pleasantville Alum Plant Study Area and staging areas would be restored to baseline conditions. The new dechlorination facility and in-kind streambank restoration measures would be permanent structures that would remain following construction. Temporary chlorination of the Catskill Aqueduct would take place from 2019 through 2023. However, the study area would not be visibly different from baseline operations due to the existing vegetation between the dechlorination facility and the identified open spaces. Following the repair and rehabilitation work activities within the Pleasantville Alum Plant Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not encroach upon, cause a loss of open space to, impact the use or physical character of, or disrupt views from the Banks Cemetery, the United Methodist Cemetery, or the Mount Pleasant Tennis Club.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Pleasantville Alum Plant Study Area.

9.17.4.4 Visual Resources

The visual resources study area is the area within the Pleasantville Alum Plant Study Area. It also includes view corridors that extend beyond the study area based on the locations that are publicly accessible.

As shown on **Figure 9.17-17**, three visual resources, consisting of three locally significant resources were identified within the Pleasantville Alum Plant Study Area; Banks Cemetery, the United Methodist Cemetery, and Mount Pleasant Tennis Club.

As noted above, Banks Cemetery is located east of the Pleasantville Alum Plant, across Broadway. It has no views of the Catskill Aqueduct and Pleasantville Alum Plant, as there are numerous residences between the cemetery and the Pleasantville Alum Plant. United Methodist Cemetery is located adjacent to and east of the Pleasantville Alum Plant. Views are dominated by the power lines that run along the aqueduct. There are limited views of the existing Pleasantville Alum Plant due to the amount of full growth vegetation within and bordering the

cemetery. The Mount Pleasant Tennis Club is located approximately 500 feet south of the Pleasantville Alum Plant, and has no views of the Pleasantville Alum Plant due to the dense vegetation adjacent to the tennis club. Therefore, views of the Pleasantville Alum Plant from the three resources are limited.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Pleasantville Alum Plant Road Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Pleasantville Alum Plant Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities would be short-term (totaling 95 weeks over 3 years; see **Table 9.17-8**). While construction is required for the new dechlorination facility, culvert drain work, unwatering, and permanent in-kind repairs, the construction would not greatly detract from the aesthetics of the area because the addition would be adjacent to existing Pleasantville Alum Plant. As noted above, views of the plant are limited. Other construction staging areas within the study area would be screened from view from the identified resources by the surrounding vegetation. The new dechlorination facility and in-kind streambank restoration measures would be permanent structures that would remain following construction.

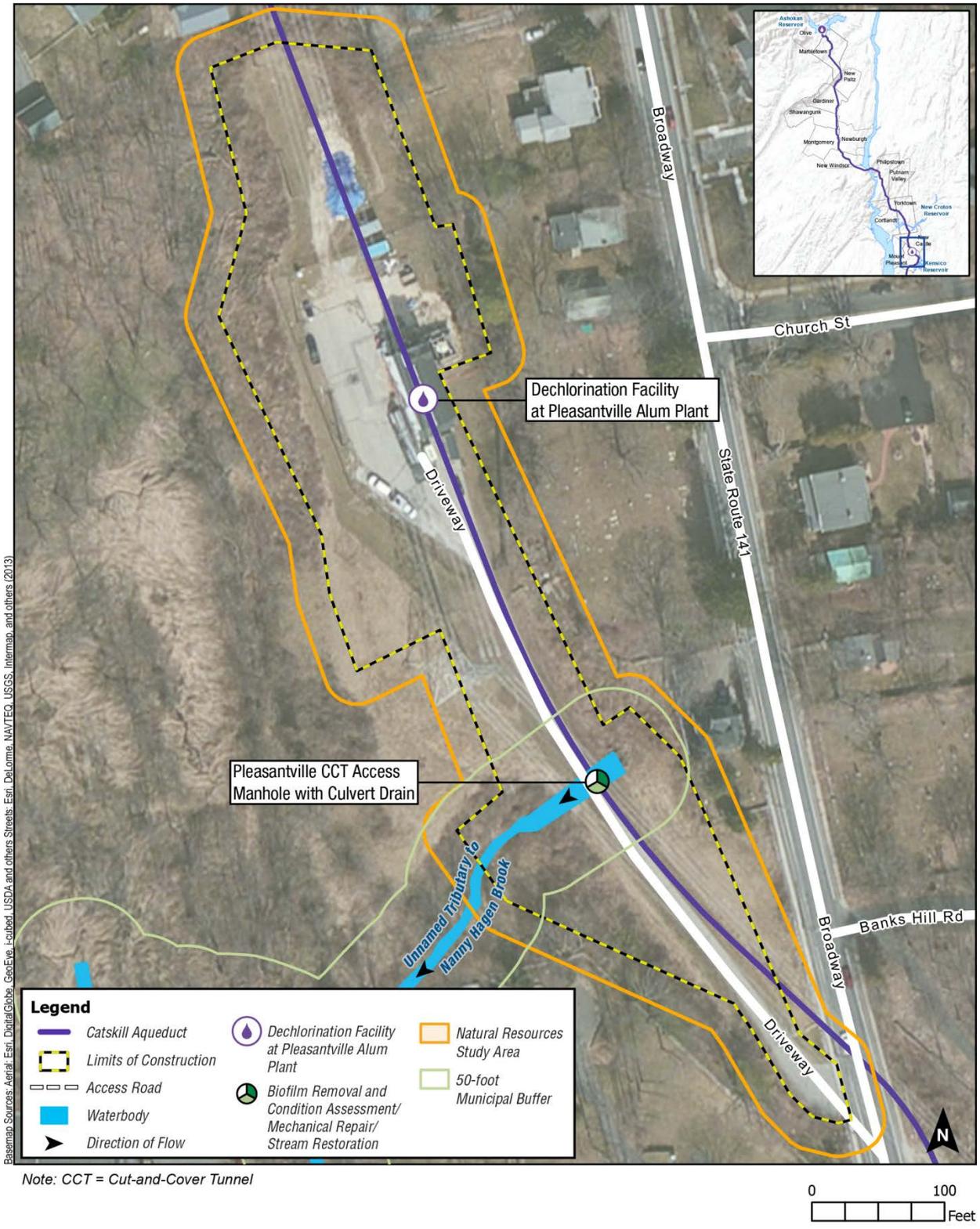
Following construction, all equipment would be removed from the Pleasantville Alum Plant Study Area and associated staging areas would be restored to baseline conditions. The new dechlorination facility and in-kind streambank restoration measures would be permanent structures that would remain following construction. Temporary chlorination of the Catskill Aqueduct would take place from 2019 through 2023, but the study area would not be visibly different from baseline operations. Following the repair and rehabilitation work activities within the Pleasantville Alum Plant Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not result in changes to the future visual and aesthetic resource conditions of the views to Banks Cemetery, the United Methodist Cemetery, and Mount Pleasant Tennis Club.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Pleasantville Alum Plant Study Area.

9.17.4.5 Natural Resources

The natural resources study area is the immediate area surrounding the limits of construction at the Pleasantville Alum Plant and culvert drain sluice gate (see **Figure 9.17-18**). A desktop survey was conducted of the culvert drain sluice gate access manhole.

The natural resources study area was analyzed based on a field visit on October 7, 2014. The natural resources study area consists of a mowed lawn with trees that contains a utility right-of-way, deciduous forest, and residential lawns. An unnamed tributary to Nanny Hagen Brook crosses under the aqueduct and access drive at the culvert drain sluice gate. These habitats



Basemap Sources: Aerial, Esri, DigitalGlobe, GeoEye, Earthstar, USDA, and others Streets, Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 9.17-18: Natural Resources – Pleasantville Alum Plant Study Area



have the potential to support protected water resources and protected wildlife, and an analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Water Resources

The natural resources study area is within the lower Hudson River drainage basin, more specifically within the Saw Mill River subwatershed (HUC 020301010403) of the lower Hudson Watershed (HUC 02030101).

Surface water in the natural resources study area is subject to U.S. Army Corps of Engineers/State jurisdiction under Sections 401 and 404 of the Clean Water Act for proposed work activities. As a Class C stream, the unnamed tributary to Nanny Hagen Brook is not subject to State Protection of Waters regulations. The Village of Pleasantville regulates activities within wetlands and watercourses with a regulated 50-foot buffer (Village of Pleasantville Code Chapter 182: Wetlands). This municipal regulation encompasses the work in and alongside the stream, including staging areas on top of the aqueduct berm. Therefore, work activities occurring within the 50-foot buffer may be subject to Village of Pleasantville review and approval.

Surface Water

The unnamed tributary to Nanny Hagen Brook crosses under the aqueduct and is located within the natural resources study area, as shown on **Figure 9.17-18**. The water resource name, area, length, and classifications are shown in **Table 9.17-9**.

Table 9.17-9: Water Resources and Classifications within the Pleasantville Alum Plant Natural Resources Study Area

Water Resource	Area (Square Feet)	Length (Feet)	Cowardin Classification
Unnamed Tributary to Nanny Hagen Brook	1,280	180	Riverine, Lower Perennial

Unnamed Tributary to Nanny Hagen Brook

The unnamed tributary to Nanny Hagen Brook flows southwesterly away from Broadway toward Willow Street, traversing the southwestern portion of the natural resources study area. Outside of the natural resources study area, the unnamed tributary continues to flow to its confluence with Nanny Hagen Brook. The culvert drain sluice gate and access manhole are associated with this unnamed tributary. The stream channel has been observed to generally be dry. The unnamed tributary to Nanny Hagen Brook is classified as a “Riverine, Lower Perennial” system base on the Cowardin System (Cowardin et al. 1979).

Future Without the Repair and Rehabilitation

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP’s understanding that no projects or developments are anticipated within the natural resources study

area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the future conditions of water resources within the Pleasantville Alum Plant Study Area would be the same as baseline conditions.

Analysis of Potential Effects

This section analyzes the potential for temporary and permanent disturbance to water resources associated with the repair and rehabilitation and long-term operation of the Catskill Aqueduct in the Pleasantville Alum Plant Study Area.

Construction

Within this study area, there would be two work sites associated with the construction; the new dechlorination facility and the culvert drain sluice gate (see **Figure 9.17-18**). Work activities associated with the culvert drain sluice gate would result in temporary disturbance to a portion of unnamed tributary to Nanny Hagen Brook and would have the potential to temporarily alter flows in the tributary.

Prior to commencement of the repair and rehabilitation, sediment and erosion control measures would be installed to prevent the transport of sediment resulting from temporary disturbance into water resources within the natural resources study area. All access and staging activities would occur in upland areas along the top of the cut-and-cover berm. Equipment would then use the side-slope of the berm to reach both the inlet and outlet of the culvert.

The original riprap aprons installed at the upstream and downstream ends of the culvert during the aqueduct's original construction have deteriorated and are no longer protecting the shoreline. As part of the repair and rehabilitation, the riprap aprons would be restored to their original, as-built condition. To complete the culvert drain repair and maintain a dry work area, sandbags would be installed and the stream would be diverted to a point downstream of the culvert with a turbidity curtain used for sediment control. To protect the stream and its banks, and prevent sediment and other pollutants from entering the waterways, these temporary measures would be designed in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements. All stream flow would be diverted around the work site and the diversion would be for the shortest possible duration. Therefore, downstream resources would not be affected.

Anticipated temporary disturbance to water resources and regulated buffers were quantified based on the limits of construction and proposed work activities (see **Table 9.17-10**). Construction staging would occur on top of the aqueduct and the temporary stream diversion would occur in the stream, resulting in approximately 1,150 square feet of temporary disturbance and no permanent disturbance to the unnamed tributary to Nanny Hagen Brook. Additionally, approximately 15,180 square feet of temporary disturbance and no permanent disturbance would occur within the 50-foot municipal water resources buffer. Following construction, temporarily disturbed areas would be restored to natural conditions and planted with native vegetation.

Table 9.17-10: Estimated Disturbance to Water Resources within the Pleasantville Alum Plant Natural Resources Study Area

Water Resource	Baseline Conditions (Square Feet)	Temporary Effects (Square Feet)	Permanent Effects (Square Feet)
Unnamed Tributary to Nanny Hagen Brook	1,280	1,150 <i>Temporary stream diversion and temporary downstream turbidity curtain and construction staging area</i>	0
50-foot Water Resource Municipal Buffer	20,210	15,180 <i>Construction staging area</i>	0

Riprap would be restored at both the inlet and outlet of the culvert. Riprap aprons placed at the culvert’s inlet and outlet would provide erosion protection and are consistent with original as-built conditions. Additionally, riprap aprons at the culvert drain sluice gate would be sized based upon the maximum discharge capacity, even though it is unlikely flows of this magnitude would be discharged at these sites.

Discharges of raw aqueduct water and groundwater could take place during a shutdown of the Catskill Aqueduct and could occur in the future during DEP’s typical operations when access to the aqueduct is required for maintenance or inspection. The aqueduct would be unwatered with temporary stream protection measures in place prior to reconstructing the culvert drain sluice gate. Unwatering events to surface water would also occur at any time following construction and therefore are described in “Operation” below.

Operation

Upon completion of the culvert drain sluice gate repairs and streambank restoration, the function of the sluice gate would be restored. Discharges of raw water to the unnamed tributary to Nanny Hagen Brook could occur in the future during DEP’s typical operations. The aqueduct could be unwatered via the sluice gate to conduct maintenance or inspection. During the aqueduct shutdowns, groundwater may infiltrate the aqueduct. Groundwater would flow by gravity to the culvert drain sluice gate and could also be discharged to the unnamed tributary to Nanny Hagen Brook.

An analysis was conducted to determine if the raw water discharge would be greater than the bankfull stream flow. Bankfull flow is the flow that just fills the channel to the top of its banks (i.e., stream capacity) and at the point in which water begins to flow onto the floodplain. Bankfull flow was predicted for the unnamed tributary to Nanny Hagen Brook using the USGS StreamStats Program. If the discharge associated with an unwatering event is greater than the bankfull flow, indirect downstream effects, such as an increase in erosion and scouring over the baseline could occur. A maximum discharge flow of 23,700 gpm is expected when the culvert drain is operated during a 2-year storm event. This is greater than the calculated bankfull flow of the unnamed tributary to Nanny Hagen Brook of approximately 310 gpm, meaning a bankfull event is possible during an unwatering event. Additionally, groundwater infiltration at this site is

expected to be approximately 50 gpm to approximately 100 gpm, which would not be expected to create flooding conditions.

To unwater the aqueduct at this location and prevent a bankfull event, the sluice gate would only be opened approximately 1 inch to limit unwatering flow to approximately 300 gpm while visually monitoring streambank flow. The sluice gate would be further opened as initial discharge velocities decrease, and flows would continue to be monitored to ensure a bankfull event does not occur and that adjacent properties or the road are not affected. It is anticipated that it would take approximately 3.5 days to drain the 1.5 million gallons of residual water from the aqueduct at 300 gpm.

Operation and maintenance of the culvert drain is not anticipated to result in scouring of the stream channel because discharges would be temporary in nature (approximately 4 days to unwater; up to 10 weeks for discharging groundwater). They would also not exceed bankfull capacity based on the unwatering monitoring protocol described above, and the streambank restoration measures would be sized for maximum anticipated flows.

Water Resources Conclusion

The repair and replacement of the culvert drain sluice gate would result in temporary disturbance to the unnamed tributary to Nanny Hagen Brook to complete the in-kind repairs. Upon completion of repair and restoration work, the unnamed tributary would be restored to its natural condition. Restoring the riprap aprons to their original condition would be an in-kind repair and would be beneficial in that these would minimize future scouring when the sluice gate is operated. Other areas temporarily affected by work activities would also be restored to natural conditions following construction. Therefore, there would be no permanent construction-related effects on water resources. Discharges of groundwater due to infiltration and raw water from aqueduct unwatering events are not anticipated to result in erosion and sediment control issues that may adversely affect the stream channel within the Pleasantville Alum Plant Study Area.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water resources within the Pleasantville Alum Plant Study Area.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section include an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, “Natural Resources,” as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected within the study area, species that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

As discussed in Section 9.3.9, “Natural Resources,” six species were identified to have the potential to be affected in the natural resources study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these six species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible effects due to changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area is shown in **Table 9.17-11**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and field visits, as applicable.

Table 9.17-11: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitat within the Pleasantville Alum Plant Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visit on October 7, 2014. Potential habitat exists within the open grassy areas and deciduous forest. Work activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, as a mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visit on October 7, 2014. Potential habitat exists within the open grassy areas and deciduous forest. However, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the work sites, a variety of habitats would be available for the species' use in the vicinity during construction. Furthermore, upon construction completion, the staging areas would be restored to natural conditions. Perimeter silt fencing would also help prevent individuals from entering work sites during construction. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No
Birds					
Cooper's Hawk	<i>Accipiter cooperii</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visit on October 7, 2014. Work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Cooper's Hawks is warranted for this study area.	No

Table 9.17-11: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitat within the Pleasantville Alum Plant Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Sharp-shinned Hawk	<i>Accipiter striatus</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visit on October 7, 2014. Work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the sites, a variety of habitats would be available for the species' use in the vicinity during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Sharp-shinned Hawks is warranted for this study area.	No
Mammals					
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	No bats were incidentally observed during the field visit on October 7, 2014. Limited roosting and foraging habitat exists within study area. No tree removal is proposed, and no direct effects anticipated. There would be temporary changes in hydrology during unwatering. However, no significant loss or modification of bat foraging habitat would occur. Therefore, there are no effects anticipated and no further analysis for Indiana bats is warranted for this study area.	No
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Threatened Unlisted	No bats were incidentally observed during the field visit on October 7, 2014. Limited roosting and foraging habitat exists within study area. No tree removal is proposed, and no direct effects anticipated. A new building would be constructed as part of the dechlorination facility and changes to the existing building are proposed. Should any bats or their guano be observed within these structures during construction or temporary chlorination activities, USFWS and NYSDEC would be contacted immediately to determine the best course of action. There would be temporary changes in hydrology during unwatering. However, no significant loss or modification of bat foraging habitat would occur. Therefore, there are no effects anticipated and no further analysis for northern long-eared bats is warranted for this study area.	No
Notes: BGPA: Bald and Golden Eagle Protection Act MBTA: Migratory Bird Treaty Act					

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), Cooper's Hawks (*Accipiter cooperii*), Sharp-shinned Hawks (*Accipiter striatus*), Indiana bats (*Myotis sodalis*), or northern long-eared bats (*Myotis septentrionalis*) associated with the repair and rehabilitation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Pleasantville Alum Plant Study Area.

9.17.4.6 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Pleasantville Alum Plant Study Area, a Phase I ESA was conducted in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify REC. The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site itself and for its neighboring properties within appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a geotechnical investigation and environmental health and safety data gap analysis and sampling, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Based on the Phase I ESA investigations, a reported spill involving 5 gallons of caustic soda occurred on September 28, 2011, and was contained to an area covered by concrete. The spill was granted a regulatory case closed status on the same day, indicating that the incident has been remediated to the satisfaction of the regulatory authority NYSDEC. There was no other history of contamination at, or in the vicinity of, the Pleasantville Alum Plant Study Area where a sluice gate would be replaced, and where temporary gravel placement would occur for the construction staging area and access road. Additionally, there is no history of open contamination at, or in the vicinity of the limits of work in the study area.

In addition, a previous inspections report completed as part of DEP's routine audit and inspections was reviewed: Legacy Item Audit and Periodic Asbestos Inspection Report; Bureau Focused Legacy Item Audit Report – Pleasantville Alum Plant (BWS-197), dated September 4, 2014 prepared by the Division of Environmental Health and Safety. The audit inspection involved the review of the Facility Specific Assessment Report, previous inspection reports, facility files, site survey of hazardous materials and other environmental health and safety issues within the facility, such as asbestos-containing materials, lead-based paint, PCB-containing paint and mercury-containing paint within the Pleasantville Alum Plant structure. The Phase I ESA investigations and legacy report reviewed revealed that asbestos-containing materials, lead-based paint, PCB-containing paint and mercury-containing paint is present in the site structure, and more may be present. The audit inspection also listed previously identified asbestos-containing materials that were previously abated by DEP. The PCB-containing paint, lead-based paint, mercury-containing paint were reported to have been managed in place, open or closed. The proposed construction and connection of utilities would

require some form of disturbance of the existing Pleasantville Alum Plant structure as part of the construction, repair and rehabilitation.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Pleasantville Alum Plant Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Pleasantville Alum Plant Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for the existing back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. Additionally, sodium bisulfite and alum tanker trucks would be temporarily stationed on site during chemical delivery as needed. Secondary containment would also be provided for each chemical storage tank and any stormwater captured within these secondary containment areas would be diverted to the existing underground infiltration system. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage, and spill reporting requirements.

If any soil contamination is identified, the excavated material would be transported to an authorized off-site storage facility. All waste material, including contaminated soil would be temporarily secured using non-permeable base material, covered with plastic or geotextile to prevent soil loss, and removed from the proposed repair and rehabilitation work sites within the Pleasantville Alum Plant Study Area at the end of each workday. All soils to be removed as part of the repair and rehabilitation would be transported off-site and disposed of in accordance with all federal, State, and local laws.

The work activities would include installation of the temporary dechlorination facility and restoration of riprap aprons associated with the culvert drain. These work activities would meet applicable regulatory limits. Two new truck bays (containment pads) would be constructed to the west of the new chemical building for delivery of the chemicals. Following the construction, all construction equipment would be removed, the staging areas would be restored to baseline conditions, and operation of the Catskill Aqueduct would be consistent with baseline conditions.

During temporary chlorination from 2019 through 2023, the temporary dechlorination facility would be operated. Chlorinated water in the Catskill Aqueduct would be treated by adding sodium bisulfite at the new dechlorination facility at Pleasantville Alum Plant. The new building, which would also contain a liquid alum system to augment the existing dry alum system at the Pleasantville Alum Plant, would effectively treat turbid Catskill Aqueduct flows during the RWBT temporary shutdown. Both sodium bisulfite and alum chemicals are historically and commonly used in water supply/treatment systems and would remove any chlorine residuals prior to discharge to the Kensico Reservoir.

Following the repair and rehabilitation, the dechlorination facility would no longer be operated and chemical storage for this facility would no longer be required. Operation of the repaired and rehabilitated Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Pleasantville Alum Plant Study Area.

9.17.4.7 Water and Sewer Infrastructure

The repair and rehabilitation has the potential to affect water supply and stormwater management associated with construction and operation of the dechlorination facility in the study area. Wastewater generated by chlorinating the aqueduct is discussed in Section 9.19, “Project-wide Impact Analysis.” The Catskill Aqueduct traverses the study area in a general northwest to southeast direction.

Water supplies in the Pleasantville Alum Plant Study Area primarily consist of surface water from the Catskill and New Croton water supply systems. There is existing water supply infrastructure at the Pleasantville Alum Plant. Several employees work at or visit the Pleasantville Alum Plant on a daily basis. Additionally, approximately 16,250 square feet of impermeable surfaces exist at the Pleasantville Alum Plant (e.g., pavement, concrete, roofs).

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP’s understanding that no new projects or structures that would affect water and sewer infrastructure are anticipated within the study area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed water and sewer infrastructure would be the same as baseline conditions.

In the future with the repair and rehabilitation, impermeable surface area (new pavement) in the study area would increase by approximately 11,500 square feet (see **Figure 9.17-16**). During the repair and rehabilitation, stormwater BMPs would be followed to minimize the potential for runoff from Pleasantville Alum Plant into the study area, including erosion and sediment control measures. To complete the culvert drain repair and maintain a dry work area, sandbags would be installed and the stream would be diverted to a point downstream of the culvert with a turbidity curtain used for sediment control. The temporary measures would be conducted in accordance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and other applicable regulatory requirements.

Installation of the dechlorination facility would be accomplished primarily while the aqueduct is in service. The final connection to the aqueduct requires a temporary shutdown of the Catskill Aqueduct that, if possible, would coincide with one of the 10-week shutdowns proposed as part of the repair and rehabilitation. The new dechlorination facility would add sodium bisulfite to remove chlorine residuals prior to discharge into Kensico Reservoir, and would operate from testing until project completion in 2023. Following start-up and testing of the dechlorination facility, the new chemical system for aluminum sulfate would also be operational and placed into service when needed.

The proposed new liquid alum system would augment the existing dry alum system at the Pleasantville Alum Plant to effectively treat turbid Catskill Aqueduct flows during the RWBT

temporary shutdown. The use of sodium bisulfite would coincide with temporary chlorination at the Ashokan Screen Chamber (in the Town of Olive) from 2019 through 2023, thereby providing a dechlorination mechanism at the Pleasantville Alum Plant. Both chemical systems, the new dechlorination and the new liquid alum systems, are compatible when mixed with aqueduct water. Therefore, this mixing is not anticipated to impact the efficacy of either chemical. DEP would continue to rely on operational turbidity control measures, as needed and with NYSDEC and NYSDOH approval, during water quality events. Since the chemical systems would be installed and operated to improve the quality of water within the Catskill Aqueduct, no adverse impacts to water supply are anticipated.

Once the Catskill Aqueduct returns to typical operations in 2023, the dechlorination facility at Pleasantville Alum Plant would no longer be required and would no longer be operated.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to water and sewer infrastructure within the Pleasantville Alum Plant Study Area.

9.17.4.8 Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Pleasantville Alum Plant Study Area (see **Figure 9.17-12**).

Access to the repair and rehabilitation limits of construction for the work sites within the Pleasantville Alum Plant Study Area would be via Broadway directly to a DEP access road (see **Figure 9.17-12**). Broadway (State Route 141) is a two-lane, two-way urban minor arterial roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Pleasantville Alum Plant Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area. There is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees work at or visit the study area on a regular basis to operate the Pleasantville Alum Plant. However, the small number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Pleasantville Alum Plant Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Pleasantville Alum Plant Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and therefore be the basis of this transportation analysis. Of these activities, biofilm removal and condition assessment would generate the most vehicle trips (see **Figure 9.17-16**). Biofilm removal and condition assessment would occur in fall ~~2020~~2019 between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the third 10-week shutdown (see **Table 9.17-8**).

In the future with the repair and rehabilitation, construction vehicles would travel along Broadway to the DEP access road. The estimated number of peak-day one-way vehicle trips associated with biofilm removal and condition assessment would be 33 vehicles trips, or approximately 66 peak-day vehicle round trips that would travel to and from the study area. The majority of the peak daily vehicle round trips, approximately 42 vehicle round trips or 42 PCEs would be workers either traveling to and from the study area or traveling directly to and from the staging area (depending on parking capacity), with potentially 8 daily shuttle trips between the study area and the staging area. The remaining approximately 16 peak-day vehicle round trips (21 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with biofilm removal and condition assessment is approximately 33 peak-hour vehicle trip ends (36 PCEs). This includes approximately 21 vehicle trip ends (21 PCEs) from workers traveling directly to and from the staging area, approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 8 vehicle trip ends (11 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one 12-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 36 peak-hour PCEs along Broadway, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, "Transportation." Work activities in the Pleasantville Alum Plant Study Area associated with the construction of the dechlorination facility would occur for less than 3 years. While use of this study area as a secondary staging area and completion of other work activities would span the duration of construction (~~2018~~2017 through 2020), concentrated activities would primarily occur during the three 10-week shutdowns (see **Table 9.17-8**) and would not generate public parking or transportation demands or pedestrian activity within the Pleasantville Alum Plant Study Area.

After the completion of the dechlorination facility construction in ~~2020~~2019, the operation of the dechlorination facility would generate vehicle trips from staff who would work at the site and delivery of chemicals by tanker trucks to the unloading station of the Pleasantville Alum Plant through 2023. During temporary chlorination, there would be two staff who would regularly work at the site to operate the facility. The chemical deliveries would generate fewer than the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs. In total, the number of vehicles associated with operation of the dechlorination facility would not deviate significantly from baseline conditions. Furthermore, upon completion of the RWBT bypass tunnel connection in 2023, the dechlorination facility would no longer be operated, and vehicle trips associated with this operation would no longer be generated.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Pleasantville Alum Plant Study Area.

9.17.4.9 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation work activities within the Pleasantville Alum Plant Study Area does not warrant analysis. As related to potential impacts to noise at DEP’s Pleasantville Alum Plant, construction vehicles would access the site from Broadway during normal work hours. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The noise study area is the area within 1,500 feet of the repair and rehabilitation work activities as shown on **Figure 9.17-19**.

The Pleasantville Alum Plant Noise Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Village of Pleasantville Noise Control Law (§123-5.C), which defines the use of any tool, pile driver, pneumatic hammer, tractor, derrick, electric hoist, gasoline- or electric-powered saw, or other noise-producing equipment to be a violation of the noise code if used between the hours of 7 PM and 8 AM or anytime on Sunday. The Village of Pleasantville does not have quantitative noise limits applicable to the Pleasantville Alum Plant Study Area.

Existing ambient noise levels within the Pleasantville Alum Plant Study Area are influenced by vehicular traffic on Broadway and other nearby local roads and existing operations at the Pleasantville Alum Plant. The existing noise levels within the study area are comparable to a quiet suburban residential environment based on the proximity to major transportation corridors, the population density of the area, and the presence of other noise-producing elements. Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP’s understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Pleasantville Alum Plant Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Pleasantville Alum Plant Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Pleasantville Alum Plant Study Area would occur at one site. The stationary noise-generating equipment that would be used within the Pleasantville Alum Plant Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with the construction of the dechlorination facility would emit the most noise. Construction of the facility would occur between the hours of 8 AM and 6 PM, Monday through Friday, between early ~~2018~~2017 and the middle of ~~2020~~2019 (see **Table 9.17-8**).

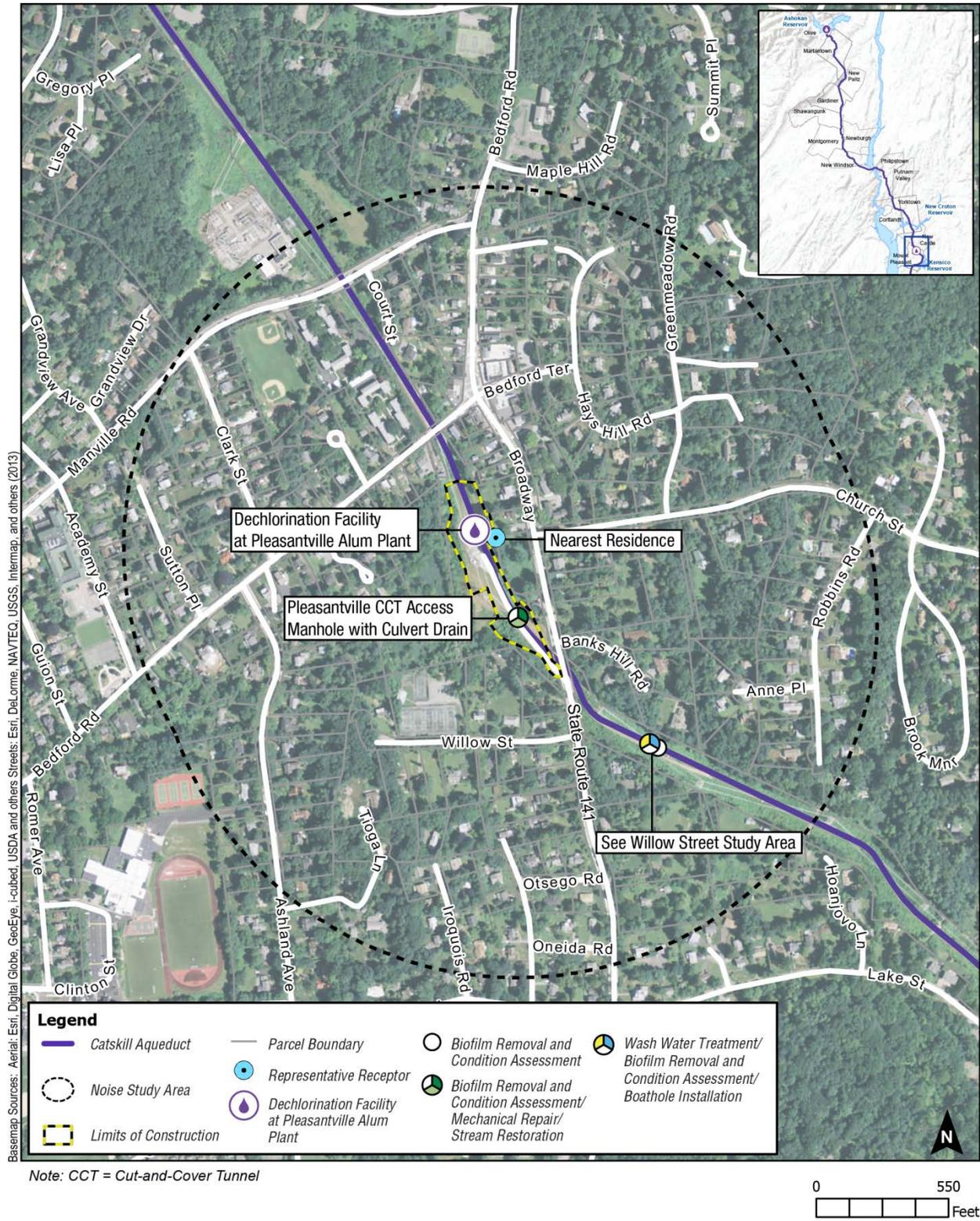


Figure 9.17-19: Noise – Pleasantville Alum Plant Study Area



The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the construction of the dechlorination facility. Associated equipment reference noise levels are shown in **Table 9.17-12**. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.17-12: Stationary Source Construction Equipment Modeled at the Pleasantville Alum Plant Study Area - Noise Analysis and Reference Noise Levels (L_{eq})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA) ¹
Mounted Impact Hammer	83
Pneumatic Tools	82
Paver	82
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.	

Table 9.17-13 shows the results of the stationary construction noise analysis. Construction of the dechlorination facility within the Pleasantville Alum Plant Study Area during the repair and rehabilitation would emit a noise level of approximately 85 dBA at the nearest residence. During construction of the dechlorination facility, the three loudest equipment types noted in **Table 9.17-13** are expected to be used during the first year of construction as part of: site preparation (demolition, grading, retaining wall work, and drywell work); demolition and grading of the west driveway area; construction of the dechlorination building (including ventilation and structure); and installation of the yard piping (from the fill station to the dechlorination building). Other noise-producing equipment would also be utilized within the noise study area for a limited period during construction. However, this equipment would not be expected to be louder than those associated with construction of the dechlorination facility. Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Village of Pleasantville. DEP would work with the Village of Pleasantville, as appropriate.

Table 9.17-13: Stationary Construction Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors for Repair and Rehabilitation Work Activities within the Pleasantville Alum Plant Study Area

Nearest Noise-Sensitive Receptor	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)	Village of Pleasantville Noise Limit (dBA)	Potential for Code Exceedance (Yes or No)
Nearest Residence	64	85	NA	Yes ¹
Notes: NA = Not Applicable ¹ Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Village of Pleasantville.				

During temporary operation of the dechlorination facility, noise-producing equipment would be located indoors. Noise outside of the building during temporary chlorination would be limited due to the masonry construction of the facility. Exterior noise sources during the operation of the dechlorination facility would be limited and would consist of chemical deliveries and other mobile sources. **Table 9.17-14** lists the noise levels associated with the temporary chlorination equipment that would operate inside the dechlorination facility.

Table 9.17-14: Stationary Operational Equipment Located Inside the Pleasantville Alum Plant

Equipment Type	Noise Level (dBA)	Source
Hydraulic Diaphragm Pumps (Alum)	< 85	Vendor
JCS Liquid Vacuum Feeders (Sodium Bisulfite)	< 85	Vendor
Chemical Transfer Pumps	< 80	Vendor

Once the Catskill Aqueduct returns to typical operations in 2023, the dechlorination facility would no longer operate.

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Pleasantville Alum Plant Study Area.

9.17.4.10 Neighborhood Character

The character of the Pleasantville Alum Plant Study Area is largely defined by a mix of residential, commercial, open space and recreation, and public services land uses and its physical setting within a suburban location (see **Figure 9.17-14**). The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. An unnamed tributary to Nanny Hagen Brook enters the study area from the south. Broadway traverses the study area in a general north to south direction, intersecting Willow Street and Bedford Road to the west and Banks Hill Road and Church Street to the east. The limits of construction for the work sites and the associated access route are located entirely in a public services corridor which is owned and maintained by DEP.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP’s understanding that no changes in land use and no new projects or structures are anticipated within the Pleasantville Alum Plant Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, “Neighborhood Character,” there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; and historic and cultural resources, an impact analysis for the Pleasantville Alum Plant Study Area was not warranted, as discussed in the following sections: Section 9.3.3, “Land Use, Zoning, and Public Policy,”

Section 9.3.4, “Socioeconomic Conditions,” and Section 9.3.7, “Historic and Cultural Resources,” respectively. As described in Section 9.17.4.3, “Open Space and Recreation,” and Section 9.17.4.4, “Visual Resources,” the work activities would not affect open space and recreation and visual resources in the Pleasantville Alum Plant Study Area. Furthermore, the public policy impact analysis provided in Section 9.17.2, “Village of Pleasantville Impact Analysis,” concluded the work activities were consistent with applicable plans.

As described in Sections 9.17.4.8, “Transportation,” and 9.17.4.9, “Noise,” during construction, the work activities in the Pleasantville Alum Plant Study Area would be short-term (totaling 95 weeks over 2 years and 7 months), with the primary staging area activities occurring for less than 2 years, and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, there would be no significant adverse impacts related to neighborhood character from the repair and rehabilitation within the Pleasantville Alum Plant Study Area.

9.17.5 WILLOW STREET STUDY AREA IMPACT ANALYSIS

Within the Willow Street Study Area, the Catskill Aqueduct consists of the Pleasantville Cut-and-Cover Tunnel and an existing boathole (see **Figure 9.17-20**).

Work activities within the Willow Street Study Area would include: staging and access improvements; boathole preparation and installation; biofilm removal and condition assessment; and small-scale wash water treatment.

9.17.5.1 Study Area Location and Description

The Willow Street Study Area is located along the upper Catskill Aqueduct in the Village of Pleasantville. The Catskill Aqueduct traverses the study area in a general northwest to southeast direction (see). Broadway (State Route 141), a two-lane arterial, traverses the western portion of the study area, intersecting Willow Street to the south and Banks Hill Road in the north. A portion of the study area overlaps the limits of construction associated with the Pleasantville Alum Plant Study Area (see Section 9.17.4, “Pleasantville Alum Plant Study Area Impact Analysis”).

The proposed work sites within the study area are located at the entrance off Broadway and surrounding the existing boathole. The study area boundary is located approximately 400 feet beyond the outermost areas of disturbance related to the work sites. **Figure 9.17-20** shows an aerial photograph of the study area, including the path of the aqueduct and the limits of construction for the work sites. **Figure 9.17-21** shows two photographs of the Pleasantville Cut-and-Cover Tunnel boathole in the study area.

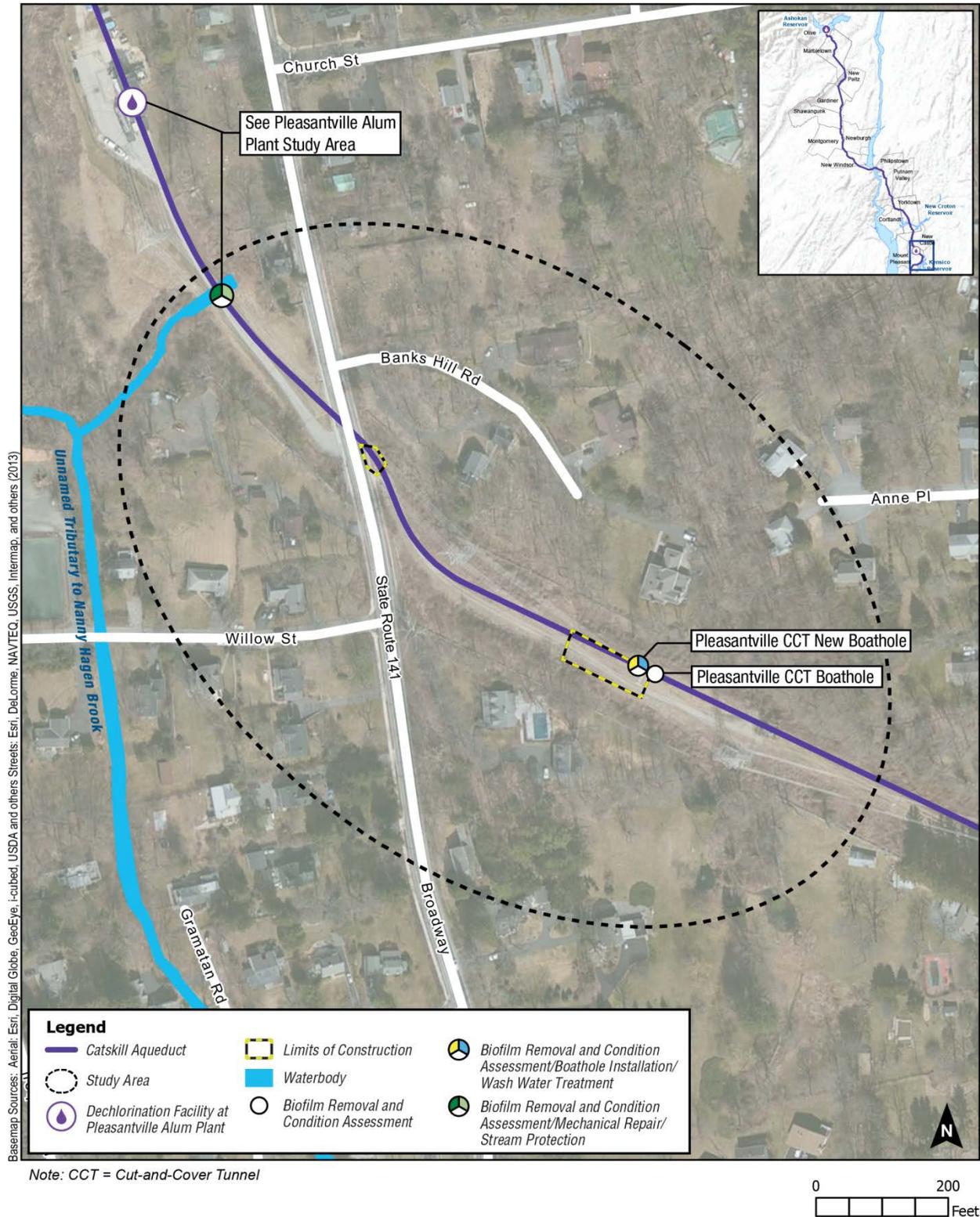


Figure 9.17-20: Study Area - Willow Street





Photograph 1: Pleasantville Cut-and-Cover Tunnel boathole.



Photograph 2: Pleasantville Cut-and-Cover Tunnel boathole, looking northwest along access road.

Figure 9.17-21: Photographs – Willow Street Study Area



Land use within the study area is primarily residential and public services, with one parcel each of open space and recreation and vacant land use. The limits of construction for the work sites are entirely located within a public services corridor with grassy cover, which is owned and maintained by DEP. **Figure 9.17-22** shows a map of the land uses in the study area and surroundings.

Zoning in the study area is single-family residential district (R and RRR), as designated by the Village of Pleasantville Zoning Code (see **Figure 9.17-23**). The Catskill Aqueduct is located within the single-family residential district (RRR), which provides for single-family residential development and a variety of supporting uses. The Catskill Aqueduct is a permitted use as a public utility facility within the single-family residential district (RRR).

There are no federal, State, or local designated landmarks, historic districts, or known archeological resources within the study area.

9.17.5.2 Proposed Activities within the Willow Street Study Area

To support activities within the Willow Street Study Area, the Catskill Influent Chamber (within the Nanny Hagen Road Study Area in the Town of Mount Pleasant) would serve as a primary staging area from which workers would be transported to the site daily. Several secondary staging areas would provide additional parking, and equipment and materials would be staged on site. Erosion and sediment control measures such as silt fencing and hay bales would be installed at the perimeter of the work sites as needed. A site plan showing a layout of the limits of construction for the work sites, which would occupy a total of 6,900 square feet, is shown on **Figure 9.17-24**. The schedule for work within the study area is shown in **Table 9.17-15**. The duration of active construction within the Willow Street Study Area is estimated to total 9 weeks over 1.5 years.

Table 9.17-15: Schedule of Work Activities within the Willow Street Study Area

Work Activity	Dates	Duration	Work Hours ¹	Crew Size ²
Staging and Access Improvements	Summer <u>2019</u> 2018	2 weeks	Monday to Friday, 8 AM to 6 PM	8
Boathole Preparation	Summer <u>2019</u> 2018	3 weeks	Monday to Friday, 8 AM to 6 PM	10
Boathole Installation	Fall <u>2019</u> 2018 (Second 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	8
Biofilm Removal and Condition Assessment/ Small-scale Wash Water Treatment	Fall <u>2020</u> 2019 (Third 10-week shutdown)	2 weeks	7 days a week, 7 AM to 7 PM	21

Notes:

¹ Work hours while the aqueduct is in service would be adjusted to meet local regulations where possible, per the Village of Pleasantville Noise Control Law (§123 5.C).

² Crew size refers to the number of people anticipated at the work site(s).

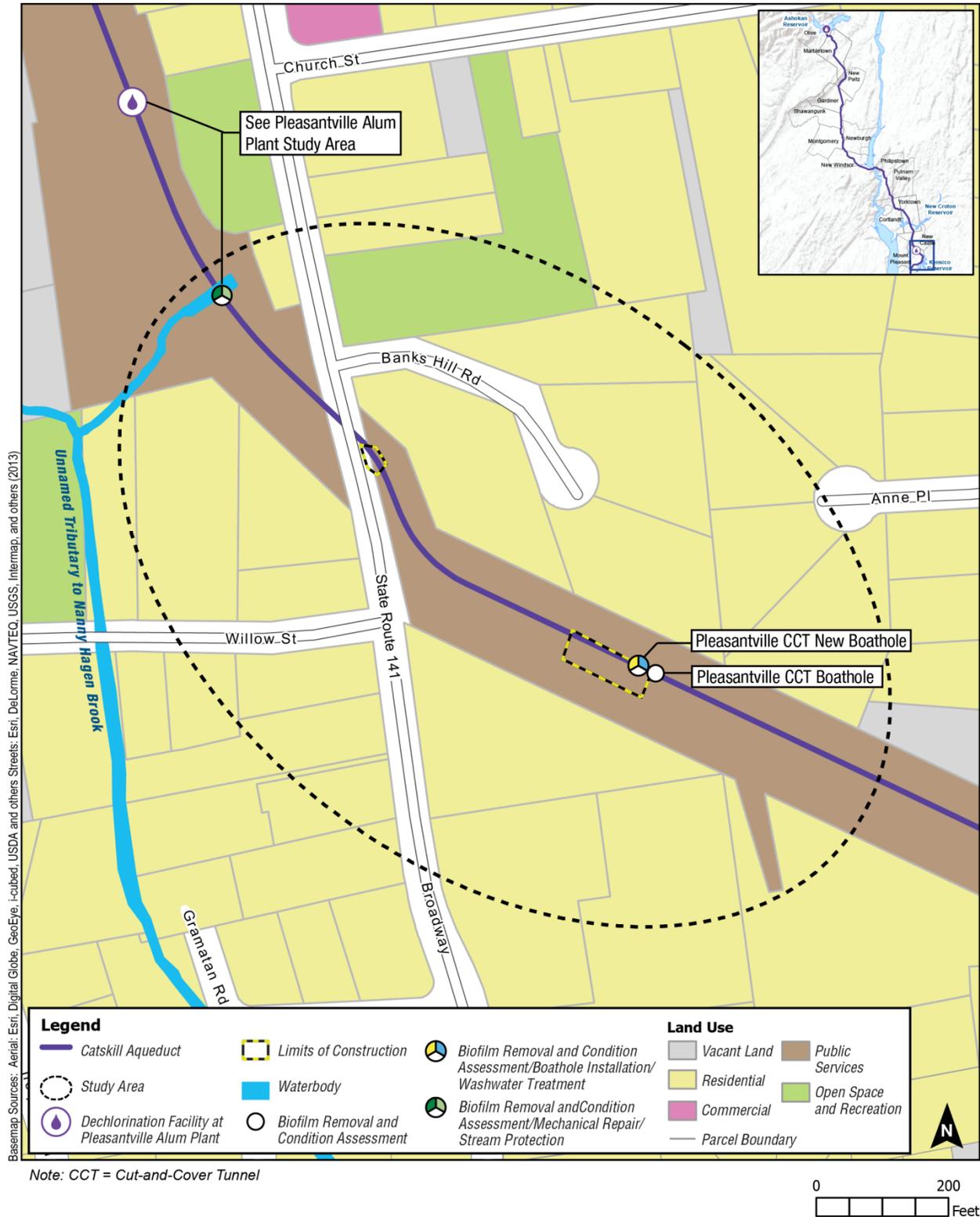


Figure 9.17-22: Land Use – Willow Street Study Area



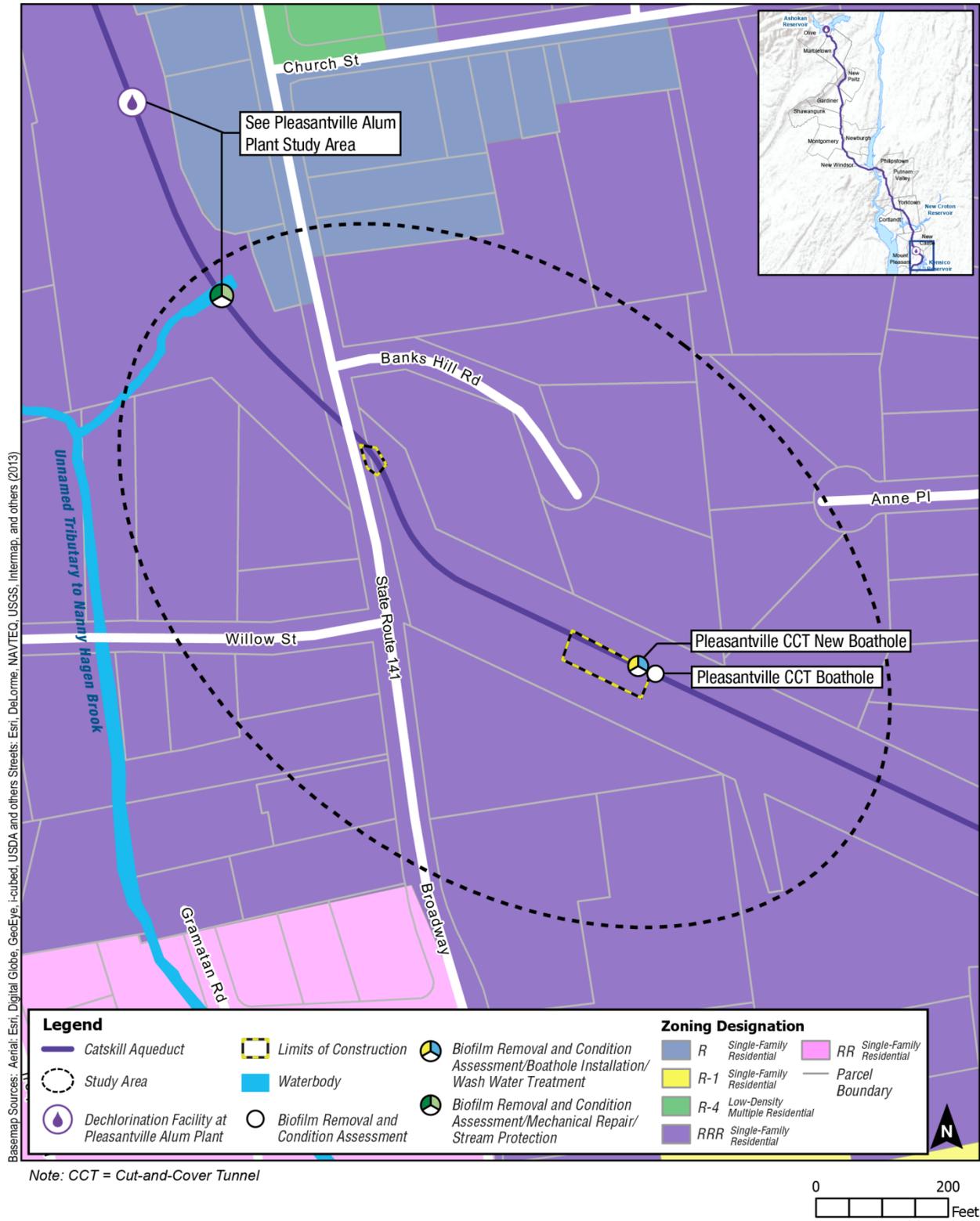


Figure 9.17-23: Zoning – Willow Street Study Area



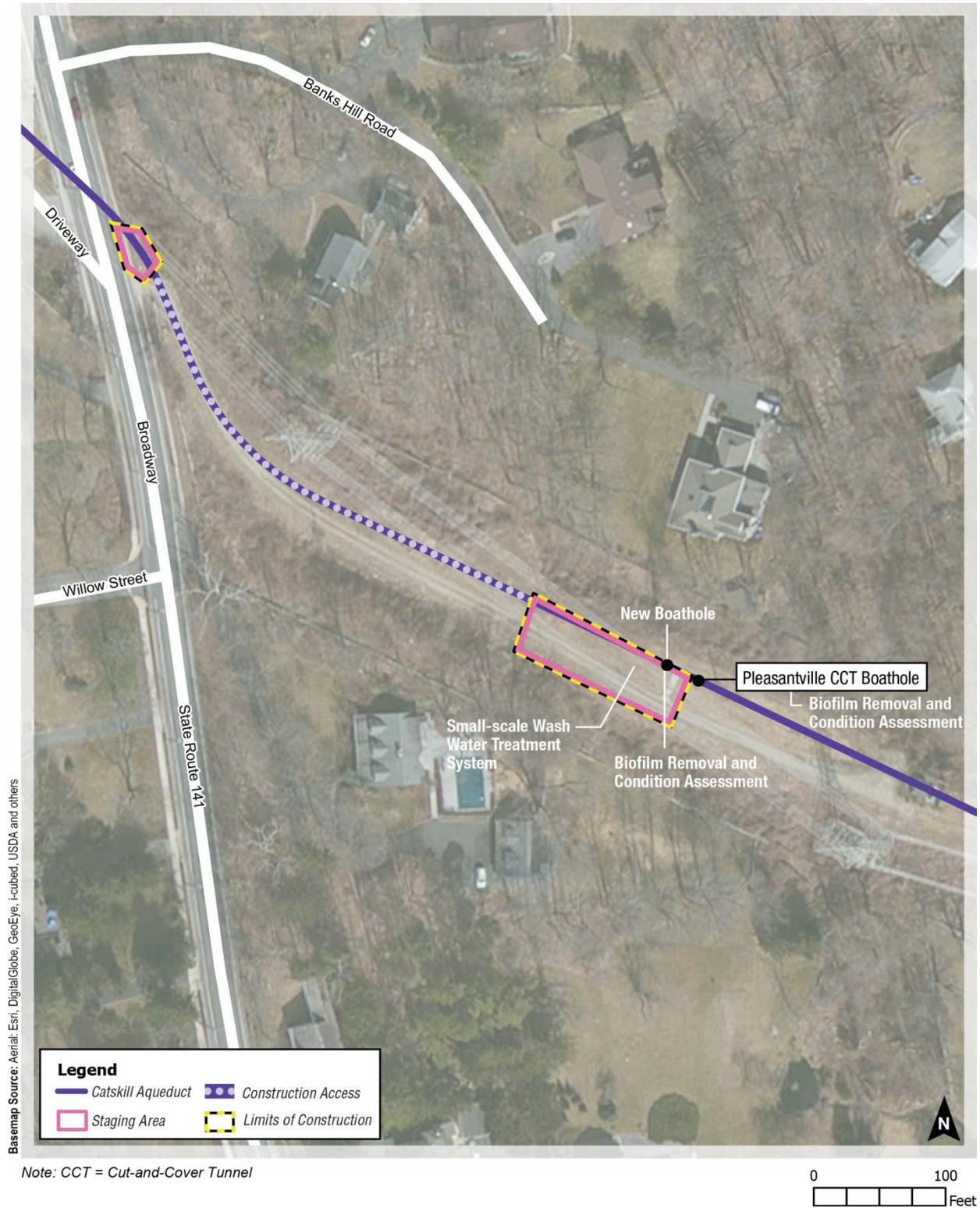


Figure 9.17-24: Site Plan – Willow Street Study Area



Work in the study area would begin with staging and access improvements in summer ~~2019~~2018 (see **Table 9.17-15**). At the entrance to the aqueduct from Broadway, grading of approximately 650 square feet would be required to facilitate loading and unloading of heavy equipment restricted from traveling over the cut-and-cover tunnel (see **Figure 9.17-24**). Additional improvements would include underbrush clearing and gravel placement for leveling and erosion control. Following the staging and access improvements, preparation of the new boathole would occur. The work would consist of the excavation of approximately 45 cubic yards of soil and construction of a cast-in-place concrete collar. Boathole installation, which requires unwatering of the aqueduct to tie into the crown of the cut-and-cover tunnel, would take place during the second 10-week shutdown in fall ~~2019~~2018.

Biofilm removal and condition assessment would occur during the third 10-week shutdown in fall ~~2020~~2019. Access into the aqueduct would be provided by both the new boathole and the existing boathole (see **Figure 9.17-24**). These locations would also serve as collection points for biofilm, which would be transported for disposal at a registered, permitted, or otherwise authorized facility. Although the aqueduct would be unwatered during this shutdown, any residual water would be diverted through an internal bypass pipe around the work segments within the aqueduct for discharge to the aqueduct downstream. Any residual water that does not meet water quality standards, and any wash water generated from biofilm removal, would then be transported to a temporary treatment system, where it would be treated to meet water quality standards for discharge back into the aqueduct or to a nearby waterbody (see Section 9.2, “Project Description”). Potential treatment locations include the new boathole, at which a small-scale wash water treatment system could be established. Upon completion of biofilm removal and condition assessment, all equipment and materials would be removed, and any areas requiring temporary disturbance would be restored to baseline conditions.

Impact categories analyzed for the Willow Street Study Area are presented in Section 9.17.5.3, “Open Space and Recreation,” through Section 9.17.5.9, “Neighborhood Character,” and include: open space and recreation; visual resources; natural resources including federal/State Threatened and Endangered Species and State Species of Special Concern; hazardous materials; transportation; stationary noise; and neighborhood character. As described in Section 9.3, “Screening Assessment and Impact Analysis Methodology,” impact analyses related to land use and zoning; socioeconomic conditions; community facilities and services; historic and cultural resources; the remaining natural resources subcategories, including geology and soils, water resources, aquatic and benthic resources, wildlife, and federal/State Candidate Species and unlisted rare and vulnerable species; energy; air quality; and mobile noise within the study area are not warranted. Finally, impacts related to project-wide natural resources, water and sewer infrastructure, and public health were analyzed within Section 9.19, “Project-wide Impact Analysis.”

9.17.5.3 Open Space and Recreation

As shown on **Figure 9.17-25**, one open space and recreation resource, Banks Cemetery, is located within the Willow Street Study Area. Approximately 1 acre of the 2-acre Banks Cemetery is located in the northern portion of the Willow Street Study Area. There are no recreational resources within the study area.

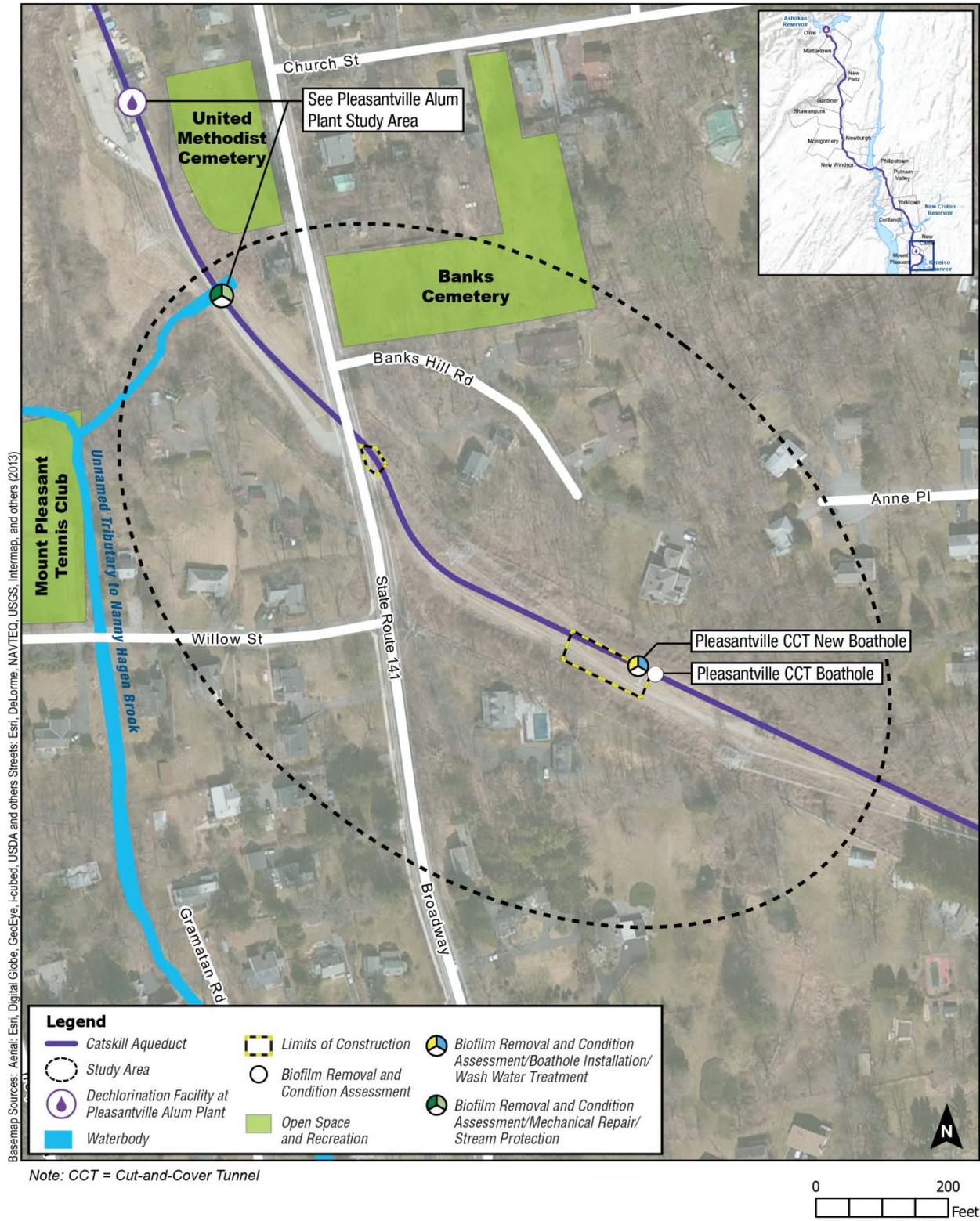


Figure 9.17-25: Open Space and Visual Resources – Willow Street Study Area



DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP's understanding that no plans to expand or create new open space or recreational resources are anticipated within the Willow Street Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Use of the identified open space is anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that open space and recreation within the Willow Street Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities within the Willow Street Study Area would be short-term (intermittently over 1.5 years; see **Table 9.17-15**). The limits of construction are located south of Banks Cemetery within the Willow Street Study Area, and would not include clearing of trees. The repair and rehabilitation would not affect the use of Banks Cemetery.

As discussed in Section 9.17.5.8, "Noise," there may be temporary increases in noise levels due to the work activities within the study area that may affect use of Banks Cemetery. However, upon completion of the repair and rehabilitation work activities, the use of this open space resource would be unaffected.

Following construction, all construction equipment would be removed from the Willow Street Study Area and would be restored to baseline conditions. The new boathole is a permanent structure that would remain. Following the repair and rehabilitation work activities within the Willow Street Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not disrupt use of the identified open space. As such, the repair and rehabilitation would not encroach upon, cause a loss of open space, impact the use or physical character of, or disrupt views from the Banks Cemetery.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to open space and recreation within the Willow Street Study Area.

9.17.5.4 Visual Resources

The visual resources study area is the area within the Willow Street Study Area. It also includes view corridors that extend beyond the study area based on the locations that are publicly accessible.

As shown in **Figure 9.17-25**, one visual resource, consisting of one locally significant resource, Banks Cemetery was identified within the Willow Street Study Area.

As noted above, the 2-acre Banks Cemetery is located north of the Catskill Aqueduct, within the Willow Street Study Area. The Pleasantville Cut-and-Cover Tunnel new boathole would not be within or adjacent to Banks Cemetery, as is separated by a residential street, residences, and vegetation. There are no views of the limits of construction from Banks Cemetery due to surrounding vegetation and structures.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP's understanding that no new projects or structures that would alter views from visual or aesthetic resources are anticipated within the Willow Street Road Study Area within the timeframe of the impact analysis. Natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Therefore, in the future without the repair and rehabilitation, it is assumed that visual resources within the Willow Street Study Area would be the same as baseline conditions.

During construction, the repair and rehabilitation work activities would be short-term (intermittently over 1.5 years). Construction staging areas within the study area would be screened from view from the cemetery by the surrounding vegetation and residences.

Following construction, all equipment would be removed from the Willow Street Study Area and staging areas would be restored to baseline conditions. The new boathole is a permanent structure that would remain. Following the repair and rehabilitation work activities within the Willow Street Study Area, operation of the Catskill Aqueduct would be consistent with baseline conditions and would not result in changes to the future visual and aesthetic resource conditions of the views to Banks Cemetery.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to visual resources within the Willow Street Study Area.

9.17.5.5 Natural Resources

The natural resources study area is the area surrounding the limits of construction, including the entrance off of Broadway to the new boathole (see **Figure 9.17-26**).

The natural resources study area was analyzed based on the field visit conducted on October 7, 2014 and a tree survey conducted on August 17, 2015. Habitat within the natural resources study area consists of a mowed roadside/pathway and an unpaved road/path. There are no wetlands or watercourses within the study area. These habitats and the surrounding natural areas have the potential to support protected wildlife species, and an analysis of the potential effects to natural resources that could result from the repair and rehabilitation activities is presented below.

Federal/State Threatened and Endangered Species and State Species of Special Concern

This section includes an analysis of potential impacts to federal/State Threatened and Endangered Species and State Species of Special Concern identified in Section 9.3.9, "Natural Resources," as having the potential to be affected by activities within the natural resources study area. To identify those species that could be affected within the study area, species that could occur up to 0.25 mile from the work sites were determined in consultation with USFWS, USACE, NYNHP, and NYSDEC, as well as county and local offices, as applicable.

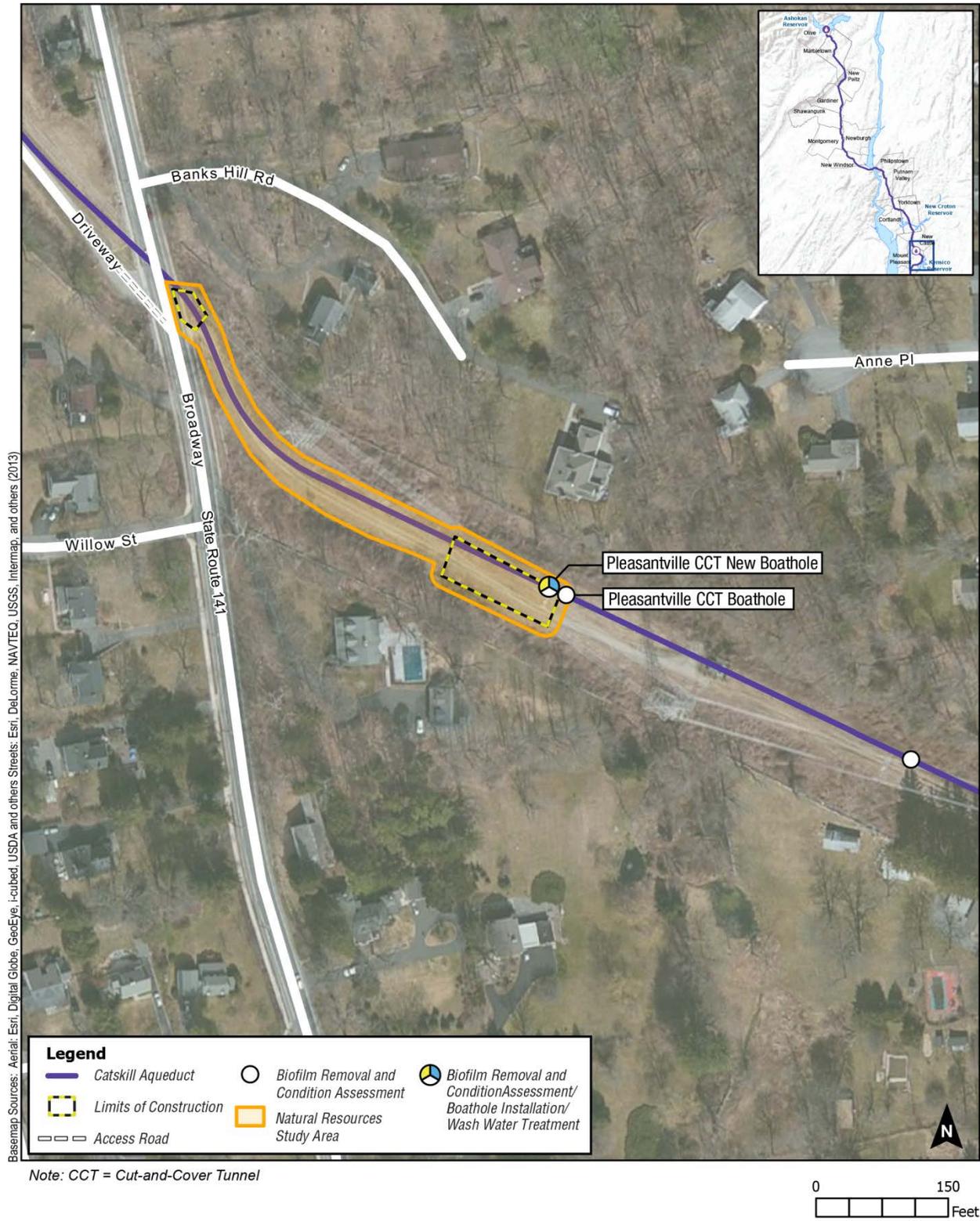


Figure 9.17-26: Natural Resources – Willow Street Study Area



As discussed in Section 9.3.9, “Natural Resources,” three species were identified to have the potential to be affected by the repair and rehabilitation within the natural resources study area. Therefore, conditions in the future without the repair and rehabilitation, an analysis of the potential for impacts to these three species, and a summary of conclusions on the potential effects resulting from the repair and rehabilitation are provided below.

In the future without the repair and rehabilitation, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as baseline conditions, other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

An analysis of the potential for disturbance to federal/State Threatened and Endangered Species and State Species of Special Concern from the repair and rehabilitation within the natural resources study area for these species are shown in **Table 9.17-16**. The analysis included an evaluation of the repair and rehabilitation work activities within the study area and field visits, as applicable.

Table 9.17-16: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitat within the Willow Street Natural Resources Study Area

Common Name	Scientific Name	Federal Listing	State Listing	Analysis of Potential Disturbance	Warrants Further Analysis
Amphibians and Reptiles					
Eastern Box Turtle	<i>Terrapene carolina</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and August 17, 2015. Potential habitat exists within the open grassy areas. Construction activities would be largely confined to previously disturbed areas. If any isolated areas of potential habitat exist at the sites, as a mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. Furthermore, perimeter silt fencing would limit disturbance to adjacent habitat and prevent individual turtles from entering the work sites during construction. Finally, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated, and no further analysis for eastern box turtles is warranted for this study area.	No
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>	Unlisted	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and August 17, 2015. Potential habitat exists within the open grassy areas along the right-of-way. However, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the work sites, a variety of habitats would be available for the species' use in the vicinity during construction. Furthermore, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted for this study area.	No
Birds					
Sharp-shinned Hawk	<i>Accipiter striatus</i>	MBTA	Special Concern	No individuals were incidentally observed during the field visits on October 7, 2014 and August 17, 2015. Potential nesting and foraging habitat exists within the study area. However, work activities would be largely confined to previously disturbed areas. Should any potential habitat exist at the work sites, a variety of habitats would be available for the species' use in the vicinity during construction. Furthermore, upon construction completion, the staging areas would be restored to natural conditions. Therefore, there are no effects anticipated and no further analysis for Sharp-shinned Hawks is warranted for this study area.	No
Note: MBTA: Migratory Bird Treaty Act					

Federal/State Threatened and Endangered Species and State Species of Special Concern Conclusions

Based on the impact analysis, no take is anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), or Sharp-shinned Hawks (*Accipiter striatus*) associated with the repair and rehabilitation.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the Willow Street Study Area.

9.17.5.6 Hazardous Materials

To evaluate the potential presence of hazardous materials within the Willow Street Study Area (see **Figure 9.17-20**), a Phase I ESA was conducted in general conformance with the scope and limitations of ASTM Practice E 1527-13 and CEQR requirements to identify REC. The Phase I ESA included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard. The findings from the Phase I ESA investigation and results from DEP's legacy files for the work sites, including a geotechnical investigation, were collectively reviewed to assess the potential presence of and potential for disturbance to hazardous materials in the study area.

Geotechnical environmental investigations and sampling were undertaken for contaminants of concern including volatile and semivolatile organics, PCBs, and total petroleum hydrocarbons along the aqueduct within the study area. Chromium was noted in the soil sampling results. Total chromium was reported in the sample collected at the existing Pleasantville Cut-and-Cover Boathole. Chromium concentrations, however, were consistent over a widespread sampling area and are more likely associated with background concentrations. Along the Catskill Aqueduct, there are widespread occurrences of chromium, which are attributed to existing geological formations. In addition, although gasoline range organics were not detected in the samples, total petroleum hydrocarbons were also detected, but at low concentrations that are not considered to be indicative of contamination that warrants remedial actions.

Based on the results of the environmental investigations completed within the Willow Street Study Area, no other hazardous materials are known to exist. The soil results support the reuse of excavated materials associated with the new boathole installation as backfill and do not suggest the need for special management, handling or health and safety measures at this time.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP's understanding that no developments or structures that would introduce hazardous materials to the environment are anticipated within the Willow Street Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that the presence of hazardous materials within the Willow Street Study Area would be the same as baseline conditions.

In the future with the repair and rehabilitation, work activities would require the potential storage and use of a variety of petroleum and other chemical products, such as diesel fuel for back-up power, lubricating oil for construction vehicles, and miscellaneous cleaning and maintenance chemicals during construction. The use and storage of all of these would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements; and State petroleum bulk storage, chemical bulk storage and spill reporting requirements. Furthermore, excavation associated with the installation of a new boathole would occur on previously disturbed soils. Following construction, all construction-related structures and equipment would be removed from the construction staging areas. The staging areas would be restored, and operation of the repaired and rehabilitated Catskill Aqueduct would be consistent with baseline conditions.

Therefore, the construction, repair and rehabilitation would not result in significant adverse impacts from the presence or disturbance of hazardous materials within the Willow Street Study Area.

9.17.5.7 Transportation

The transportation study area consists of the major convergent roadways that would potentially be used by employee and construction vehicles associated with repair and rehabilitation work activities en route to and from the Willow Street Study Area.

Access to the limits of construction for the work sites within the study area would occur via Broadway (State Route 141, see **Figure 9.17-20**). Broadway is a two-lane, two-way urban minor arterial roadway. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the Willow Street Study Area. The Westchester Bee-Line Bus System provides public transportation within the study area. There is little to no pedestrian activity in the immediate vicinity of the study area. Under current operations, DEP employees periodically access the sites. However, there are no DEP employees who work at or visit the study area on a daily basis, and the low number of DEP employee vehicles has little to no effect on traffic conditions within the study area.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the Willow Street Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to baseline conditions.

Repair and rehabilitation work activities within the Willow Street Study Area were evaluated to determine which would have the potential to generate the most vehicle trips and, therefore, be the basis of this transportation analysis. Of these activities, biofilm removal and condition assessment would generate the most vehicle trips. Biofilm removal and condition assessment would occur in fall ~~2020~~2019 between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the third 10-week shutdown (see **Table 9.17-15**).

In the future with the repair and rehabilitation, construction vehicles would travel along Broadway. The estimated number of peak-day one-way vehicle trips associated with the biofilm

removal and condition assessment is 33 vehicle trips, or approximately 66 peak-day vehicle round trips that would travel to and from the study area. The majority of the peak daily vehicle round trips, approximately 42 vehicle round trips or 42 PCEs, would be workers traveling directly to and from the staging area, with an additional 8 daily shuttle trips between the study area and the staging area. The remaining approximately 16 peak-day vehicle round trips (21 PCEs) would be trucks or other construction vehicles.

During a peak day, the estimated number of peak-hour vehicle trip ends associated with biofilm removal and condition assessment is approximately 33 peak-hour vehicle trip ends (36 PCEs). This includes approximately 21 vehicle trip ends (21 PCEs) from workers traveling directly to and from the staging area, approximately 4 peak-hour shuttle trips between the study area and the staging area, and approximately 8 vehicle trip ends (11 PCEs) from trucks or other construction vehicles. For the purpose of this analysis, the peak-hour project-generated vehicles are anticipated to coincide with typical construction hours for employee vehicles entering the site. Assuming one, 12-hour shift, this would be from 6 AM to 7 AM, and would be unlikely to coincide with the peak hour for existing traffic.

The repair and rehabilitation would result in approximately 36 peak-hour PCEs along Broadway, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs as described in Section 9.3.13, “Transportation.” The work activities at the Willow Street Study Area would be short-term (totaling 9 weeks over 1.5 years; see **Table 9.17-15**) and would not generate public parking or transportation demands or pedestrian activity within the Willow Street Study Area. Following completion of the repair and rehabilitation, traffic patterns would return to baseline conditions.

Therefore, although there would be a minor temporary increase in traffic, the repair and rehabilitation would not result in significant adverse impacts to transportation within the Willow Street Study Area.

9.17.5.8 Noise

As described in Section 9.3.15, “Noise,” mobile noise associated with the repair and rehabilitation work activities within the Willow Street Study Area does not warrant analysis. This section includes an analysis of potential impacts from stationary noise associated with the repair and rehabilitation to sensitive receptors within the study area.

The noise study area is the area within 1,500 feet of the repair and rehabilitation activities as shown on **Figure 9.17-27**, which encompasses areas within the Towns of Mount Pleasant and Village of Pleasantville.

The Willow Street Noise Study Area includes residential parcels within 1,500 feet of the repair and rehabilitation work sites that are considered noise-sensitive receptors for this analysis. The temporary work activities were evaluated to determine compliance with the local noise code. The repair and rehabilitation is subject to the Village of Pleasantville Noise Control Law (§123-5.C), which defines the use of any tool, pile driver, pneumatic hammer, tractor, derrick, electric hoist, gasoline- or electric-powered saw, or other noise-producing equipment to be a violation of the noise code if used between the hours of 7 PM and 8 AM or anytime on Sunday. The Village of Pleasantville does not have quantitative noise limits applicable to the Willow Street Study Area.

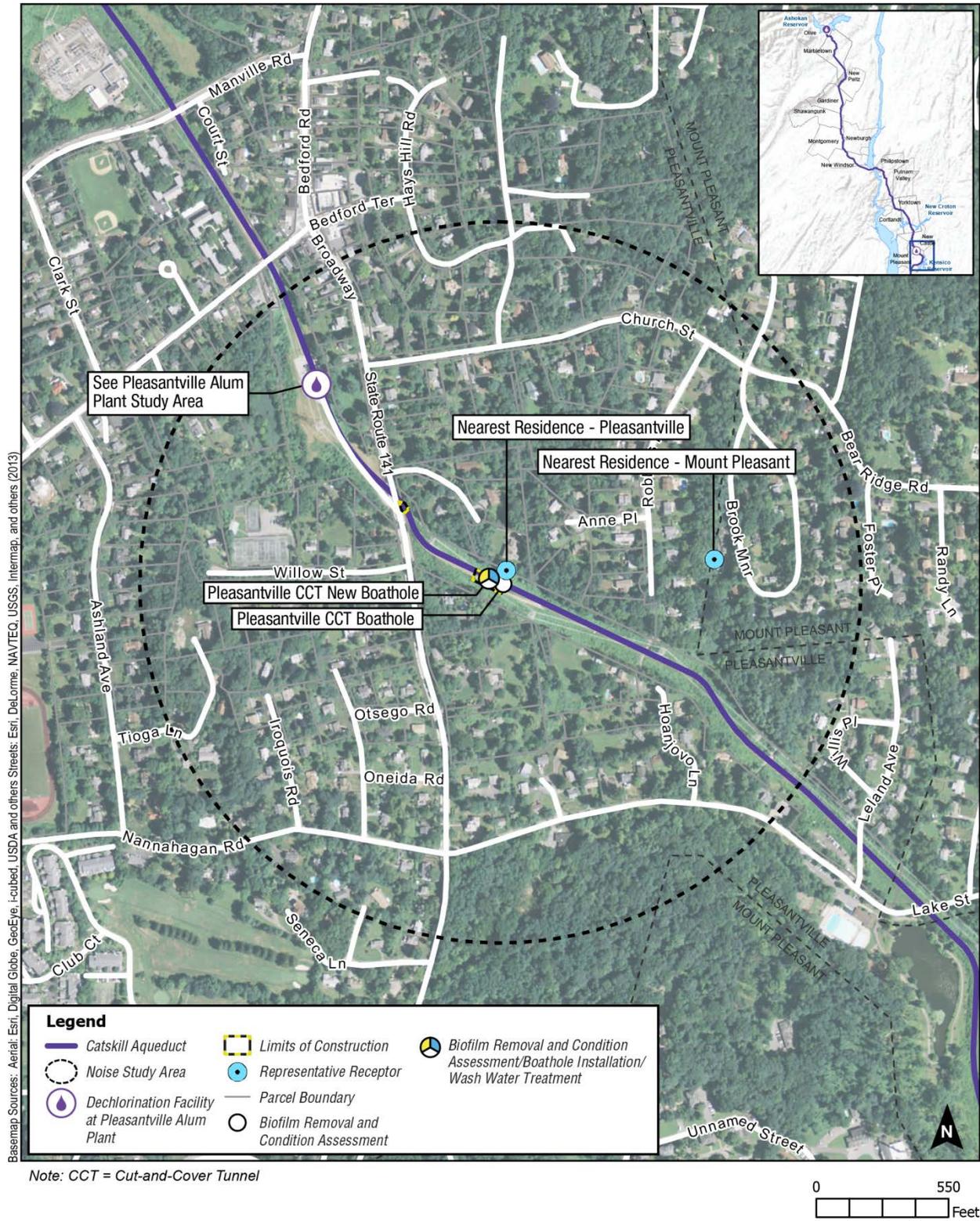


Figure 9.17-27: Noise – Willow Street Study Area



The Willow Street Study Area includes lands in the Town of Mount Pleasant, which regulates construction noise at a distance of 400 feet (§139-18 of the Town of Mount Pleasant Noise Control Laws). No repair and rehabilitation in the Willow Street Study Area would occur within 400 feet of the Town of Mount Pleasant, so the Town of Mount Pleasant quantitative limits were not applied. However, construction activities are prohibited between the hours of 5 PM and 8 AM in all zoning districts, except in the event of urgent necessity or in the interest of safety, in which case the Building Inspector may issue a permit.

Existing ambient noise levels within the Willow Street Study Area are influenced by vehicular traffic traveling on Broadway and other local roadways. The existing noise levels within the study area are comparable to a quiet suburban residential environment based on the distance from major transportation corridors, the population density of the area, and the presence of other noise-producing elements (e.g., commercial uses). Typical noise levels (measured as L_{eq}) for quiet suburban communities are 45 dBA during the daytime and 39 dBA during the nighttime.

DEP has consulted with the Village of Pleasantville, Town of Mount Pleasant, and Westchester County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels, are anticipated within the Willow Street Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that ambient noise levels within the Willow Street Study Area would be similar to baseline conditions.

In the future with the repair and rehabilitation, stationary noise-producing work activities within the Willow Street Study Area would occur at two sites. The stationary noise-generating equipment that would be used within the Willow Street Study Area was evaluated to determine which work activity would have the potential to emit the most noise and, therefore, be the basis of this stationary noise analysis. Of the activities, the stationary noise-generating equipment associated with the boathole installation would emit the most noise. Boathole installation would occur in fall ~~2019~~2018 between the hours of 7 AM and 7 PM, 7 days a week for approximately 2 weeks during the second 10-week shutdown (see **Table 9.17-15**). Other noise-producing equipment would also be utilized within the noise study area for a limited period during work activities. However, this equipment would not be expected to be louder than those associated with boathole installation.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for the boathole installation. Associated equipment reference noise levels are shown in **Table 9.17-17**. The Town of Mount Pleasant Code defines allowable noise levels using the L10 metric, which represents the sound level exceeded 10 percent of the time. The Village of Pleasantville does not specify a metric, so the equivalent average sound level was used. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.17-17: Stationary Source Construction Equipment Modeled at the Willow Street Study Area - Noise Analysis and Reference Noise Levels (L_{eq}/L_{10})

Equipment Type	Reference Noise Level (L_{eq}) at 50 feet (dBA)	Reference Noise Level (L_{10}) at 50 feet (dBA) ¹
Crane	77	80
Generator	82	82
Concrete Mixer Truck	81	84
Note: ¹ City Environmental Quality Review (CEQR) Technical Manual, Chapter 22.		

Table 9.17-18 shows the results of the stationary construction noise analysis. Boathole installation within the Willow Street Study Area during the repair and rehabilitation could produce noise levels (L_{eq}) of approximately 84 dBA at the nearest residence in the Village of Pleasantville, and 62 dBA at the nearest residence in the Town of Mount Pleasant. Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Village of Pleasantville and the Town of Mount Pleasant; DEP would work with the Village of Pleasantville and Town of Mount Pleasant, as appropriate.

Table 9.17-18: Stationary Noise Analysis Results (L_{eq}/L_{10}) at the Nearest Noise-Sensitive Receptors within the Willow Street Study Area

Location	Distance from Site (Feet)	Predicted Stationary Noise Level (L_{eq}/L_{10}) at Noise-Sensitive Receptor (dBA)	Village of Pleasantville Noise Limit (dBA)	Town of Mount Pleasant Noise Limit (dBA)	Potential for Exceedance (Yes or No)
Nearest Residence - Pleasantville	56	84 ¹	NA	NA	Yes ³
Nearest Residence - Mount Pleasant	896	62 ²	NA	NA	Yes ⁴
Notes: NA = Not Applicable ¹ Metric for noise level is the hourly equivalent average noise level (L_{eq}). ² L_{10} noise level per the Town of Mount Pleasant noise limit. ³ Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Village of Pleasantville. ⁴ Repair and rehabilitation work activities have the potential to occur outside of the allowable construction hours defined by the Town of Mount Pleasant.					

Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the Willow Street Study Area. The repair and rehabilitation would be temporary in nature with the peak work activities occurring during boathole installation in fall ~~2019~~2018 for a limited period (e.g., 2 weeks).

Therefore, although there would be a temporary increase in noise, noise from the repair and rehabilitation would not result in significant adverse impacts to sensitive receptors within the Willow Street Study Area.

9.17.5.9 Neighborhood Character

The character of the Willow Street Study Area is largely defined by a mix of residential and public services land uses and its physical setting within a suburban location (see **Figure 9.17-22**). The Catskill Aqueduct traverses the study area in a general northwest to southeast direction. Broadway, a two-lane arterial, traverses the western portion of the study area, intersecting Willow Street in the south and Banks Hill Road in the north. A portion of the study area overlaps the limits of construction associated with the proposed dechlorination facility in the Pleasantville Alum Plant Study Area. The limits of construction for the work sites are entirely located within a public services corridor with grassy cover, which is owned and maintained by DEP.

DEP has consulted with the Village of Pleasantville and Westchester County, and it is DEP's understanding that no changes in land use and no new projects or structures are anticipated within the Willow Street Study Area within the timeframe of the impact analysis. Therefore, in the future without the repair and rehabilitation, it is assumed that neighborhood character within the study area would be similar to baseline conditions.

As described in Section 9.3.16, "Neighborhood Character," there would be no potential for the repair and rehabilitation to affect shadows and urban design. In addition, based on the screening assessment for land use and zoning; socioeconomic conditions; and historic and cultural resources, an impact analysis for the Willow Street Study Area was not warranted, as discussed in the following sections: Section 9.3.3, "Land Use, Zoning, and Public Policy," Section 9.3.4, "Socioeconomic Conditions," and Section 9.3.7, "Historic and Cultural Resources," respectively. As described in Section 9.17.5.3, "Open Space and Recreation," and Section 9.17.5.4, "Visual Resources," the work activities would not affect open space and recreation and visual resources in the Willow Street Study Area. Furthermore, the public policy impact analysis provided in Section 9.17.2, "Village of Pleasantville Impact Analysis," concluded the work activities were consistent with applicable plans.

As described in Sections 9.17.5.7, "Transportation," and 9.17.5.8, "Noise," during construction, the work activities in the Willow Street Study Area would be short-term (intermittently over 1.5 years) and would result in a temporary increase in traffic and noise. Following completion of the repair and rehabilitation, the construction equipment and vehicles would be removed from the study area and traffic patterns would return to baseline conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The repair and rehabilitation would not generate significant adverse effects in: land use, zoning, and public policy; socioeconomic conditions; open space and recreation; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise.

Therefore, the repair and rehabilitation would not result in significant adverse impacts to neighborhood character within the Willow Street Study Area.

9.18 NEW PALTZ TEMPORARY TRANSMISSION WATER MAIN STUDY AREA IMPACT ANALYSIS

9.18.1 INTRODUCTION

Subsequent to the publication of the DEIS, DEP identified an additional element of UWSR. This new project element would involve the development of a temporary transmission water main (temporary pipeline) to supply water to the Village and Town of New Paltz, referred to collectively here as New Paltz. As discussed in the DEIS, DEP would coordinate closely with the communities served by the Outside Community Connections to confirm they have access to adequate water supply independent of the upper Catskill Aqueduct prior to any temporary shutdown of the aqueduct required for the repair and rehabilitation. As the Catskill Aqueduct represents the primary water supply for New Paltz, during these proposed shutdowns this new temporary pipeline would supply water to New Paltz.

DEP issued a Draft Scope of Work for the preparation of a Supplemental Environmental Impact Statement (SEIS) on May 26, 2017 to assess the potential impacts of the temporary pipeline. Copies of the Draft Scope of Work for the SEIS were made available for public review at various locations including the Town of New Paltz Town Hall, the Village of New Paltz Village Hall, and DEP offices located in Kingston and Queens. The document was also made available for public review on DEP's website.¹ To solicit public comments on the New Paltz Temporary Transmission Water Main Project and, specifically, on the scope of the environmental analysis, a public meeting on the Draft Scope of Work was held on June 29, 2017, at the Town of New Paltz Community Center, 3 Veterans Drive, New Paltz, NY. Written comments were accepted throughout the public comment period, which closed on July 11, 2017. Subsequent to the public scoping meeting, DEP reviewed and considered the comments received during the public scoping process. The Final Scope of Work was prepared after consideration of the relevant public comments and was issued on September 6, 2017.

Based on the Final Scope of Work, a Draft SEIS was prepared and released for public review on September 6, 2017. Copies of the Draft SEIS were made available for public review at various locations including the Town of New Paltz Town Hall, the Village of New Paltz Village Hall, and DEP offices located in Kingston and Queens. The document was also made available for public review on DEP's website.¹ DEP held a public meeting to solicit public comments on the New Paltz Temporary Transmission Water Main SEIS on September 27, 2017 at the Town of New Paltz Community Center, 3 Veterans Drive, New Paltz, NY. Written comments were accepted throughout the public comment period, which closed on October 10, 2017.

This section of the FEIS, describes the proposed new element of UWSR presented in the SEIS, and identifies potential significant adverse impacts, if any.

¹ The SEIS was made available at the following link:
<http://www.nyc.gov/dep/upstatewatersupplyresiliency>

9.18.2 BACKGROUND

New Paltz draws water from the Catskill Aqueduct and does not have a back-up supply in place that is capable of fully sustaining its supply needs during a continuous 10-week aqueduct shutdown. Water from the aqueduct is currently transferred to New Paltz Lower Reservoir where it is stored prior to treatment and distribution. This connection occurs at the New Paltz Connection Chamber, located north of Mountain Rest Road (see Section 9.6.3, “Mountain Rest Road Study Area”).

New Paltz is dependent on the Catskill Aqueduct as its primary water source and is considering independent projects to provide back-up water supply. Projects may include the development of a new well field capable of supplying 400 gpm and upgrading its existing reservoir system, including the installation of flashboards and dredging, to provide several additional days of storage capacity. The Village also plans to implement demand management initiatives in order to reduce demand during the repair and rehabilitation shutdown periods. In the event that New Paltz’s independent back-up supply projects are not completed in time for the extended repair and rehabilitation shutdowns, DEP is proposing the temporary pipeline to convey water supply from the Catskill Aqueduct Wallkill Pressure Tunnel to New Paltz’s existing raw water line.

The intent of this pipeline is to support completion of repair and rehabilitation work activities in a safe, dry environment, with the Catskill Aqueduct unwatered. In order to allow for the greatest length of the Catskill Aqueduct to be unwatered for the repair and rehabilitation work activities, DEP is proposing to provide Delaware Aqueduct water from the existing Catskill/Delaware Interconnection at Shaft 4 (Shaft 4 Interconnection). The Delaware Aqueduct water would be back fed to the Catskill Aqueduct’s Wallkill Pressure Tunnel Downtake Chamber (Wallkill Downtake Chamber). The proposed temporary pipeline would provide a connection from the Wallkill Downtake Chamber to New Paltz Lower Reservoir.

The proposed temporary pipeline would be implemented directly by DEP and would allow segments of the aqueduct to be unwatered to facilitate in-aqueduct repairs of the Catskill Aqueduct while maintaining a supply of water to New Paltz and thereby not impacting the later shutdown of the RWBT.

9.18.3 PROJECT DESCRIPTION

In the event that the construction of independent back-up supply projects in New Paltz are not completed in advance of the proposed Catskill Aqueduct shutdowns, DEP is proposing the temporary pipeline as an alternative way to supply water to New Paltz during the planned shutdowns. This project will ensure any delays to the construction of the repair and rehabilitation project are avoided.

9.18.3.1 Temporary Transmission Water Main

To address the maintenance of water supply to New Paltz during these shutdowns, DEP is proposing a temporary pipeline. The temporary pipeline would be constructed between the Wallkill Downtake Chamber and New Paltz’s existing raw water line, located adjacent to Mountain Rest Road, a distance of approximately 2.3 miles. DEP would connect this temporary pipeline to New Paltz’s existing raw water line, which would ultimately direct water to New Paltz Lower Reservoir (see **Figure 9.18-1**). The temporary pipeline would be placed at grade

along the Catskill Aqueduct, primarily for use during the 2020 shutdown, although DEP may choose to install the pipeline earlier for use during either the 2018, 2019, and/or 2020 shutdowns. If repair and rehabilitation shutdowns are required beyond 2020, then the temporary pipeline may also be used during additional repair and rehabilitation project shutdowns. Once the repair and rehabilitation project is complete, the temporary pipeline would be removed, and the area would be restored to existing conditions.

The temporary pipeline would be supplied with water pumped from the Wallkill Downtake Chamber, which would be back fed (re-supplied) via the Catskill Aqueduct from the Delaware Aqueduct through the existing Shaft 4 Interconnection in Gardiner, New York (see **Figure 9.18-1**). The Shaft 4 Interconnection, an approximately 4,500 square foot partially buried facility, would allow water from the Delaware Aqueduct to be diverted to the Catskill Aqueduct. DEP would install valves and an internal 6-inch hose to provide the necessary water volume from the Delaware Aqueduct. Water would be fed to the Wallkill Uptake Chamber (the downstream section of the Wallkill Pressure Tunnel), which would convey the Delaware System water toward the Wallkill Downtake Chamber and the temporary pipeline for New Paltz. This would allow the portion of the Catskill Aqueduct north of the Wallkill Pressure Tunnel to remain unwatered for the duration of the extended shutdown.

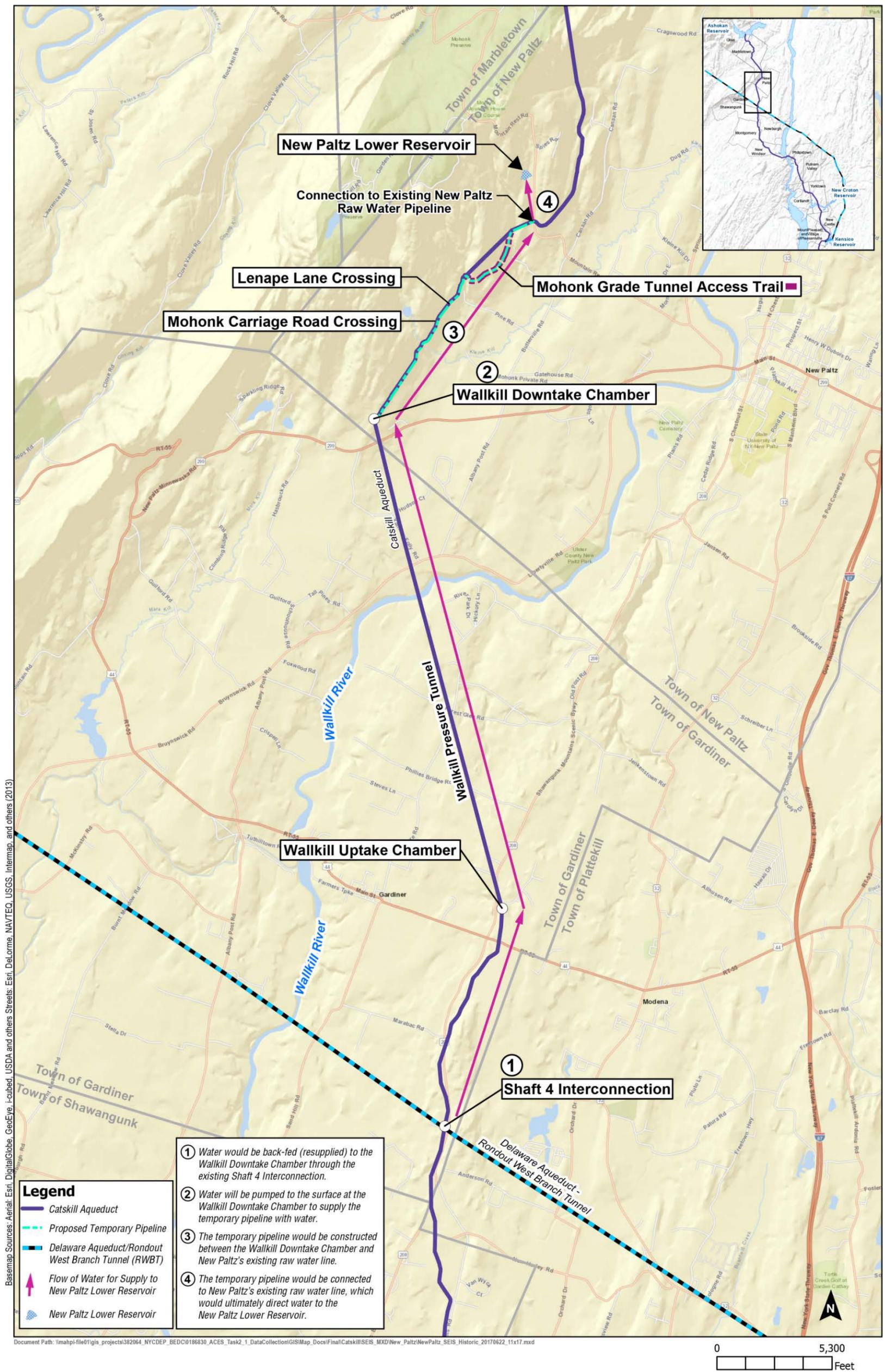


Figure 9.18-1: New Paltz Temporary Transmission Water Main and Connection to the Catskill/Delaware Interconnection at Shaft 4



Raw water would be transferred to New Paltz Lower Reservoir for storage prior to treatment and distribution by New Paltz, similar to current operations. The temporary pipeline has been designed to convey the flow to New Paltz Lower Reservoir raw water, as necessary, to meet demand to support a 10-week shutdown. This supply would be accomplished through an existing interconnection at DEP's Shaft 4, back feeding the Catskill Aqueduct to the Wallkill Downtake Chamber via the Wallkill Pressure Tunnel, and pumping from the Wallkill Downtake Chamber through the proposed temporary pipeline to New Paltz's existing raw water pipeline, located adjacent to the Mountain Rest Road, then to the New Paltz Lower Reservoir (see **Figure 9.18-1**).

The proposed temporary pipeline would consist of a 10-inch diameter high-density polyethylene (HDPE) pipe, running approximately 12,400 linear feet, primarily at grade, along the aqueduct from the Wallkill Downtake Chamber to Mountain Rest Road, where it would be connected to the existing New Paltz raw water pipeline. The temporary pipeline would be placed down slope from the top of the aqueduct cut-and-cover berm, to maintain vehicular access on the aqueduct, where possible (see **Figure 9.18-2**). The proposed temporary pipeline would be located adjacent to the top of the aqueduct cut-and-cover berm with the exception of one area where the aqueduct traverses through a steep and heavily wooded area. In this area, the temporary pipeline would not follow the aqueduct, but would follow an existing road ("Mohonk Grade Tunnel Access Trail") for a length of approximately 1,100 feet, before returning to the aqueduct alignment (see **Figure 9.18-1**). The use of the Mohonk Grade Tunnel Access Trail may require temporary property access permission from the property owner.

The temporary pipeline is anticipated to be delivered to the site in 40- and 50-foot lengths and staged at the Wallkill Downtake Chamber or a parking area adjacent to Mountain Rest Road directly from the delivery trucks, on City property. The sections of pipe would then be transported to the work site by driving along the aqueduct. The pipe sections would be butt-fused together as they are placed along the aqueduct. The temporary pipeline would be supported and restrained to keep the pipes in place during operation.

There are existing vehicle and pedestrian crossings along the aqueduct, including the Mohonk Carriage Road (intersects with the Historic Duck Pond Trail), Lenape Lane, and the Mohonk Grade Tunnel Access Trail (see **Figure 9.18-1**). The temporary pipeline would be direct buried at Lenape Lane and the Mohonk Carriage Road crossings to maintain vehicle and pedestrian access, as required. Minor excavation would be required to install the temporary pipeline below grade in these locations. The vehicle crossings would be restored to existing conditions upon removal of the temporary pipeline.

The temporary pipeline would cross approximately 10 locations where the aqueduct has culverts crossing beneath it. The existing crossings are located approximately 10 to 70 feet down slope from the proposed temporary pipeline and allow existing watercourses or stormwater drainage to flow under the aqueduct. Blow-off valves would be placed at each of these crossings to allow drainage of the temporary pipeline to downstream of these culverts. The pipe would be drained by connecting a hose to the blow-off valve and releasing the raw water into the culvert or drainage ditch. Draining the pipe is especially necessary when not operational to prevent freezing.

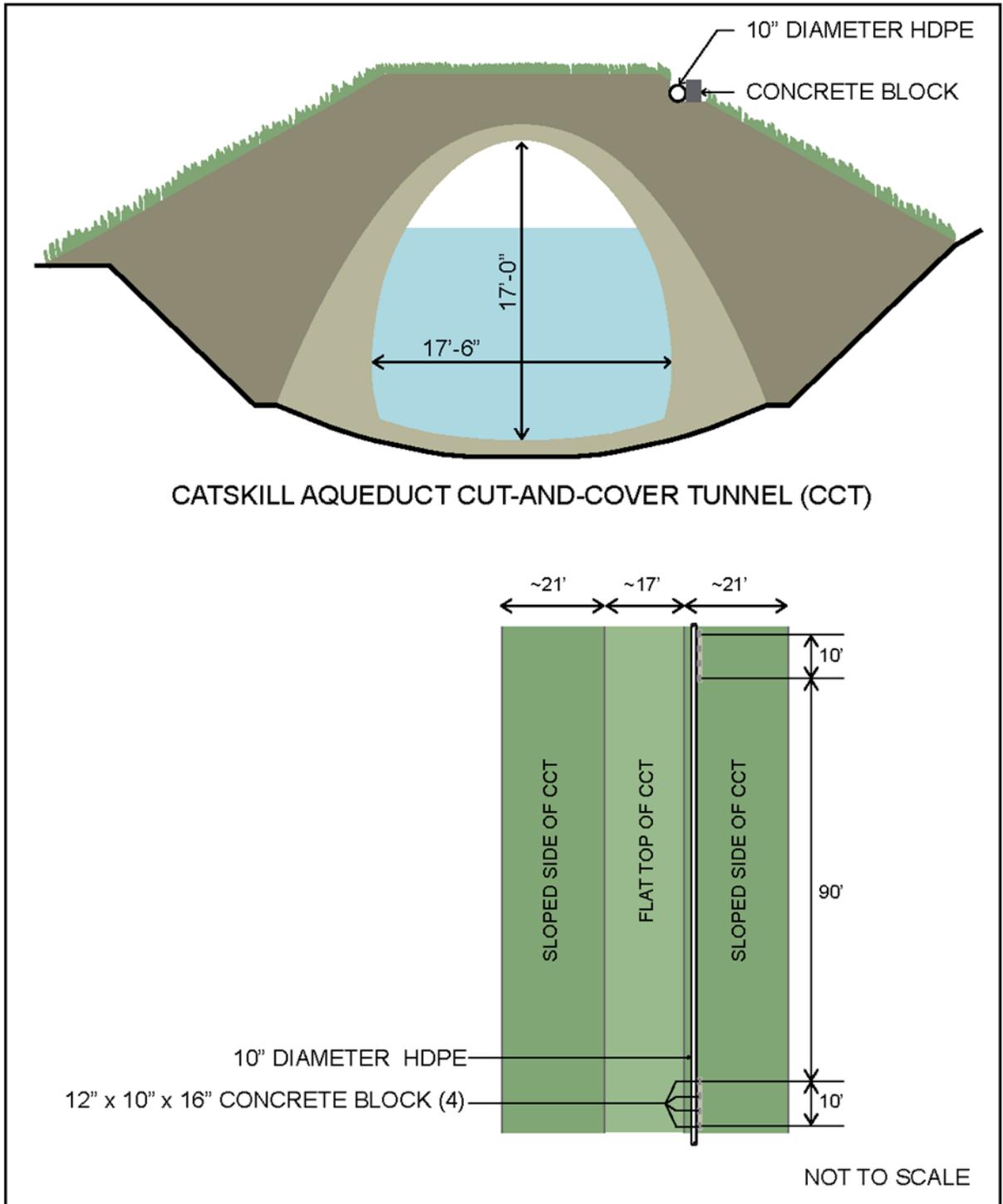


Figure 9.18-2: Proposed Pipeline Cross-Section and Plan View



The proposed temporary pipeline would be monitored and inspected before start up and frequently during operation. In addition, DEP would be prepared to address any repairs in a timely manner, if necessary.

9.18.3.2 Connection at Wallkill Downtake Chamber

During planned shutdowns of the Catskill Aqueduct, raw water would be diverted from the Delaware Aqueduct via the Shaft 4 Interconnection to maintain a consistent water surface elevation within the Wallkill Pressure Tunnel to provide the necessary water level for supplying water to the New Paltz Lower Reservoir. As part of construction of the temporary pipeline, temporary pumps would be installed at the Wallkill Downtake Chamber. The pumps (one primary and one standby) have been designed to deliver water from the Wallkill Downtake Chamber through the temporary pipeline to New Paltz's existing raw water line adjacent to Mountain Rest Road, ultimately supplying the New Paltz Lower Reservoir. The pumps at the Wallkill Downtake Chamber are anticipated to operate for approximately 96 hours continuously and rest for approximately 32 hours before starting up again; however, operation of the pumps would occur as necessary to maintain sufficient water supply to New Paltz. Personnel would be on-site during the operation of the pumps.

The pumps would be mounted on a steel frame spanning the opening of a removed Wallkill Downtake Chamber panel. A new diesel-powered generator would be located at the Wallkill Downtake Chamber and would supply power to the pumping system while in use. A back-up generator would also be installed, but only one generator would be used at a time.

9.18.3.3 Connection at Mountain Rest Road

The temporary pipeline would connect to New Paltz's existing raw water line located adjacent to Mountain Rest Road. This water line currently conveys water from the New Paltz Pumping Station to New Paltz Lower Reservoir. The existing raw water line is located approximately 4.5 feet below grade and while it does not operate on a continuous basis, it would be temporarily shut down for approximately 5 days to allow for installation of a tee and connection with an isolation valve at grade, to facilitate the operation of the new connection. This gate valve would be removed and replaced with a blind flange after completion of the last 10-week shutdown. These activities would be of short-term duration and would not interrupt the water supply to New Paltz. The existing raw water line is located outside of the paved roadway, but within the roadway right-of-way, and therefore road closures and maintenance and protection of traffic is not anticipated.

9.18.4 PROJECT SCHEDULE

The proposed temporary pipeline would need to be operational in advance of the shutdown of the aqueduct that supplies New Paltz. For the purpose of the SEIS analyses, it was conservatively assumed that construction of the temporary pipeline would be completed in 2018 prior to the first planned shutdown for the repair and rehabilitation project, and the temporary pipeline would remain in place until after the final shutdown, anticipated in 2020. Installation of the temporary

pipeline is anticipated to be completed in approximately 30 working days, with construction at the Wallkill Downtake Chamber anticipated to be completed in approximately 10 working days.

9.18.5 ANALYTICAL FRAMEWORK

The DEIS included an assessment of work locations in the Town of New Paltz. These work locations were included in two study areas, Mountain Rest Road and New Paltz-Minnewaska Road, Sections 9.6.3 and 9.6.4, respectively. Notable work sites within the study area for Mountain Rest Road include the New Paltz Connection Chamber and New Paltz Pump Station in the eastern portion of the study area and the culvert drain access manhole in the western portion of the study area. Notable sites within the study area for New Paltz-Minnewaska Road include the Poor Farm Arch Bridge and the Wallkill Downtake Chamber. The Kleine Kill, a tributary to the Wallkill River, traverses the northern portion of the New Paltz-Minnewaska Road Study Area and is bounded to the south by New Paltz-Minnewaska Road (also known as State Route 299 and County Route 8) and to the northeast by Lenape Lane, a local roadway. The study area for the New Paltz Temporary Transmission Water Main includes the southern portion of the Mountain Rest Road and the entire New Paltz-Minnewaska Road Study Areas. Additional analyses, as applicable and appropriate, are included herein to supplement the assessments previously completed for these two study areas as part of the DEIS.

Screening Assessment

Desktop evaluations, and a supplementary field visit, are referenced or summarized in each screening assessment below. In addition, a review of potentially applicable State and local public policies informed many of the screening assessments to determine whether the temporary pipeline would be consistent with these. Those public policies that the temporary pipeline could be inconsistent with warranted an impact analysis and were identified relative to the applicable impact category.

Several impact categories did not warrant an assessment as per *CEQR Technical Manual* guidance, and were thus screened out of the impact analysis.

- A land use and zoning assessment are not applicable as the proposed temporary pipeline would not result in land use or zoning changes within existing public services or vacant land use areas and agricultural zoning designations. The temporary pipeline would be largely located along the alignment of the existing aqueduct or buried below grade where the temporary pipeline crosses Lenape Lane and the Mohonk Carriage Road (Historic Duck Pond Trail).
- A community facilities and services assessment is not applicable because the operation of the temporary pipeline would not involve substantive new populations and is not expected to result in any changes to community services (e.g., schools, libraries, child care centers, healthcare facilities, police and fire protection). Any community service needs (e.g., police associated with traffic control or equipment deliveries) required during construction would be limited and very short-term, likely a few days or a few weeks. As a result, no impacts to

existing or the need for new community facilities and services is expected and no detailed assessment is required.

- A shadows assessment is not applicable because the temporary pipeline would not result in new structures or additions to existing structures greater than 50 feet tall, or be located adjacent to, or across from a sunlight-sensitive resource.
- An urban design and visual resource assessment is not warranted because the temporary pipeline would not include the construction of any structures, and there would be minimal permanent physical changes to the project site. While visual resources may exist in the study area, upon completion of construction, no impacts to visual resources would occur. As a result, there would be no impacts related to urban design and visual resources and no detailed assessment is required.
- There would be no substantive disturbance to geology and soils, aquatic/benthic resources, wildlife, and unlisted rare and vulnerable species associated with the temporary pipeline. Therefore, an impact analysis related to these natural resources is not warranted.
- A solid waste and sanitation services assessment is not warranted because the temporary pipeline would not result in the generation of 50 tons per week or more of solid waste.
- An energy assessment is not warranted because the temporary pipeline would not result in any substantive increase in energy demands or new electrical or gas services and would likewise not result in new generation or transmission of energy.
- A greenhouse gas emissions and climate change assessment is not warranted because the temporary pipeline would not result in any substantive generation of greenhouse gases.
- An air quality impact analysis associated with the operation of the proposed temporary pipeline is not warranted as there would be no substantive and new mobile or stationary emission sources.
- A noise impact analysis related to mobile noise associated with the operation of the proposed temporary pipeline is not warranted.
- A traffic assessment for the operation of the temporary pipeline is not warranted as the proposed temporary pipeline would result in a nominal number of vehicle trips significantly below the *CEQR Technical Manual* screening threshold of 50 peak-hour passenger car equivalents (PCEs).
- A Critical Environmental Area assessment is not warranted because the temporary pipeline is not located in any Critical Environmental Areas.

For each impact category that did not screen out, an impact analysis was conducted that included an evaluation of existing conditions, future conditions without the temporary pipeline, and future conditions with the temporary pipeline, as described further below. This assessment focuses on the following impact categories: public policy, socioeconomic conditions, open space and

recreation, historic and cultural resources, natural resources, hazardous materials, water and sewer infrastructure, transportation, air quality and noise, neighborhood character and public health.

Unless otherwise noted in the impact categories below, the impact analysis methodologies for each of the impact categories presented within Section 9.3 were utilized.

Study Area Location and Description

The temporary pipeline study area is located along the upper Catskill Aqueduct in the Town of New Paltz, Ulster County, New York. The study area is generally bounded by Mountain Rest Road to the north and the existing Wallkill Downtake Chamber to the south near New Paltz-Minnewaska Road (State Route 299). The study area boundary is located approximately 400 feet beyond the limits of the aqueduct and/or within the areas of disturbance related to the proposed work to be performed. An aerial photograph of the study area, including the aqueduct corridor, proposed route of the temporary pipeline, staging and access areas, are shown on **Figure 9.18-3**.

The Catskill Aqueduct crosses Mountain Rest Road within the UWSR DEIS Mountain Rest Study Area, see DEIS Chapter 9.6.3. The Wallkill Downtake Chamber is located within the UWSR DEIS New Paltz-Minnewaska Road Study Area, see DEIS Chapter 9.6.4. As detailed in the UWSR DEIS, access to the Wallkill Downtake Chamber is provided from New Paltz-Minnewaska Road (State Route 299). Staging for the proposed temporary pipeline would be available at Mountain Rest Road and the Wallkill Downtake Chamber.

The study area consists of public service, open space, vacant, and agricultural land uses. The proposed temporary pipeline is mainly located in a public service corridor (i.e., the Catskill Aqueduct) which is owned and maintained by DEP. The proposed temporary pipeline would be located entirely within an Agricultural (A-3) zoning district and is identified as a permitted use as a public utility within the Town of New Paltz.

A small portion of the Lake Mohonk Mountain House Complex, listed on the National Register of Historic Places (NR), is located in the study area. There are no other federal, State, or local designated historic districts, landmarks, or known archeological resources within the study area.

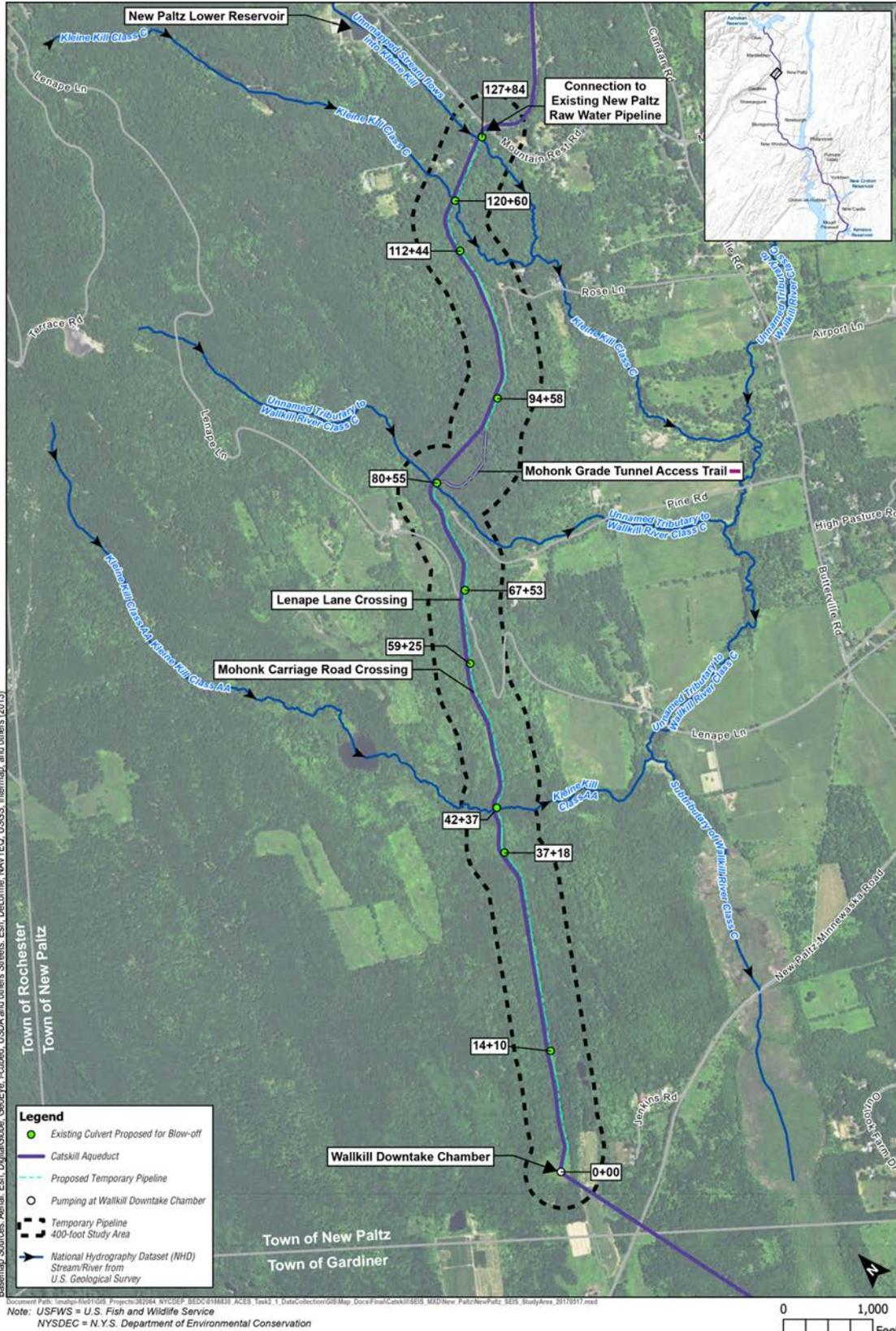


Figure 9.18-3: Study Area – New Paltz Temporary Transmission Water Main Study Area



9.18.6 PROBABLE IMPACTS

9.18.6.1 Land Use, Zoning, and Public Policy

As discussed in the screening assessment, the proposed temporary pipeline would not result in significant changes to land use or zoning. Therefore, an impact analysis related to these categories is not warranted. In accordance with the CEQR Technical Manual, this section considers the proposed temporary pipeline's consistency with applicable public policies.

Public Policy

Applicable public policies for Ulster County and the Town of New Paltz were reviewed in relationship to the proposed temporary pipeline. The 2007 Ulster County Open Space Plan establishes a framework for the management and protection of open space resources identified by Ulster County. These include water resources, working landscapes, landforms and natural features, ecological communities, cultural and historic resources, and recreational resources. To provide guidance on these open space resources, Ulster County has established "Principles of the Open Space Plan" that seek to safeguard the county's open space values. Based upon a review of these principles, there are two principles (Open Space Principles 2 and 7) applicable to the proposed temporary pipeline:

- (2) Preserve and protect open space, unique natural areas and heritage areas and sites, wetlands, water and woodland resources, scenic views, areas of natural beauty and the rural character of Ulster County.
- (7) Protect and enhance the county's most valuable open space landforms and natural features with coordinated planning and safeguard policies.

Historic and cultural resources within the study area are discussed in Section 9.18.6.4, "Historic and Cultural Resources," and water and terrestrial resources within the study area are discussed in Section 9.18.6.5, "Natural Resources and Water Resources." Open space and recreation resources are also identified within the study area and are discussed in Section 9.18.6.3, "Open Space and Recreation."

Future Without the Proposed Project

In the future without the proposed temporary pipeline, continued operation of the Catskill Aqueduct would be consistent with existing conditions and no new developments or structures are anticipated. Operation of the aqueduct in the future without the proposed temporary pipeline would remain consistent with public policies within the Town of New Paltz, Town of Gardiner, and/or Ulster County.

Probable Impacts with the Proposed Project

The proposed temporary pipeline would also be consistent with the two applicable “Principles of the Open Space Plan” within the 2007 Ulster County Open Space Plan as discussed below.

- (2) Preserve and protect open space, unique natural areas and heritage areas and sites, wetlands, water and woodland resources, scenic views, areas of natural beauty and the rural character of Ulster County.

Under this principle, valuable landforms and natural features are protected in order to benefit residents and preserve the rural character of Ulster County.

A portion of Mohonk Preserve property is located in the central and southwestern portion of the study area, west of the Catskill Aqueduct; see Section 9.18.6.3, “Open Space and Recreation.” A portion of the temporary pipeline would be installed within Mohonk Preserve, however, the pipeline would be buried and the ground surface would be restored to existing conditions after initial construction and placement of the pipeline and also after the temporary pipeline is removed. As described above, the proposed temporary pipeline would be installed under existing roadways and trails used for public access through the Mohonk Preserve. Construction in the study area may temporarily affect views from the trails and roadways, however, the construction of the temporary pipeline would be for a limited amount of time (approximately 30 days) and vehicle and pedestrian access to these trails would be maintained at all times. The operation of the temporary pipeline would not impact land use, roadways or trail usage and following removal of the proposed temporary pipeline, the crossings would be restored to existing conditions.

Portions of the Lake Mohonk Mountain House Complex, a site listed on the NR, are located in the central and southern portions of the study area (see Section 9.18.6.4, “Historic and Cultural Resources”). The Lake Mohonk Mountain House Complex is located within the larger Mohonk Preserve, an approximately 8,000-acre, non-profit nature preserve used for outdoor recreation such as hiking, picnicking, snowshoeing, and biking. As described in the Historic and Cultural Resources section, the installation and removal of the temporary pipeline would not be visible from the Lake Mohonk Mountain House and no impacts to historic resources would occur.

As described in Section 9.18.6.5, “Natural Resources and Water Resources,” the proposed temporary pipeline would not create adverse impacts to wetlands, water, and woodland resources. The temporary pipeline would be largely located within DEP-owned property along the alignment or adjacent to the Catskill Aqueduct. Construction and operation of the temporary pipeline would not be located within or adversely impact wetlands, water resources or woodlands.

As such, the temporary pipeline would not affect open space resources, unique natural areas and heritage areas and sites, wetlands, water and woodland resources, scenic views, areas of natural beauty, or the rural character of Ulster County and would be consistent with this principle.

(7) Protect and enhance the county's most valuable open space landforms and natural features with coordinated planning and safeguard policies.

The potential for impacts to open space resources associated with the temporary pipeline are analyzed in detail in Section 9.18.6.3, "Open Space and Recreation." Under this principle, the Open Space Plan recommends preserving the visual or ecological values of significant landforms and natural features in order to protect against inappropriate development.

The installation, operation, and removal of the temporary pipeline would not permanently affect landforms and natural features such as valleys, ridgelines, slopes, coastal areas, or scenic areas. Proposed work activities would take place largely within DEP-owned property adjacent to the Catskill Aqueduct on previously disturbed lands and within or adjacent to existing roadways. During construction, views of the equipment and vehicles from the Mohonk Preserve would be temporary and partially screened by a dense stand of trees along the Catskill Aqueduct. Construction of the temporary pipeline would take approximately one month and any visual effects would be temporary. During operation of the pipeline, no adverse impacts associated with visual resources would be anticipated. The proposed temporary pipeline would therefore be consistent with this policy, and would not result in significant impacts to the county's most valuable open space landforms and natural features.

Therefore, the temporary pipeline would not result in significant adverse impacts to public policy within the study area.

9.18.6.2 Socioeconomic Conditions

In accordance with the CEQR Technical Manual, this section considers the proposed temporary pipeline's potential to affect socioeconomic conditions in the study area.

Existing Conditions

The study area is predominately open space, public services (i.e., Catskill Aqueduct), vacant land, and residential land uses with limited agricultural areas. It is primarily forested, with low-density residential areas and agricultural fields in the south. The Wallkill Downtake Chamber site is accessed by crossing a private property for which DEP has existing access rights. The Mountain Rest Road staging area is accessed from Mountain Rest Road. The length of the aqueduct is accessed by driving on top of the Catskill Aqueduct from the Wallkill Downtake or Mountain Rest Road, with the exception of one section. At this location, the transmission water main would leave the aqueduct and follow an existing path around an inaccessible portion of the aqueduct for a length of approximately 1,150 feet, following the existing Mohonk Grade Tunnel Access Trail, before returning to the aqueduct.

Future Without the Proposed Project

DEP has consulted with the Towns of New Paltz and Gardiner and Ulster County, and it is DEP's understanding that no major developments or programs are planned within the study area within the timeframe of the impact analysis. Therefore, in the future without the temporary pipeline, it is assumed that land use, population, housing, and economic activity within the study area would be similar to existing conditions.

Probable Impacts with the Proposed Project

The proposed temporary pipeline would not result in (1) direct residential displacement; (2) direct business displacement; (3) indirect residential displacement; (4) indirect business displacement; or (5) adverse effects on a specific industry. However, the proposed temporary pipeline may require the acquisition of land/easements (or other agreements); therefore, a socioeconomic assessment was done. The temporary pipeline would require access to private property along the approximately 1,150 foot length following the existing Mohonk Grade Tunnel Access Trail that is owned by the Mohonk Preserve. DEP would require necessary property access permission from the owner.

Construction would occur along the length of this Trail to install the proposed pipeline at grade. Following construction, all equipment would be removed. Following operation of the temporary pipeline, the temporary pipeline would be removed and the area would be restored to existing conditions. The property access permission acquired by DEP would not create any significant impacts to the existing landowner. As a result, the temporary pipeline would not directly displace businesses (or employees) or residences.

Therefore, the temporary pipeline would not result in significant adverse impacts to socioeconomic conditions.

9.18.6.3 Open Space and Recreation

The CEQR Technical Manual requires an open space assessment if a project “potentially has a direct or indirect effect on open space.” Open space resources are located within the study area and this section considers the potential effects of the temporary pipeline to open space and recreational resources.

Existing Conditions

The open space and recreation study area encompassed those areas within 400 feet of the proposed temporary pipeline as shown on **Figure 9.18-4**. Two open space and recreation resources exist within the study area: the Mohonk Preserve and the Mohonk Carriage Road (Historic Duck Pond Trail) (see **Figure 9.18-4**). In addition, the temporary pipeline would also follow the Mohonk Grade Tunnel Access Trail, an informal road that is not formally mapped or maintained by the Mohonk Preserve, where the temporary pipeline would diverge from the Catskill Aqueduct. The Mohonk Preserve is an approximately 8,000-acre, non-profit nature preserve used for outdoor recreation such as hiking, picnicking, snowshoeing, and biking. Approximately 41 acres of the Mohonk Preserve are located within the central and southwestern portion of the study area. A short segment of a Lake Mohonk Mountain House Complex mapped hiking trail, Historic Duck Pond Trail, is also located within the central portion of the study area, and crosses the proposed temporary pipeline route. Other informal trails exist in the study area; however, these trails are not mapped or formally maintained and would have limited views of the proposed temporary pipeline through the densely forested areas along the trails.

Future Without the Proposed Project

DEP has previously consulted with the Towns of New Paltz and Gardiner, and Ulster County, and it is DEP's understanding that no plans to expand or create new open spaces or recreational resources are anticipated within the area of the proposed temporary pipeline within the timeframe of the impact analysis. In the future without the proposed temporary pipeline, natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue and use of the identified open spaces is anticipated to continue. Therefore, in the future without the proposed temporary pipeline, it is assumed that open space and recreation would remain the same as under existing conditions.

Probable Impacts with the Proposed Project

No changes to open space and recreation resources would occur from the proposed temporary pipeline. Work activities for the proposed temporary pipeline would be located outside the limits of the Mohonk Preserve and would not cause impacts to the preserve. The temporary pipeline route would be largely located on the Catskill Aqueduct earthen berm. The temporary pipeline route would cross over existing trails, including the Historic Duck Pond Trail (Mohonk Carriage Road), where the temporary pipeline would be buried below grade, and the informal Mohonk Grade Tunnel Access Trail, where the temporary pipeline would be located at grade. To accommodate hikers during construction, access to the existing trails across the project site would be maintained. Construction vehicles would proceed with caution while driving in the vicinity of hiking trails and would yield to trail users. The installation and removal of the temporary pipeline may temporarily affect views from mapped and informal trails adjacent to and/or within a limited portion of the study area, however, these work activities would be short-term. Following construction activities, all equipment would be removed from the work areas and the site would be revegetated to restore to existing conditions. Trail crossings would be maintained or restored to existing conditions once the new pipeline is installed to avoid impacts to these contributing features of the Lake Mohonk Mountain House Complex.

During operation of the temporary pipeline, no significant impacts to open space and recreation resources are anticipated. Diesel-powered generators (one primary and one standby) would be located at the Wallkill Downtake Chamber to supply power to the pumps during operation of the temporary pipeline. While there may be temporary increases in noise levels in close proximity these, potential impacts to hiking or other recreational uses within Mohonk Preserve are not anticipated at the Lake Mohonk Mountain House Preserve and the aforementioned trails as these are located a significant distance from the Wallkill Downtake Chamber site. The proposed temporary pipeline would not encroach upon, cause a loss of open space, impact the use or physical character of, or disrupt views from the Mohonk Preserve or the Historic Duck Pond Trail.

Therefore, the proposed temporary pipeline would not result in significant adverse impacts to open space and recreation within the study area.

9.18.6.4 Historic and Cultural Resources

In accordance with the CEQR Technical Manual, an historic and cultural resources assessment, which include both archeological and architectural resources is warranted for projects that would have any ground disturbance or if the project would result in a new or alteration to a historically important building, structure or object. The proposed temporary water pipeline would not affect historically important buildings, structures, or objects, but would involve ground disturbance. This section analyzes the potential for the proposed temporary pipeline to affect historic and cultural resources.

Existing Conditions

Historic resources identified in the New York State Historic Preservation Office (SHPO) Cultural Resource Information System (CRIS) were reviewed within the historic resources study area, as shown on Figure 9.18-5. One site listed on the NR, the Lake Mohonk Mountain House Complex (NR Number 90NR02849) is located within the study area. The Complex comprises a majority of the central and southern portions of the study area and extends further east and west of the study area. The Lake Mohonk Mountain House Complex includes the large resort hotel (Lake Mohonk Mountain House) located on the Shawangunk Ridge of the Catskill Mountains on 1,325 acres of forest, landscaped meadows, and gardens. It adjoins the Mohonk Preserve and is crisscrossed by hiking trails and carriage roads connected to the Mohonk Preserve. The Lake Mohonk Mountain House is a National Historic Landmark located within the Complex, but is located outside of the study area. The temporary pipeline would cross Mohonk Carriage Road (Historic Duck Pond Trail) and Lenape Lane within the Lake Mohonk Mountain House Complex. In addition, the temporary pipeline would cross, the Mohonk Grade Tunnel Access Trail, an informal road within the Complex. According to the CRIS database, and previous correspondence with SHPO conducted as part of the UWSR DEIS, there are no NR/State Register (SR) listed archeological resources, no additional NR/SR historic districts, no State landmarks, and no other known structures eligible for listing on the NR/SR within the study area.

Future Without the Proposed Project

DEP has previously consulted with the Towns of New Paltz and Gardiner and Ulster County as part of the UWSR DEIS, and it is DEP's understanding that no impacts to historic and cultural resources are anticipated in the study area within the timeframe of the impact analysis. Therefore, in the future without the proposed temporary pipeline, it is assumed that historic and cultural resources within the study area would remain the same as under existing conditions.

Probable Impacts with the Proposed Project

Within the NR-listed Lake Mohonk Mountain House Complex, no impacts to NR-listed structures would occur. Potential impacts from the proposed temporary pipeline would be limited to where the temporary pipeline crosses the Mohonk Carriage Road (Historic Duck Pond Trail), Lenape Lane, and the Mohonk Grade Tunnel Access Trail. To avoid impacts to Lenape Lane and Mohonk Carriage Road, the temporary pipeline would be buried below ground to maintain vehicle and pedestrian access during operations of the proposed temporary pipeline.

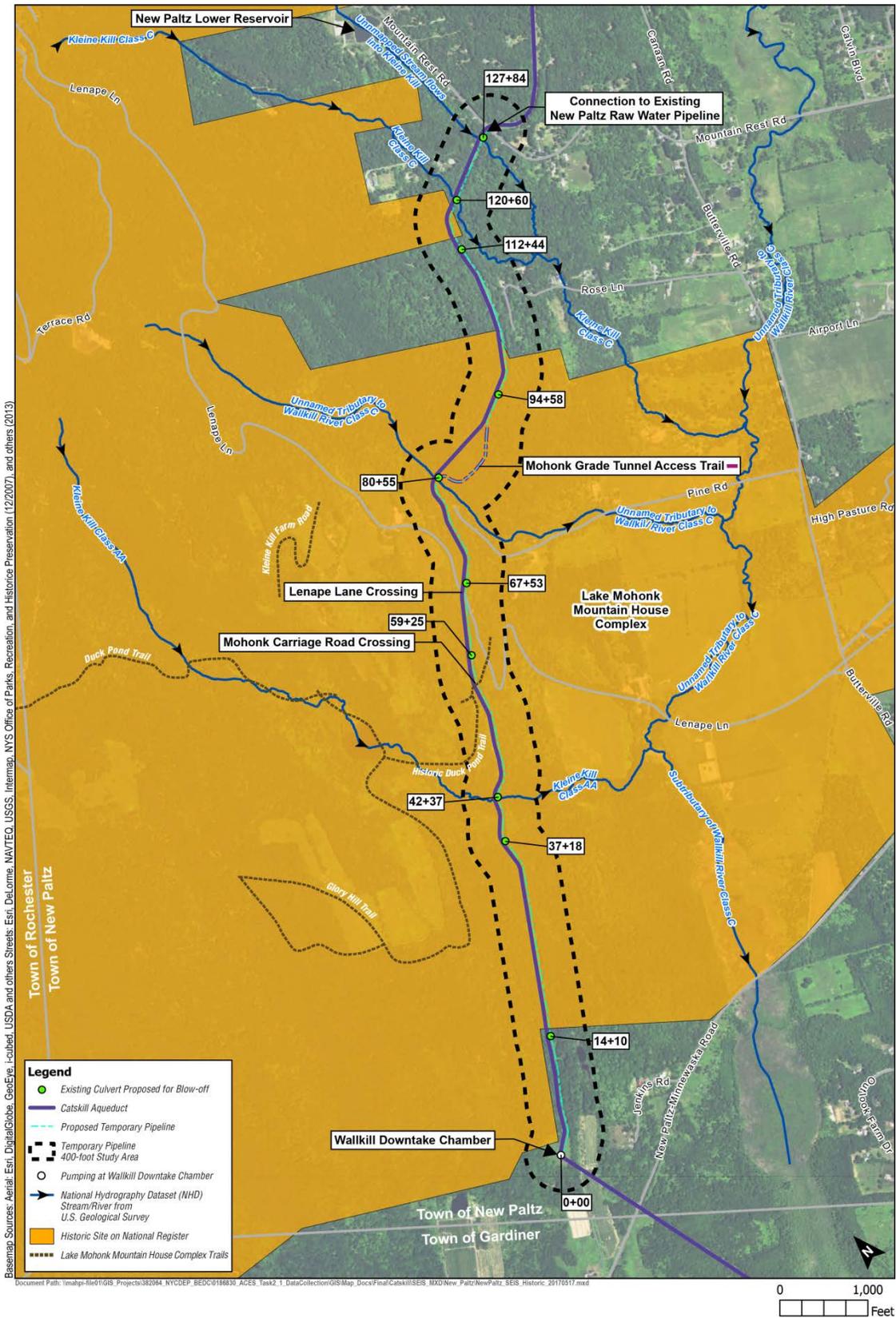


Figure 9.18-5: Historic Resources – New Paltz Temporary Transmission Water Main Study Area



Pursuant to prior consultation with SHPO on potential impacts to cultural or archeological resources, no impacts associated with the limited soil disturbance within these areas within the Preserve would be anticipated.

Operation of the temporary pipeline would not involve significant disturbances to these crossings or other portions of the Lake Mohonk Mountain House Complex, and would not affect historic and cultural resources. After the temporary pipeline is decommissioned and removed, the crossings would be restored to existing conditions.

The balance of the proposed temporary pipeline route would be largely located on the Catskill Aqueduct earthen berm, which was previously disturbed during the initial construction of the Catskill Aqueduct in the early 1900s. Work activities for the installation and operation of the temporary pipeline would be located within these areas of previous soil disturbance. As described in the UWSR DEIS, SHPO issued a determination of No Effect for work activities along the aqueduct corridor, including the area of the proposed temporary pipeline. As there are no known archeological resources within the study area, the activities of the proposed temporary pipeline would not impact archeological resources.

Therefore, the proposed temporary pipeline would not result in significant adverse impacts to historic and cultural resources.

9.18.6.5 Natural Resources and Water Resources

The *CEQR Technical Manual* indicates that a natural resource assessment should be conducted when a natural resource is present on or near a project site, and when that project has the potential to cause direct or indirect disturbances to a natural resource. The following may be considered, as appropriate, in a natural resources analysis: “groundwater, soils, and geologic features; numerous types of natural and human-created aquatic and terrestrial habitats (including wetlands, dunes, beaches, grasslands, woodlands, landscaped areas, gardens, parks and built structures) and any areas used by wildlife.” The proposed temporary pipeline would not result in significant disturbance to geology and soils, aquatic/benthic resources, wetlands, wildlife, and unlisted rare and vulnerable species associated with the temporary pipeline. Therefore, an impact analysis related to these natural resources is not warranted. The natural resources study area does have the potential to support protected water resources, terrestrial resources, and federal/State Threatened and Endangered Species and State Species of Special Concern. An analysis of the potential effects to these resources as a result of the temporary pipeline was therefore prepared.

The natural resources study area (NRSA), as shown on **Figure 9.18-6**, was assessed to identify potential resources occurring within the study area. The analysis included a desktop evaluation of New York State Department of Environmental Conservation (NYSDEC) water classification data, NYSDEC freshwater wetlands maps, United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, national hydrography data, published soil survey maps, and United States Geological Survey (USGS) topographic maps. The NRSA includes a portion of the Catskill Aqueduct containing a mowed corridor ranging from approximately 16 to 36 feet wide surrounded by deciduous forest and multiple culverts associated with the aqueduct. The existing culverts are located approximately 10 to 70 feet down slope from the location of the proposed temporary pipeline.

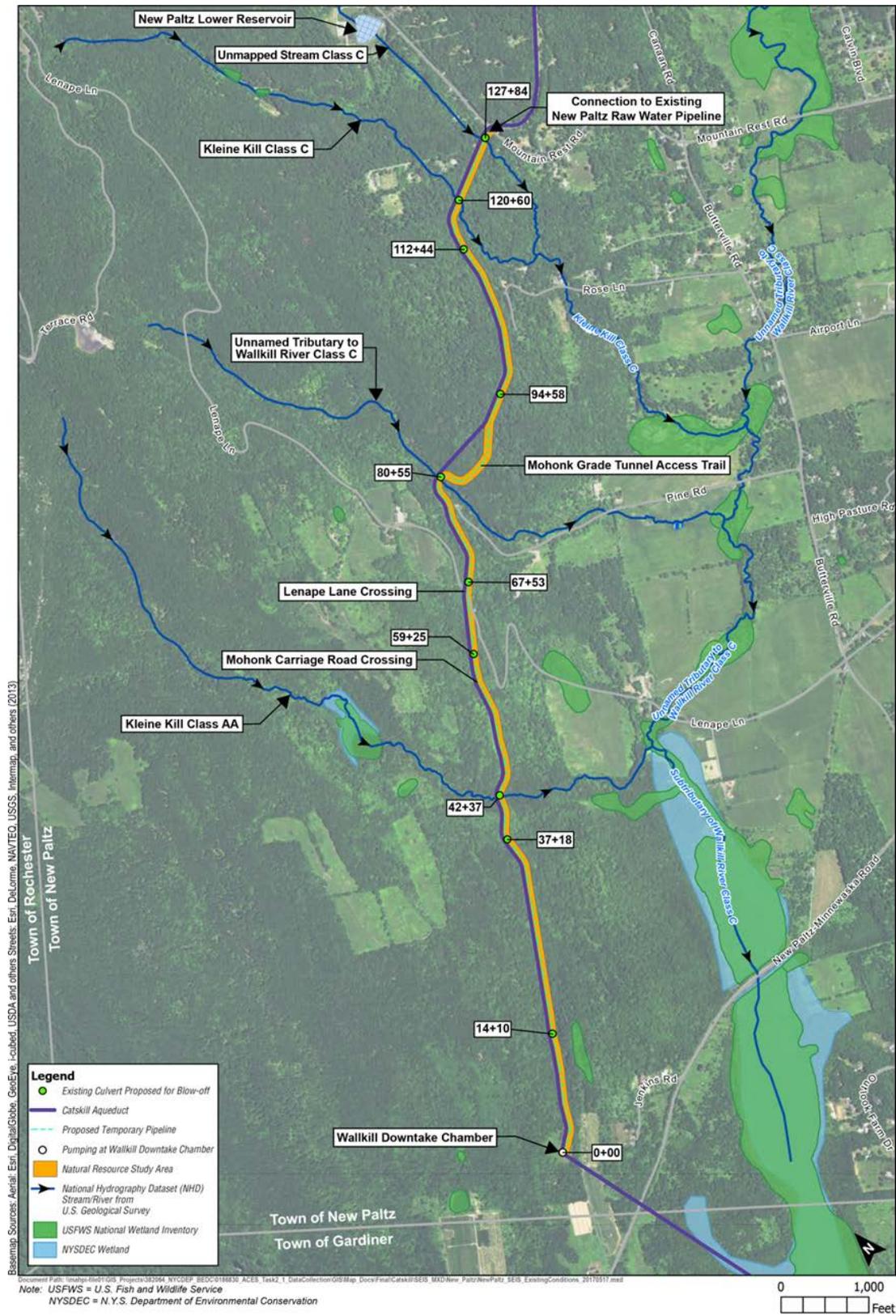


Figure 9.18-6: Natural Resources – New Paltz Temporary Transmission Water Main Study Area



Water Resources

Existing Conditions

The NRSA is located within the Lower Hudson River drainage basin, more specifically within the Rondout watershed (hydrologic unit code [HUC] 02020007) and the Kleine Kill-Walkkill River subwatershed (HUC 020200070406).

The alignment of the proposed temporary pipeline would largely be adjacent to the top of the existing Catskill Aqueduct. Existing culverts pass beneath the existing aqueduct and the proposed temporary pipeline would likewise cross these due to its location along the aqueduct. Ten (10) of these crossings would be used during the operation of the proposed temporary pipeline as discussed below. The locations of these ten culverts are shown on **Figure 9.18-6**. Based on a desktop analyses and a field visit conducted on April 13, 2017, four of the 10 culverts allow streams to flow under the aqueduct that are mapped and classified by NYSDEC (see **Table 9.18-1**). The remaining six culverts allow water to flow to drainage swales, channels, or ditches that are not formally mapped or regulated by NYSDEC.

Table 9.18-1: Surface Waters within the Natural Resource Study Area– New Paltz Temporary Transmission Water Main Study Area

<u>Water Resource</u>	<u>NYSDEC Classification</u>	<u>Cowardin Classification</u>
<u>Kleine Kill</u>	<u>AA¹</u>	<u>Riverine, Upper Perennial, Unconsolidated Bottom, Permanently Flooded (R3UBH)</u>
<u>Kleine Kill</u>	<u>C²</u>	<u>Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded (R5UBH)</u>
<u>Unmapped Stream flows into Kleine Kill</u>	<u>NA</u>	<u>Riverine, Intermittent Streambed, Seasonally Flooded (R4SBC)</u>
<u>Unnamed Tributary to Walkkill River</u>	<u>C²</u>	<u>Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC)</u>
<u>Notes:</u>		
¹ <u>Class AA waters: water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish, shellfish, and wildlife propagation and survival.</u>		
² <u>Class C waters: fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival. The waters shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.</u>		

A desktop evaluation of NYSDEC freshwater wetlands maps, USFWS NWI maps, published soil survey maps, and USGS topographic maps was conducted. No mapped wetlands exist within the NRSA. In addition, no wetlands were observed during the April 13, 2017 site visit.

Future Without the Proposed Project

It is DEP's understanding that no developments or structures are anticipated within the area of the temporary pipeline, within the timeframe of the impact analysis based upon consultation with the Town of New Paltz and Ulster County. Therefore, it is assumed that water resources within the NRSA would remain the same as existing conditions under the future without the proposed temporary pipeline.

Probable Impacts with the Proposed Project

This section analyzes the potential for temporary disturbances to water resources associated with the installation and operation of the temporary pipeline in the NRSA.

Construction

The temporary pipeline would be located near the top of the existing aqueduct. While the proposed temporary pipeline would traverse the aqueduct and cross the 10 existing culvert crossings, no work is proposed within the streams or their banks. The temporary pipeline would be located at an elevation well above the location of the actual streams or drainage features. Concrete blocks would be placed at a regular spacing distance along the route to support the temporary pipeline against the existing aqueduct slope. The exception would be the Kleine Kill crossing. The temporary pipeline would cross over the Kleine Kill via the existing Poor Farm Arch Bridge. No disturbances to the regulated buffer at this culvert crossing would occur. DEP would also implement appropriate erosion and sediment control measures to limit potential impacts during construction.

Following construction, temporarily disturbed areas would be restored to pre-existing conditions and seeded with native vegetation. Therefore, the temporary pipeline would not result in significant adverse impacts to water resources.

Operation

No significant impacts to surface waters associated with the operation of the proposed temporary pipeline is in operation are expected. When not in use, the temporary pipeline would be drained at the Wallkill Downtake Chamber and the 10 existing culvert crossings. Blow-off valves would be placed at each of these crossings to allow drainage of the temporary pipeline to the culvert crossings. The temporary pipeline would be drained by connecting a hose to the blow-off valve and releasing the raw, uncontaminated water into the culvert or drainage ditch. The flow rate would be controlled with the blow-off valves to prevent the potential for erosion or scouring at the discharge point. Freeze protection during pipeline operation would be addressed by maintaining flow or draining the temporary pipeline at the Wallkill Downtake Chamber or blow-off locations, if necessary.

Terrestrial Resources

Existing Conditions

Based on a field visit conducted on April 13, 2017 and field visits completed in support of the UWSR DEIS, ecological communities in the vicinity of the proposed temporary pipeline include a hemlock-northern hardwood forest and chestnut oak forest in the northern portion of the study area and a successional old field in the southern portion of the study area. The study area contains portions of a mowed corridor associated with the Catskill Aqueduct surrounded by deciduous forest. Tree species within the hemlock-northern hardwood forest include eastern hemlock (*Tsuga canadensis*), black cherry (*Prunus serotina*), red oak (*Quercus rubra*), black oak (*Q. velutina*), sugar maple (*Acer saccharum*), red maple (*A. rubrum*), and bigtooth aspen (*Populus grandidentata*). The understory is dominated by New York fern (*Thelypteris noveboracensis*). Trees within the chestnut oak forest include scarlet oak (*Q. coccinea*), chestnut oak (*Q. prinus*), black oak, red oak, red maple, sugar maple, and black cherry. American beech (*Fagus grandifolia*) saplings and New York fern were also observed in the understory. These areas of hemlock-northern hardwood forest and chestnut oak forest observed during field visits are not mapped as a significant natural community by the New York Natural Heritage Program (NYNHP).

The study area also contains a successional old field. Trees at the forest edge, which is nearly 200 feet from the Wallkill Downtake Chamber, include eastern red-cedar (*Juniperus virginiana*), black walnut (*Juglans nigra*), white ash (*Fraxinus americana*), white pine (*Pinus strobus*), and black cherry. Shrubs include northern spicebush (*Lindera benzoin*) and tatarian honeysuckle (*Lonicera tatarica*), and herbs observed include timothy-grass (*Phleum pratense*), dandelion (*Taraxacum* spp.), strawberry (*Fragaria x ananassa*), Russian knapweed (*Rhaponticum repens*), wild bergamot (*Monarda fistulosa*), and garlic mustard (*Alliaria petiolata*).

Future Without the Proposed Project

DEP has previously consulted with the Towns of New Paltz and Gardiner and Ulster County, and it is DEP's understanding that no new projects or developments that would affect terrestrial resources are anticipated within the area of the temporary pipeline within the timeframe of the impact analysis. Under the future without the proposed temporary pipeline condition, natural processes, such as changes in habitat due to natural vegetative succession, are anticipated to continue. Terrestrial resources within the study area would therefore be anticipated to remain similar to existing conditions.

Probable Impacts with the Proposed Project

No tree removal is anticipated as part of the temporary pipeline; however, minor underbrush clearing and trimming may be required. Following construction of the temporary pipeline, all equipment would be removed and operation of the temporary pipeline would not adversely affect terrestrial resources. Upon removal of the temporary pipeline, DEP would revegetate areas, as applicable and appropriate, with native species and/or allow areas to naturally recolonize with existing species. The temporary pipeline would therefore not result in significant adverse impacts to terrestrial resources.

Federal/State Threatened and Endangered and State Species of Special Concern

Existing Conditions

As assessed in the UWSR DEIS, nine federal/State Threatened and Endangered Species and State Species of Special Concern were identified as potentially utilizing the habitat within the NRSA. None of these species were observed during the field visit on April 13, 2017, however the potential for impacts to these species were assessed.

Future Without the Proposed Project

In the future without the proposed temporary pipeline, it is assumed that federal/State Threatened and Endangered Species and State Species of Special Concern within the study area would largely be the same as existing conditions, other than other than possible changes in habitat due to natural vegetative succession and general anthropogenic influences.

Probable Impacts with the Proposed Project

Based on the analysis presented in Table 9.18-2, no impacts are anticipated. There would be no effects to eastern box turtles (*Terrapene carolina*), eastern hognose snakes (*Heterodon platyrhinos*), timber rattlesnakes (*Crotalus horridus*), wood turtles (*Glyptemys insculpta*), cerulean warblers (*Setophaga cerulean*), sharp-shinned hawks (*Accipiter striatus*), Indiana bats (*Myotis sodalists*), northern long-eared bats (*Myotis septentrionalis*), or scarlet indian-paintbrush (*Castilleja coccinea*) associated with the proposed temporary pipeline.

While not anticipated, should any federal/State Threatened and Endangered Species and State Species of Special Concern, such as timber rattlesnakes (*Crotalus horridus*), be encountered during construction, DEP would enact an encounter plan. Among other elements, the encounter plan would include having a natural resource specialist relocate the species outside of the work area, as appropriate.

Therefore, the proposed temporary pipeline would not result in significant adverse impacts to federal/State Threatened and Endangered Species or State Species of Special Concern within the NRSA.

Table 9.18-2: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Natural Resources Study Area– New Paltz Temporary Transmission Water Main Study Area

<u>Common Name</u>	<u>Scientific Name</u>	<u>Federal Listing</u>	<u>State Listing</u>	<u>Analysis of Potential Disturbance</u>	<u>Warrants Further Analysis</u>
<u>Amphibians and Reptiles</u>					
<u>Eastern Box Turtle</u>	<u><i>Terrapene carolina</i></u>	<u>Unlisted</u>	<u>Special Concern</u>	<u>Potential habitat exists within the adjacent hemlock-northern hardwood and chestnut oak forests, as well as within the successional old field. Work activities would be confined to previously disturbed areas. If any isolated areas of potential habitat exist within the NRSA, as a mobile species, any eastern box turtles that might otherwise use these areas are expected to instead utilize similar, adjacent habitats during construction. As part of the proposed temporary pipeline, wildlife crossings would be placed every 500 feet along the proposed route to maintain an access corridor for smaller species, such as turtles. Therefore, there are no effects anticipated and no further analysis for eastern box turtles is warranted.</u>	<u>No</u>
<u>Eastern Hognose Snake</u>	<u><i>Heterodon platyrhinos</i></u>	<u>Unlisted</u>	<u>Special Concern</u>	<u>Work activities would be limited to areas previously disturbed. Should any potential habitat exist within the study area, a variety of habitats would be available for the species' use in the vicinity during construction. Therefore, there are no effects anticipated and no further analysis for eastern hognose snakes is warranted.</u>	<u>No</u>
<u>Timber Rattlesnake</u>	<u><i>Crotalus horridus</i></u>	<u>Unlisted</u>	<u>Threatened</u>	<u>The old field and open land at the Walkill Downtake Chamber would provide potential foraging and basking habitat. According to NYNHP, however, no records of timber rattlesnakes were identified within 1.5 miles of the NRSA. Therefore, there are no effects anticipated and no further analysis for timber rattlesnakes is warranted.</u>	<u>No</u>
<u>Wood Turtle</u>	<u><i>Glyptemys insculpta</i></u>	<u>Unlisted</u>	<u>Special Concern</u>	<u>Potential habitat exists within the adjacent hardwood forest and successional old field areas. However, work activities would be confined to previously disturbed areas. Should any potential habitat exist within the NRSA, a variety of habitats would be available for the species' use in the vicinity during construction. Therefore, there are no effects anticipated and no further analysis for wood turtles is warranted.</u>	<u>No</u>

Table 9.18-2: Analysis of Potential Disturbance to Federal/State Threatened and Endangered Species and State Species of Special Concern and Habitats within the Natural Resources Study Area– New Paltz Temporary Transmission Water Main Study Area

<u>Common Name</u>	<u>Scientific Name</u>	<u>Federal Listing</u>	<u>State Listing</u>	<u>Analysis of Potential Disturbance</u>	<u>Warrants Further Analysis</u>
<u>Cerulean Warbler</u>	<u><i>Setophaga cerulea</i></u>	<u>MBTA</u>	<u>Special Concern</u>	<u>Preferred habitat for Cerulean Warblers is high in the canopy of mature forests. No impacts to or tree removals would occur as part of the proposed temporary pipeline. Therefore, there are no effects anticipated and no further analysis for Cerulean Warblers is warranted.</u>	<u>No</u>
<u>Sharp-shinned Hawk</u>	<u><i>Accipiter striatus</i></u>	<u>MBTA</u>	<u>Special Concern</u>	<u>Potential habitat exists within the adjacent hardwood forest and forest edge. However, work activities would be confined to previously disturbed areas. Due to the abundant forested habitat near the work site and the lack of anticipated impacts to these forested habitats as a result of the proposed temporary pipeline, no effects are anticipated and no further analysis for Sharp-shinned Hawks is warranted.</u>	<u>No</u>
<u>Mammals</u>					
<u>Indiana Bat</u>	<u><i>Myotis sodalis</i></u>	<u>Endangered</u>	<u>Endangered</u>	<u>Potential bat roosting habitat was observed surrounding the Poor Farm Arch Bridge in the central portion of the study area during a previous field visit, conducted on August 3, 2015 as part of the UWSR DEIS. However, no tree removal is anticipated as part of the installation, operation, or removal of the temporary pipeline. Therefore, there are no effects anticipated and no further analysis for Indiana bats is warranted.</u>	<u>No</u>
<u>Northern Long-eared Bat</u>	<u><i>Myotis septentrionalis</i></u>	<u>Threatened</u>	<u>Threatened</u>	<u>Potential bat roosting habitat was observed surrounding the Poor Farm Arch Bridge during a previous field visit, conducted on August 3, 2015 as part of the UWSR DEIS. However, no tree removal is anticipated as part of the installation, operation, or removal of the temporary pipeline. Therefore, there are no effects anticipated and no further analysis for northern long-eared bats is warranted.</u>	<u>No</u>
<u>Plants</u>					
<u>Scarlet Indian-Paintbrush</u>	<u><i>Castilleja coccinea</i></u>	<u>Unlisted</u>	<u>Endangered</u>	<u>No suitable habitat or evidence of specimens was found in the NRSA during presence/absence surveys. Therefore, there are no effects anticipated and no further analysis for Scarlet Indian-paintbrush is warranted.</u>	<u>No</u>
<u>Note:</u> <u>MBTA: Migratory Bird Treaty Act</u>					

9.18.6.6 Hazardous Materials

A hazardous material is define in the CEQR Technical Manual as “any substance that poses a threat to human health or the environment.” An evaluation was conducted to determine whether the proposed temporary pipeline would increase the exposure of people or the environment to hazardous materials.

Existing Conditions

As part of the hazardous materials assessments, existing documentation was reviewed. To evaluate the potential presence of hazardous materials within the study area, the Phase 1 Environmental Site Assessments (ESA) completed in 2014 and 2015 as part of the UWSR DEIS were used to identify Recognized Environmental Conditions (RECs) in general conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Practice E 1527-13 and CEQR requirements. The Phase I ESAs completed for the Catskill Aqueduct corridor, Mountain Rest Road and New Paltz-Minnewaska Road Study Areas were used and encompassed the interconnection to the temporary pipeline and the Wallkill Downtake Chamber, respectively. The Phase I ESAs included site reconnaissance, research on current/historical use, and review of federal and State regulatory listings for both the site and neighboring properties within the appropriate search distance defined in the ASTM standard.

Based on the Phase I ESA investigations, there was no indication of an environmental impact that would constitute a REC as defined by the ASTM standard that would affect the proposed activities. Additionally, there is no history of contamination at or in the vicinity of the study area where the proposed work activities would occur. Furthermore, proposed excavation areas would be located on a previously disturbed section of the Catskill Aqueduct and would be very limited. Similarly, excavation within or adjacent to existing roadways, such as Lenape Lane are not anticipated to result in adverse impacts as these would also be limited in areal extent and would be located in areas of prior disturbance. Given the findings of previous subsurface investigation along similar portions of the aqueduct corridor, no subsurface ground contamination is anticipated.

Future Without the Proposed Project

No change in hazardous materials would be expected under the future without proposed temporary pipeline condition and a result conditions related to these materials would be expected to remain the same.

Probable Impacts with the Proposed Project

There would be a limited amount of ground disturbance associated with the installation, operation, or removal of the temporary pipeline. Ground disturbance would be associated with the establishment of foundations to support the temporary pipeline, two subsurface crossings, and the interconnection of the temporary pipeline to the existing New Paltz raw water supply line. In the future with the proposed temporary pipeline, work activities would require temporary

storage and use of diesel fuel to support portable power supply. The fuel supply would be enclosed in a secondary containment system, located downgrade of the Wallkill Downtake Chamber. The use and storage of diesel fuel would be in accordance with applicable regulatory requirements and guidelines including those relating to: federal Spill Prevention, Control, and Countermeasures requirements, as applicable; and State petroleum bulk storage, and spill reporting requirements. DEP and its contractors would handle all materials in accordance with applicable federal, State, and local regulations and guidelines.

Therefore, the temporary pipeline would not result in significant adverse impacts from the presence or disturbance of hazardous materials or the use of these during construction and operation.

9.18.6.7 Water and Sewer Infrastructure

This section analyzes the potential for the temporary pipeline to affect water and sewer infrastructure. The temporary pipeline would be constructed and operated to provide water supply to New Paltz when DEP requires shutdown of the Catskill Aqueduct to conduct biofilm removal and repair and rehabilitation work.

Existing Conditions

The existing water supply source for the Town and Village of New Paltz is the Catskill Aqueduct and four reservoirs, located near the New Paltz water filtration facility on Mountain Rest Road. DEP provides raw aqueduct water to New Paltz and this water is then filtered and chlorinated by New Paltz prior to distribution to the community. New Paltz uses an average of approximately 0.88 mgd.

No existing sewer infrastructure is located in proximity to the proposed temporary pipeline.

Future Without the Proposed Project

In the future without the proposed temporary water pipeline, New Paltz might not have sufficient water supply available during the temporary shutdowns of the Catskill Aqueduct anticipated by DEP as part of its UWSR project, specifically repair and rehabilitation. While New Paltz has been pursuing separate and independent projects to supplement its existing water supply system, in the future without the proposed temporary pipeline, it is assumed that existing water and sewer infrastructure would remain the same as existing conditions without the addition of the new sources of water supply from other sources that are currently being advanced by New Paltz.

Probable Impacts with the Proposed Project

The proposed temporary pipeline would be constructed to supply the New Paltz Lower Reservoir with water from the Delaware Aqueduct. The temporary pipeline would be designed to convey raw water to the New Paltz Lower Reservoir to meet required demand. This supply would be accomplished through an existing interconnection at DEP's Shaft 4, backfeeding the Catskill

Aqueduct to the Wallkill Downtake Chamber via the Wallkill Pressure Tunnel, and pumping from the Wallkill Downtake Chamber through the proposed temporary pipeline to New Paltz's existing raw water line adjacent to the Mountain Rest Road to the New Paltz Lower Reservoir. The pumps at the Wallkill Downtake Chamber are anticipated to operate for approximately 4 days and rest for approximately 1.3 days. The optimal operating level range of the New Paltz Lower Reservoir will be coordinated with New Paltz filter plant operation.

When not in operation, draining of the temporary pipeline may be warranted to prevent freeze damage during extreme cold air temperatures. A total of approximately 70,000 gallons of water would be drained to nearby surface waters or drainage channels at 10 existing culverts located along the alignment of the proposed temporary pipeline and the Catskill Aqueduct. Raw water from the temporary pipeline would be discharged to existing drainage channels or directly to surface water via blow-off valves installed at the branches of the temporary pipeline. During a blow-off event, hoses may be used to direct the water to the discharge location. If necessary, flow rates would be controlled with the blow-off valves to prevent the potential for erosion or scouring at the discharge point.

The proposed temporary pipeline would not result in any significant new water infrastructure needs as the temporary pipeline would connect to an existing New Paltz raw water supply line that would direct water to the existing New Paltz Lower Reservoir. The purpose of the proposed temporary pipeline is to maintain access to a reliable source of water for New Paltz. No increase in existing water supply is anticipated and therefore no significant new sources of wastewater or impacts to wastewater treatment would occur as a result of the temporary pipeline. As a result, a detailed assessment of impacts to sewer and wastewater infrastructure is not warranted. The operation of the temporary pipeline would also not result in any significant change in existing impervious surfaces or stormwater conveyances. Construction staging areas would be limited to two existing developed areas that would not require significant ground disturbance. No significant impacts due to stormwater are therefore anticipated and a detailed analysis is not warranted.

The proposed temporary pipeline would involve maintaining access to existing water supply from the Catskill Aqueduct to New Paltz and would not result in significant impacts to water and sewer infrastructure.

9.18.6.8 Transportation

This section assesses the potential for the temporary pipeline to affect transportation. The operation of the proposed temporary pipeline would require, for each shutdown, a DEP employee to travel to the site and turn on the temporary pumping system that would be located at the Wallkill Downtake Chamber. The employee would return to the site to turn off the system after the conclusion of each shutdown. In addition, occasional trips for any required maintenance would be made. As a result, a nominal number of vehicle trips significantly below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs. Traffic patterns would therefore remain largely the same as existing conditions. Following the removal of the temporary pipeline, any minor change in the traffic patterns within the study area would return to existing conditions.

Therefore, the operation of the proposed temporary pipeline would not result in significant adverse impacts to transportation within the study area and no further analysis is required.

9.18.6.9 Air Quality

The operation of the temporary pipeline would be short-term in nature. Air quality emissions from stationary sources associated with the temporary pipeline operation would be limited to primarily the use of generators to operate the temporary pumping system that would be located at the Wallkill Downtake Chamber. These generators would only be anticipated to operate during the short-term (approximately 10 week) shutdowns of the aqueduct during repair and rehabilitation. Mobile sources would include vehicles traveling to/from the temporary pipeline study area. As discussed in Section 9.18.6.8, “Transportation,” the operation of the proposed temporary pipeline would result in a nominal number of new vehicle trips, significantly below the CEQR Technical Manual screening thresholds, which would result in little or no change in air quality due to mobile sources. Following the removal of the temporary pipeline, short-term air quality emissions from stationary and mobile sources within the proposed temporary pipeline study area would return to existing conditions.

Therefore, an air quality impact analysis associated with the operation of the proposed temporary pipeline is not warranted.

9.18.6.10 Noise

Activities that could generate noise emissions from stationary and/or mobile sources were assessed in this section.

Stationary Noise

The study area for the noise analysis is the area within 1,500 feet of the stationary noise-generating equipment that would be used during operation of the temporary pipeline. The study area, as shown on **Figure 9.18-7**, encompasses areas within the Towns of New Paltz and Gardiner and includes residential parcels. Two sensitive noise receptors are located in the study area and include residences. The operation of the temporary pipeline was evaluated to determine compliance with local noise codes.

The operation of the temporary pipeline, specifically the operation of the temporary pumping system at the Wallkill Downtake Chamber, is subject to the Towns of New Paltz and Gardiner Noise Control Laws for operational noise sources. The Town of Gardiner Noise Control Law (§220-40.C) limits daytime and nighttime noise levels at the property line of the lot from which noise is emitted. Noise between the hours of 7 AM and 8 PM cannot exceed 70 A-weighted decibels (dBA), and noise between the hours of 8 PM and 7 AM cannot exceed 60 dBA. The Town of New Paltz does not contain quantitative noise limits applicable to the proposed temporary pipeline. The Town of New Paltz Noise Control Law (§100-3.A) generally prohibits any person to make, continue, aid, countenance, cause to be made, or assist in making any unreasonably loud, disturbing, and unnecessary noise on Sunday commencing at 8 PM and

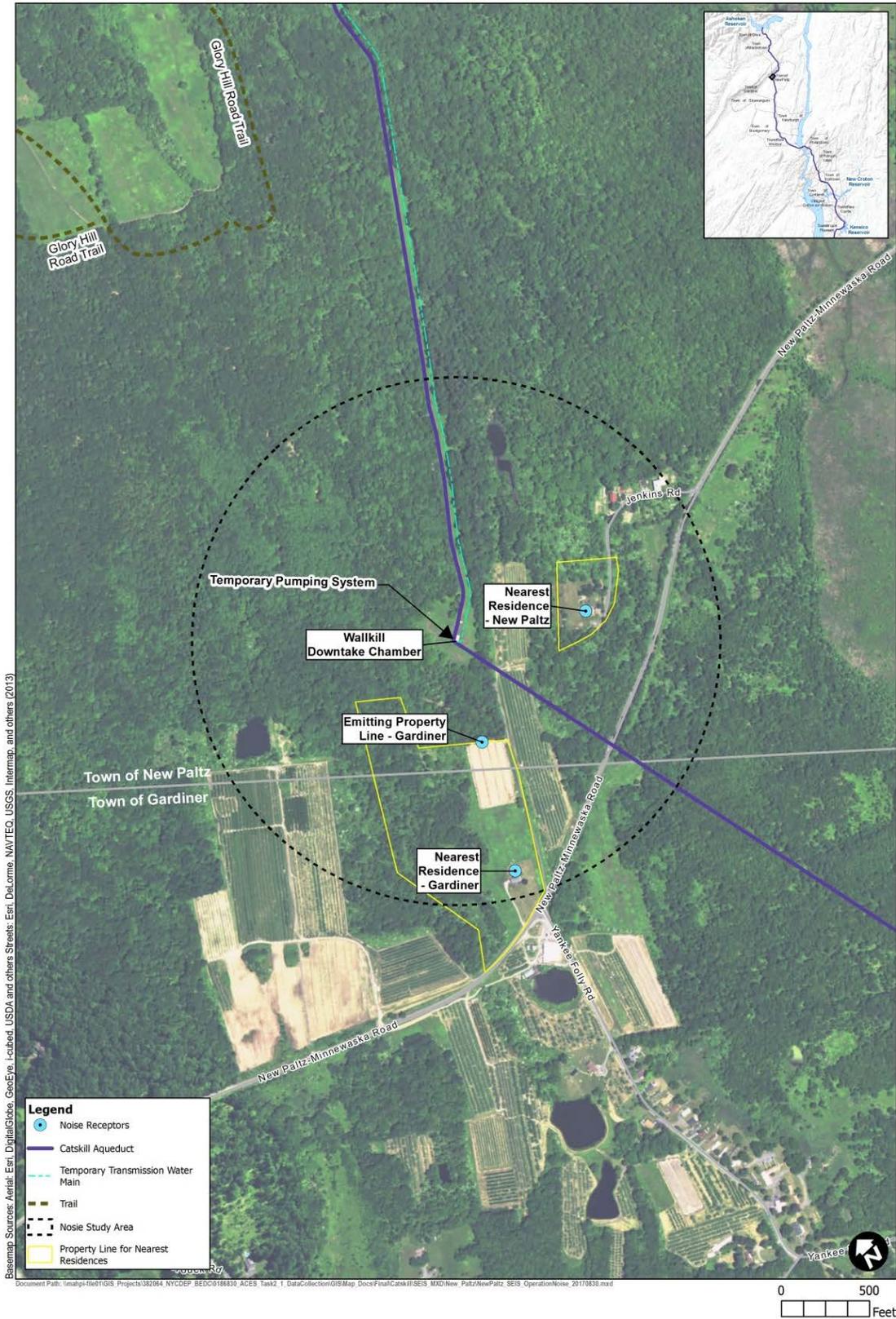


Figure 9.18-7: Noise – New Paltz Temporary Transmission Water Main Study Area



continuing through and including Monday at 7 AM and during the same hours upon each successive evening and morning of each successive day of the week thereafter through and including Saturday at 7 AM and on Saturday commencing at 8 PM and continuing through and including Sunday at 9 AM; provided, however, that the foregoing hours shall be extended until the hour of 9 AM on any day upon which there is celebrated a legal holiday. Any noise which unreasonably interferes with the sleep, comfort, repose, health, or safety of others is prohibited during the hours mentioned above.

Future Without the Proposed Project

DEP has consulted with the Towns of New Paltz and Gardiner and Ulster County, and it is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels are anticipated within the temporary pipeline study area within the timeframe of the impact analysis. Therefore, in the future without the proposed temporary pipeline, it is assumed that ambient noise levels within the study area would be similar to existing conditions.

Probable Impacts with the Proposed Project

In the future with the operation of the temporary pipeline, noise-producing activities at the Wallkill Downtake Chamber would include 24-hour operations during the 2018, 2019, and/or 2020 10-week shutdown periods for the repair and rehabilitation project. The primary noise-generating equipment that would be used during operation of the temporary pipeline are two generators with a reference noise level (L_{eq}) of 75 dBA at 50 feet². Each generator will be equipped with sound attenuating enclosures to reduce the noise level (L_{eq}) to 75 dBA or lower. Additional noise sources, such as pumps, would also be utilized during the operation of the temporary pipeline at the Wallkill Downtake Chamber. These noise sources, however, would be located inside of the structure and would be lesser noise contributors at nearby residences and noise-sensitive land uses.

The operation of the temporary pipeline has the potential to occur during daytime and nighttime hours and would result in a noise level of up to 57 dBA at the nearest emitting property line in the Town of Gardiner. Therefore, stationary operational noise levels are anticipated to comply with the Town of Gardiner noise level limits.

There would be an increase in stationary noise levels during 24-hour operation of the temporary transmission pipeline during the 2018, 2019, and/or 2020 10-week shutdown periods for the repair and rehabilitation project. However, the duration of the increase in noise levels would be over relatively short durations, approximately 10 weeks, once per year. Following the removal of the temporary pipeline, noise levels from stationary noise sources within the study area would return to existing conditions. Therefore, although there would be a temporary increase in noise

² Caterpillar Weather Protective and Sound Attenuated Enclosures (2014).

during operation of the temporary pipeline, noise from the temporary operation would not result in significant adverse impacts to sensitive receptors within the study area.

Mobile Noise

Mobile noise sources would include vehicles traveling to/from the temporary pipeline study area. The operation of the proposed temporary pipeline would result in a nominal number of vehicle trips significantly below the CEQR Technical Manual screening thresholds. Following the removal of the temporary pipeline, noise levels from mobile noise sources within the study area would return to existing conditions.

Therefore, a noise impact analysis related to mobile noise associated with the operation of the proposed temporary pipeline is not warranted.

9.18.6.11 Neighborhood Character

A neighborhood character assessment, as defined by the CEQR Technical Manual, “considers how elements of the environment combine to create the context and feeling of a neighborhood and how a project may affect that context and feeling.” An assessment of neighborhood character is needed when a Proposed Project has the potential to result in significant impacts to technical areas, such as land use, zoning and public policy, open space, historical and cultural resources, transportation and noise, among others. An assessment of neighborhood character was completed as the proposed temporary pipeline has the potential to impact noise during construction as discussed in Section 9.18.6.13, “Construction.”

Existing Conditions

The character of the study area is largely defined by a mix of residential, public service, open space, vacant and portions of agricultural land uses. The temporary pipeline’s physical setting is within a rural location. The temporary pipeline would traverse the study area in a general north to south direction and would be largely located within a right-of-way associated with the existing Catskill Aqueduct. Mountain Rest Road traverses the northern portion of the study area, paralleling an unnamed tributary to Kleine Kill which flows to the south. The study area is bounded to the south by New Paltz-Minnewaska Road (also known as State Route 299 and County Route 8), a heavily traveled two-lane arterial, and to the east by Lenape Lane, a local roadway.

Future Without the Proposed Project

DEP has previously consulted with the Towns of New Paltz and Gardiner and Ulster County, and it is DEP’s understanding that no changes in land use and no new projects or structures are anticipated within the study area within the timeframe of the impact analysis. Therefore, in the future without the temporary pipeline, it is assumed that neighborhood character within the study area would remain the same as existing conditions.

Probable Impacts with the Proposed Project

The temporary pipeline would be located within a public services corridor which is owned and maintained by DEP and vacant land where the temporary pipeline diverges from the Catskill Aqueduct. Primary staging would occur at the Wallkill Downtake Chamber. Access to the Wallkill Downtake Chamber would occur via New Paltz-Minnewaska Road to an existing gravel access road. An existing parking area off Mountain Rest Road would serve as a secondary staging area, and provide additional parking. As detailed in the UWSR DEIS, staging and access improvements would be completed to facilitate access to the Wallkill Downtake Chamber as part of the larger repair and rehabilitation project. These improvements were assessed in the UWSR DEIS and are currently scheduled to be completed during spring or summer 2018, prior to commencement of the proposed temporary pipeline project.

As described previously, no analysis of potential impacts to land use and zoning due to the proposed temporary pipeline was required. In addition as discussed in Section 9.18.6.3, “Open Space and Recreation” and Section 9.18.6.4, “Historic and Cultural Resources,” the work activities would not adversely affect, open space and recreation, or historic and cultural resources in the study area. Furthermore, the public policy impact analysis provided in Section 9.18.6.1, “Land Use, Zoning, and Public Policy,” concluded the work activities were consistent with applicable plans.

As described in Sections 9.18.6.8, “Transportation,” and 9.18.6.10, “Noise,” during construction, the work activities in the study area would be short-term and would result in a temporary increase in traffic and noise. Following completion of installation of the temporary pipeline, construction equipment and vehicles would be removed from the study area and traffic patterns would return to existing conditions. These temporary increases in traffic and noise levels would not result in a density of activity or service conditions that would affect the overall character of the study area.

The temporary pipeline would not generate significant adverse effects on public policy, open space and recreation, historic and cultural resources, transportation, or noise. Therefore, the proposed temporary pipeline would not result in significant adverse impacts to neighborhood character.

9.18.6.12 Public Health

The CEQR Technical Manual identifies that a public health assessment is not warranted where “no significant unmitigated adverse impact is found in other CEQR analysis areas, such as air quality, water quality, hazardous materials or noise.” As discussed above, operation of the proposed temporary pipeline would not result in significant adverse effects related to air quality, hazardous materials, transportation, or noise. Therefore no significant adverse effects to public health associated with exposure to contaminated materials, traffic, air quality, or noise would occur; nor would any federal, State, or local standards be exceeded. The project would also not involve solid waste management practices that would attract pest or vermin to the area. Therefore, the temporary pipeline would not result in significant adverse impacts to public health within the study area.

9.18.6.13 Construction

The sections below provide a description of the construction activities and equipment associated with the proposed temporary pipeline and the potential effects on transportation, air quality, and noise in the study area for the 2018 build year. Construction activities and equipment would include mobilization, site preparation, construction, and demobilization, as appropriate, as well as equipment that would be present on-site to carry out these activities.

Transportation

The study area for the transportation analysis consists of the major convergent roadways that would potentially be used by the employees and construction vehicles associated with the proposed temporary pipeline.

To support activities within the temporary pipeline study area, the primary staging area, from which workers would be transported to the site daily, would be located at the Wallkill Downtake Chamber. Access to the Wallkill Downtake Chamber would occur via New Paltz-Minnewaska Road (State Route 299) to an existing gravel access road. An existing parking area off Mountain Rest Road (County Route 6) would serve as a secondary staging area, and provide additional parking. To the extent available, construction vehicles would travel on truck-permitted roadways directly to and from the work sites within the temporary pipeline study area.

DEP had previously consulted with the Towns of New Paltz and Gardiner and Ulster County, and it is DEP's understanding that no changes in land use or an increase in traffic due to outside developments are anticipated within the temporary pipeline study area within the timeframe of the impact analysis. Therefore, in the future without the temporary pipeline, it is assumed that traffic, public transportation, and pedestrian activities within the study area would be similar to existing conditions.

Work activities would mainly consist of the installation of the temporary pipeline and construction of the temporary pumping system. Temporary pipeline installation would generate the most vehicle trips and was therefore the basis of the construction transportation analysis.

The temporary pipeline installation would result in approximately 28 peak-hour PCEs along New Paltz-Minnewaska Road, which is below the *CEQR Technical Manual* screening threshold of 50 peak-hour PCEs. In addition, the construction work activities within the temporary pipeline study area would be short-term, significantly less than two years in duration (approximately 30 days) and would not generate public parking, transportation demands or pedestrian activity within the study area. Following completion of the temporary pipeline construction, traffic patterns would return to existing conditions.

Therefore, although there would be a minor temporary increase in traffic, the construction of proposed temporary pipeline would not result in significant adverse impacts to transportation within the study area.

Air Quality

The temporary pipeline construction work activities would be short-term in nature, approximately 30 work days. Air quality emissions from mobile and stationary sources

associated with the temporary pipeline construction would primarily consist of construction equipment, including worker and delivery vehicles, and fugitive dust emissions associated with excavation and grading activities and diesel exhaust from heavy equipment (e.g., generator, trencher, excavator, material delivery trucks). The number of heavy equipment units that would be needed at a given location within the temporary pipeline study area at a single time would be limited. Once construction is completed, the construction equipment and vehicles would be removed from the work sites. Therefore, an air quality impact analysis related to construction of the temporary pipeline is not warranted.

Noise

Stationary Noise

The study area for the noise analysis is the area within 1,500 feet of the temporary pipeline construction work activities as shown on **Figure 9.18-8**, which encompasses areas within the Towns of New Paltz and Gardiner. The study area is split into three distinct areas (polygons), which together are considered the noise study area. One worst-case receptor was analyzed for each type of receptor (i.e., residence, emitting property line) within the three noise study area polygons.

The temporary pipeline noise study area included residential parcels located in the northern and southern portions of the study area. It also included the Mohonk Preserve and a recreational trail in the center portion of the study area. These were considered noise-sensitive receptors for this analysis. The construction work activities were evaluated to determine compliance with local noise codes.

The construction activities within the study area are subject to the Towns of New Paltz and Gardiner Noise Control Laws. The Town of New Paltz Noise Control Law (§100-3.B) prohibits construction work between the hours of 8 PM and 7 AM, specifically the operation of pile drivers, steam shovels, pneumatic hammers, derricks, hoists, or other equipment that creates loud or unusual noise. The Town of Gardiner Noise Control Law (§220-40.C) limits daytime and nighttime noise levels at the property line of the lot from which noise is emitted. However, construction and maintenance activities between 8 AM and sunset are exempt. Noise between the hours of 7 AM and 8 PM cannot exceed 70 dBA, and noise between the hours of 8 PM and 7 AM cannot exceed 60 dBA.

It is DEP's understanding that no major projects that would result in a change in land use, or new noise-generating sources that would contribute to an increase in ambient noise levels are anticipated within the temporary pipeline study area within the timeframe of the impact analysis. Therefore, in the future without the proposed temporary pipeline, it is assumed that ambient noise levels within the study area would be similar to existing conditions.

In the future with the proposed temporary pipeline, stationary noise-producing activities associated with construction of the temporary pipeline would occur at five primary sites: near Mountain Rest Road at the northern end of the study area, Wallkill Downtake Chamber at the southern end of the study area, and two road crossings between Mountain Rest Road and the Wallkill Downtake Chamber in the center portion of the study area. The northern and southern noise-producing work sites are more than 1,500 feet apart and include unique receptors.

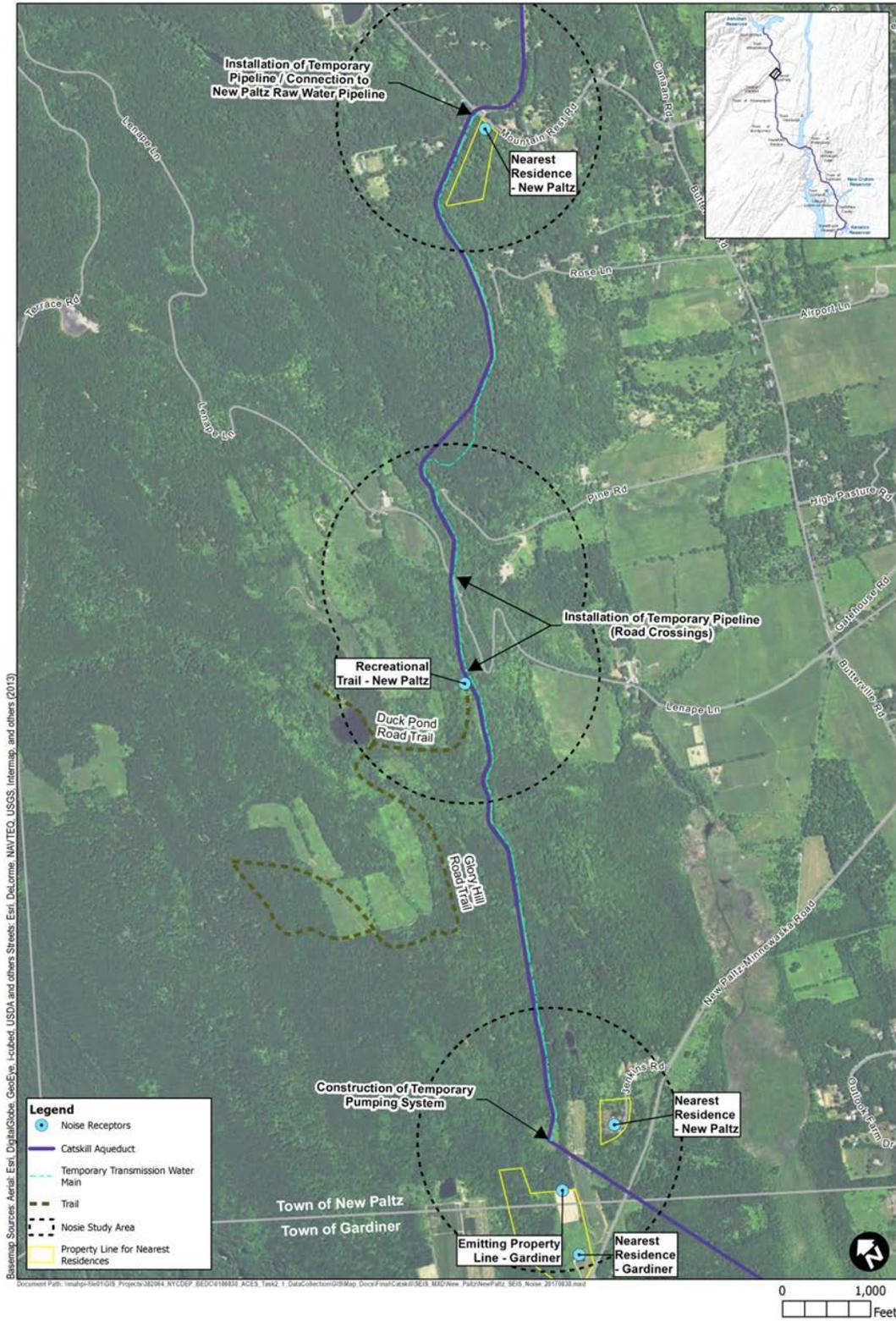


Figure 9.18-8: Construction - Noise – New Paltz Temporary Transmission Water Main Study Area



Work associated with road and trail crossings were also located more than 1,500 feet from the Mountain Rest Road and Wallkill Downtake Chamber work areas and included unique receptors. Therefore, three areas were included in the stationary noise analysis.

In the northern portion of the study area, the stationary noise-generating equipment associated with the connection of the temporary pipeline at Mountain Rest Road would emit the most noise. In the southern portion of the study area, the stationary noise-generating equipment associated with the construction of the temporary pumping system at the Wallkill Downtake Chamber would emit the most noise. In the center portion of the study area, installation of the temporary pipeline near the Mohonk Preserve and recreational trails would be the loudest noise-producing activity near these recreational land uses.

The noise analysis focused on the three loudest stationary noise-generating equipment types necessary for each of the temporary pipeline construction work activities. **Table 9.18-3** lists the noise-generating equipment that would be used during each of the temporary pipeline construction work activities and the associated reference noise levels. The types of noise-generating equipment analyzed were conservatively based on peak construction operating conditions.

Table 9.18-3: Stationary Source Construction Equipment Modeled - Noise Analysis and Reference Noise Levels (L_{eq}) – New Paltz Temporary Transmission Water Main Study Area

<u>Equipment Type</u>	<u>Reference Noise Level (L_{eq}) at 50 feet (dBA)[†]</u>
<u>Installation of Temporary Pipeline (Mountain Rest Road and Road/Trail Crossings – 8 AM to 6 PM or Sunset, whichever is earlier, Monday through Friday)</u>	
Trencher	82
Excavator	81
Welder	69
<u>Construction of Temporary Pumping System (Wallkill Downtake Chamber – 8 AM to 6 PM or Sunset, whichever is earlier, Monday through Friday)</u>	
Hand Tools	82
Excavator	81
Loader	76
<u>Note:</u> <u>[†] CEQR Technical Manual, Chapter 22.</u>	

The construction of the temporary pumping system would result in a noise level of up to 64 dBA at the nearest emitting property line in the Town of Gardiner (see **Table 9.18-4**). Therefore, the construction work activities would not exceed the Town of Gardiner noise level limits.

Following the removal of the temporary pipeline, noise levels from stationary construction noise sources within the study area would return to existing conditions. Therefore, although there would be a temporary increase in noise during the construction of the temporary pipeline, noise

from the construction work activities would be for a short period of time (ranging from 10 to 30 work days dependent upon location) would not result in significant adverse impacts to sensitive receptors within the temporary pipeline study area.

Table 9.18-4: Stationary Construction Noise Analysis Results (L_{eq}) at the Nearest Noise-Sensitive Receptors – New Paltz Temporary Transmission Water Main Study Area

<u>Nearest Noise-Sensitive Receptor</u>	<u>Distance from Site (Feet)</u>	<u>Predicted Stationary Noise Level (L_{eq}) at Noise-Sensitive Receptor (dBA)</u>	<u>Town of New Paltz Noise Limit</u>	<u>Town of Gardiner Noise Limit</u>	<u>Potential for Exceedance (Yes, No or NA)¹</u>
<u>Installation of Temporary Pipeline (Mountain Rest Road and Road and Trail Crossings – 8 AM to 6 PM or Sunset, whichever is earlier, Monday through Friday)</u>					
<u>Recreational Trail (Mohonk Preserve)</u>	<u>150</u>	<u>75</u>	<u>NA</u>	<u>NA²</u>	<u>NA</u>
<u>Nearest Residence – New Paltz</u>	<u>177</u>	<u>74</u>	<u>NA</u>	<u>NA²</u>	<u>NA</u>
<u>Construction of Temporary Pumping System (Walkkill Downtake Chamber – 8 AM to 6 PM or Sunset, whichever is earlier, Monday through Friday)</u>					
<u>Nearest Residence - New Paltz</u>	<u>754</u>	<u>62</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
<u>Nearest Residence - Gardiner</u>	<u>1,347</u>	<u>57</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
<u>Emitting Property Line - Gardiner</u>	<u>592</u>	<u>64</u>	<u>NA</u>	<u>70³/60⁴</u>	<u>No</u>
<u>Notes:</u>					
NA = Not Applicable					
¹ Potential for Exceedance outcomes are:					
<ul style="list-style-type: none"> • <u>“Yes” if there is an applicable quantitative town noise limit and the predicted stationary noise level at the noise-sensitive receptor would exceed that limit.</u> • <u>“No” if there is an applicable quantitative town noise limit and the predicted stationary noise level at the noise-sensitive receptor would not exceed that limit.</u> • <u>“NA” if there is no applicable quantitative town noise limit.</u> 					
² The Town of Gardiner is located outside of the 1,500-foot noise study buffer.					
³ Noise limit is applicable between the hours of 7 AM and 8 PM.					
⁴ Noise limit is applicable between the hours of 8 PM and 7 AM.					

Mobile Noise

Mobile noise sources associated with the temporary pipeline work would include vehicles traveling to and from the work sites and staging areas within the study area. A mobile noise screening assessment was conducted to determine if a mobile noise analysis was warranted. The mobile noise screening assessment accounts for such factors as location of the work activities in relation to noise-sensitive receptors and the magnitude and intensity of work activities. Mobile noise sources would range from 8 to 18 peak-day vehicle trips (192 to 662 noise PCEs). All vehicle trips were assumed to occur during the peak hour. However, the temporary pipeline construction activities would be short-term (between 10 and 30 work days) and intermittent in nature with the peak number of vehicle trips to and from the work sites occurring during a limited period during the overall duration of construction activities. Therefore, a noise impact analysis related to mobile noise associated with the construction of the temporary pipeline is not warranted