



December 18, 2019

Mr. Muhammad Khan, PE  
NV5  
32 Old Slip, Suite 401  
Middletown, NY 10005-3500

**Re: Wetland Investigation Technical Memorandum  
Monhagen Brook Culvert Project – Site 1  
West Main Street over Monhagen Brook  
City of Middletown, Orange County, NY**

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On November 26, 2019, Amy Greene Environmental, a Davey Company (AGE) staff conducted a wetland investigation at the proposed culvert project located in the City of Middletown, Orange County, NY (See **Figure 1** – Site Location Map and **Figure 2** – USGS Topographic Map in **Appendix A**). The project is located within the context of Valley and Ridge Physiographic Province of New York and appears on the Middletown, NY USGS 7.5-minute Topographic Quadrangle. The proposed project is located within the National Hydrography Dataset (NHD) Hydrologic Unit Code (HUC12) 020200070402 Masonic Creek-Walkkill River. The proposed site activity includes the replacement of the existing box culvert under West Main Street.

The project study area is comprised mainly of woods, light commercial, and residential lots. The site topography is flat and site elevation is approximately 595 feet mean sea level (msl). The project is located within a suburban residential area. The project is bounded to the northeast by light commercial buildings and Dorothy Dix Drive beyond and northwest by an open lot and woods, and to the southeast and southwest by residential lots. Site photographs are attached in **Appendix B**.

#### **WETLAND DELINEATION SUMMARY**

The purpose of the wetland investigation was to determine the potential of wetland habitat within the project study area. The investigation was performed in accordance with the criteria set forth in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region Version 2.0* (January 2012). The project study area was observed for signs of hydric soils, hydrophytic vegetation, and/or wetland hydrology. One waterbody, Monhagen Brook, was delineated along the ordinary high water mark (OHWM) within the project study area. Detailed findings of the investigation are presented below in accordance with these criteria.

### Preliminary Data Gathering

A desktop review of existing published information was completed to determine the approximate extent of wetlands within and proximal to the site location. The desktop review included the gathering and review of various online data layers and maps including:

- USGS Topographic Map
- US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soils Survey Geographic (SSURGO) Soils database mapping
- US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map
- New York State Department of Environmental Conservation (NYSDEC) Freshwater Wetland and Streams map
- Aerial Photography

No soils with hydric inclusions were found within the project study area on Orange County USDA-NRCS SSURGO Soils Mapping (**Figure 3**). No wetlands were mapped within the project study area by the USFWS NWI map (**Figure 4**) or NYSDEC freshwater wetland mapping (**Figure 5**).

The NYSDEC mapping does not map wetlands onsite. The nearest mapped feature is one NYSDEC-mapped wetland, located approximately 4,350 feet northeast of the site. The Monhagen Brook runs generally northwest to southeast through the project study area. USFWS NWI mapping shows one mapped Freshwater Pond, Lake, or Riverine wetland onsite classified as ‘R3UBH – Riverine, Upper perennial, Unconsolidated bottom, Permanently flooded’.

### Soils

USDA-NRCS SSURGO Soil mapping identified Erie gravelly silt loam (ErB) soil type within the project study area (**Appendix A, Figure 3 – SSURGO Soils Map**). Descriptions of these soils include silt loam with 3-8% slopes with parent material is described as ‘Loamy till derived from siltstone, sandstone, shale, and limestone’. ErB soils mapped by the soil survey is not listed as hydric and is considered somewhat poorly drained. Hydric soils characterized by low chroma matrix and mottling were not identified within the project study area in any investigative soil samples less than 12” deep. Soils in the field observations were silt- and sandy-loam with some gravel. Soils were generally a 10YR 2/2 color to approximately 2” below ground surface with a silt-loam texture. Below 2”, soils were a 10YR 5/3 color with a sandy-loam texture.

### Vegetation

Vegetation identified within the project study area was mowed and maintained as lawn dominated by Kentucky blue grass (*Poa pratensis*, FACU). Other vegetation identified on the banks of Monhagen Brook included Norway maple (*Acer platanoides*, UPL), white ash (*Fraxinus americana*, FACU), red osier (*Cornus alba*, FACW), European privet (*Ligustrum vulgare*, FACU), wine raspberry (*Rubus phoenicolasius*, FACU), Japanese barberry (*Berberis thunbergii*, FACU), Japanese-knotweed (*Reynoutria japonica*, FACU), common timothy (*Phleum pratense*, FACU), reed canary grass (*Phalaris arundinacea*, FACW), common wormwood (*Artemisia*

*vulgaris*, UPL), Japanese stilt grass (*Microstegium vimineum*, FAC), Asian bittersweet (*Celastrus orbiculatus*, UPL), and Japanese honeysuckle (*Lonicera japonica*, FACU). The right bank of Monhagen Brook northwest of West Main Street and both banks south of West Main Street indicated signs of recent streambank restoration efforts with new rip-rap banks. The northwest bank had several new plantings of northern bayberry (*Morella pensylvanica*, FAC) and red osier.

### Hydrology

No indicators of wetland hydrology were observed within the proposed project study area. The soil was dry and compacted south of West Main Street and gravel fill north of West Main Street.

### **CONCLUSION**

Based on the developed conditions of the general land use surrounding the project study area, lack of hydric vegetation, lack of hydric soils, and lack of indicators of wetland hydrology; it is AGE's professional opinion that *no wetlands exist* within the project study area located in the City of Middletown, Orange County, NY. This opinion is based on our understanding of current State and Federal Laws and Regulations concerning the protection of wetlands and "Waters of the United States" within the State of New York. Any proposed work activities below the OHWM on Monhagen Brook may require a U.S. Army Corps of Engineers Nationwide Permit 3 - Maintenance.

Prepared by:

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**Autumn M. Thomas, PWS, QBTS**

Cc: Sue Quackenbush, AGE

AGE #4438

Appendix A  
Figures



**Study Area**

**Legend**

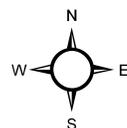
 Study Area



**Figure 1**  
**Site Location Map**

West Main Street Culvert  
Replacement Project  
City of Middletown  
Orange County, New York

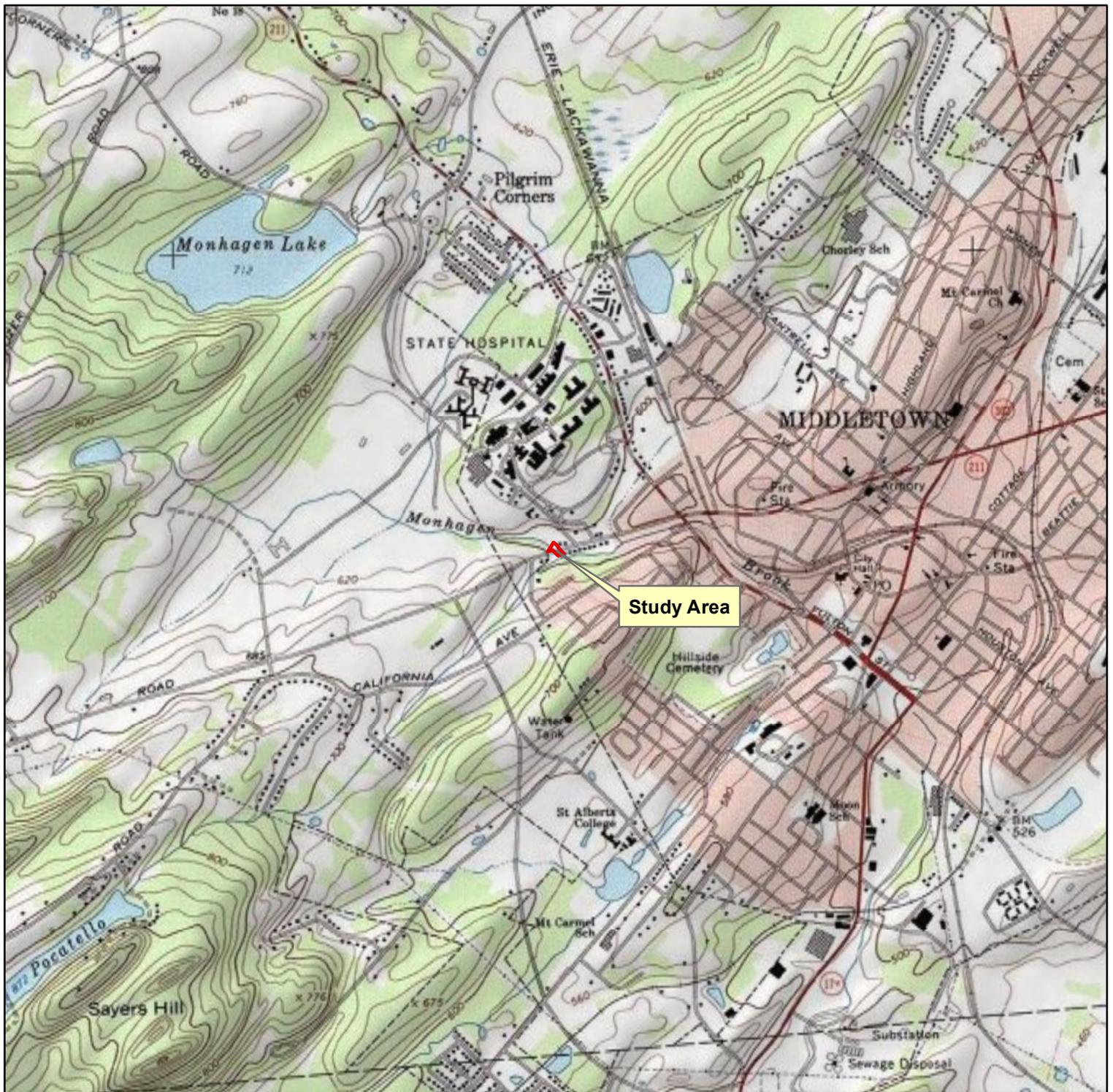
ASGECI Project # 4438



3,000  
Feet



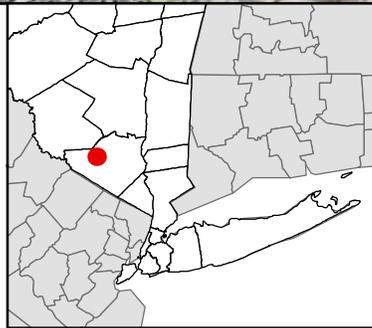
Source:  
ESRI Street Map was developed using Esri basemap data, DeLorme basemap layers, U.S. Geological Survey elevation data, HERE data, and select data from the GIS user community, released by ESRI® Data & Maps, Redlands, California, 2019.



**Legend**

 Study Area

Latitude & Longitude Coordinates in NAD83  
for the approximate center of the study area -  
N: 41° 26' 48.22" / W: 74° 26' 16.84"

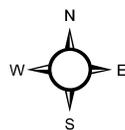


**Figure 2**  
**USGS Topographic Map**

West Main Street Culvert  
Replacement Project  
City of Middletown  
Orange County, New York

ASGECI Project # 4438

Source:  
National Geographic Society (NGS) USA Topographic Maps, seamless, scanned images of  
United States Geological Survey (USGS) paper topographic maps, Middletown NY Quadrangle,  
copyright 2013, distributed as a web mapping service by ESRI® Data & Maps, Redlands, California, 2019.



2,000  
  
Feet



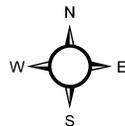


**Legend**

 Study Area

**SOILS LIST:**

ErB - Erie gravelly silt loam, 3 to 8 percent slopes



**Figure 3**  
**SSURGO Soils Map**

West Main Street Culvert  
Replacement Project  
City of Middletown  
Orange County, New York

ASGECI Project # 4438

50



Feet



Sources: Soil Survey Geographic (SSURGO) database for Orange County, New York, U.S. Department of Agriculture, Natural Resources Conservation Service, Fort Worth, Texas, September 2019. World Imagery, a composite of imagery provided by Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES / Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, distributed by ESRI® Data & Maps, Redlands, California, 2019.



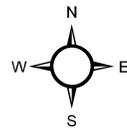
**Legend**

-  Study Area
-  Stream (with classification)
-  NWI Freshwater Wetland
-  NWI Estuarine / Marine Wetland
-  NWI Freshwater Pond, Lake, or Riverine

Water Quality Classifications  
 C - Best usage is fishing; suitable for fish propagation & survival.

**NWI WETLAND CLASSIFICATIONS:**  
 R3UBH - Riverine, Upper Perennial, Unconsolidated Bottom, Permanently Flooded

Sources: Classification of Wetlands and Deepwater Habitats of the United States (New York State), U.S. Department of the Interior, Fish and Wildlife Service, National Wetlands Inventory, Washington, DC., October 2019. Water Quality Classifications (WQC) - NYS (NYSDEC), NYS Department of Environmental Conservation, Division of Water, Bureau of Flood Protection and Dam Safety, vector digital data, NYSDEC, Albany, New York, May 2019. World Imagery, a composite of imagery provided by Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES / Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, distributed by ESRI® Data & Maps, Redlands, California, 2019.



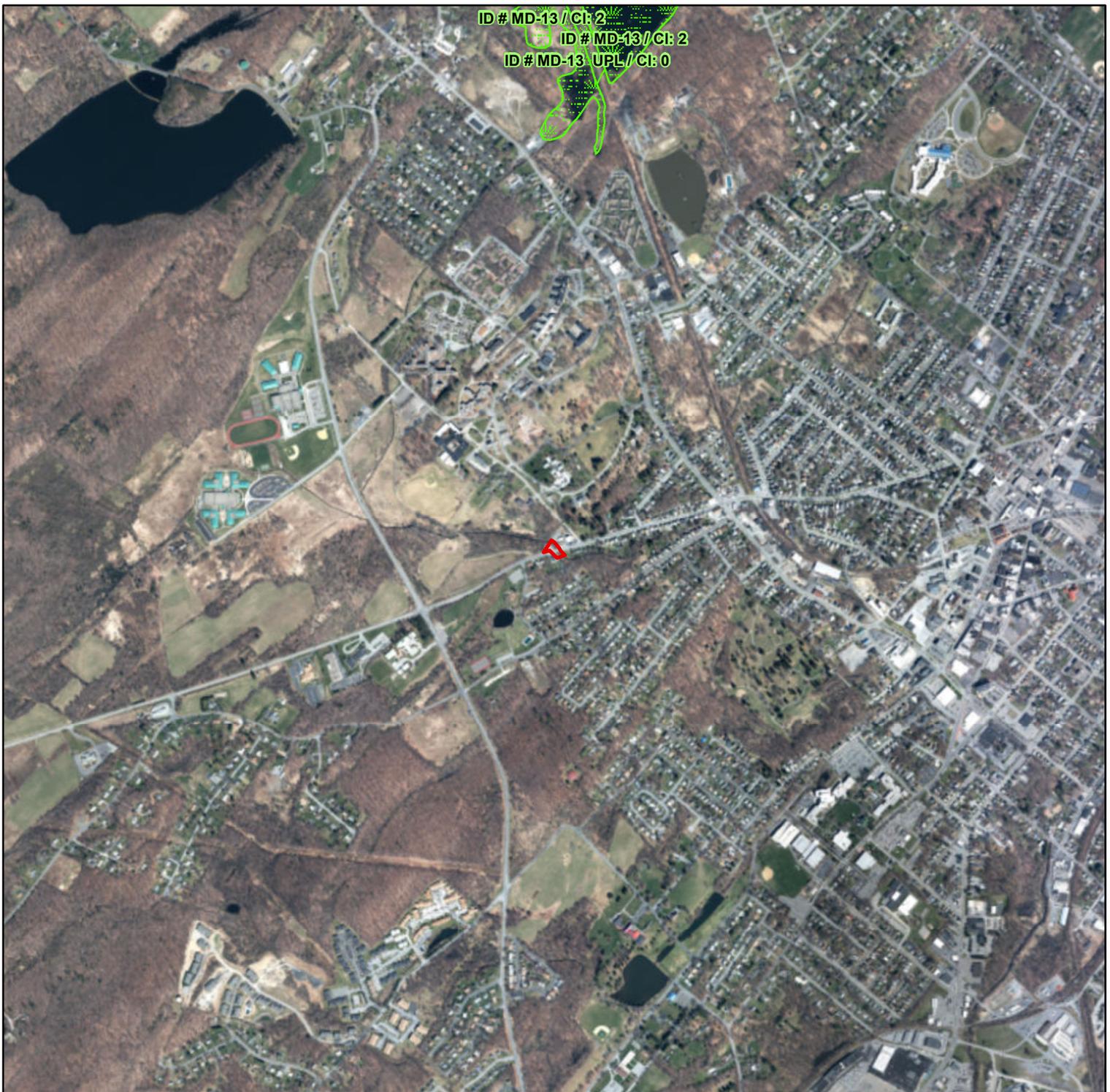
**Figure 4**  
**NWI Wetlands Map**

West Main Street Culvert  
 Replacement Project  
 City of Middletown  
 Orange County, New York

ASGECI Project # 4438

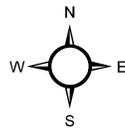
200  
 Feet





**Legend**

-  Study Area
-  NYSDEC Wetlands



**Figure 5**  
**NYSDEC Wetlands Map**

West Main Street Culvert  
Replacement Project  
City of Middletown  
Orange County, New York

ASGECI Project # 4438

Sources: New York State Regulatory Freshwater Wetlands For Orange County, New York State Department of Environmental Conservation (NYSDEC), Latham, NY, 1999. Water Quality Classifications (WQC) - NYS (NYSDEC), NYS Department of Environmental Conservation, Division of Water, Bureau of Flood Protection and Dam Safety, vector digital data, NYSDEC, Albany, New York, May 2019. World Imagery, a composite of imagery provided by Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES / Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, distributed by ESRI® Data & Maps, Redlands, California, 2019.

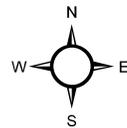
1,500  
  
Feet





**Legend**

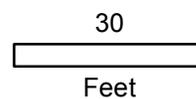
-  Study Area
-  Photograph Location with direction
-  Monhagen Brook OHWM GPS Points
-  Monhagen Brook OHWM Line
-  Soil Sample Location



**Figure 6 - Delineated Wetland & Waterbody Map**

West Main Street Culvert Replacement Project  
 City of Middletown  
 Orange County, New York

ASGECI Project # 4438



Sources:  
 Photograph Locations provided by Amy S. Greene Environmental Consultants Inc. based on fieldwork conducted December 2019.  
 GPS Points and Lines provided by Amy S. Greene Environmental Consultants Inc. based on fieldwork conducted November 2019.  
 Soil Sample Locations provided by Amy S. Greene Environmental Consultants Inc. based on fieldwork conducted December 2019.  
 World Imagery, a composite of imagery provided by Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES / Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, distributed by ESRI® Data & Maps, Redlands, California, 2019.

Appendix B  
Site Photographs

*MONHAGEN BROOK CULVERT PROJECT  
MIDDLETOWN, ORANGE COUNTY, NY  
SITE PHOTOLOG*



**Photo 1:** View looking northwest and upstream along Monhagen Brook from West Main Street bridge (11/26/19).



**Photo 2:** View looking southeast and downstream along Monhagen Brook from West Main Street bridge (11/26/19).



**Photo 3:** View looking northwest and upstream along Monhagen Brook towards existing West Main Street bridge from edge of limits of disturbance (11/26/19).



**Photo 4:** View looking southeast and downstream from edge of limits of disturbance (11/26/19).



**Photo 5:** View looking west across gravel pull-off adjacent to Monhagen Brook from West Main Street bridge (11/26/19).



**Photo 6:** View looking east from West Main Street bridge at adjacent abandoned lot (11/26/19).