Chapter 5: Geology, Soils, and Topography

A. INTRODUCTION AND SUMMARY OF FINDINGS

This chapter describes the Project Site's existing geology, soils, and topography, and analyzes potential impacts to on-site surface and subsurface geologic resources as a result of the Proposed Project. Bedrock geology, surface soils, and steep slopes are described based on published data from the United States Department of Agriculture (USDA) Web Soil Survey, the New York State Geological Survey, New York State High Resolution Digital Elevation Model data, information available through Westchester County GIS, and a site-specific Phase I Environmental Site Assessment ("Phase I ESA").

The Proposed Action would disturb approximately 20.29 acres of the Project Site (inclusive of the 10.74 acres of the Project Site that were previously disturbed) to demolish the existing buildings and associated site improvements and construct the 250 new dwelling units, roadways and associated parking, landscaping, amenities, and stormwater management facilities. As detailed in the analyses below, the cut/fill activities associated with these improvements, inclusive of the measures included to avoid and mitigate adverse impacts, would not result in significant adverse impacts to on-site surface and subsurface geologic resources.

B. EXISTING CONDITIONS

B.1. SOILS

Seven soil complexes are situated within or immediately adjacent to the Project Site. These soil types are described in greater detail in **Table 5-1** and depicted on **Figure 5-1**. The mapped soils are consistent with areas characterized by hills and/or steep slopes. Nearly all of these soil complexes are associated with Charlton Fine Sandy Loam or Charlton Loam (ChB, ChC, ChD, ChE, and ClD). The Charlton soil series typically represent well-drained soils found on hills and ridges in areas with varying slopes that range between 3 to 8 percent (ChB); 8 to 15 percent (ChC); 15 to 25 percent (ChD and ClD); and 25 to 35 percent (ChE). In one area, soils are characterized as part of the Charlton-Chatfield Complex, where slopes range from 0 to 15 percent and soils are characterized as very rocky (CrC). These soil complexes and/or their component soil types are summarized in **Table 5-1** and depicted on **Figure 5-1**.

Table 5-1
Study Area Soils

Series Name (Map Symbol)	Soil Horizon Depth (in)	Soil Type	Slope (%)	Percentage of Project Site	Drainage	Landform
Charlton-Chatfield, Very Rocky (CrC)	Oe: 0 to 2	Moderately decomposed plant material	0 to 15	0.1%	Well-drained	Ridges and hills
	A: 2 to 4	Fine sandy loam				
	Bw: 4 to 27	Gravelly fine sandy loam				
	C: 27 to 65	Gravelly fine sandy loam				
Charlton Fine Sandy Loam (ChB, ChC, ChD and ClD)	Ap: 0 to 7	Fine sandy loam	ChB: 3 to 8 ChC: 8 to 15 ChD: 15 to 25	ChB: 49.3% ChC: 30.1% ChD: 19.6%	Well-drained	Ridges, ground moraines, and hills
	Bw: 7 to 22	Gravelly fine sandy loam				
	C: 22 to 65	Gravelly fine sandy loam				
Charlton Loam (ChE, ClD)	H1: 0 to 8	Loam	ChE: 25 to 35 ClD: 15 to 25	ChE: 0.3% ClD: 0.01%	Well-drained	Till plains, ridges, and hills
	H2: 8 to 24	Sandy loam				
	H3: 24 to 60	Sandy loam				

Note: See **Figure 5-1**.
Source: Soil Survey Staff, Natural Resources Conservation Service, U.S. Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed December 5, 2023.

B.2. TOPOGRAPHY

Approximately 10.74 acres of the Project Site have been previously disturbed to accommodate the current commercial office use. The undeveloped, northern, portion of the Project Site consists of forested land.

The topography of the currently developed portion of the Project Site ranges from a low of approximately 456 feet above mean sea level at the entrance to the Project Site, to a high of approximately 565 feet above sea level in the northern parking area. The currently developed portion of the Project Site generally slopes from north to south. Among the undeveloped areas of the Project Site, the highest elevation is 701 feet.

The areas and percentages of the Project Site within each slope category are quantified in **Table 5-2**. The Project Site features noticeable changes in topography, with areas of 15 percent or greater slopes comprising 52.4 percent of the Project Site (see **Figure 5-2**).

Table 5-2
Existing Slopes Within the Project Site (Surveyed Area)

Slope Grade	Area (acres)	Percent of Site
0% to 10%	9.67	27.2%
10% to 15%	7.22	20.4%
Greater than 15%	18.61	52.4%
Total	**35.5**	**100%**

Sources: New York State High Resolution DEM data, Site Design Consultants

B.3. GEOLOGY

According to the Surficial Geologic Map of New York Lower Hudson Sheet, retrieved from the New York State Museum, the Project Site is underlain completely by till (see **Figure 5-3**). The Bedrock underlying the Project Site is Biotite-quartz-plagioclase paragneiss. This geology is derived from the Middle Proterozoic age, and is comprised mostly from metamorphic,

metasedimentary and paragneiss constituents[1] (see **Figure 5-4**). The Phase I ESA also indicated that groundwater is likely present within fractured bedrock at the Project Site and likely flows to the west towards a nearby stream located approximately 500 feet from the Project Site.

C. THE FUTURE WITH THE PROPOSED PROJECT

Approximately 20.29 acres of the Project Site would be disturbed during construction of the Proposed Project, including the approximately 10.74 acres previously disturbed to construct the Project Site's current improvements (see Drawing C-104.2 in **Appendix I**). The existing and proposed lot and building coverage of the existing and proposed improvements is shown in **Table 5-3**. The Proposed Project would increase the building coverage from 1.9 percent to 10.5 percent and the total impervious coverage from 14.6 percent to 26.2 percent. Mitigation for the increase in impervious coverage would include the implementation of a comprehensive Stormwater Pollution Prevention Plan ("SWPPP"), which would outline methods to reduce the amount of stormwater runoff leaving the Project Site, as well as to improve the quality of the Project Site's runoff. Preliminary stormwater management practices have been designed, and are discussed in Chapter 10, "Stormwater Management."

Table 5-3
Existing and Proposed Building and Impervious Surface Coverage

	Existing Condition	Proposed Condition
Total Site Area (acres)	35.5	35.5
Total Permeable area (acres)	30.3	26.2
Total Impervious Area (acres)	5.2	9.3
Percent Impervious	14.6%	26.2%
Total Building Area (acres)	0.7	3.7
Percent Building Coverage	1.9%	10.5%

Note: Totals may not sum due to rounding.
Source: Site Design Consultants, Perkins Eastman

Approximately 8.55 acres of the disturbance required to construct the Proposed Project would occur on slopes greater than 15 percent and approximately 4.35 acres would occur on slopes between 10 percent and 15 percent. The remaining 7.39 acres of disturbance would occur on slopes less than 10 percent. The Proposed Project would require excavation of approximately 90,155 cubic yards of material (i.e., "cut") and would require approximately 8,319 cubic yards of fill material, resulting in a net cut of 81,836 cubic yards of earthen material. If all of the net cut material was removed from the Project Site, approximately 4,546 truck trips would be required, based on 18 cubic yards per truck. It is anticipated that these trips would be spread out over several months of the Proposed Project's construction, such that the number of truck trips per day would be reduced to a level that would not affect traffic operations. Earthwork would be conducted pursuant to an excavation and regrading permit issued pursuant to Chapter 248, "Stormwater Management and Erosion and Sediment Control," of the Town of Yorktown Code. Pursuant to that Chapter of the Town's Code, as well as State requirements, a Soil Erosion and Sediment Control Plan has been developed as part of the SWPPP for the Proposed Project. The SESC,

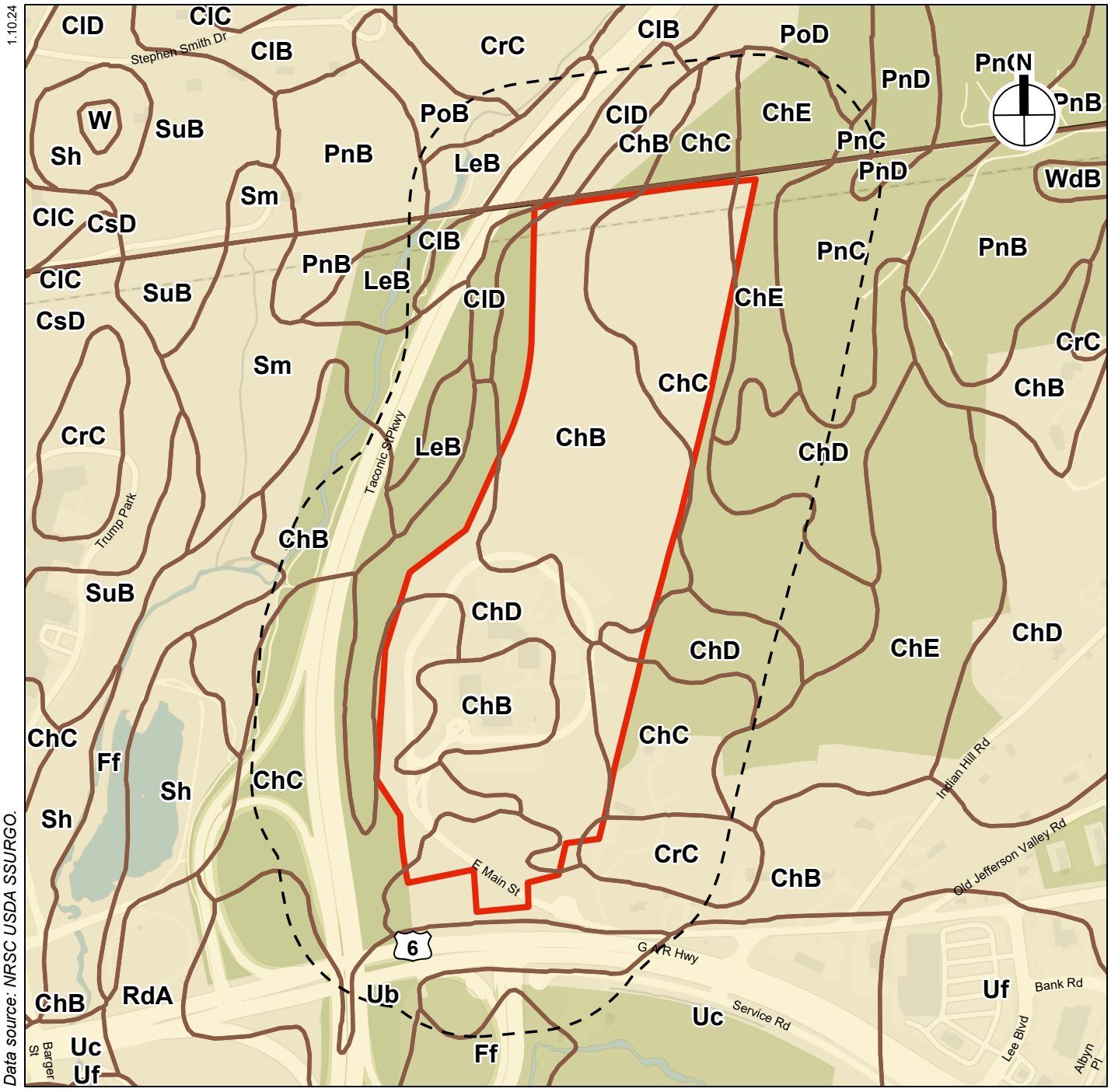
[1] Fisher, D.W., Isachsen, Y.W., and Rickard, L.V., 1970, Geologic Map of New York State, consisting of 5 sheets: Niagara, Finger Lakes, Hudson-Mohawk, Adirondack, and Lower Hudson, New York State Museum and Science Service, Map and Chart Series No. 15, scale 1:250,000. Accessed online at https://mrdata.usgs.gov/geology/state/sgmc-unit.php?unit=NYYbqpq%3B1 01/29/2024.

described in detail in Chapter 16, "Construction," details the methods by which soil erosion and runoff would be minimized during construction.

It is anticipated that rock removal will be required. Final determination of the need for rock removal would be determined as construction plans are advanced and additional data collected. If rock removal is necessary, hydraulic hammers could be used. While unlikely, any potential blasting would be conducted in accordance with Chapter 124, "Blasting and Explosives," of the Town of Yorktown Code and pursuant to a blasting permit that would be obtained from the Town. As per the Town Code, a notice of intent to blast would be delivered to all required recipients 30 days to 72 hours prior to blasting and a notice of blasting would be served 72 to 24 hours prior to blasting. Finally, per Section 124-7 of the Town Code, blasting would only be conducted on Monday through Saturday between 8:00 am and 5:00 pm.

D. MITIGATION MEASURES

Measures to mitigate potential impacts to geology, soils, and topography are included as part of the Proposed Project. During the construction phase, a SESC Plan would be implemented to mitigate potential soil erosion impacts. The SESC Plan is summarized in Chapter 16, "Construction." The Proposed Project would require the removal of approximately 81,836 cubic yards of earthen material from the Project Site. However, final grading of the Proposed Project, which would occur during the site plan approval phase of the Proposed Project, would be anticipated to reduce this amount by refining the grading and building plans to better balance the cut and fill. If a more balanced grading plan could not be achieved, and if all of the excess earthen material were removed from the Project Site, it would take approximately 4,546 truck trips. These trips would be spread throughout the duration of the Proposed Project's construction, such that the number of truck trips on any given day would be reduced to a level that would not affect traffic operations. Finally, a SWPPP would be prepared to manage stormwater runoff after the Proposed Project has been completed (see Chapter 10, "Stormwater Management"). With the implementation of such measures, no significant adverse impacts to geology, soils, or topography are anticipated as a result of the Proposed Project. ✷



Project Site

Soils

Soil Symbol - Soil Name

ChB - Charlton fine sandy loam, 3 to 8 percent slopes

ChC - Charlton fine sandy loam, 8 to 15 percent slopes

ChD - Charlton fine sandy loam, 15 to 25 percent slopes

ChE - Charlton loam, 25 to 35 percent slopes

CIB - Charlton fine sandy loam, 3 to 8 percent slopes, very stony

CIC - Charlton fine sandy loam, 8 to 15 percent slopes, very stony

CID - Charlton loam, 15 to 25 percent slopes, very stony

CrC - Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky

CsD - Chatfield-Charlton complex, 15 to 35 percent slopes, very rocky

Ff - Fluvaquents-Udifluvents complex, frequently flooded

LeB - Leicester loam, 2 to 8 percent slopes, very stony

PnB - Paxton fine sandy loam, 3 to 8 percent slopes

PnC - Paxton fine sandy loam, 8 to 15 percent slopes

PnD - Paxton fine sandy loam, 15 to 25 percent slopes

PoB - Paxton fine sandy loam, 0 to 8 percent slopes, very stony

PoD - Paxton fine sandy loam, 15 to 25 percent slopes, very stony

RdA - Ridgebury complex, 0 to 3 percent slopes

Sh - Sun loam

Sm - Sun loam, extremely stony

SuB - Sutton loam, 3 to 8 percent slopes

Ub - Udorthents, smoothed

Uc - Udorthents, wet substratum

Uf - Urban land

W - Water

WdB - Woodbridge loam, 3 to 8 percent slopes

NRCS Soils

800 EAST MAIN STREET

Figure 5-1

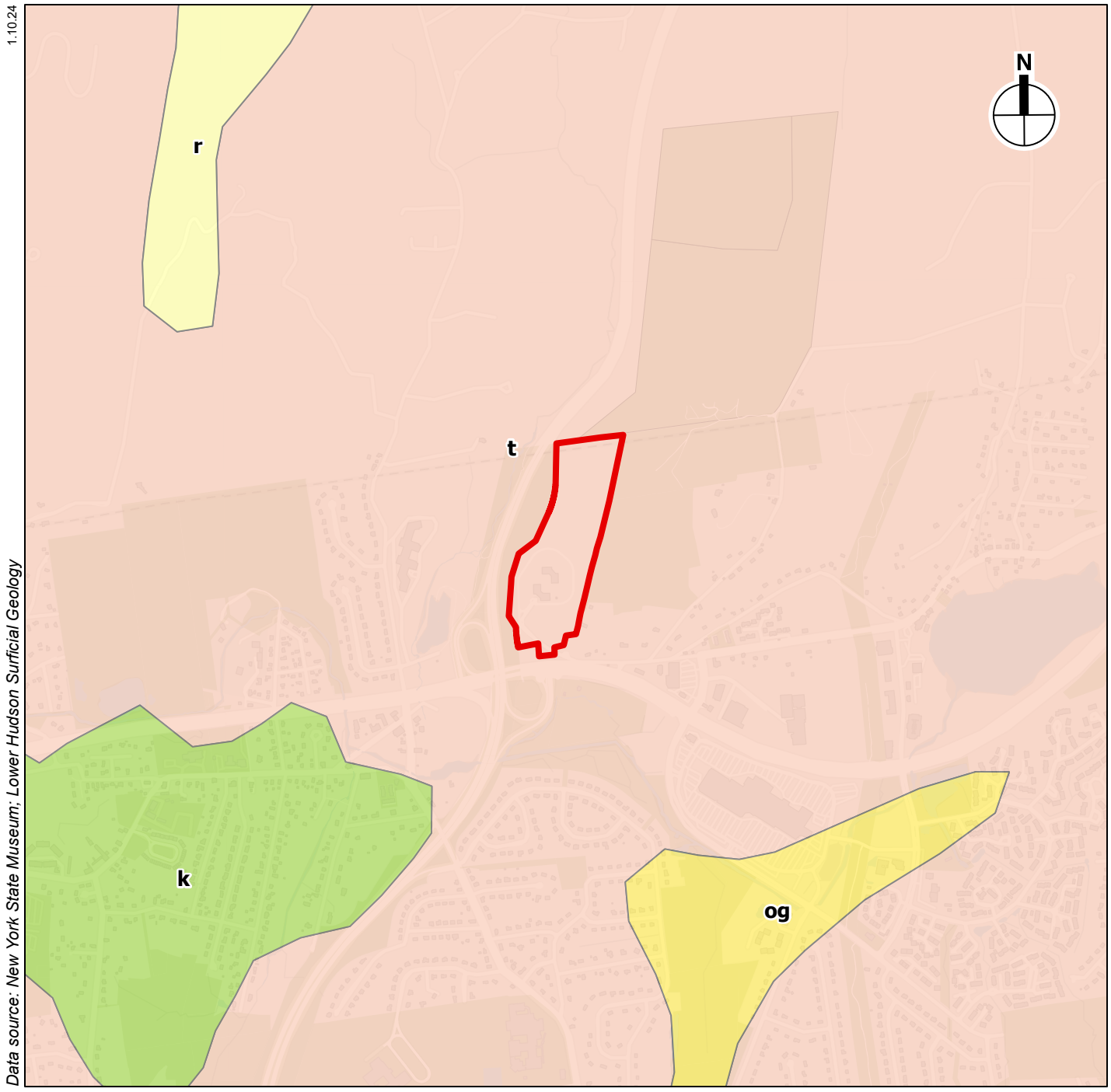
5.15.24

Data source: NYS High Resolution DEMs.

Topography

800 EAST MAIN STREET

Figure 5-2



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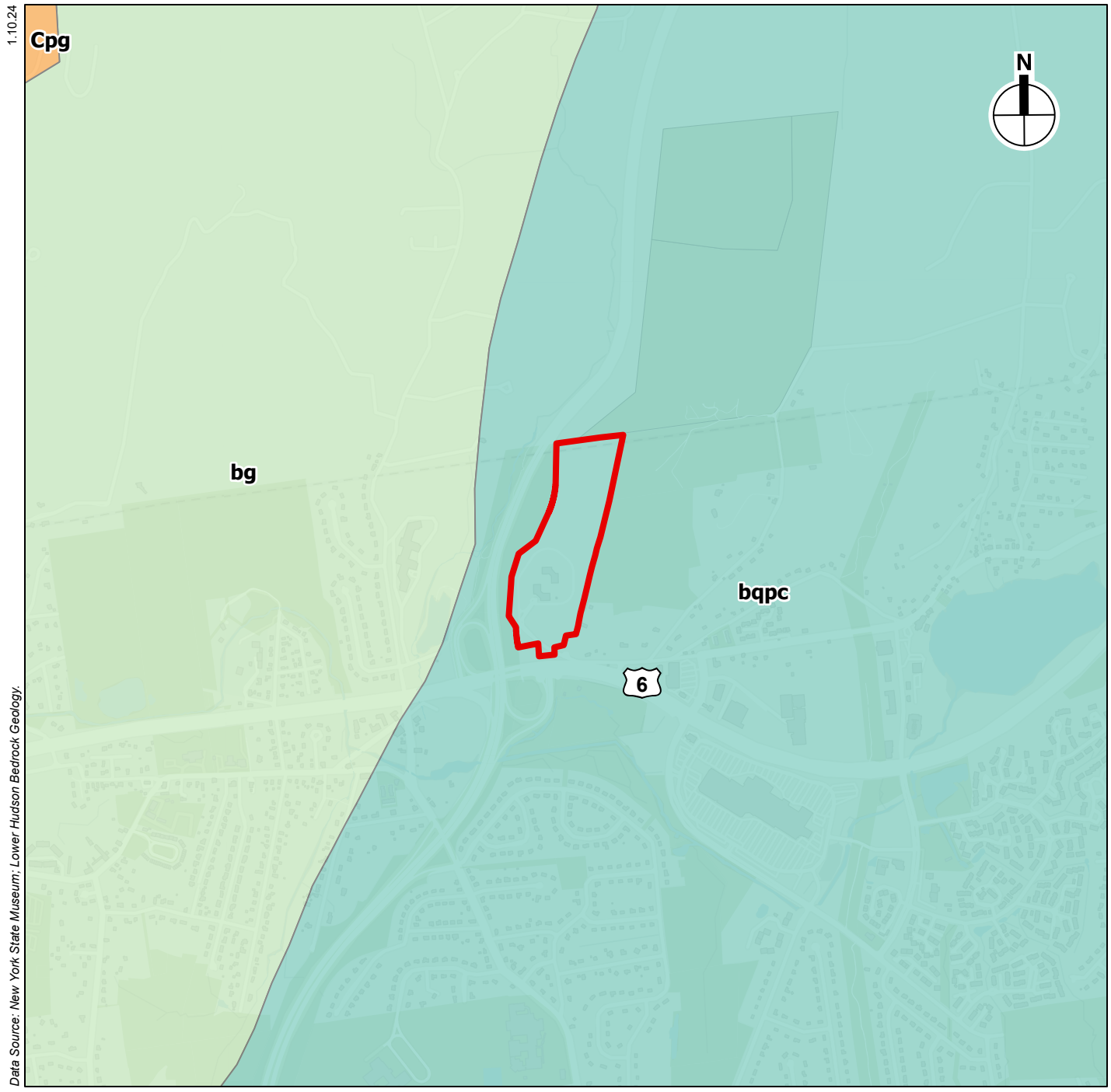
Surficial Geology

Figure 5-3



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Bedrock Geology

Figure 5-4