Woodstock School, Woodstock, CT

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Soil Scientist Report

Site Locus: 150 Rt. 169, Woodstock School, Woodstock, CT 06281

Prepared for: CHA Companies

Prepared by: Goddard Consulting LLC, 291 Main St, Suite 8, Northborough MA 01532

Date: 8/22/2023

INTRODUCTION

On August 16, 2023, the wetland resources were delineated on land located at 150 Rt. 169, Woodstock School, Woodstock, CT 06281 (refer to enclosed locus maps). The wetland boundaries were flagged using the criteria in the most recent edition of the Inland Wetlands and Watercourses Act (IWWA) and US Army Corps of Engineers standards using flag series GCA1-GCA10, GCA20-GCA27, and GCA30-GCA57. Hydric soil indicators, vegetation changes, hydrological indicators, and topography were all considered for delineation purposes.

The titles of attached documents are as follows:

- ACOE Delineation Data Sheets
- Figure 1: USGS of Locus Site, Goddard Consulting, LLC, 8/18/2023
- Figure 2: Orthophoto & Soils Map, Goddard Consulting, LLC, 8/18/2023
- Figure 3: Closeup Soils Map, Goddard Consulting, LLC, 8/18/2023
- Figure 4: FEMA Map, Goddard Consulting, LLC, 8/18/2023
- Figure 5: NDDB Rare Species Map, Goddard Consulting, LLC, 8/18/2023

INLAND WETLANDS AND WATERCOURSES ACT & BYLAW:

Inland resource areas were delineated in accordance with relevant federal, state, and local regulations. As stated in the IWWA Sec. 22a-38, "Wetlands" means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any soil types designed as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey..."

Additionally, "Watercourses" means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs, and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within flow through or border upon the City or any portion thereof... Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (a) evidence of scour or deposits of recent alluvium or detritus, (b) the presence of standing or flowing water for duration longer than a particular storm incident, and (c) the presence of hydrophytic vegetation."

MAPPED NRCS SOILS

The table below provides the regulatory jurisdiction, flag numbers/colors, and wetland types and locations for the resource areas delineated. Based on the State of Connecticut GIS Soil Survey information (see the Orthophoto & Soils Map), the soils in association with the site location primarily include Woodbridge fine sandy loam and Sutton find sandy loam. Brief descriptions of these types of soils are explained below.

Woodbridge Fine Sandy Loam: These soils are fine sandy loams that become gravelly around a depth of 30 inches or greater. The typical profile of this soil is 0 to 65 inches of depth, with slopes between 0 to 8 percent. These are moderately well drained soils with a depth to water table between 18 to 30 inches, and have no hydric rating. They can typically be found in ground moraines, hills, and drumlins.

<u>Sutton Fine Sandy Loam:</u> These soils are fine sandy loams which become more gravelly at greater depths. The typical profile for this soil is from 0 to 62 inches, with slopes between 0 to 15 percent. These are very deep, moderately well drained soils with a water table at around 12 to 27 inches, and have no hydric rating. They can typically be found in ground moraines and hills.

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<u>Ridgebury Fine Sandy Loam:</u> These soils are fine sandy loams which become gravelly at greater depths and have a layer of moderately decomposed plant material at the surface. The typical profile for these soils is from 0 to 66 inches, with slopes from 0 to 15 percent. These are poorly drained soils with a depth to water table of about 0 to 6 inches, and have a hydric rating. They can typically be found in ground moraines, hills, drumlins, depressions, and drainageways.

Based on the inspection of soils associated with the delineated wetland, the soil types researched appear to be consistent with what was discovered in the field.

OBSERVED ON-SITE SOILS

Consistent with the NRCS based soil survey, soils identified on the property were found to be similar, with sandy loams being the primary soil texture. Upland soils generally contained an A-Horizon with a depth of 0 to 8 inches, sandy loam texture, and a matrix of 10YR 4/2. Underlying this was a Bw-Horizon with a depth of 8 to 18+ inches, a sandy loam texture, and a matrix of 10YR 6/3. There was refusal at between 14 and 20 inches. Wetland soils generally contained an A-Horizon with a depth of 0 to 12 inches of depth, sandy loam texture, and matrix of 10YR 2/1. This was followed by a Bg-Horizon with a depth of 12 to 18+ inches, a sandy loam texture, and a matrix of 10YR 7/1.

VEGETATION

Vegetation in the upland consisted primarily of white pine, red oak, pignut hickory, red maple, maple leaf viburnum, jewelweed, multiflora rose, oriental bittersweet, morrow's honeysuckle, glossy buckthorn, Japanese barberry, poison ivy, goldenrod, primrose, and sensitive fern. Vegetation in the wetland primarily consists of red maple, red oak, green ash, morrow's honeysuckle, glossy buckthorn, oriental bittersweet, poison ivy, sensitive fern, and wild geranium. Vegetation differences between the upland and wetland were generally distinct, with obvious hydrophytes present here but absent from the adjacent upland areas. Vegetation in general was disturbed and invasive dominated in the upland areas.

HYDROLOGY AND WATERCOURSES

Multiple features of evident hydrologic conditions were identified on the property. A pool of standing water was found within the wetland east of the flag series GCA20-27, in addition to hydric soils. Two linear watercourses were identified along flag series GCA30-57. A narrow southern watercourse (flags GCA33-43) extends southeast from the main wetland, and terminates just before reaching a road. The northern watercourse (flags GCA55-57) extends north of the main wetland, and continues outside the delineated area.

FEMA FLOOD ZONES

The National Flood Hazard Layer provided by the Federal Emergency Management Agency (FEMA) does not depict the area of proposed development on site to be within a designated flood zone.

NDDB

The Natural Diversity Data Base (NDDB) does not depict the site to be within a Natural Diversity Area. The nearest NDDB area is over 500 feet southeast from the site boundary.

FINDINGS

Based on these hydric soil indicators, vegetation, hydrological indicators, and topography, the flagged locations on site were found to be the boundary of wetland and watercourse areas reviewed.

Sincerely,

Goddard Consulting, LLC

Steven Riberdy, MS, PWS, CWB, CERP, CE, PSS

Lead Biologist / Senior Manager / Palmer Office Manager



SITE PHOTOS



Photo 1. View of wetland (facing west) from flag GCA2 in the southeastern corner of the site.



Photo 2. View of upland (facing east) from flag GCA2 in the southeastern corner of the site.





Photo 3. View of upland path between wetland flags GCA10 & 20 (facing west).



Photo 4. View of standing water within wetland (facing west) between flags GCA20 & 27.





Photo 5. View of southern watercourse (facing northeast).



Photo 6. View of northern watercourse (facing north) at northern edge of delineation.

BORDERING VEGETATED WETLAND DETERMINATION FORM

Applicant/Owner: Woodstock School Investigator(s): Steven Riberdy Soil Map Unit Name: S1B NWI or DEP Classification: PFO1E UPGRADIENT Are climatic/hydrologic conditions on the site typical for this time of year? Are Vegetation Soil Or Hydrology Interval of this time of year? Are Vegetation Or Hydrology Interval of this time of year? Are Vegetation Or Hydrology Interval of this time of year? Are Vegetation Or Hydrology Interval of this time of year? Are Vegetation Or Hydrology Interval of this time of year? Are Vegetation Or Hydrology Interval of this time of year? Are Vegetation Or Hydrology Interval of this time of year? Are Vegetation of the site typical for this time of year? Are Vegetation of the site typical for this time of year? Are Vegetation of the site typical for this time of year? Are Vegetation Or Hydrology Or Hyd
Soil Map Unit Name: 51B
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks) Are Vegetation , Soil , or Hydrology significantly disturbed? (If yes, explain in Remarks) Are Vegetation , Soil , or Hydrology naturally problematic? (If yes, explain in Remarks) SUMMARY OF FINDINGS – Attach site map and photograph log showing sampling locations, transects, etc Wetland vegetation criterion met? Yes No X Is the Sampled Area within a Wetland? Yes No X Wetlands hydrology present? Yes No X No X
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Wetlands hydrology present? Yes No X
Remarks, Photo Details, Flagging, etc.:
Remarks, Photo Details, Flagging, etc.:
HYDROLOGY
Field Observations:
Surface Water Present? Yes No X Depth (in)
Water Table Present? Yes No X Depth (in)
Saturation Present (including capillary fringe)? Yes No X Depth (in)
Wetland Hydrology Indicators
Reliable Indicators of Wetlands Indicators that can be Reliable with Indicators of the Influence of Water
Reliable Indicators of Wetlands Indicators that can be Reliable with Indicators of the Influence of Water Hydrology Proper Interpretation
Hydrology Proper Interpretation
Hydrology Proper Interpretation Direct observation of inundation
Hydrology Proper Interpretation Water-stained leaves Hydrological records Direct observation of inundation Evidence of aquatic fauna Free water in a soil test hole Drainage patterns
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This form is only for BVW delineations. Other wetland resource areas may be present and should be delineated according to the applicable regulatory provisions.

Sampling Point	GCA-2

$\label{eq:VEGETATION} \textbf{-} \ \textbf{Use both common and scientific names of plants}.$

Tre	ee Stratum	Plot size30'					
	1			1		Γ	T
			Indicator	Absolute %	Dominant?	Wetland Indictor?	
	Common Name	Scientific name	Status	Cover	(yes/no)	(yes/no)	% Dominant
_	Northern Red Oak	Quercus rubra	FACU	63.0%	Х		85.7%
2	,	Carya glabra	FACU	10.5%			14.3%
3							
4							
5							
6							
7							
8							
9							
				73.5%	_=Total Cover		
Shi	rub/Sapling Stratum	Plot size15'					
					_		
			Indicator	Absolute %	Dominant?	Wetland Indictor?	
	Common Name	Scientific name	Status	Cover	(yes/no)	(yes/no)	% Dominant
_	Northern Spicebush	Lindera benzoin	FACW	10.5%	Х	Х	25.9%
_	Morrow's Honeysuckle	Lonicera morrowii	FACU	10.5%	Х		25.9%
_	Multiflora Rose	Rosa multiflora	FACU	10.5%	Х		25.9%
	Japanese Barberry	Berberis thunbergii	FACU	3.0%			7.4%
-	American Beech	Fagus grandifolia	FACU	3.0%			7.4%
	Burning Bush	Euonymus atropurpureus	FACU	3.0%			7.4%
7							
8							
9							
				40.5%	=Total Cover		
He	rb Stratum	Plot size5'					
			Indicator	Absolute %	Dominant?	Wetland Indictor?	
	Common Name	Scientific name	Status	Cover	(yes/no)	(yes/no)	% Dominant
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
	•	•	•	0.0%	=Total Cover	•	•

VEGETATION – continued.

Woody Vine Stratum Plot size 30'								
Common Name	Scientific name	Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indictor? (yes/no)	% Dominant		
1 Eastern Poison Ivy	Toxicodendron radicans	FAC	10.5%	Х	Х	33.3%		
2 Virginia Creeper	Parthenocissus quinquefolia	FACU	10.5%	Х		33.3%		
3 Oriental Bittersweet	Celastrus orbiculatus	FACU	10.5%	Х		33.3%		
4								
	·		31.5%	=Total Cover				

Rapid Test:	Do all dominant species have an inc	dicator status of OBL o	r FACW?	Yes	No X	
Dominance Test:	Number of dominant species	Number of dominant	species that are	Do wetland indicator plants make		
		wetland indicator plants up		up ≥ 50% of dominant plant		
	7	2		Yes	No X	
Prevalence Index:		Total % Cover	Multiply by:		Result	
		(all strata)				
	OBL species	0%	x1	=	0%	
	FACW species	11%	x2	=	21%	
	FAC species	11%	х3	=	32%	
	FACU species	125%	x4	=	498%	
	UPL species	0%	x5	=	0%	
	Column Totals (A)	146%		(B)	551%	
	Prevalence Index	B/A=	3.78	Is the Prevaler	nce Index ≤ 3.0?	
				Yes	No X	
Wetland vegetation cri	terion met? Yes No X	•		•		

Definitions of Vegetation Strata

Tree Woody plants 3 in. (7.62 cm) or more in diameter at breast height (DBH), regardless of height

Shrub/Sapling Woody plants less than 3 in. (7.62 cm) DBH and greater than or equal to 3.3 ft. (1 m) tall

Herb All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.3 ft. (1 m) tall

Woody vines All woody vines greater than 3.3 ft. (1 m) in height

Cover	Ranges
Range	Midpoint
1-5 %	3.00%
6-15 %	10.50%
15-25 %	20.50%
26-50 %	38.00%
51-75 %	63.00%
76-95 %	85.50%
96-100 %	98.00%

Profile Description:	(Describe to t	he de	pth needed to	docu	ment the indicato	or confirm the abse	nce of indicators)		
Depth	Matrix				Redox Featur				
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Location ²	Texture	Remarks	
0-8"	10YR4/2	100					Sandy Loam	Α	
8-18"+	10YR6/3	100					Sandy Loam	Bw	
, ·	· '			, MS=	I Masked Sand Grains	² Location: PL=Pore Lin	0,		
Hydric Soil Indicators (Check all that apply)					Indicators for Problematic Hydric Soils				
Histosol (A1)			Sandy Redox (S5)			2 cm Muck (A10)			
Histic Epipedon (A	(2)		Stripped Matrix (S6)			5 cm Mucky Peat or Peat (S3)			
Black Histic (A3)			Polyvalue Below Surface (S8)			Dark Surface (S7)			
Hydrogen Sulfide			Thin Dark Surface (S9)			Polyvalue Below Surface (S8)			
Stratified Layers (A5)		Loamy Mucky Mineral (F1)			Thin Dark Surface (S9)			
Depleted Below D	ark Surface (A:	11)	Loamy Gleyed Matrix (F2)			Iron-Manganese Masses (F12)			
Thick Dark Surface	e (A12)		Depleted	d Matı	ix (F3)	Mesic Spodic (A17)			
Sandy Mucky Min	eral (S1)	,	Redox D	ark Su	rface (F7)	Red Pare	ent Material (F21)		
Sandy Gleyed Mat	trix (S4)		Depleted	d Dark	Surface (F8)	Very Sha	allow Dark Surface (TF12)	
Dark Surface (S7)		,				Other (I	nclude Explanation in Re	marks)	
Restrictive Layer (if	observed)	Type:			De	oth (inches):			
Remarks									
Hydric Soils criterion i	met?	Yes	No	Х					

DOWNGRADIENT

Are climatic/hydrologic conditions or				No		If no, explain in Remarks)
Are Vegetation, Soil	, or Hy	drology	_ significantly disturbed? (If yes, ex	cplain in R	emarks)	
Are Vegetation , Soil	, or Hy	drology	naturally problematic? (If yes, ex	plain in Re	emarks)	
SUMMARY OF FINDINGS – Attach site map and photograph log showing sampling locations, transects, etc Wetland vegetation criterion met? Yes X No Is the Sampled Area within a Wetland? Yes X No Wetlands hydrology present? Yes X No Wetlands hydrology present? Yes X No Remarks, Photo Details, Flagging, etc.: HYDROLOGY Field Observations: Surface Water Present? Yes No X Depth (in) Water Table Present? Yes No X Depth (in) Saturation Present (including capillary fringe)? Yes No X Depth (in) Wetland Hydrology Indicators						
SUMMARY OF FINDINGS – Attact	n site map a	nd photogra	ph log showing sampling location	ons, trans	sects, e	tc
Wetland vegetation criterion met?	Yes X	No	Is the Sampled Area within a We	tland?	Yes	X No
Hydric Soils criterion met?	Yes X	No	_			
Wetlands hydrology present?	Yes X	No	_			
Remarks Photo Details Flagging etc						
remarks, Filoto Details, Flagging, etc	•••					
				No		
Water Table Present?			Yes	No	Χ	Depth (in)
Saturation Present (including canillar	v fringe)?		Yes	No	Χ	Depth (in)
Saturation i resent (including capinal	7 0-7-					
· · · · · · · · · · · · · · · · · · ·	7 0-7-					
Wetland Hydrology Indicators		Indicators tha	t can be Reliable with	Indicato	rs of the	Influence of Water
Wetland Hydrology Indicators Reliable Indicators of Wetlands						
Wetland Hydrology Indicators Reliable Indicators of Wetlands X Water-stained leaves		Hydr	ological records	D	irect obs	ervation of inundation
Wetland Hydrology Indicators Reliable Indicators of Wetlands X Water-stained leaves Evidence of aquatic fauna		Hydr Free	ological records water in a soil test hole	D	irect obs	ervation of inundation patterns
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Sampling Point	GCA-2

VEGETATION – Use both common and scientific names of plants.

	e Stratum	Plot size30'					
	Common Name	Scientific name	Indicator	Absolute %	Dominant?	Wetland Indictor?	% Dominant
	Red Maple	Acer rubrum	FAC		X	X	67.0%
_	Green Ash	Fraxinus pennsylvanica	FACW	63.0%	X	X	21.8%
_			FACU		_ ^	^	11.2%
4	Northern Red Oak	Quercus rubra	FACU	10.5%			11.2%
5							
							-
6 7							
_							
8					-		
9				1			
				94.0%	=Total Cover		
<u>ihr</u>	ub/Sapling Stratum	Plot size15'					
	Common Name	Scientific name	Indicator	Absolute %	Dominant?	Wetland Indictor?	% Dominant
_	Morrow's Honeysuckle	Lonicera morrowii	FACU	20.5%	Х		46.1
2	Glossy Buckthorn	Frangula alnus	FAC	10.5%	Х	Х	23.6
3	Multiflora Rose	Rosa multiflora	FACU	10.5%	Х		23.6
4	Japanese Barberry	Berberis thunbergii	FACU	3.0%			6.7
5							
6							
7							
8							
9							
_		•	!	44.5%	=Total Cover		!
					-		
Her	b Stratum	Plot size5'					
							
_	Common Name	Scientific name	Indicator	Absolute %	Dominant?	Wetland Indictor?	% Dominant
	Sensitive Fern	Onoclea sensibilis	FACW	10.5%	X	X	63.6
	Wild Geranium	Geranium maculatum	FACU	3.0%			18.2
_	White Snakeroot	Ageratina altissima	FACU	3.0%			18.2
4	White Shakeroot	//geratina artissima	17100	3.070			10.2
5							
6							
7					 		
8							-
9							
					-		-
				1	1		1
10 11			<u> </u>				

VEGETATION – continued.

Woody Vine Stratum	Plot size30'					
Common Name	Scientific name	Indicator	Absolute %	Dominant?	Wetland Indictor?	% Dominant
1 Oriental Bittersweet	Celastrus orbiculatus	FACU	20.5%	Х		50.0%
2 Eastern Poison Ivy	Toxicodendron radicans	FAC	20.5%	Х	Х	50.0%
3						
4						
			41.0%	=Total Cover		

Rapid Test:	Do all dominant species have an inc	dicator status of OBL or	FACW?	Yes	No X	
Dominance Test:	Number of dominant species	Number of dominant s	species that are	Do wetland ind	icator plants make	
	8	5		Yes X	No	
Prevalence Index:		Total % Cover	Multiply by:		Result	
	OBL species	0%	x1	=	0%	
	FACW species	31%	x2	=	62%	
	FAC species	94%	х3	=	282%	
	FACU species	71%	x4	=	284%	
	UPL species	0%	x5	=	0%	
	Column Totals (A)	196%		(B)	628%	
	Prevalence Index	B/A=	3.20	Is the Prevalence	ce Index ≤ 3.0?	
				Yes	No X	
Wetland vegetation criterion	n met? Yes No X					

Definitions of Vegetation Strata

Tree Woody plants 3 in. (7.62 cm) or more in diameter at breast height (DBH), regardless of height Shrub/Sapling Woody plants less than 3 in. (7.62 cm) DBH and greater than or equal to 3.3 ft. (1 m) tall

Herb All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.3 ft. (1 m) tall

Woody vines All woody vines greater than 3.3 ft. (1 m) in height

Cover Ranges						
Range	Midpoint					
1-5 %	3.00%					
6-15 %	10.50%					
15-25 %	20.50%					
26-50 %	38.00%					
51-75 %	63.00%					
76-95 %	85.50%					
96-100 %	98.00%					

Depth	Matrix	- 1	epth needed to document the indicator or confirm the absence of Redox Features					- 1	1	
· —							ocation ²	⊣		
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	LC	ocation	Texture	Remarks	
0-12"	10YR2/1	100						Sandy Loam	A	
12-18"+	10YR7/1	100						Sandy Loam	Bw	
Type: C=Concentrati				, MS=N	Masked Sand Grains			M=Matrix		
Histosol (A1) Sandy Redox (S5)				5)	2 cm Muck (A10)					
Histic Epipedon (A2)	Stripped Matrix (S6)			•	5 cm Mucky Peat or Peat (S3)				
Black Histic (A3)	· · · · · · · · · · · · · · · · · · ·					Dark Surface (S7)				
<u> </u>			, Thin Dar	Thin Dark Surface (S9)			Polyvalue Below Surface (S8)			
Stratified Layers (A5) Loamy Mucky				lucky N	Mineral (F1)		Thin Dark Surface (S9)			
Depleted Below Dark Surface (A11) Loamy Gleyed Matrix (F2			Matrix (F2)		Iron-Manganese Masses (F12)					
Thick Dark Surface (A12) X Depleted Matrix (F3)			x (F3)		Mesic Spodic (A17)					
Sandy Mucky Mi	neral (S1)	•	Redox Dark Surface (F7)				Red Parent Material (F21)			
Sandy Gleyed Ma	atrix (S4)		Depleted Dark Surface (F8)				Very Shallow Dark Surface (TF12)			
Dark Surface (S7)				Other (Include Explanation in Remarks)						
Restrictive Layer (i	observed)	Type:			De	pth (inches):				
Remarks										
Hydric Soils criterion		Yes	X No							









