Exhibit K – Vernal Pool Survey Technical Memorandum

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Memorandum

To: Susan Moberg PWS

Date: June 16, 2017

Project #: 42256.00

From: Jeff Peterson, PWS
Chelsea Glinka ENV SP

Re: Vernal Pool Survey for the Tobacco Valley Solar Project
Simsbury, Connecticut

Proposed Project and Site Description

DWW Solar II LLC (DWW) proposed the Tobacco Valley Solar Farm (the Project) in response to the New England Clean Energy request for proposals solicited by the Connecticut Department of Energy and Environmental Protection (CT DEEP), Eversource Energy, National Grid, and Unitil. In October of 2016, DWW's Simsbury project was selected as one of the bidders to enter final contract negotiations with Eversource Energy. The proposed Project includes a new 26.4 MW-AC solar power generating facility located on ±156 acres of land previously developed for agriculture in Simsbury, Connecticut (the Project), and it is adjacent to Connecticut Light & Power's existing 115 kV Northeast Simsbury substation. The Project is proposed on five parcels of land identified by the Town of Simsbury Tax Assessor as G03-403-032, G03-403-012, G03-403-026-32H, G03-403-014, and H05-103-024, collectively referred to herein as the Project Site.

Wetlands and Vernal Pool Resources

A delineation of inland wetlands and watercourses was completed within the Project Site between December 2016 and April 2017. This delineation determined that there are nine wetland systems with three perennial streams and four farm ponds within the Project Site. All the wetlands were investigated for vernal pool indicators by VHB staff between April 3, April 19, 2017, and May 11, 2017. The result of the surveys was that no vernal pools were identified within the Project Site. The findings are presented in more detail below.

Vernal Pool Identification Criteria

The CT DEEP no longer provides a definition of vernal pool on its website.[1] Calhoun and Klemens (2002) noted that there was no official definition for a vernal pool in Connecticut and cited the following guidance provided by Donahue 1995:

a) physical features and the presence of one or more obligate species,

b) water for approximately 2 months during the growing season,

c) a confined depression that lacks a permanent outlet stream,

d) no fish, and

e) dries out in most years.

The Connecticut Association of Wetland Scientist's website notes that a DEP Task Force developed the following vernal pool draft definition:

1 http://www.ct.gov/deep/cwp/view.asp?a=2720&q=325676&depNav_GID=1654 (accessed 5/1/2017)

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109-2377
P 860.807.4300

Vernal pool means a seasonal watercourse in a defined depression or basin, that lacks a fish population and supports or is capable of supporting breeding and development of amphibian or invertebrate species recognized as obligate to such watercourses. These species include spotted salamander, Jefferson salamander complex, marbled salamander, wood frog, and fairy shrimp.

Table 1 Vernal Pool Obligate Species

Jefferson salamander (*Ambystoma jeffersonianum*)	Wood frog *(Lithobates sylvaticus*)
Spotted salamander (*Ambystoma maculatum*)	Eastern spadefoot toad (*Scaphiopus holbrookii*)
Marbled salamander (*Ambystoma opacum*)	Fairy shrimp (*Eubranchipus* spp.)

These criteria are similar, although the second does not require the pool to dry in most years.

Methodology to Identify Vernal Pools

Vernal pools were surveyed in April of 2017 by traversing the wetlands to find pools that could hold amphibians. Once potential vernal pools were identified, VHB logged auditory cues (e.g. wood frog breeding calls). Wearing waders VHB dip netted within the pools looking primarily for wood frog and spotted salamander adults, egg masses or spotted salamander spermatophores along the pool edge. VHB focused the surveys most intensely in areas where substrate, such as submerged branches, beds of reed-canary grass or other emergent species were present. Dip netting, minnow traps, baited fishing lines and visual surveys using polarized glasses were used to determine the presence/absence of fish. Photographs were taken of the pools investigated and of specimens captured during sampling.

Findings

The only potential vernal pools observed within the Project Site consisted of four farm ponds constructed as part of the irrigation system that supported the crop production on the parts of the Project Site managed as tilled field. Two types of farm ponds are present: impoundments constructed in perennial streams and ponds excavated into groundwater. All four ponds were found to support fish populations and therefore are not vernal pools. Wood frog were encountered in puddles which had formed during snow melt in the access drive from County Road just northwest of Litchfield Drive. These puddles had dried entirely by April 19th such that successful breeding could not occur in them.

VHB found wood frog egg masses and a small number of chorusing adults at the edge of the southernmost Farm Pond 4. This pond held a large population of an unidentified juvenile Centrarchid (*Lepomis* sp. bluegill or sunfish) and larger fish up to an estimated five inches in length were observed from the shore. A description of each resource area investigated is provided below.

Farm Pond 1

This irrigation pond is in the northwestern portion of the Project Site approximately 550 feet south east of the intersection of Munnisunk Drive and Tim Clark Circle. This pond is impounded by an earthen dam constructed across Munnisunk Brook. The surface area of the pond is 1.2 acres. A large corrugated metal riser pipe serves as the outlet control for the level of the pond. The pond is several feet deep and cannot be crossed while wearing waders. Still backwater areas appear to provide suitable vernal pool habitat.

VHB observed adult green frog (*Lithobates clamitans*) and northern spring peeper (*Pseudacris crucifer*) along the shores of this pond. No adults or egg masses of any vernal pool obligate species were found during the perimeter search. Depredated mussel shells were common along the shoreline of the pond. VHB observed fish in the pond and captured juvenile Centrarchids (*Lepomis* sp.) in a minnow trap and adult golden pond shiners (*Notemigonus crysoleucas*). Photographs are appended. The presence of fish in the pond means that this resource area is not a vernal pool.

Farm Pond 2

This excavated farm pond also is part of the irrigation system for the farm. Farm Pond 2 is located approximately 500 feet northeast of the cul-de-sac at the end of Berkshire Way. The water surface area of the pond is about one acre. The pond is too deep to wade more than 15 to 20 feet in from the shoreline. This pond has no natural inlet or outlet. An irrigation line from Pond 1 is used to supply water to this pond and water in this pond is used to irrigate crops.

Perimeter visual and dip-net surveys did not reveal any evidence of obligate species in this resource area. The northern shoreline of the pond includes an area of floating reed canary-grass that appeared particularly suitable for wood frog or spotted salamander breeding. During the final inspection on April 19th, this area was covered with strings of American toad (*Anaxyrus americanus*) eggs. However, no evidence of wood frog or spotted salamanders breeding was observed.

Fish presence was suspected as the pond was visited by a pair of hooded mergansers and a belted kingfisher during the investigation. Dip netting produced second year green frog larva with leg buds and juvenile brown bullhead (*Ameiurus nebulosus*). Fleeting observations of larger fish and schools of juvenile centrarchids were also made as they broke the water surface while feeding or escaping predation.

The absence of evidence of use by vernal pool obligate species and presence of fish led to the conclusion that this resource area is not a vernal pool.

Farm Pond 3

This impoundment constructed on Saxton Brook is about one third of an acre in area. Farm Pond 3 is located approximately 700 feet west of the temporary cul-de-sac at the end of Casterbridge Crossing. It was constructed by a combination of excavation and construction of an earth dam across the stream. The earth dam has partially breached in the northern corner of the pond and water flows through the pond at a lower elevation. An intake structure for diverting stream flow for use in irrigation remains in this pond.

Our visual and dipnet surveys around the entire pond perimeter did not produce any evidence of use by an obligate species. We were unable to capture fish with a baited minnow trap placed at several locations in the pond. VHB observed a belted kingfisher (*Megaceryle alcyon*) catch and consume a small fish. During our multiple observations, VHB found the pond is frequented by a pair of hooded mergansers (*Lophodytes cucullatus*) which include small fish in their diet. Finally, on May 11, 2017 large schools of juvenile centrarchids were observed close to shore in the northwest corner of the pond.

VHB concluded that this small pond constructed in a perennial watercourse is not a vernal pool.

Farm Pond 4

This excavated farm pond is the southernmost of the four potential vernal pools investigated in the Project Site. It is approximately 800 feet south of the intersection of Kilbourn Road with Hoskins Road. This pond has no inlet but an ephemeral outlet was flowing at the time of the inspection. The pond has a surface area of about 0.4 acres.

This pond held a small raft of wood frog eggs (estimated 6–8) along its western shoreline where a red maple sapling dipped into the water. A small group of adults would chorus when sunlight broke from behind clouds. No evidence of spotted salamander breeding was observed.

Painted turtle (*Chrysemys picta*) was also observed sunning in the pond on May 11, 2017. Inspection of the pond found that it held a large population of Centrarchids (*Lepomis* sp.) in multiple age classes. Despite the presence of wood frog, the presence of these fish led VHB to conclude that Farm Pond 4 is not a vernal pool.

Conclusions

No vernal pools were found within the limits of the property being considered for the Project. Wetland systems do extend beyond the property limits and vernal pools may occur off-site near the Project. A summary of findings is presented in Table 1 below.

Table 2 Summary of Findings

Pond ID	Area (ac)	Inlet/Outlet Flowing	Obligate Species	Fish Present	Vernal Pool Criteria Met
Farm Pond 1	1.2	Yes	None detected	Yes	No
Farm Pond 2	1.0	No	None detected	Yes	No
Farm Pond 3	0.3	Yes	None detected	Yes	No
Farm Pond 4	0.4	No inlet; Outlet-Yes	Wood frog[1]	Yes	No

1: An estimated six to eight egg masses and small group of chorusing wood frog observed near northwest corner of Farm Pond 4

References:

Calhoun, A. J. K. and M. W. Klemens. 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.

Connecticut Association of Wetland Scientists vernal pool web page fact sheet: http://www.ctwetlands.org/forms/CAWS_VernalPoolMonitoring_FactSheet.pdf

Donahue, D. F. 1996. A guide to the identification and protection of vernal pool wetlands in Connecticut. University of Connecticut Cooperative Extension Program.

Klemens, M. W. 1993. Amphibians and reptiles of Connecticut and adjacent regions. State Geological and Natural History Survey of Connecticut, Bulletin No. 112, Connecticut Department of Environmental Protection, Hartford, CT.

Whitworth, W. R. 1996. Freshwater Fishes of Connecticut. 2nd ed. State Geological and Natural History Survey of Connecticut Bulletin 114, Connecticut Department of Environmental Protection, Hartford, CT.

Farm Pond 1 Photos

Farm Pond 1 - Photo 1	**Description:**
	An intermittent stream enters Farm Pond 1 from the southeast. This area looked likely to provide vernal pool habitat, however no evidence of obligate species was found in this pond. Munnisunk Brook, a perennial tributary to the Farmington River, enters the pond from its northwestern corner that is not visible in this photograph.
Farm Pond 1 - Photo 2	**Description:**
	View of the corrugated metal riser pipe that serves as the outlet at Farm Pond 1. The pond is an impoundment of Munnisunk Brook and another intermittent tributary. This photo was taken from the earth dam at the northeast side of the pond looking southwest across the pond.

Farm Pond 1 - Photo 3	**Description:**
	Adult golden pond shiners are present in Pond 1. The presence of these fish confirms the pond is not a vernal pool.
Farm Pond 1 - Photo 4	**Description:**
	Spring peeper observed along the pond's shoreline. Spring peeper is not an obligate vernal pool species.

Farm Pond 1 - Photo 5	**Description:**
	A juvenile Centrarchid was captured in a minnow trap placed in Farm Pond 1.

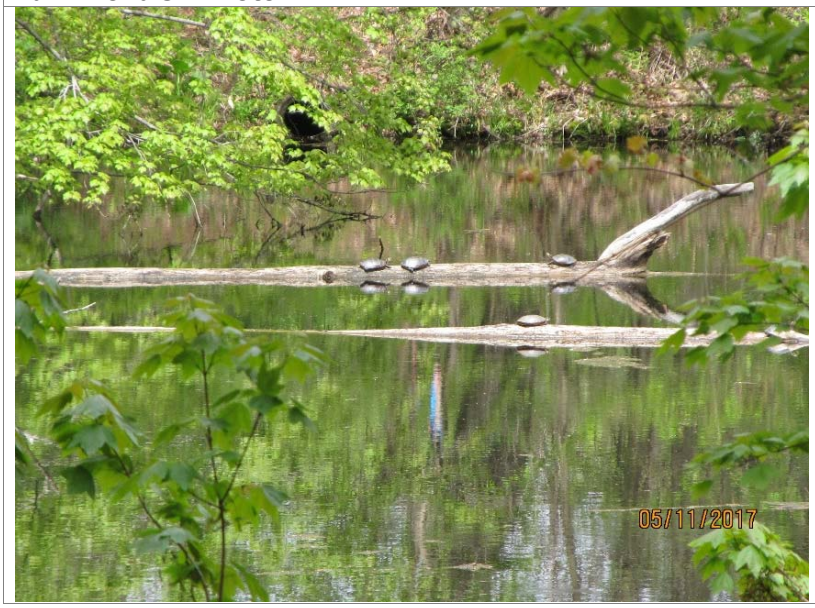
Farm Pond 2 Photos

Farm Pond 2 - Photo 1	**Description:**
	Farm Pond 2 was excavated below the water table next to tobacco barns. This irrigation pond held fish and second year green frog larvae indicating it does not dry.
Farm Pond 2 - Photo 2	**Description:**
	Dip netting did not result in any vernal pool obligate species captures, but three brown bullhead juveniles were captured, all similar in size to the specimen in this photo.

Farm Pond 2 - Photo 3	**Description:**
	Second year green frog larvae were also common. This robust individual was beginning to develop hind legs.
Farm Pond 2 - Photo 4	**Description:**
	American toad use this pond to spawn, but are not obligate vernal pool species. American toad preferred the submerged reed canary grass found along the north side of the pond as a substrate for egg deposition. Large schools of American toad larvae such as seen in this photographed were present on May 11, 2017.

Farm Pond 2 - Photo 5	**Description:**
	This photo shows the existing condition along the north side of Pond 2 where a shelf of partially submerged reed canary grass attracted spawning American toad.

Farm Pond 3 Photos

Farm Pond 3 - Photo 1	**Description:**
	Farm Pond 3 is an impoundment along Saxton Brook (foreground). It was constructed through a combination of excavation and construction of an earth impoundment.
Farm Pond 3 - Photo 2	**Description:**
	No evidence of use by obligate vernal pool species was found. While we were unable to capture and identify fish in the pond, we did witness a belted kingfisher capture and consume a fish from this pond. Painted turtles were photographed sunning in this pond on May 11, 2017. This instream impoundment is not a vernal pool.

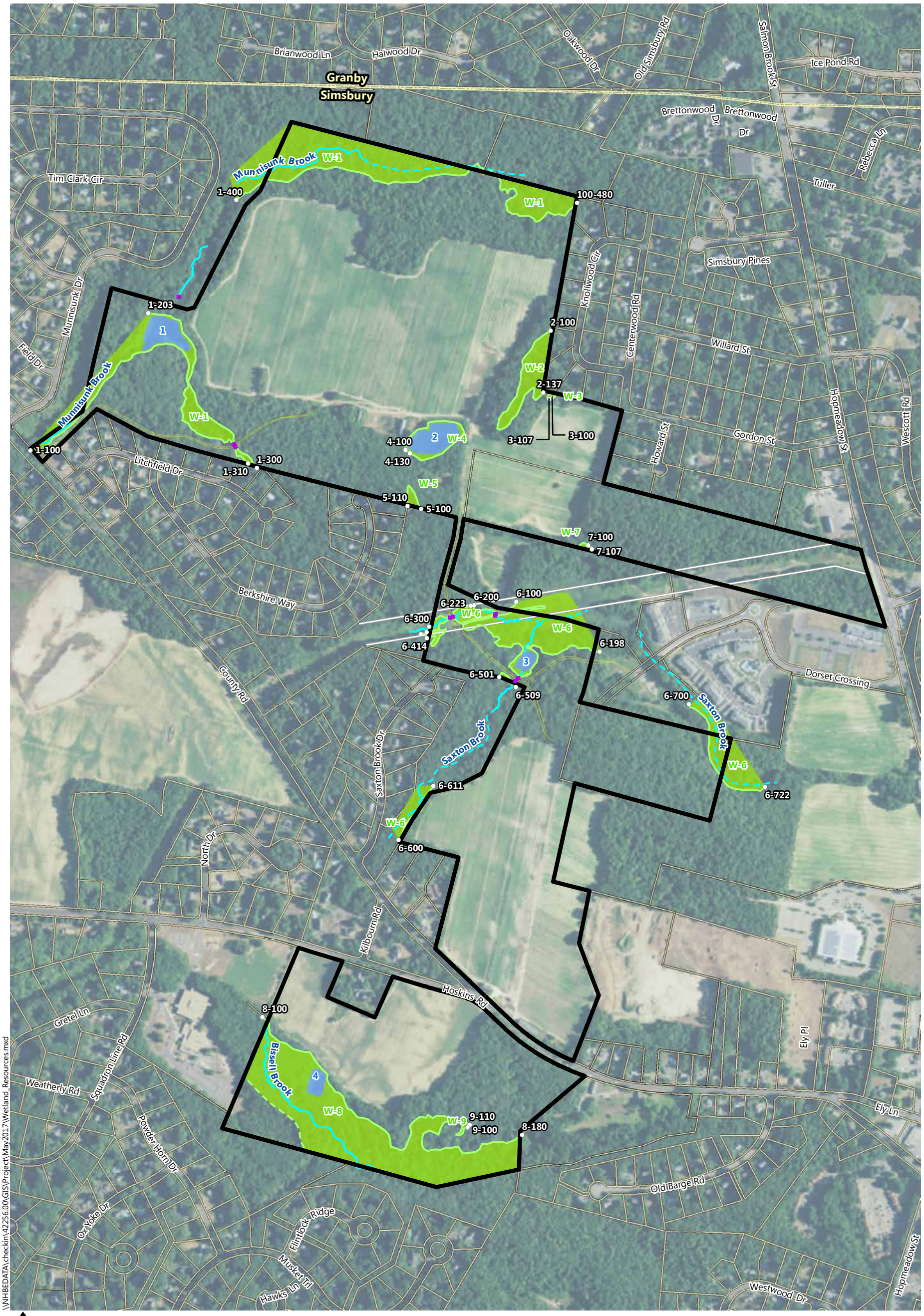
Farm Pond 4 Photos

Farm Pond 4 - Photo 1	**Description:**
	View of Farm Pond 4 looking southwest towards outlet. The pond was constructed by cutting into the northern hillside and constructing a berm along the southern half of the pond.
Farm Pond 4 - Photo 2	**Description:**
	View of Farm Pond 4 looking north along the western bank. A small raft of wood frog eggs was found attached to the downed red maple sapling visible near the far corner of the pond.

Farm Pond 4 - Photo 3	**Description:**
	A small raft of wood frog eggs was attached to the branches of a red maple sapling that had recently bent into the pond.
Farm Pond 4 - Photo 4	**Description:**
	Farm Pond 4 supported a large population of an unidentified Centrarchid (*Lepomis* sp.). These juveniles were caught in a baited minnow trap placed in the pond. Larger fish were also observed within the pond.

Farm Pond 4 - Photo 5	**Description:**
	Pond 4 was found to contain fish and is inhabited by painted turtle.
Farm Pond 4 - Photo 6	**Description:**
	Farm Pond 4 viewed from the pond outlet looking north. The floating algal mats indicate that the pond is eutrophic.

June 20, 2017



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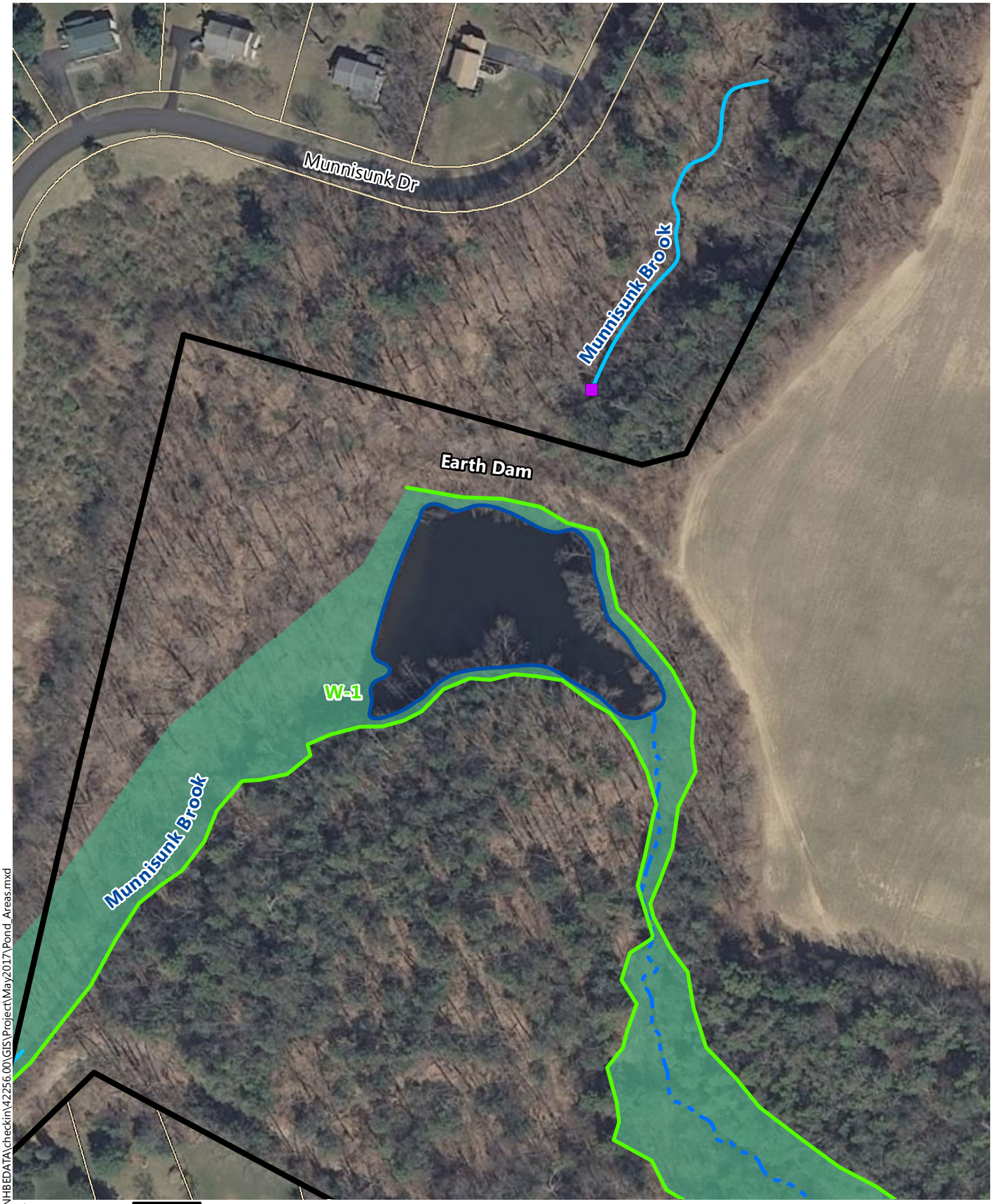
0 325 650 1300 Feet

- Property Boundary
- Adjacent Parcels
- Town Boundary
- Existing Eversource ROW
- Existing Gravel Road
- Wetland Resource Area
- Farm Pond
- Delineated Wetland Edge
- Approximate Wetland Edge
- Stream
- Approximate Stream
- Wetland Flag
- Culvert

Tobacco Valley Solar | Simsbury, Connecticut

Wetland Delineation Map

Source: VHB, CTDEEP, ESRI



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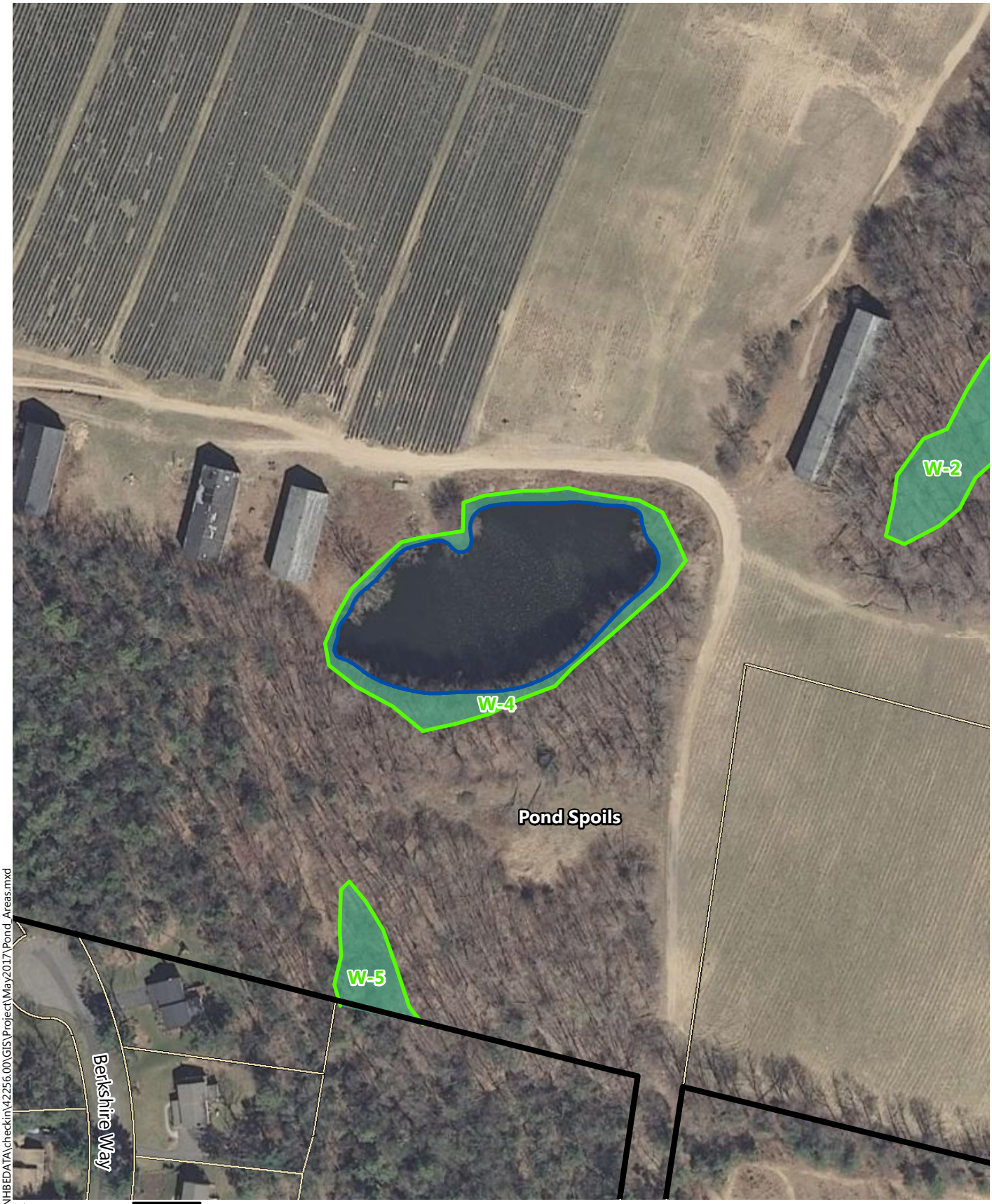
0 75 150 300 Feet

Property Boundary
Adjacent Parcels
Existing Eversource ROW
Sewer Easement
Farm Pond
Wetland Resource Area
Delineated Wetland Edge
Approximate Wetland Edge
Stream
Approximate Stream
Intermittent Watercourse
Culvert

Tobacco Valley Solar | Simsbury, Connecticut

Farm Pond 1

Source: VHB, CTDEEP, ESRI



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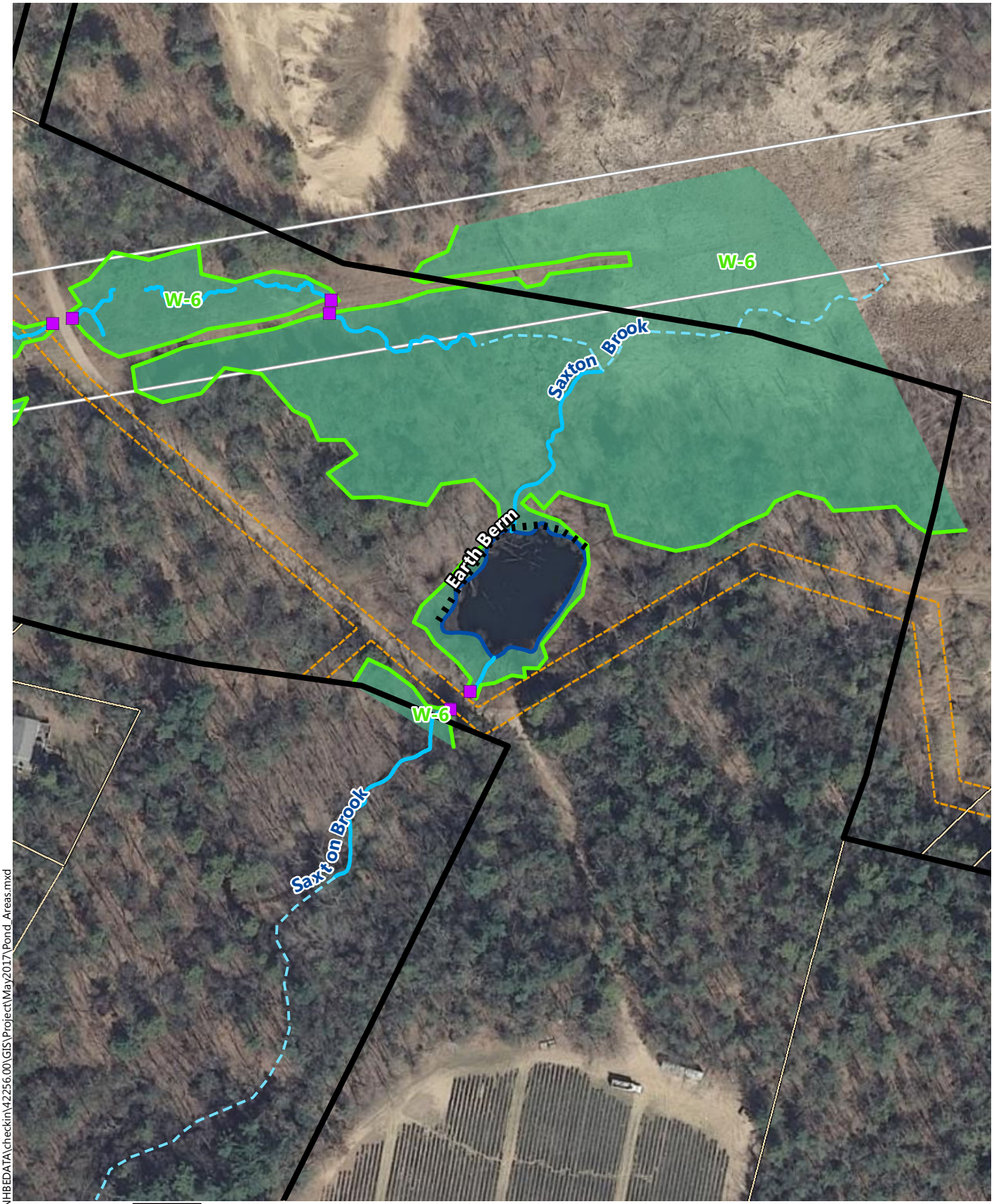
0 75 150 300 Feet

Property Boundary
Adjacent Parcels
Existing Eversource ROW
Sewer Easement
Farm Pond
Wetland Resource Area
Delineated Wetland Edge
Approximate Wetland Edge
Stream
Approximate Stream
Intermittent Watercourse
Culvert

Tobacco Valley Solar | Simsbury, Connecticut

Farm Pond 2

Source: VHB, CTDEEP, ESRI



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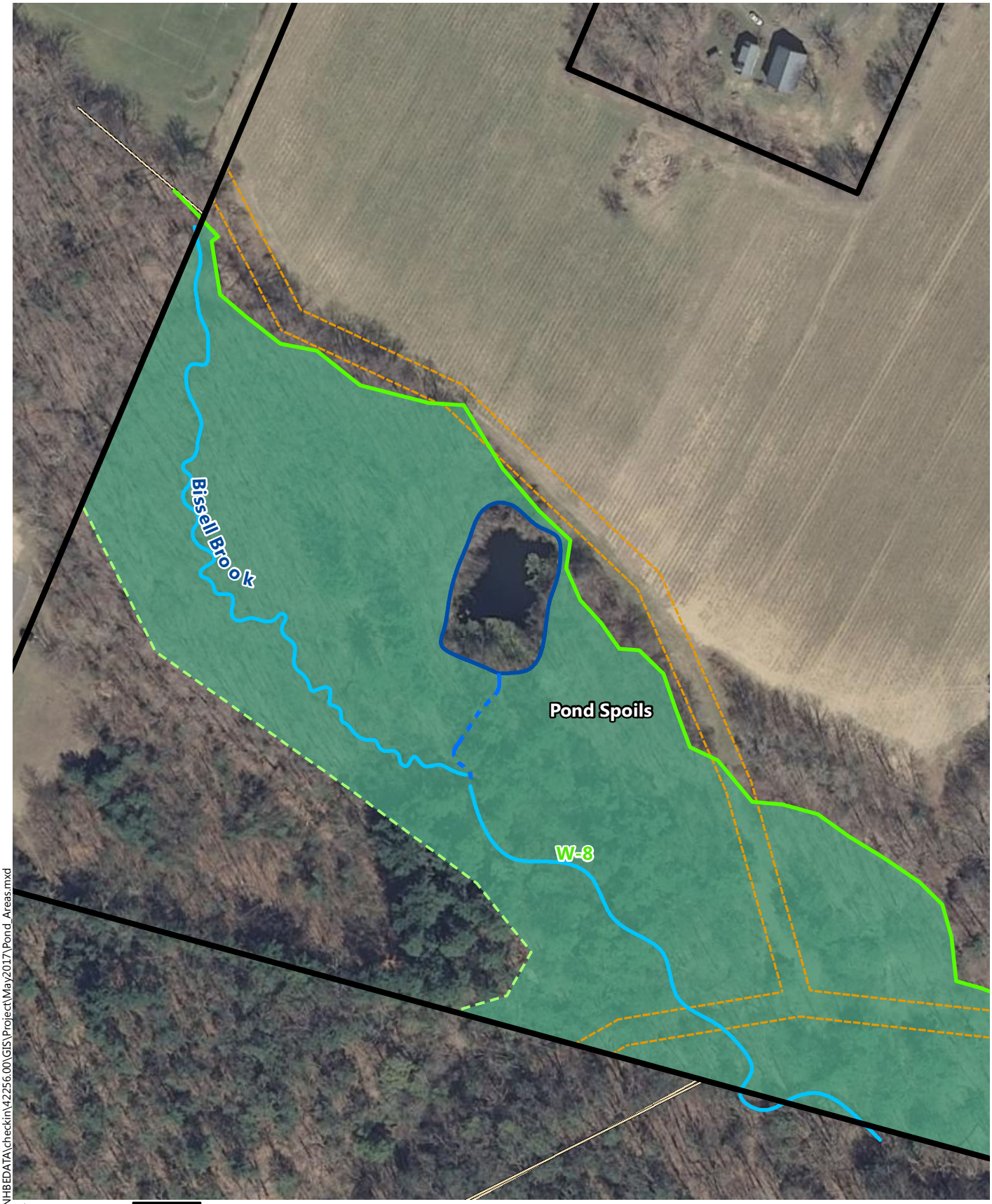
0 75 150 300 Feet

Property Boundary
Adjacent Parcels
Existing Eversource ROW
Sewer Easement
Farm Pond
Wetland Resource Area
Delineated Wetland Edge
Approximate Wetland Edge
Stream
Approximate Stream
Intermittent Watercourse
Culvert

Tobacco Valley Solar | Simsbury, Connecticut

Farm Pond 3

Source: VHB, CTDEEP, ESRI



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0 75 150 300 Feet

Property Boundary
Adjacent Parcels
Existing Eversource ROW
Sewer Easement
Farm Pond
Wetland Resource Area
Delineated Wetland Edge
Approximate Wetland Edge
Stream
Approximate Stream
Intermittent Watercourse
Culvert

Tobacco Valley Solar | Simsbury, Connecticut

Farm Pond 4

Source: VHB, CTDEEP, ESRI

pond #1

VERNAL POOL DATA SHEET

Survey Date: 4/5/17 | Investigator(s): C. Glinka & T. Peterson | Town: Simsbury | CAWS Pool #: | CAWS Project #:

Town Staff Contacted? Yes ☐ No ☐ | Project/property name: Simsbury Solar | Pool Type: Development: ☑ Reference: ☐

Address/location (*or include annotated map*): ~600 Ft N/W of the end of Berkshire Way | Investigator's Contact information: tpeterson@vhb.com

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
Trace	1" ±

Cloud Cover:
clear ☐
partly cloudy ☐
mostly cloudy ☒
full cloud cover ☐

Start time: 9:30
End time: 11:00

Methods used:
Visual ☒
Dipnetting ☒

Type of Inspection:
baseline ☒
during construction ☐
post construction ☐

Polarized sunglasses used?
Yes ☐
No ☒

Comments: No egg masses observed

Temporary flagging used to mark egg masses? Yes ☐ No ☐

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ☐ 50-80

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	50-75 ☐	250-300 ☐		
	75-100 ☐	300-400 ☐		
	100-150 ☐	400-500 ☐		
	150-200 ☐	500-750 ☐		
	200-250 ☐	750-1000 ☐		
		1000-1250 ☐		
		>1250 ☐		
intact:				
breaking up:				
hatching:				

Describe estimation method used for a large raft: None observed

Spotted Salamanders: None observed

Condition:	Total Number
intact:	
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Near wetland flag series 4-100

CONDITIONS/OBSERVATIONS WITHIN POOL *(required data)*

			Flowing	Not flowing
Inlet observed?	No ☒	Yes ☐	☐	☒
Outlet observed?	No ☒	Yes ☐	☐	☒
finfish observed?	No ☒	Yes ☐		

Estimated water depth range? 1-5'

Optional Data (see also back of sheet)

Other Vernal Pool Species:
fairy shrimp present? Yes ☐ No ☒
marbled salmander larvae present? Yes ☐ No ☒

Vegetation (within or overhanging pool):
Trees/Saplings: Red maple, oak
Shrubs/Vines: Alder, willow
Herbs:
Percent tree canopy closure? <20%
Woody debris content? High ☐ Med. ☐ Low ☒

Pool Substrate: (top three)
Mud/muck ☒ Sand/Silt ☒ Peat ☐ Bedrock ☐ Leaf Litter ☒ Silt/clay ☐ Gravel/cobbles ☐

Water Quality:
ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐
Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐
turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☒
Approximate % cover by algal mat or duckweed? 0
GPS coordinates: 41.911852, -72.799453

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL *(required data)*

Give approximate percentage or show on sketch on back

Landuses/conditions					
forest	40%	shrubland		meadow	
pasture		lawn		building	5%
exposed soil		grading		ag. field	45%
road	10%	busy (>1 car/10 min.)		yes ☐	no ☐
parking lot					

Comments:

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	Along south perimeter
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:	✓	✓
moderate:		
high:		

Dominant vegetation *(optional)*
Trees/saplings: Red maple, oak
Shrubs/Vines:
Herbs:

CONDITIONS IN ENVELOPE AROUND POOL *(required data)*

Estimate %cover (Hi,Med,Low,VLow,None)

Landuses	Within 100 feet	100'-300' *(optional)*
forest	40%	40%
shrubland		
exposed soil		
pavement		
building		
lawn		
field (agricultural)	60%	60%
busy road (<1 car/10 min.)?	yes ☐	yes ☐

Leaf Litter within 100' (in wooded cover type)

none/low:	
moderate:	On south perimeter
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		on south side
moderate:	on south side	
high:		

Dominant vegetation within 100' *(optional)*
Trees/saplings: Oak
Shrubs/Vines:
Herbs:

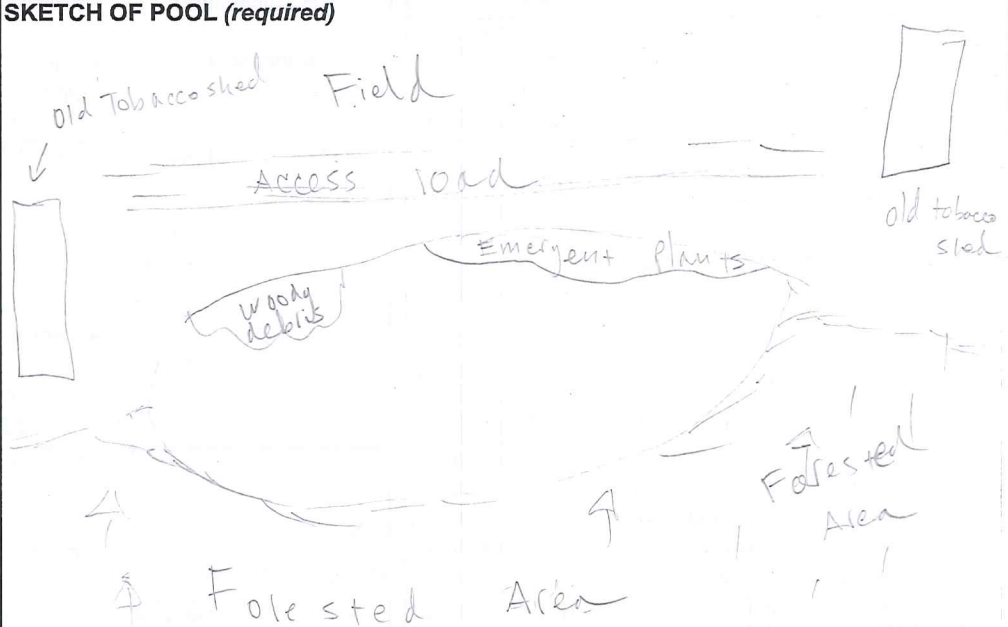
Pond #1

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/5/17	Investigator(s): C. Glinka + J. Peterson	Town: Simsbury	CAWS Pool #:		CAWS Project #:
Project/property name: Simsbury - Solar				Pool Type:	Development: ☒ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approximate scale.*

SKETCH OF POOL ***(required)***



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☑
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

several bird species observed, including an active King Fisher

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approximate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL ***(required)***

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	
2. Surface pollen	
(3.) Dark, tannin-colored water	
(4.) Deep water	
5. Turbidity	
6. Dense shrubs	
(7.) Other (specify)	

Garbage debris - moderate amount littered around the perimeter of the pond

Overcast/cloudy weather

ADDITIONAL NOTES: *(optional)*

Used a fishing pole and minnow trap to try to detect presence of fish, No fish were observed.

Walked perimeter of pond with a dip net and did not observe any egg masses.

No wood frog chorusing

Wetland flag series 4-100

Hockey net observed on perimeter - suggests pond holds water year-round.

Pond #2

VERNAL POOL DATA SHEET

Survey Date: 4/5/17	Investigator(s): Glinka Peterson	Town: Simsbury	CAWS Pool #: 7	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☒	Project/property name: Simsbury Solar		Pool Type: Development: ☒ Reference: ☐	
Address/location (*or include annotated map*): 1200' ENE Intsct Munnisunk Drd Field Dr.			Investigator's Contact information:	

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation: Current	Within last 24 hours
Trace	1" ±

Cloud Cover:
- clear ☐
- partly cloudy ☐
- mostly cloudy ☒
- full cloud cover ☐

Start time: 11:00
End time: 12:30

Methods used:
- Visual ☑
- Dipnetting ☑

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☐ No ☑

Comments: No eggmasses found

Temporary flagging used to mark egg masses? Yes ☐ No ☐

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ☒ 50+

condition	
If condition mixed, note "some","many" or "most"	
intact:	
breaking up:	
hatching:	

Abundance categories

50-75	☐	250-300	☐
75-100	☐	300-400	☐
100-150	☐	400-500	☐
100-150	☐	500-750	☐
150-200	☐	750-1000	☐
200-250	☐	1000-1250	☐
		>1250	☐

0

Describe estimation method used for a large raft: No egg masses found

Spotted Salamanders:

Condition:	Total Number
intact:	0
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Near wetland flag series
1-100

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

		Flowing	Not flowing
Inlet observed?	No ☐ Yes ☒	☑	☐
Outlet observed?	No ☐ Yes ☑	☑	☐
finfish observed?	No ☐ Yes ☑		

Estimated water depth range? 2-6'

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☒
- marbled salamander larvae present? Yes ☐ No ☒

Vegetation (within or overhanging pool):
- Trees/Saplings: Hemlock, Red Maple, Yellow Birch
- Shrubs/Vines: Alder Willow
- Herbs: Cinnamon fern Wool grass
- Percent tree canopy closure? 5
- Woody debris content? High ☒ Med. ☐ Low ☐

Pool Substrate: (top three)
- Mud/muck ☒
- Leaf Litter ☒
- Sand/Silt ☒
- Silt/clay ☐
- Peat ☐
- Bedrock ☐
- Gravel/cobbles ☐

Water Quality:
- ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐
- Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐
- turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐
- Approximate % cover by algal mat or duckweed? 0
- GPS coordinates: 41.91397 -72.80644

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions

forest	90	shrubland	10	meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	

road ☐ busy (>1 car/10 min.) yes ☐ no ☐

parking lot ☐

Comments:

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	✓
high:	

Cover Objects:	*Logs*	*Rocks*
none:		✓
low:		
moderate:	✓	
high:		

Dominant vegetation *(optional)*
- Trees/saplings: Red Oak Hemlock White Pine
- Shrubs/Vines: Bittersweet
- Herbs:

CONDITIONS IN ENVELOPE AROUND POOL

(required data) Estimate %cover (Hi,Med,Low,VLow,None)

Landuses	Within 100 feet	100'-300' *(optional)*
forest	90	
shrubland	9	
exposed soil	1	
pavement		
building		
lawn		
field		
busy road (<1 car/10 min.)?	yes ☐	yes ☐

Leaf Litter within 100' (in wooded cover type)

none/low:	
moderate:	X
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		X
moderate:	X	
high:		

Dominant vegetation within 100 *(optional)*
- Trees/saplings: Red oak, hemlock, white pine
- Shrubs/Vines:
- Herbs:

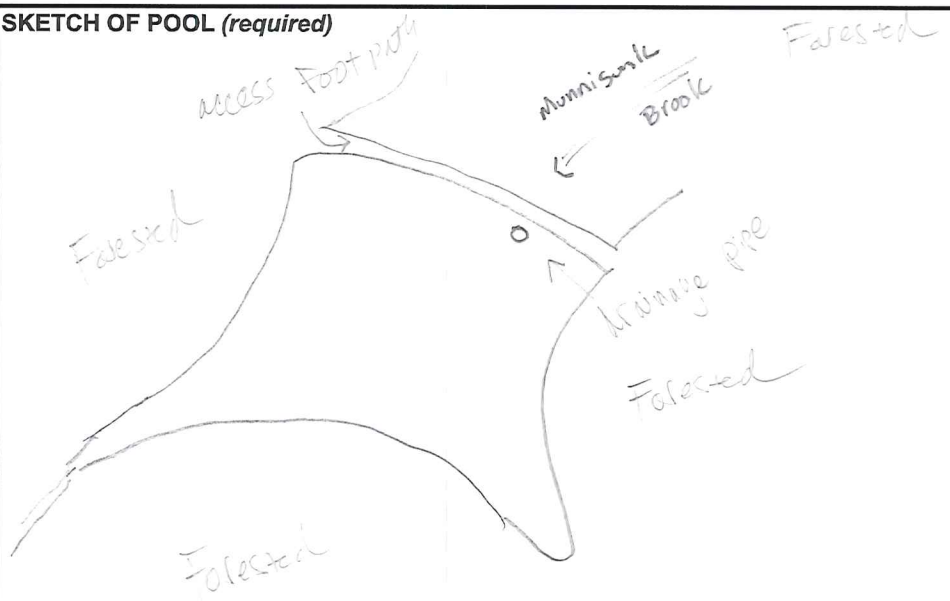
Pond #2

VERNAL POOL DATA SHEET, *p. 2*

Survey Date:	Investigator(s):	Town:	**CAWS Pool #:**		CAWS Project #:
Project/property name:				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approximate scale.*

SKETCH OF POOL ***(required)***



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☑
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

Golden Pond Shiner
Juvenile Centrachids
Freshwater mussel shells

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approximate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL ***(required)***

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	
2. Surface pollen	
3. Dark, tannin-colored water	
4. Deep water	
5. Turbidity	
6. Dense shrubs	
7. Other (specify)	

ADDITIONAL NOTES: *(optional)*

Flow through pond created by impounding Mumisunk Brook

Two adult golden pond shiner were caught via fishing pole

Pond #3

VERNAL POOL DATA SHEET

Survey Date: 4/5/17	Investigator(s): C. Glinka + T. Peterson	Town: Simsbury	CAWS Pool #:	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☒	Project/property name: Simsbury - Solar		Pool Type: Development: ☒ Reference: ☐	
Address/location (*or include annotated map*): ~900 Ft West of Canterbridge Crossing Condos			Investigator's Contact information: tpeterson@vhb.com	

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation: Current	Within last 24 hours
Trace	1" ±

Cloud Cover:
clear ☐
partly cloudy ☐
mostly cloudy ☒
full cloud cover ☐

Start time: 12:00
End time: 14:00

Methods used:
Visual ☒
Dipnetting ☒

Type of Inspection:
baseline ☒
during construction ☐
post construction ☐

Polarized sunglasses used?
Yes ☐
No ☒

Comments: No egg masses found

Temporary flagging used to mark egg masses? Yes ☐ No ☐

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ☒ 50+

condition	Abundance categories			
If condition mixed, note "some", "many" or "most"	50-75	☐	250-300	☐
	75-100	☐	300-400	☐
	100-150	☐	400-500	☐
	150-200	☐	500-750	☐
	200-250	☐	750-1000	☐
			1000-1250	☐
			>1250	☐
intact:				
breaking up:				
hatching:				

Describe estimation method used for a large raft:
No egg masses found

Spotted Salamanders:

Condition:	Total Number
intact:	0
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Near wetland flag series G-100
This is an excavated farm pond that collects flow from Saxton Brook. Water flows in from an overhanging concrete culvert (~12" diameter) from the SW and flows NE through a collapsed portion of the pond bank.

CONDITIONS/OBSERVATIONS WITHIN POOL *(required data)*

			Flowing	Not flowing
Inlet observed?	No ☐	Yes ☒	☒	☐
Outlet observed?	No ☐	Yes ☒	☒	☐
finfish observed?	No ☐	Yes ☒		

Estimated water depth range? 1-6'

Optional Data (see also back of sheet)

Other Vernal Pool Species:
fairy shrimp present? Yes ☐ No ☒
marbled salamander larvae present? Yes ☐ No ☒

Vegetation (within or overhanging pool):
Trees/Saplings: Eastern hemlock, oak
Shrubs/Vines:
Herbs: Christmas fern
Percent tree canopy closure? 80%
Woody debris content? High ☐ Med. ☒ Low ☐

Pool Substrate: (top three)
Mud/muck ☒ Sand/Silt ☐ Peat ☐ Bedrock ☐ Leaf Litter ☒ Silt/clay ☐ Gravel/cobbles ☐

Water Quality:
ph ☐ conductivity (uS/cm) ☐ temperature (°C) ☐
Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO (mg/l) ☐
turbidity (NTU's) ☐ Sulphidic odor? No ☐ Yes ☒
Approximate % cover by algal mat or duckweed? 0
GPS coordinates: 41.907701, -72.797064

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL *(required data)*

Give approximate percentage or show on sketch on back

Landuses/conditions					
forest	100%	shrubland		meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	
road		busy (>1 car/10 min.)	yes ☐	no ☐	
parking lot					

Comments:

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	✓
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		✓
moderate:	✓	
high:		

Dominant vegetation *(optional)*
Trees/saplings: Eastern hemlock, oak
Shrubs/Vines:
Herbs:

CONDITIONS IN ENVELOPE AROUND POOL *(required data)*

Estimate %cover (Hi, Med, Low, VLow, None)

Landuses	Within 100 feet	100'-300' *(optional)*
forest	100%	80%
shrubland		15% → transmission row
exposed soil		
pavement		
building		5%
lawn		
field		
busy road (<1 car/10 min.)?	yes ☐	yes ☐

Leaf Litter within 100' (in wooded cover type)

none/low:	
moderate:	X
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		X
moderate:	X	
high:		

Dominant vegetation within 100' *(optional)*
Trees/saplings: Eastern hemlock, oak
Shrubs/Vines:
Herbs:

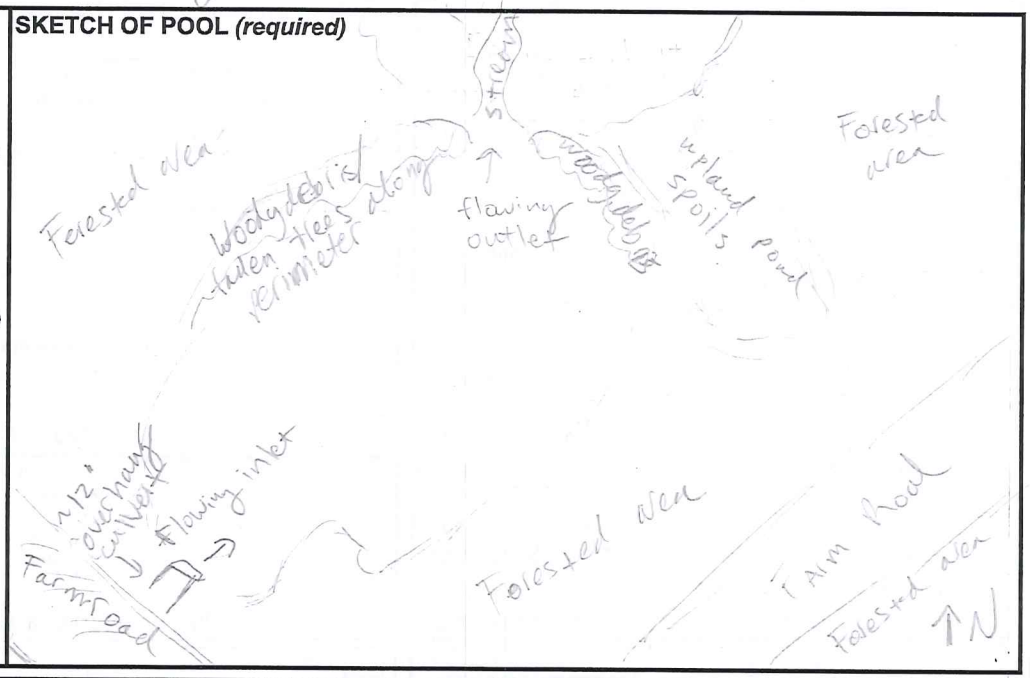
Pond #3

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/5/17	Investigator(s): C. Glinka & T. Peterson	Town: Simsbury	CAWS Pool #:		CAWS Project #:
Project/property name: Simsbury Solar				Pool Type:	Development: ☑ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approximate scale.*

SKETCH OF POOL ***(required)***



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

Fresh water mussel shells observed in the pond
Kingfisher observed catching a fish

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approximate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL ***(required)***

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	
2. Surface pollen	
(3.) Dark, tannin-colored water	
(4.) Deep water	
5. Turbidity	
6. Dense shrubs	
7. Other (specify)	

Overcast/cloudy weather

ADDITIONAL NOTES: *(optional)*

Used a fishing pole and minnow trap to detect presence of fish. No fish were caught via these methods but we observed a kingfisher catch a fish in the NE area of the pond near woody debris.

Pond # 4

VERNAL POOL DATA SHEET

Survey Date: 4/5/17 | Investigator(s): C. Glinka & J. Peterson | Town: Simsbury | CAWS Pool #: | CAWS Project #:

Town Staff Contacted? Yes ☐ No ☒ | Project/property name: Simsbury - Solar 1 | Pool Type: Development: ☑ Reference: ☐

Address/location (*or include annotated map*): ~500 NE of Squadron Line School | Investigator's Contact information:

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation: Current	Within last 24 hours
True	1±

Cloud Cover: clear ☐ | partly cloudy ☐ | mostly cloudy ☒ | full cloud cover ☐

Start time: 2:00

End time: 4:30

Methods used: Visual ☒ | Dipnetting ☒

Type of Inspection:

baseline ☒ | during construction ☐ | post construction ☐

Polarized sunglasses used? Yes ☐ No ☒

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☒

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☒ 1-25 ☐ 26-49

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	~~50~~	☐	250-300	☐
	50-75	☐	300-400	☐
	75-100	☐	400-500	☐
	100-150	☐	500-750	☐
	150-200	☐	750-1000	☐
	200-250	☐	1000-1250	☐
			>1250	☐
intact: All				
breaking up:				
hatching:				

Describe estimation method used for a large raft: 4 fresh/new egg masses, possibly deposited that day or the day before

Spotted Salamanders:

Condition:	Total Number
intact:	0
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Near wetland flag series 9-100

Wood frogs heard chorusing on West side of pond

CONDITIONS/OBSERVATIONS WITHIN POOL *(required data)*

			Flowing	Not flowing
Inlet observed?	No ☒	Yes ☐	☐	☐
Outlet observed?	No ☒	Yes ☐	☐	☐
finfish observed?	No ☐	Yes ☒		

Estimated water depth range?

Optional Data (see also back of sheet)

Other Vernal Pool Species:

fairy shrimp present? Yes ☐ No ☒

marbled salamander larvae present? Yes ☐ No ☒

Vegetation (within or overhanging pool):

Trees/Saplings: Oak, White pine

Shrubs/Vines: Sweet pepperbush

Herbs:

Percent tree canopy closure? 80%

Woody debris content? High ☐ Med. ☒ Low ☐

Pool Substrate: (top three) Peat ☐

Mud/muck ☒ | Sand/Silt ☐ | Bedrock ☐

Leaf Litter ☒ | Silt/clay ☐ | Gravel/cobbles ☐

Water Quality:

ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐

Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐

turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☒

Approximate % cover by algal mat or duckweed? 20%

GPS coordinates: 41.899846, -72.802344

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL *(required data)*

Give approximate percentage or show on sketch on back

Landuses/conditions

forest 80% | shrubland ☐ | meadow ☐

pasture ☐ | lawn ☐ | building ☐

exposed soil ☐ | grading ☐ | ag. field 20%

road ☐ | busy (>1 car/10 min.) yes ☐ no ☐

parking lot ☐

Comments: located on forested perimeter of agriculture field

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	X

Cover Objects:	*Logs*	*Rocks*
none:		
low:		X
moderate:	X	
high:		

Dominant vegetation *(optional)*

Trees/saplings: Oak, White pine

Shrubs/Vines: Sweet pepperbush

Herbs:

CONDITIONS IN ENVELOPE AROUND POOL

(required data) Estimate %cover (Hi,Med,Low,VLow,None)

Landuses	Within 100 feet	100'-300' *(optional)*
forest	80 %	80%
shrubland		
exposed soil		
pavement		
building		
lawn		
field	20%	20%
busy road (<1 car/10 min.)?	yes ☐	yes ☐

Leaf Litter within 100' (in wooded cover type)

none/low:	
moderate:	X
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		X
moderate:	X	
high:		

Dominant vegetation within 100' *(optional)*

Trees/saplings: Oak, White pine

Shrubs/Vines:

Herbs:

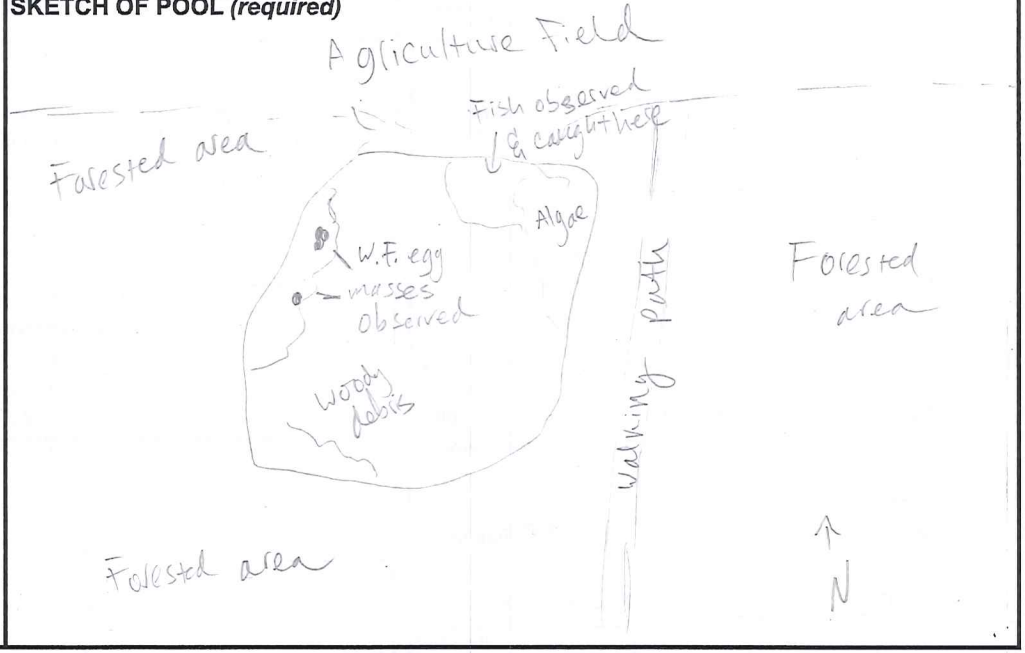
Pond #4

VERNAL POOL DATA SHEET, *p. 2*

Survey Date:	Investigator(s):	Town:	CAWS Pool #:		CAWS Project #:
Project/property name:				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approximate scale.*

SKETCH OF POOL ***(required)***



WILDLIFE OBSERVATIONS: ***(optional)***

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

Juvenile centrarchids

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approximate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL ***(required)***

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	
2. Surface pollen	
3. Dark, tannin-colored water	
4. Deep water	
5. Turbidity	
6. Dense shrubs	
7. Other (specify)	

Cloud cover

ADDITIONAL NOTES: ***(optional)***

Hockey net observed on perimeter, suggests that pond holds water year-round.

used a fishing pole and minnow trap to catch fish. 2 juvenile Centrarchids were caught in the minnow traps, no fish were caught by line. Several (~100s) juvenile centrarchids were observed in the north sunny area of the pond.