



OXBOW ASSOCIATES, INC.

Wetlands Delineation & Permitting • Wildlife Studies • Herpetology • Botany • Vernal Pool Ecology

Site Visit Summary – Cryptic Vernal Pool Delineation – September 30, 2017

Site conditions: Overcast, with about 45 min of heavy rain with thunder 1100-1200h. Had rained previous overnight as well. Temps 68F initially, 64F at departure ca. 2000h.

Methods: An area of palustrine forested wetland constituting the headwaters of an intermittent stream drainage located in the easterly portion of the proposed solar array parcel associated with the Candlewood Solar Photovoltaic Project were surveyed for the purpose of mapping the horizontal extent of functional vernal pool habitat within an area identified as “cryptic” vernal pool habitat per Calhoun and Klemens (2002) criteria. The “cryptic” descriptor refers to functional areas meeting the physical and biological criteria for vernal pools in the northeast, but which are not necessarily distinct “pools”. In this instance an area of forested wetland drained by a historic farmer’s ditch within a jurisdictional wetland was found to implicitly provide a suitable hydroperiod and other attributes to function as vernal pool(s).

The headwater wetland was examined for features indicative of persistent standing water likely to provide aquatic habitat for egg deposition and development, or shallows for submerged basking and feeding by amphibian larvae. In general, these areas have sparse or no vegetation, except on hummocks, or have annual or otherwise adapted plant species, such as skunk cabbage, *Sphagnum* and other semi-aquatic mosses, nettles and cordgrass. Horizontal moss lines, and moderately deep organic muck are additional criteria used to establish the probable horizontal extent of functional vernal pool habitat.

Flags were hung in vegetation at the boundary deemed to be the upland limit of vernal pool (seasonally aquatic) habitat. Whereas two distinct areas of cryptic vernal pool habitat were found to occur, separated by a poorly defined intermittent stream, two alpha-numeric flag series were placed in the field. The southerly basin was termed: CVP1 through CVP45 (with intermediate flags CVP 29A and 29B making a total of 47 boundary flags). The northerly basin was labeled as CVPx1 through CVPx20.

Approximately four (4) field hours were spent within and among the two above referenced pool features. The flags were placed according to the self-prescribed criteria described above and recovered using a hand held Trimble GEO XH device with sub-foot accuracy. Not all flags recovered were within the one-foot accuracy threshold due to satellite constellation availability, particularly with steep adjacent topography, but all flags appear to be within less than two feet accuracy.

Cover objects were turned within the pools and within the adjacent upland. Red and lead-back salamanders (*Plethodon cinereus*), post-metamorphic and adult Ambystomatid salamanders were also noted. Persistent vernal pool indicators (caddis fly larval cases, Pisid clams) were searched for casually, however whereas other compelling indicators of vernal pool status were apparent, this was not a focal effort.

Notations on the extant, in-pool vegetation were taken as were representative photographs and photographs linked to particular flag locations.

Observations: Whereas both CVP and CVPx are of similar general character and derivation, they are described jointly below.

The cryptic vernal pools examined have characteristics of having been manipulated during agricultural use of the land. Neither basin is a classic, parabolic pool. Rather, both have a subtle, mote-like band over most of their perimeters suggesting historic ditching to facilitate their drainage to an intermittent stream that drains south-southeast from “CVP”, to a steep escarpment northeast of a large pasture and ultimately off the subject property to Rocky River.

The two pools are joined by a subtle stream located between the vicinity of CVPx flag 19 and flags 6 and 7 of CVP. The interior of the pools both have elevated areas that though jurisdictional wetland, do not appear to experience regular or prolonged flooding. Neither pool exhibits significant depth, owing to the invert outlet of the farmer’s ditch on the south limit of CVP. Nonetheless, the hydroperiod of both basins appears to be protracted, presumably flooding in mid-fall and drying in late July or August of most years. The presence of marbled salamanders (*Ambystoma opacum*) within and adjacent to the basins as well as an observation of four-toed salamander (*Hemidactylium scutatum*) [9/26/17] within CVP and post-metamorphic spotted salamander (*Ambystoma maculatum*) near the pools all support the presumption of function and productivity of these pools.

In addition to the mole salamanders referenced above, additional indicators of vernal pool function were observed during the Connecticut Siting Council (CSC) site review on September 26, 2017. Post metamorphic wood frogs (*Lithobates sylvaticus*), an eft stage eastern newt (*Notophthalmus viridescens*), and sub-adult American toads (*Anaxyrus americanus*) were also observed within CVP during the CSC site review.

Both pools have an estimated maximum depth of approximately one (1) foot; the majority of the inundated zones being significantly shallower. However, as stated above, the average annual hydroperiod appears protracted within both pools, and may be caused by an aquaclude of underlying bedrock or the dense organic muck that belies both basins.

Whereas the two vernal pools are almost immediately adjacent to one another, and are confluent during periods of seasonally high surface water, they have been merged in the drawing of the VPE and CTH polygons associated with them.

Figure 1, showing the relative locations of the two pools is attached herewith.



Photo 1. Southern portion of pool CVP showing decaying woody debris, mosses, hummocks and barren areas of extended inundation.



Photo 2. Cordgrass (*Spartina pectinata*), nettles, mosses and hummocks in the interior of CVP.



Photo 3. CVPx near flag CVPx3 showing hummocks, downed logs, shrub islets and areas of persistent standing water.



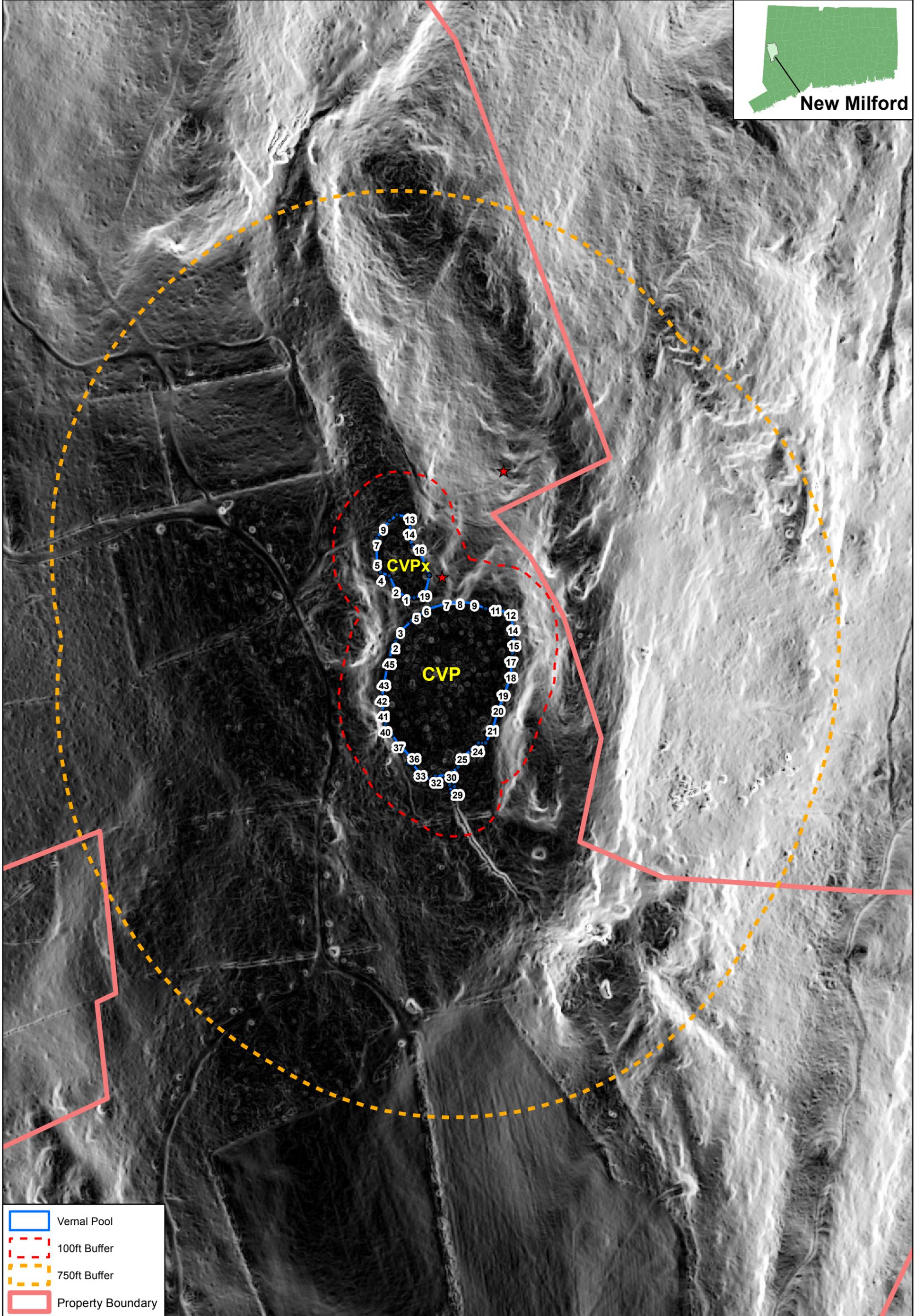
Photo 4. Northwest portion of CVPx.

Citations:

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, NY. 57 pp.

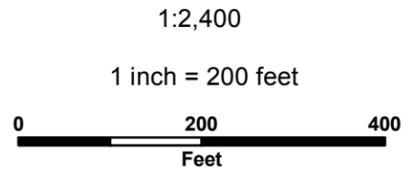
Attachments:

Figure 1. Cryptic Vernal Pool Delineation, Orthophotographic, enhanced slope raster figure, Oct. 5, 2017



-  Vernal Pool
-  100ft Buffer
-  750ft Buffer
-  Property Boundary

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**Figure 1. Cryptic Vernal Pool Delineation
Candlewood Mtn. PV
Candlewood Mtn. Rd
New Milford, CT
October 5, 2017**