

July 13, 2022

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**Subject: Goddard Consulting Wildlife Study for “The Sanctuary”
Assessors Map 43, Lot 18, School Street, Manchester-By-The-Sea, MA**

Dear Dan:

The Manchester Essex Conservation Trust, Inc. (“MECT”) has asked me to review the Goddard Consulting (“Goddard”) Wildlife Habitat Assessment & Vernal Pool Study (“Report”) for “The Sanctuary” project (the “Project”) located off School Street in Manchester-By-The-Sea. The Report is dated June 10, 2022.

Because the Applicant has denied site access to MECT experts, I cannot affirm Goddard’s estimation of specific habitat features or their values, such as the various physical characteristics that the Report catalogs at great length (including vegetation, woody debris and “snags”). Goddard conclusions on site characteristics need to be confirmed by the Beals + Thomas (“B+T”) peer review to establish whether they are accurate.

Consequently, I am limited to addressing Goddard’s conclusions regarding project impacts on the northerly and southerly Vernal Pools (“VPs”).¹ My analysis has determined that the Project will negatively impact the VPs because the proposed roads, buildings, infrastructure and drainage features will substantially alter the VP watersheds and the VP water quality, which Goddard does not address in the Report.

Further, I recommend that the Goddard study be viewed solely as a possible representation of existing conditions, and *not* as a reliable indicator of wildlife habitat impacts from the Project. As I detail below, the Goddard conclusion² that the Project will have minimal impacts to wildlife is without foundation. For instance, Goddard leaps from describing existing physical conditions on site to stating that: “Based on the technical analysis ... The project will not substantially or materially reduce the site’s capacity for wildlife or wildlife functions.” However, I find no “technical analysis” within the Report to justify Goddard’s sweeping conclusion.

¹ An off-site VP is located west of the Project beside Old School Street and is not part of this analysis.

² Goddard Report, page 40.

VP Impacts

The Report cites MassDEP Wetland Protection Act (“WPA”) Regulations regarding VP wildlife habitat assessments (310 CMR 10.60), but the Report then ignores the salient portion of those regulations. For instance, the WPA states in part at 310 CMR 10.60(1)(a):

(a) To the extent that a proposed project on inland Banks, Land under Water, Riverfront Area, or Land Subject to Flooding will alter **vernal pool habitat** or will alter other wildlife habitat beyond the thresholds permitted under 310 CMR 10.54(4)(a)5., 10.56(4)(a)4., 10.57(4)(a)3. and 10.58(4)(d)1., such alterations may be permitted only if they will have no adverse effects on wildlife habitat. Adverse effects on wildlife habitat mean the alteration of any habitat characteristic listed in 310 CMR 10.60(2), insofar as such alteration will, following two growing seasons of project completion and thereafter (or, if a project would eliminate trees, upon the maturity of replanted saplings) substantially reduce its capacity to provide the important wildlife habitat functions listed in 310 CMR 10.60(2) ... [emphasis added]

The WPA Regulations at 310 CMR 10.60(2)(c)1.2 then further define wildlife characteristics, as follows:

(2) Wildlife Habitat Characteristics of Inland Resource Areas
(c) Vernal Pool Habitat. The topography, soil structure, plant community composition and structure, and **hydrologic regime of vernal pool habitat**
2. Food for other wildlife ... [emphasis added]

The WPA Regulation is conclusive. Any wildlife habitat report³ must assess impacts to the “hydrologic regime of vernal pool habitat.” The Goddard report is silent on this matter, other than stating without any calculations or analysis that: “All the vernal pools will continue to receive water during the wetter months and will continue to provide the essential breeding habitat for both spotted salamanders and wood frogs.”⁴

This is insufficient. Based on such a statement, the VPs could lose 90% of their historic water volumes and Goddard would still assure approving authorities that the VPs “will continue to receive water during the wetter months ...” Such an assurance ignores both Project impacts and the Regulations, which state that: “Adverse effects on wildlife habitat mean the alteration of any habitat characteristic” (310 CMR 10.60(1)(a)). Habitat characteristics include impacts to a VP’s “hydrologic regime,” which I have already indicated will occur.⁵ Further, those impacts to the hydrologic regime will be substantial.

My June 6, 2022 VP water budget analysis for the Project determined that *substantial* alterations to the hydrologic regime of the VPs will occur. As I previously noted, a VP water budget is critical to any design analysis to ensure that the Project does not alter⁶ these protected resources.

³ For projects that alter a VP watershed.

⁴ Goddard report, page 40.

⁵ See my June 6, 2022 water budget analysis.

⁶ “Alter” under 310 CMR 10.04 is defined as follows: “Alter means to change the condition of any Area Subject to Protection under M.G.L. c. 131, § 40. Examples of alterations include, but are not limited to, the following: (a) the changing of pre-existing drainage characteristics, flushing characteristics, salinity distribution, sedimentation patterns, flow patterns and flood retention areas; (b) the lowering of the water level or water table; (c) the destruction of vegetation; (d) the changing of water temperature, biochemical oxygen demand (BOD), and other physical, biological or chemical characteristics of the receiving water.”

The applicant cannot remain silent on this issue. Multiple MassDEP Office of Appeals and Dispute Resolution (“OADR”) adjudicatory decisions address the importance of maintaining a vernal pool’s water budget post-development. In The Matter of Bosworth (2016), the OADR decision stated:

It is well known that vernal pool habitat is particularly susceptible to impacts from certain work in the buffer zone because of the habitat’s relative fragility. Vernal pool habitat is sensitive to changes in water, light, and chemical influences. *Generally, in order for vernal pool habitat to continue to function and co-exist with nearby development its water budget must be sustained post-development.* If surface runoff is redirected or groundwater recharge in proximity to the vernal pool is reduced by impervious surfaces, then the vernal pool water budget could be adversely impacted, potentially resulting in adverse impacts to the vernal pool habitat. Land use changes, such as clearing, increases in impervious surfaces, and changes in the watershed can increase or decrease water runoff, which could alter the amount of water received by a vernal pool, destroying the water budget that is necessary to sustain the habitat of that pool. Vernal pools with a significantly disturbed watershed generally have a higher pH, more mineral substrate, and more algae, which negatively impacts the habitat... *This susceptibility to changes in light, chemicals, or water is why in similar cases project applicants have performed detailed assessments to determine how work in the buffer zone will impact the vernal pool habitat, particularly its water budget.*⁷ (emphasis added).

My calculations indicate that the VPs would be *substantially* altered by the Project. As I state in my June 6, 2022 analysis, alterations to all VP hydrologic components occur — that is, watershed areas, impervious areas, runoff velocity, and volume are altered. These changes are shown in Table 1, which illustrates Project changes to the northerly VP.

Table 1. Changes to northerly VP, Pre- and Post-Development

	Area (ac)	Cn	Velocity (cfs)	Volume (af)	Tc
PRE-DEV	2.84	83	3.85	0.29	7.0
POST-DEV	1.04	79	1.33	0.092	3.8
	Area (ac)	Cn	Velocity (cfs)	Volume (af)	Tc
POST-DEV	-63%	-5%	-65%	-68%	-46%

Clearly, projected watershed changes are significant. For example, my analysis shows that the volume of water in the northerly VP would decrease as much as 68% post-development. Volumetric changes alter the VP water elevation, and consequently, alter the Wildlife Habitat conditions for the VP. Volumetric alterations may also appreciably change the hydroperiod (i.e., the duration of flooding) of the pool. These changes are not allowed under 310 CMR 10.60, because they threaten the species which inhabit the VPs on and near this site.

To maintain the fragile wildlife habitat characteristic of a vernal pool, a site designer normally strives to ensure that the annual water budget post-development, including proposed runoff characteristics, is in balance with pre-development conditions. In the case of this Project, there is no attempt to mimic pre-development hydrologic characteristics for the VPs on or near the site.

Incorrectly and without technical basis, the Goddard Report concludes that minimal impacts will occur. My detailed water budget analysis refutes Goddard’s unsupported claim.

⁷ Matter of Bosworth, OADR Docket No. WET-2015-015, Recommended Final Decision (February 17, 2016) adopted by Final Decision (March 14, 2016) (emphasis added); see also Matter of Scott Nielsen and The Levi-Nielsen Company, Inc. (April 12, 2010) (improperly-designed stormwater system that deprives a vernal pool of its water budget would fail to meet the Act’s performance standard for BVW under 310 CMR 10.55(4)).

Water Quality

The Report also fails to note that a certified VP is, under state regulations, a Class A water, as well as an Outstanding Water Resource (ORW).

ORWs (Class A) are defined in 314 CMR 4.05(3)(a), which states:

314 CMR 4.05: (3) Inland Water Classes

- (a) Class A. These waters include waters designated as a source of public water supply and their tributaries. They are designated as excellent habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation, even if not allowed. These waters shall have excellent aesthetic value. These waters are protected as Outstanding Resource Waters.
- 1. Dissolved Oxygen. Shall not be less than 6.0 mg/l in cold water fisheries and not less than 5.0 mg/l in warm water fisheries. Where natural background conditions are lower, DO shall not be less than natural background conditions. Natural seasonal and daily variations that are necessary to protect existing and designated uses shall be maintained.
- 2. Temperature. a. Shall not exceed 68° F (20° C) based on the mean of the daily maximum temperature over a seven day period in cold water fisheries, unless naturally occurring. Where a reproducing cold water aquatic community exists at a naturally occurring higher temperature, the temperature necessary to protect the community shall not be exceeded and natural daily and seasonal temperature fluctuations necessary to protect the community shall be maintained. Temperature shall not exceed 83°F (28.3°C) in warm water fisheries. The rise in temperature due to a discharge shall not exceed 1.5°F (0.8°C); and b. natural seasonal and daily variations that are necessary to protect existing and designated uses shall be maintained. There shall be no changes from natural background conditions that would impair any use assigned to this Class, including those conditions necessary to protect normal species diversity, successful migration, reproductive functions or growth of aquatic organisms.
- 3. pH. Shall be in the range of 6.5 through 8.3 standard units but not more than 0.5 units outside of the natural background range. There shall be no change from natural background conditions that would impair any use assigned to this Class ...6. Color and Turbidity. These waters shall be free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to this class.
- 7. Oil and Grease. These waters shall be free from oil and grease, petrochemicals and other volatile or synthetic organic pollutants ...

Based on this regulation, a project must meet defined parameters for: Dissolved Oxygen; Temperature; pH; Oil and grease; and other parameters. Scientists are aware (and scientific literature affirms without controversy) that changes to VPs from nearby development typically include higher saline measurements, lower Biological Oxygen Demand (BOD) and higher pH values, which are all detrimental to the fauna of vernal pools and negatively impact wildlife habitat. In addition, changes to stormwater may increase pool temperatures, because short-circuited flows off lawns and unshaded areas are hotter than stormwater from wooded areas. Each of these well-known changes potentially violates the ORW regulations found in 314 CMR 4.05(3)(a).

Again, the Report ignores and is silent about the Project's likely alterations to the VPs water quality, including changes to salinity, oxygen demand, pH values, and temperature of the VPs.

SUMMARY

The Report concludes without foundation that: “The project will not substantially or materially reduce the site’s capacity for wildlife or wildlife functions” Yet, the Report omits required analysis regarding the VP hydrologic regimes, and impacts to ORWs, including water quality and temperature alterations. Therefore, its conclusions must be considered incorrect.

My professional opinion is that the Report is incomplete and its conclusions misleading, as it ignores key provisions in the WPA and other state regulations.

Very truly yours,



Patrick C. Garner
Wetland Scientist, Hydrologist