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April 13, 2017

Mr. Joseph W. Freeman, Chairman
Hingham Zoning Board of Appeals
210 Central Street
Hingham, MA 02043

Subject: Broadstone Bare Cove – Comprehensive Permit

Dear Mr. Freeman:

At the continued public hearing on April 5, 2013 for the subject project, the Board heard testimony from Attorney Allcock related to his letter of the same date. Having received the letter the afternoon of the public hearing we were unable to provide the Board with an opinion on its content. Based on our review of the letter we offer the following:

1. We concur with Allen & Major Associates conclusion that the 12-inch sewer line between the manhole at which the 230 Beal Street property connects to the Beal's Cove Sewer system and the Beal's Cove Pumping Station has sufficient capacity to accommodate sewer flows from the proposed Broadstone Bare Cove project.
2. At its design capacity of 500 gallons per minute (GPM), the existing Beal's Cove Pumping Station appears to have sufficient capacity to accommodate sewer flows from the proposed Broadstone Bare Cove project. We note that in its sewer assessment report¹, Allen & Major Associates stated that "BPI observed that the existing station was operating properly, at its original design capacity of 500 gallons per minute." However, the BPI (Bridgewater Pump, Inc.) documentation contained in the report does not indicate that pump capacity tests were performed. Therefore, current pump capacity is unknown.
3. Attorney Allcock's letter included a letter report from Wright-Pierce which raised concern about the age of the pipes in the existing sewer system and their susceptibility to potential infiltration and inflow (I&I). Aside from the age of the pipes, Wright-Pierce suggested the discrepancy between flow measurements recorded at the Beal's Cove Pumping Station wet well and the manhole where the 230 Beal Street property connects to the Beal's Cove Sewer system is an indicator of I&I. Measurements were recorded at these two locations during a common time period from May 13 through May 26, 2016. During this period the average daily flow measured at the wet well was about 52,200 gallons per day (GPD) and the average daily flow measured at the manhole was about 41,000 GPD. Wright-Pierce stated that the difference in measured flow "may reflect the presence of approximately 10,000 GPD of extraneous flows from pipe or manhole

¹ Beal's Cove Existing Sewer Infrastructure Assessment, revised October 10, 2016

leakage between the two measurement points.” We do not disagree that there is potential for I&I in the existing sewage conveyance system. However, we note the following:

- a. The testing flow meter at the manhole where the 230 Beal Street property connects to the Beal’s Cove Sewer system was installed in the outlet pipe from the manhole so it recorded flow from the Hingham Mutual building and all upstream contributors. Flows from the Hingham Mutual building were not measured during the same time period, but when measured they averaged about 1,000 GPD. Removing the Hingham Mutual building flows, the average daily flow from upstream contributors would be about 40,000 GPD. Attorney Allcock identified 902 bedrooms in the developments upstream from this location. This results in an average daily flow of about 44.3 GPD per bedroom. Using the average daily flow recorded at the wet well, minus the Hingham Mutual building flow, results in an average daily flow of about 56.8 GPD per bedroom. Both of these flows are at or below what would be expected per bedroom, which would indicate little to no I&I.
- b. The flow meter at the manhole recorded fairly consistent average daily flows, ranging from 37,000 to 46,000 GPD. The flow meter at the wet well recorded average daily flows that were not as consistent, ranging from 43,000 to 62,000 GPD. The difference between recorded flows at each location was not consistent and the high and low flows occurred on different days. We would expect I&I, when present, should be a fairly consistent value and should decline during periods of dry weather, which was the case for the month leading up to, and the period of, flow measurements. BPI indicated that the flow meter at the wet well “was prone to debris buildup that changed the site flow characteristic during the monitoring duration.” Based on these discrepancies we believe that there was an issue with the flow measuring device at the wet well.

Without further study, we cannot confirm whether there is or is not I&I in the existing sewage conveyance system. However, average daily flows lead us to believe that I&I is not a major problem in this system. We have noted previously, the Grant of Easement document specifies that Broadstone Bare Cove will be responsible for a proportional share of the operation and maintenance of the pumps and incidental facilities associated with this system. We also note that Broadstone Bare Cove will need to negotiate with the Beals Cove Condominium Trust about potential upgrades to the privately owned system. We trust that the outcome of these negotiations will result in a system that will adequately serve all stakeholders.

Please give us a call should you have any question.

Very truly yours,

AMORY ENGINEERS, P.C.

By:



Patrick G. Brennan, P.E.

