



Town of Madbury
13 Town Hall Rd
Madbury, NH 03823

April 8, 2017

Christine Bowman, P.G.
NH Department of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Dear Christine,

The Madbury Water Resources Board (MWRB) has reviewed Emery & Garrett Groundwater Investigation's December 2016 Preliminary Hydrogeologic Report on the City of Portsmouth's well number 5 and would like to express some concerns and share some comments:

- Can the Freshet Road Aquifer sustain the total rate of water withdrawal the City of Portsmouth has requested? Portsmouth currently operates three wells (#2, #3, & #4) in this same aquifer with recent combined historical yield of up to .84 million gallons per day (mgd). The requested permit for Well #5 is .72 mgd, nearly doubling the potential strain on this aquifer (1.56 mgd total).

There is historical evidence that this aquifer cannot sustain this withdrawal rate: A 1957 report "Memorandum on the Hydrology of the Johnson Creek Area" by Edward Bradley of the US Department of the Interior states that Portsmouth wells #1 through #4 (*current well numbering*) were pumped at a rate averaging 1.60 mgd for a five month period from March through July 1956 until "By the end of July 1956 much of the ground water in storage in the Johnson Creek kame had been pumped out. The drawdown in the well field reversed the natural water-table gradient toward the stream, and the [service] of wells 1, 2 and 3 was discontinued during the summer of 1956." From this time through at least the date of the report, March 1957, only well #4 was operated at a rate of .80 mgd. Also of significant note; during this period flow in Johnson Creek disappeared, especially between wells #3 and #4.

The evidence of this prior experience is contrary to, and therefore calls into question, EGGI's assertion that Johnson Creek is hydraulically isolated from the aquifer from south of Well #2 to north of the City's property line.

- Risk to water quality. The map in EGGI's preliminary report appears to indicate that the well head protection area (WHPA) for Well #5 extends to within less than 1000 feet of the City of Dover's contaminated Griffin well. The flow of PFOA, PFOS and PFHpA toward the Griffin well is known, and is moving in the general direction of Well #5. The MWRB is very concerned that increasing withdrawal rates at the Portsmouth well field could draw that contamination into the Freshet Road aquifer.

- Future supply. A fully detailed long term water use plan should be developed that considers regional needs. The Freshet Road Aquifer is a natural resource that must be protected to ensure the wellbeing of multiple local communities. All other means to meet Portsmouth's water needs should be considered before committing to further tax the Freshet Road Aquifer.
- Portsmouth's additional water must not come at the expense of the Bellamy River. Portsmouth is obligated to maintain a minimum flow rate through the Bellamy reservoir dam to ensure health of the river and sufficient volume of water for those downstream. Regardless of permitting Well #5, the MWRB is concerned about how Portsmouth will balance water withdrawal between the Freshet Road Aquifer and the Bellamy Reservoir as Portsmouth's demand for water continues to increase.

For these reasons the Madbury Water Resources Board asks that NHDES consider the following when reviewing Portsmouth's request:

1. If a long term pumping test of Well #5 is allowed, that test should be performed with other wells in the well field continuing to operate. Ceasing current continuous extraction of .84 mgd while testing to see if a new well can supply .72 mgd tests only the performance of the new well, it does little or nothing to indicate sustainable yield rate of the aquifer.
2. NHDES should ensure that a maximum (sustainable) allowed water withdrawal rate is defined, monitored and enforced for the Freshet Road Aquifer.
3. Water levels in the aquifer and flow rates in Johnson Creek need to be monitored in perpetuity via a network of monitoring wells and Piezometers.
4. Threshold limits for ground water levels and stream flow should be established, documented and enforced to preclude overtaxing the aquifer.
5. Routine testing should be required to detect any migration of groundwater contaminants into the well head protection area, especially from the region near Dover's Griffin well.
6. NHDES must ensure that flow of the Bellamy River downstream of the reservoir will not be compromised if the Freshet Road Aquifer cannot sustain Portsmouth's demand for water.
7. The Town of Madbury would like to be copied on all ground water monitoring submissions to the NHDES.

Respectfully Yours,

Garret Ahlstrom
Chair, Madbury Water Resources Board