

What effect would a Municipal Groundwater Well have on Franklin Farm's east field?

Why Franklin Farm?

The Town of Cumberland Water Department (CWD) and our consulting engineering firm, Woodard & Curran (W&C), conducted a Town wide evaluation of Town owned property within the Town of Cumberland for the purpose of the exploration of new municipal groundwater well water supply. The evaluation yielded five sites, Franklin Farm being one of the five. Each site had to meet the following criteria:

- 1) Are the proper geological conditions present that would possibly support a groundwater production well?
- 2) Does the Town of Cumberland have ownership of the required 400 foot radius for a groundwater production well?
- 3) Are there any deed restrictions on the property that would prohibit the installation of a groundwater production well?
- 4) Does CWD have existing infrastructure in a relatively close proximity to the site that would support the transmission of water from a groundwater production well?

Franklin Farm was the primary site which met all of the criteria for the exploration of a new municipal groundwater well.

Why does the Town of Cumberland need new sources of municipal water supply and why a groundwater well?

The CWD currently has several sources of municipal water supply. Water is provided from the Sneece Pond Surface Water Treatment Plant, the Abbott Run and Manville Well fields and water which is purchased from the Pawtucket Water Supply Board (PWSB). CWD has trouble meeting peak demand periods during the summer months, which can be as high as 6 million gallons per day.

The CWD conducted an analysis of the cost to produce and distribute water from each of its sources. The analysis showed that water produced from groundwater wells was on average \$2.00 per thousand gallons less expensive than both Sneece Pond Water Treatment Plant Water and water purchased from the PWSB. That \$2.00 per thousand gallons difference equates to an annual savings of \$200,000.00 for every additional 100 gallons per minute that is produced from groundwater wells as opposed to the Sneece Pond Water Treatment Plant or purchased from the PWSB.

What impact will the exploration of a new source of municipal water supply have on the current operations of Franklin Farm?

There will be minimal impact to the current operation of Franklin Farm during the initial stages of the exploration of a new municipal water supply. The CWD has contracted with Layne Christensen Company of Dracut Massachusetts to drill test wells and conduct short term pumping tests of the test wells.

The test wells will consist of between 2 and 5 sets of 2 ½ inch wells which will be drilled at different locations in the east field. Each set of test wells will be drilled 2 feet away from each other, one for the purpose of pumping water and one to monitor the ground water level while the other well is being pumped. Each set of test wells will undergo a 4 hour pumping test from which water samples will be collected and sent to a laboratory for analysis. The 4 hour pumping tests will also determine what the probable safe yield of water will be and whether that safe yield varies by location in the east field. CWD and Layne Christensen Company anticipate that the drilling of the test wells and the completion of the pumping tests will take 7 days to complete.

The test wells will be drilled in late August or early September of 2013 due to ground water levels typically being at their lowest during this time of year. CWD experiences its highest demand periods during the summer months so it is critical that the probable safe yield of water be established during a period in which our residents will be most reliant upon a potential new source of water.

Once the test wells have been completed, what comes next?

What comes next at Franklin Farm's east field will be contingent on the results of both the short term pumping tests and the water samples. If the results of the short term pumping tests reveal that ground water levels are inadequate to support a production well or the water sample results show that water produced from a well would require a costly treatment process, the project will be terminated with no further effect to Franklin Farm. If the results of the short term pumping tests and water sample results prove that there is an adequate ground water supply of high quality water beneath the east field the project will progress to the next stage. The next stage would consist of the drilling of an 8 inch test well, long term pumping tests, additional water analysis and permitting processes with all applicable state of Rhode Island regulatory agencies.

The location of an 8 inch test well will be determined by the results of the short term pumping tests and water sample results of the 2 ½ inch test wells. The test well/wells best fitting the safe yield and water quality criteria desired by CWD for a source of water supply will advance to this stage. The 8 inch well will be drilled 2 feet away from both the 2 ½ inch test wells. Long term pumping tests which will require the continuous pumping of water for between 5 and 7 days coupled with additional water sampling will be conducted. Electricity will be needed to operate the pumps during the 5 to 7 day test which will require the use of a generator, a 12 to 14 foot job trailer may be needed to house equipment and provide a temporary field office for the long term tests. CWD and Layne Christensen Company anticipate that

the drilling of the 8 inch test well/wells and the long term pumping tests will take 20 days to complete. Due to the permitting requirements of state regulatory agencies, CWD is unsure as to when this work could begin at this time.

The impact to Franklin Farm's current operations in the east field would still be minimal during this stage. The only disruption that would occur would be in the immediate vicinity of the 8 inch test well/wells for a period of twenty days. Haying activities could still take place during that time, excluding the immediate area where work was being done.

Okay, there's a source of ground water supply under the east field now what?

Once all permit applications have been approved by all the required state regulatory agencies, construction of a production well/wells will begin. The production well/wells will be installed in the same location as the 8 inch test well/wells and could vary in diameter, typically between 18 inches and 36 inches. The installation of the production well could take between 1 and 2 months and will require a larger portion of the east field to house material and equipment for the construction of the production well.

The impact to Franklin Farm's current operations in the east field would be higher during this phase of the project due to the longer period of time that construction activities would be taking place. Haying activities could still take place during this phase excluding the immediate area where work was being done.

Will a building or structure be needed to house the production well and how will it affect the scenery of the east field?

A building or structure will not be needed to house the production well however a structure will be needed to house chemicals, water quality monitoring equipment and controls. The size of the structure will be determined during the design phase of the project and preliminary discussions have favored an underground or walkout vault. The advantage to this type of structure would be that there would be no visual change to the landscape of the east field. The vault could be constructed at a location in the east field where access for operational activities will be least intrusive. A fence may have to be constructed around the entrance to the vault and around the production well, both of which however will not be visible from Abbott Run Valley Road.

Construction of the structure and excavation for utilities will occur concurrently with the drilling of the production well. CWD anticipates that all construction activities will be completed in a 2 to 3 month period. The impact on the scenery as well as the current operations of Franklin Farm's east field will be the greatest during this phase. Haying activities will be limited to a smaller area for the 2 to 3 month period of the construction phase. However when the project is completed the visual impact will be nonexistent and operational impact will be minimal.

Will an access road be necessary for the ground water production well and structure?

An access road to the production well/wells and structure will be necessary for CWD's operational and maintenance purposes. The access road would be as inconspicuous as possible and be made of gravel, not asphalt or concrete. There may be a need for small amount of asphalt or concrete near the entrance of the walk out vault however it again would not be visible from Abbott Run Valley Road.

The location of the gravel access road would be dependent on the location of the production well/wells and vault and will be determined during the design phase. Initial discussions have favored an entrance off of Rolling Green Drive however it is too early in the process to determine if that will be a feasible access point.

If a ground water production well is installed how will Franklin Farm's current and future operations in the east field be impacted?

The State of Rhode Island Department of Health (RIDOH) requires that a 400 foot radius from the ground water production well be maintained as a watershed protection area. In the event that the production well/wells were located in the center of the east field the radius would encompass the entire field.

CWD has inquired to RIDOH if a variance could be granted for agricultural purposes within the 400 foot radius. RIDOH has granted variances for agricultural purposes within the 400 foot protective radius on a case by case basis in several locations within the state. The variances typically reduce the 400 foot radius to a 100 foot radius. Agricultural operations (growing of vegetables) would be permitted in the east field excluding a 100 foot radius around the production well if a variance were granted. Haying activities could continue within the 100 foot radius excluding the use of pesticide, herbicide, or organic fertilizer (manure). Application of pesticide or herbicide would be prohibited within a 400 foot radius of the production well however the use of organic fertilizer (manure) would be permitted within the 400 foot radius, just not within a 100 foot radius of the production well. RIDOH would require more frequent testing for nitrates if organic fertilizer was applied to the east field which CWD has no objection to.