Medfield Water Treatment Plant Project

Frequently Asked Questions (FAQ)

March 2021

The Town of Medfield through its Board of Water and Sewerage will request Town approval of a $12 million water treatment plant at the 2021 Annual Town Meeting. This project is the culmination of an extensive period of analysis and design in keeping with the Board's strategy to ensure a safe and reliable Town water supply. In 2018, Annual Town Meeting approved $610,000 for the design and permitting of this project. Prior spending to study this project was also approved at the 2016 and 2017 Annual Town Meetings.

Two alternate routes to this objective were pursued. The first was seeking new ground water resources within the Town. The second was connecting to the Massachusetts Water Resource Authority (MWRA) system, which supplies water sourced from western Massachusetts to many communities in the eastern part of the Commonwealth. After investigation of all options was completed, the Board concluded that the most viable option was to install a manganese removal facility at Wells 3 and 4. Manganese treatment is a proven technology that is utilized by many other Massachusetts public water suppliers. This project will expand the Town's water production and treatment capabilities to add resiliency and redundancy to our water distribution system.

Here is a list of Frequently Asked Questions that will help provide a better understanding of the project, finances, and science.

Project Overview

1. Where does our water come from?

   Our water is sourced from five wells located in Medfield: Well Nos. 1, 2, 3, 4, and 6. These wells draw from underground aquifers that reside in two watershed basins, the Neponset River and the Charles River watersheds. Wells 1 and 2 are located on Route 109 at the Millis town line, Wells 3 and 4 are located off of Elm Street, behind the soccer fields at Wheelock School and Well 6 is located off of Route 27, at the Sherborn town line. These wells are permitted for various levels of water withdrawal by the Massachusetts Department of Environmental Protection (MassDEP), the state agency which regulates public water resources and drinking water.

2. Why do we need a filtration system for Wells 3 and 4?

   Water produced at Well 3 has manganese levels that exceed MassDEP guidelines. This project is designed to treat water from both Wells 3 and 4, which are in close proximity.

3. Is this due to pollution or is it a natural situation? Is this common?

   Manganese is a naturally occurring metal that is found in the mineral geology of many parts of New England, including the area around Wells 3 and 4. As water percolates through underground aquifers, manganese is leached from the underground strata.

4. When did these levels of manganese first become an issue?

   MassDEP notified Medfield that manganese concentration in water produced at Well 3 exceeded its guidelines in 2013.

5. Other than filtering water, what else will be accomplished with this project?

   This project will accomplish several other goals important to the Town, primarily improving the Town's water production resiliency and capability. Currently, the Town is not able to fully utilize the permitted water production volumes at Wells 3 and 4. This project will address both capacity and water quality issues at these wells by:

   - Rehabilitating Well 3 to increase its pumping capacity. Due to mechanical issues with the piping system, Well 3 cannot operate at it fully licensed capacity. Installation of a new well and casing will restore production to its full licensed capacity.
   - Well 4 equipment restorations to enable utilization of this well to its permitted levels. Water from this well will be treated at the new facility located adjacent to Well 3
   - Restoration of capacity at Wells 3 and 4 will provide resiliency and redundancy to the Town's water distribution system. Full operational capability at these wells is required to assure adequate water supply in the event that other wells in the system need to be taken off line for maintenance.

6. What alternatives have we considered to avoid this filtration project?

   In 2017, the Town of Medfield conducted an exhaustive search to find alternative water sources in Town with sufficient quantity and quality to meet the Town's needs. In this investigation, 16 locations were studied, but no acceptable new sources were identified.

   We also investigated becoming a member of the MWRA. There are advantages to joining the MWRA, including assurances about quantity and quality of water. In addition, the MWRA offers attractive financing options that reduce capital costs to member communities.

   There are several obstacles to joining the MWRA. First, its supply infrastructure is not located near Medfield. Bringing MWRA water to Medfield would require a complicated infrastructure project to connect to the MWRA's system, including obtaining rights (or rights of way) to bring the water through adjacent communities (which are not on the MWRA system). We found this alternative to be cost prohibitive. The estimated capital cost of this connection, $20 to $30 million, is 2x to 3x the manganese filtration project cost. In addition, there is no certainty that adjacent communities will approve the construction of the necessary pipeline. Finally, the purchase price for MWRA sourced water will be at least 200% more than the cost of Medfield sourced water. The Town would remain responsible for investing in and maintaining its infrastructure, vehicles, and equipment.

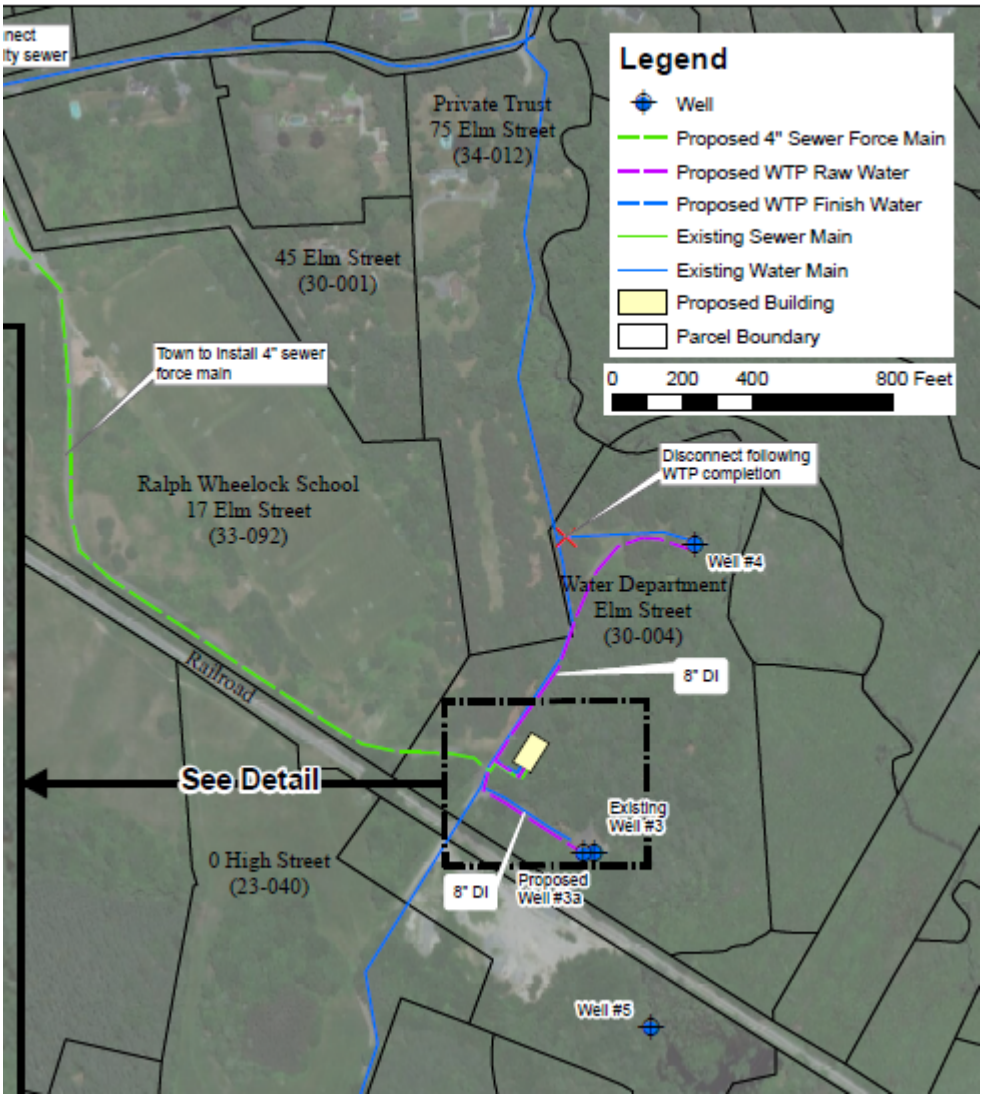
   Lastly, the timeline to reach agreements with neighboring communities, obtain the necessary permits, design, and construct an MWRA interconnection will exceed the timeline MassDEP has

mandated for Medfield to reduce manganese levels. This could require making significant short term water infrastructure investments to bridge the time gap.

Water Treatment Plant Design and Schedule

7. Where will the filtration plant be located?

   The new treatment facility will be located adjacent to Well 3 on Town land that is dedicated to water production.



8. What is the plan for the project?

   Environmental Partners Group completed pilot plant studies in 2018 to determine the size and configuration of the equipment required to treat the required water volume. The result of this

process design work is located on the Town website: https://www.town.medfield.net/1952/Water-Treatment-Plant-Project

Detailed engineering is complete, and construction bid documents will be released on March 17 to potential bidders. The schedule including remaining engineering, construction and commissioning activities is:

- March 17, 2021: Bid documents released
- May 2021: Recommendation of Bid Award
- May 17, 2021: Annual Town Meeting for project funding vote
- July 2021 to December 2022: Construction and Commissioning
- January 2023: Town Occupancy of Plant
- April 2023: Contracts closed out

9. What are the major elements of this project?

- Permit application and approval
- Well 3 replacement
- Well 4 refurbishment
- Building construction
- Filtration process equipment construction and commissioning
- Filtration waste line construction Town's existing sewerage piping

Project Costs and Finances

10. How much will it cost?

The estimated project construction cost is $9.4 million. Total project costs, including construction, engineering, and project management are estimated at $12 million. Design and engineering costs of $610,000 were approved at the 2018 Annual Town Meeting. Additional funds for study and engineering were approved at the 2016 and 2017 Annual Town Meetings.

11. How will this project be paid and financed?

This project is funded by the Water Enterprise Fund. This fund is not part of the Town's General Fund (i.e., property taxes). Once approved at the 2021 Annual Town Meeting, the Enterprise fund will use bonds to fund the project. Debt payments on the bonds will be paid from water revenues collected by the Water Enterprise Fund.

12. Are there state grants or other programs to help fund the costs?

The Town has applied to a special state lending facility called the Drinking Water State Revolving Fund (DWSRF). This program provides discounted interest rates to communities to support water supply improvements. Limited funds are available and Towns must apply annually for consideration

in this program. The DEP prioritizes the applications and awards loans based on the priorities and the funds available. The interest rate for projects that qualify for this program is currently 2.0%.

13. How will it change my water rates?

    This filtration program will add a sizable debt load to the water enterprise fund for the next 20 years, with debt service declining over that time period. In anticipation of the project, last year's water rates were increased 5%, and this year water rates were increased by 12% to cover the debt service.

14. Will this project change my sewerage rates?

    Sewerage rates will not be affected by the costs of the filtration project.

15. What other large water projects were recently completed?

    The recent projects executed on the water system include a new water tank at the Medfield State Hospital for $5.4 million completed in 2016.

    This past fall, the Town completed a $550,00 refurbishment of the Mt. Nebo water tank. This included internal and external tank recoating and some improvements to the tank's systems.

16. What are the other large water investments in the foreseeable future?

    The capital plan for other investments in the water system include:
    - Upgrading the town wide water system control and metering system
    - Refurbishment/replacement of selected water and sewer lines to address leaks and infiltration
    - Replacement of Water Department equipment, such as trucks
    - Other normal maintenance items

17. Where can I find more details about the project?

    The recently completed preliminary design report is a good source of information, and it can be found on the Town's website: https://www.town.medfield.net/1952/Water-Treatment-Plant-Project

    This project is also reviewed during the Board of Water and Sewerage meetings, which are public meetings. In order for adequate preparation time for responses to questions regarding this project, it is strongly advised for questions to be submitted to the Board prior to preparation of the meeting agenda. See the Board's Agenda Policy for more information.

Science of Iron and Manganese Filtration

18. How will the water composition change?

    The filtration system is specifically designed to remove the manganese and iron.

19. What is the filtration process that will be used?

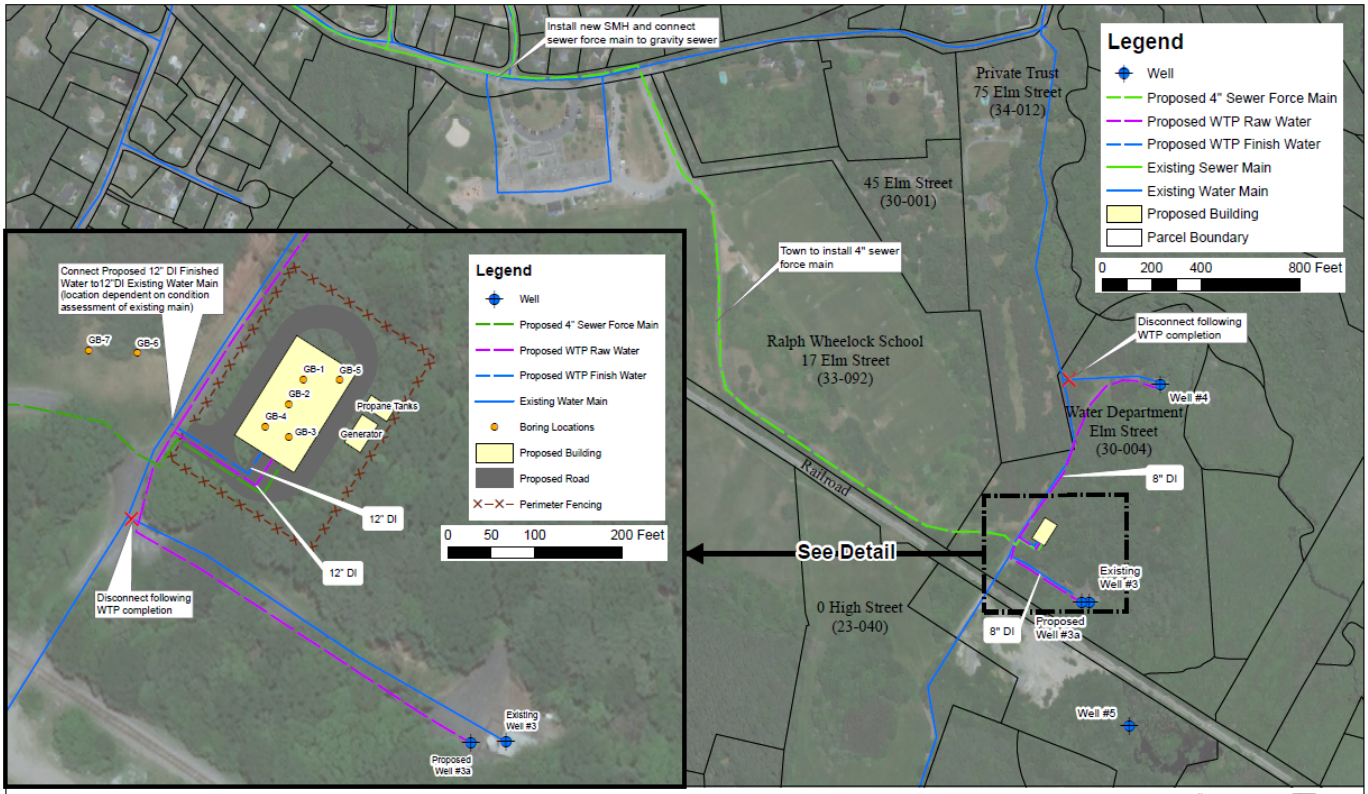
    The process will use a special type of sand that converts the dissolved manganese to a suspended solid form that can be filtered by the sand. The chemical term is oxidation, which uses a low level of chlorine to catalyze the conversion of manganese from the dissolved form to the suspended form.

20. Has this been used before?

    This filtration process has been in use for decades in drinking water systems. Other communities in Massachusetts that use this technology include Webster, Plymouth, Shrewsbury, Kingston and Topsfield.

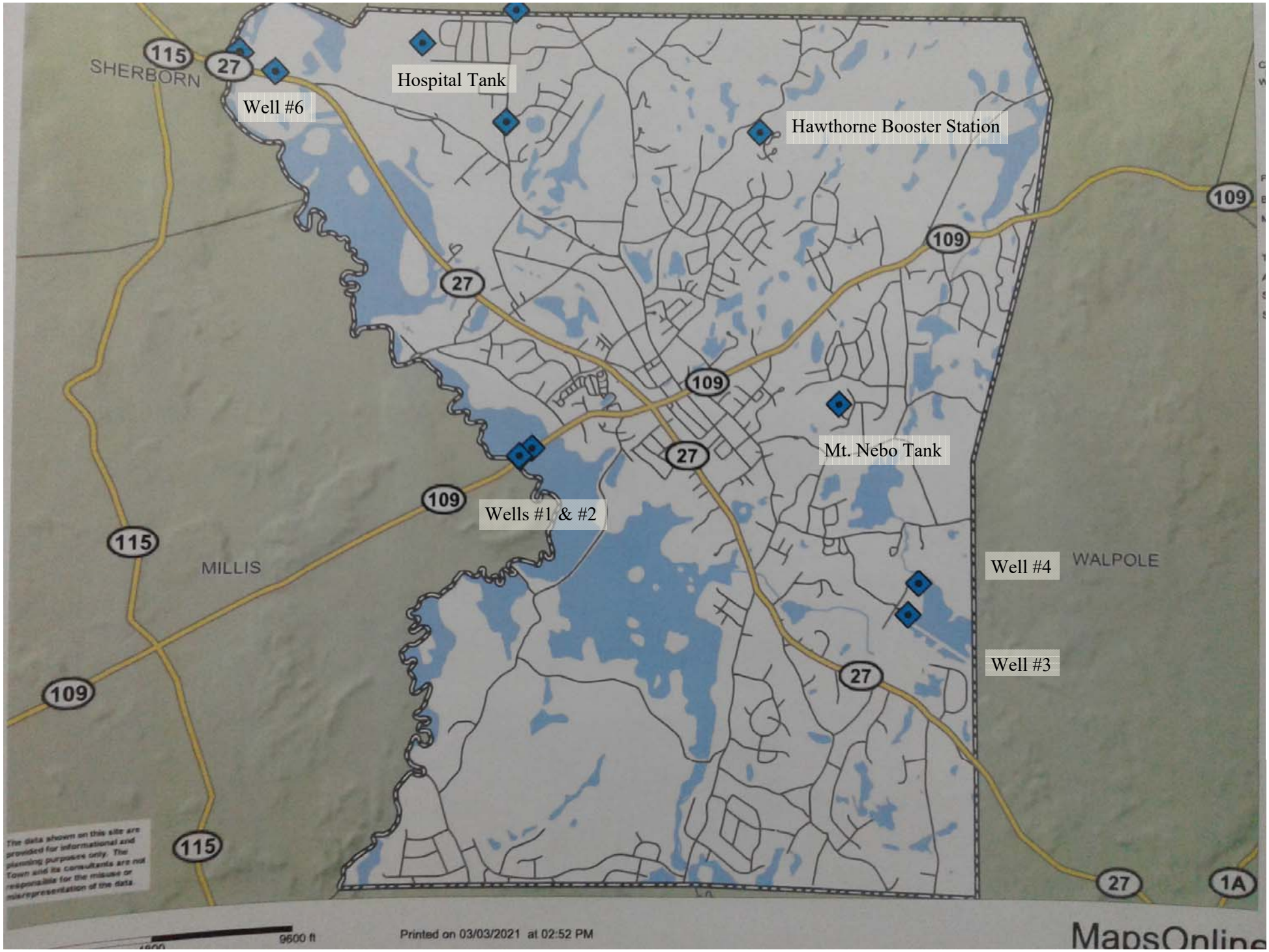
21. What waste will be generated from this, and how will it be dealt with?

    The process generates a backwash water stream that will be sent to Medfield's wastewater treatment plant. The manganese and iron solids will become part of the sludge that is hauled to a landfill.



ENVIRONMENTAL PARTNERS

Medfield Water Treatment Plant
Preliminary Design Schematic
February 2020


Hospital Tank
Well #6
Hawthorne Booster Station
Mt. Nebo Tank
Wells #1 & #2
Well #4
Well #3
SHERBORN
MILLIS
WALPOLE
115
27
109
1A
The data shown on this site are provided for informational and planning purposes only. The Town and its consultants are not responsible for the misuse or misrepresentation of the data.
9600 ft
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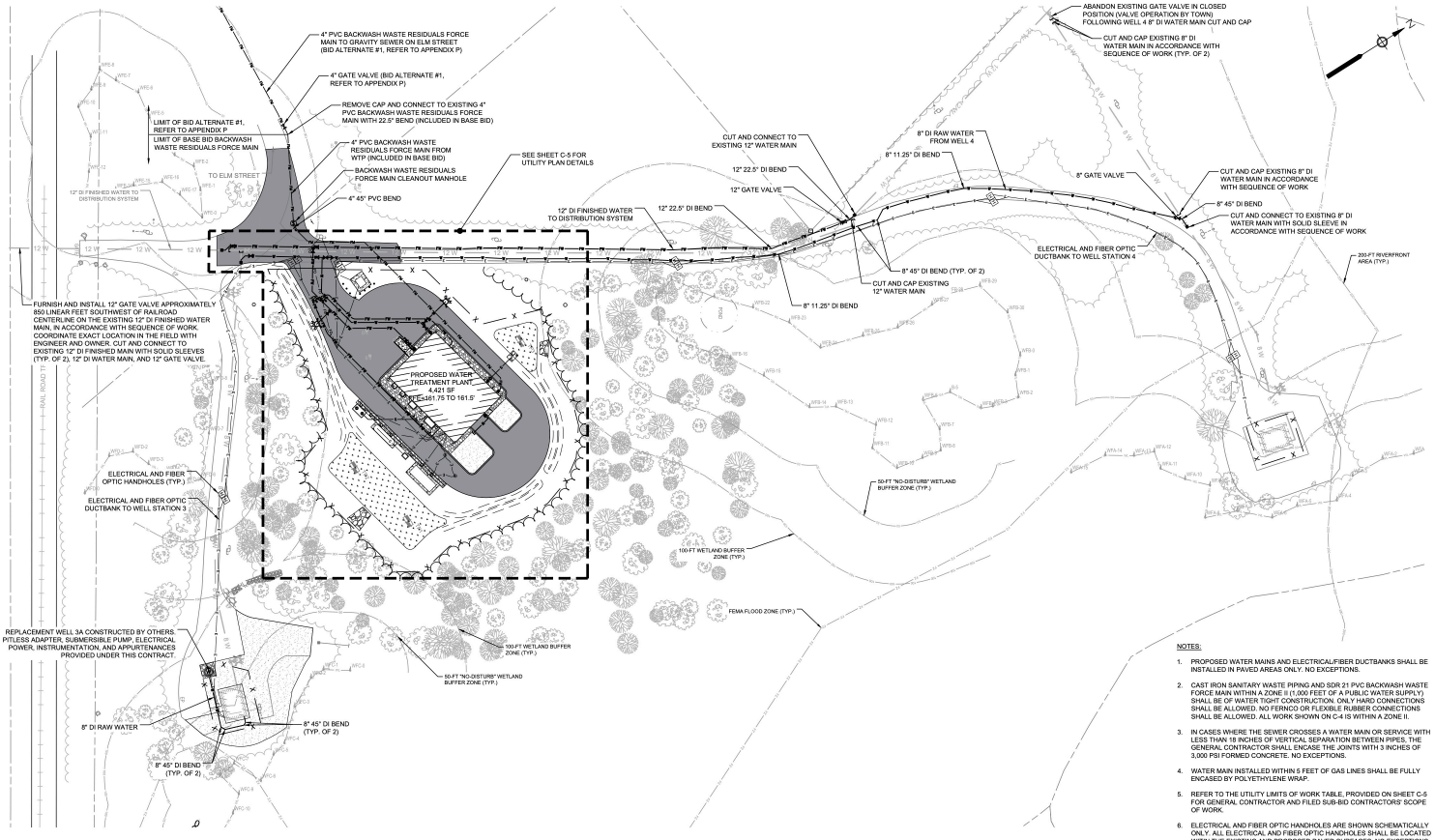
MapsOnline



NOTES:

1. PROPOSED WATER MAINS AND ELECTRICAL/FIBER DUCTBANKS SHALL BE INSTALLED IN PAVED AREAS ONLY. NO EXCEPTIONS.
2. CAST IRON SANITARY WASTE PIPING AND SDR 21 PVC BACKWASH WASTE FORCE MAIN WITHIN A ZONE II (1,000 FEET OF A PUBLIC WATER SUPPLY) SHALL BE OF WATER TIGHT CONSTRUCTION. ONLY HARD CONNECTIONS SHALL BE ALLOWED. NO FERNCO OR FLEXIBLE RUBBER CONNECTIONS SHALL BE ALLOWED. ALL WORK SHOWN ON C-4 IS WITHIN A ZONE II.
3. IN CASES WHERE THE SEWER CROSSES A WATER MAIN OR SERVICE WITH LESS THAN 18 INCHES OF VERTICAL SEPARATION BETWEEN PIPES, THE GENERAL CONTRACTOR SHALL ENCASE THE JOINTS WITH 3 INCHES OF 3,000 PSI FORMED CONCRETE. NO EXCEPTIONS.
4. WATER MAIN INSTALLED WITHIN 5 FEET OF GAS LINES SHALL BE FULLY ENCASED BY POLYETHYLENE WRAP.
5. REFER TO THE UTILITY LIMITS OF WORK TABLE, PROVIDED ON SHEET C-5 FOR GENERAL CONTRACTOR AND FILED SUB-BID CONTRACTORS' SCOPE OF WORK.
6. ELECTRICAL AND FIBER OPTIC HANDHOLES ARE SHOWN SCHEMATICALLY ONLY. ALL ELECTRICAL AND FIBER OPTIC HANDHOLES SHALL BE LOCATED WITIN THE EXISTING AND PROPOSED PAVED SURFACES. NO EXCEPTIONS.

TOWN OF MEDFIELD

ENVIRONMENTAL PARTNERS

ERIC A. KELLEY ENVIRONMENTAL No. 4609

MARK	DATE	DESCRIPTION

Scale	1"=20'
Date	MARCH 2021
Job No.	134-2002
Designed by	MEPA
Drawn by	HAZ
Checked by	DNRP
Approved by	EAK

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS 3 & 4 WATER TREATMENT PLANT
MEDFIELD, MASSACHUSETTS

CIVIL UTILITY SITE PLAN

FOR CONSTRUCTION

Sheet No.

C-4

Drawing file: I:\Medfield 134\Water Supply\134-2002 - Well 3_4 WTP Final Design\01 CAD\3.0 Civil Drawings And Plot Data\ Mar 12,2021 4:37pm