Town of Exeter, New Hampshire

Proposed Groundwater System Factsheet

February 2011

Article 12
Groundwater System & Treatment Facility

DESCRIPTION

Article 12 on the 2011 warrant would raise and appropriate $6,350,000 for the design and construction of new groundwater system and treatment facility.

After a multi-year, thorough review of water deficiency issues facing the Town and investigating water supply alternative solutions, the Board of Selectmen, Town Manager, and Public Works Department have reorganized the Town's Water Capital Improvement Plan to include a recommendation for implementing the Groundwater System project this year. Warrant Article 12 is another step in implementing solutions to the Town's long-range water supply improvement plan.

These improvements will allow the Town to further diversify its water supply sources and improve overall water quality in the system. These improvements include upgrades to the Lary Lane Well, equipping the Gilman Park and Stadium Wells and constructing a new Groundwater Treatment Facility to be located either at Gilman Park or adjacent to the Lary Lane Well.

BACKGROUND

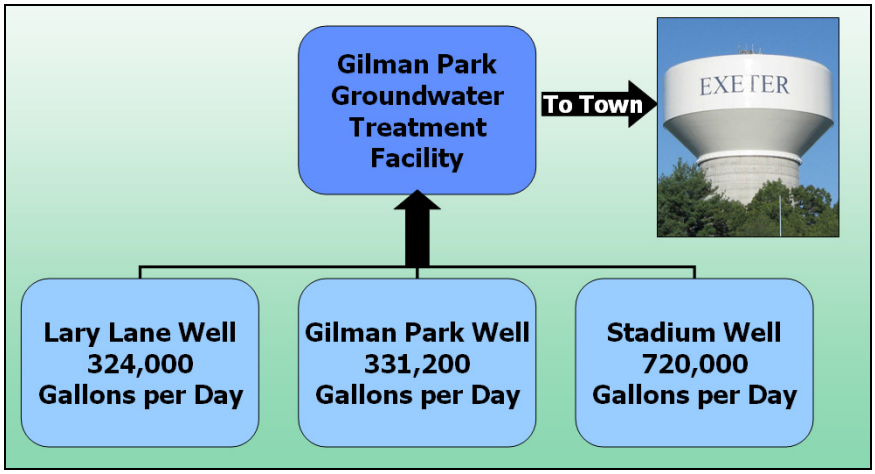
The Town conducted a detailed study in 2007 to further explore the groundwater options. Following extensive research of available sites it was recommended to the Board of Selectmen in 2008 that two inactive sites, the Stadium and Gilman Park wells, be rehabilitated and reactivated. That work was approved and the following items have been accomplished to date:

- **Spring 2009** – Rehabilitation of the Stadium and Gilman Park wells
- **July 2009** – Pumping test and water treatment piloting of Stadium, Gilman Park and Lary Lane wells
- **2009/2010** – Data analysis and submittal of final pumping test and piloting reports to the New Hampshire Department of Environmental Services (DES)
- **2009/2010** – Water Supply Options Study which included an analysis of potential operational cost savings of approximately $50,000 to $100,000 a year by using more groundwater supply versus surface water to meet the Town's water demands
- **2010** – Preliminary design of well and groundwater treatment facility construction
- **November 1, 2010** – Town receives letter from DES approving reactivation of the Stadium and Gilman Park wells

THE WELLS

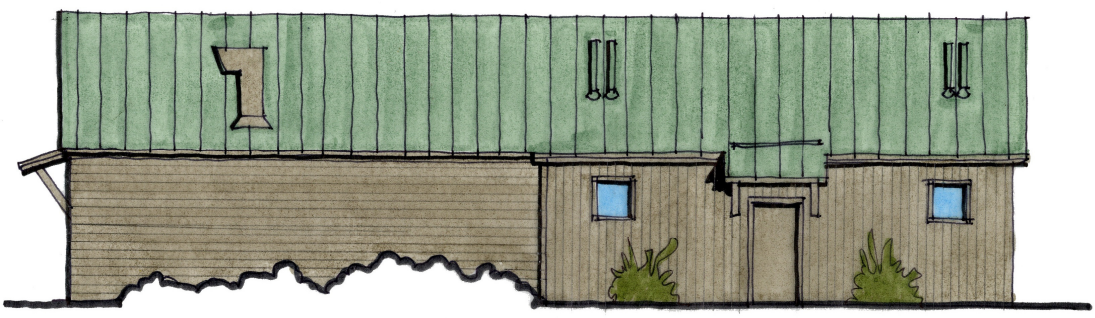
Existing Lary Lane and Gilman Park Wells – Stadium Well Prior to Rehabilitation

The Town's water system relied on groundwater from the Gilman Park, Lary Lane and Stadium wells from the 1950's until 1974 when they shifted over to the surface water system. The Lary Lane well remained in service and has been used as a supplemental water source since that time. Changes to regulations lowered the acceptable level of arsenic in this well from 50 parts-per-billion (ppb) to 10 ppb. This change has warranted the need for treatment of the well. The Stadium and Gilman Park wells require treatment for high levels of iron and manganese, therefore, the intent is to construct pipelines to combine all three wells and treat them at a new groundwater treatment facility. The following schematic shows the wells, their rated maximum daily flow and the proposed groundwater treatment facility:



As the schematic shows, the total system capability for the three combined wells is 1.375 million gallons a day. This volume is more than the Town's average day of water demand, which is approximately 1.1 million gallons, but less than the peak demand of approximately 1.8 million gallons. Therefore, the intent of the new groundwater system is to blend the groundwater with the surface water and manage all of the sources in a sustainable and integrated manner in order to optimize all the sources.

PROPOSED GROUNDWATER TREATMENT SYSTEM



Architects Rendering of Proposed Groundwater Treatment – TMS Architects

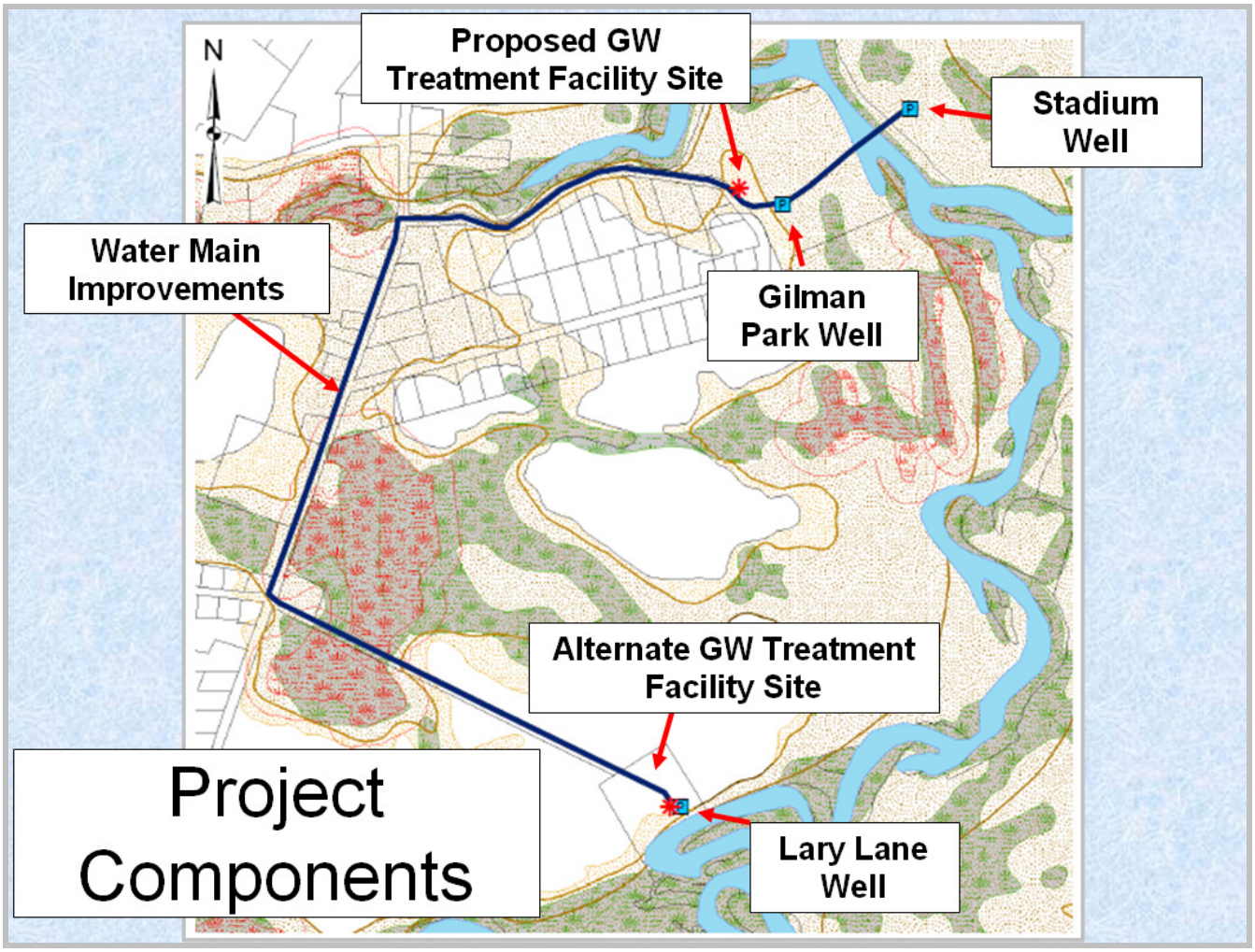
After reviewing the groundwater treatment pilot findings and considering site and operational issues Weston & Sampson has developed a preliminary design of groundwater treatment (GWT) to include:

- Construction of a new GWT facility located at the former volleyball court at Gilman Park. The facility would be designed to be:
  - An approximate footprint of 30 feet x 80 feet (2400 square feet of interior space).
  - Built to be as energy and environmentally efficient as possible, including porous pavement, rain gardens and other "green" building components.
  - Incorporated into the park-like atmosphere of the Gilman Park, and possibly have the construction coincide with the construction of a pavilion to serve users of the park. This concept has already been brought forth through the preliminary architectural design of the facilities
- Four (4) new 8-foot diameter pressure filters and filter media with Greensand Plus.
  - These filters would be capable of producing 250 gallons per minute (GPM) of flow at a loading rate of 5.0 gpm/square foot (higher rates may be possible). With all four filters this provides a design flow rate of 1.44 million gallons a day.
  - Provisions to add two additional filters at a later date to increase capacity of system to 2.16 million gallons a day.
- An alternate site, located adjacent to the Lary Lane Well, is available for the purpose of locating this facility if the Gilman Park site is not feasible.

THE PROPOSED PROJECT

- Renovate and equip Gilman Park Well pump house, build and equip Stadium Well pump house. Both sources were recently approved by NHDES for reactivation as water supply sources at a combined flow of approximately 1 million gallons per day.
- Renovate the Lary Lane Well to allow treatment for arsenic removal. This well has a daily flow of approximately 324,000 gallons per day.
- Install new transmission water mains to manifold the three wells and upgrade distribution water mains in the area of Gilman Park.

- Construct a new groundwater treatment facility to remove iron, manganese and arsenic from the source water. This facility will be design to handle the maximum flow from the three combined wells, plus have room for expansion if necessary in future years.



PROBLEMS ADDRESSED:

- Intermittent violations of the arsenic standard (lowered from 50 to 10 parts per billion) for the Lary Lane Well will be solved by blending with the other two wells and treating at the groundwater treatment facility.
- Current violations of the Total Trihalomethane (TTHM) standard will be partly addressed by the blending of treated groundwater into the water system.
- Two sources of supply which have been idle for over 35 years will be reactivated and utilized by the Town in an integrated manner.

BENEFITS:

- This is a less expensive capital project than building an entirely new surface water treatment facility.
- The operations and maintenance of the groundwater system is also less expensive than surface water, about half the electrical and chemical costs of what surface water costs to produce.
- The source water is of higher and more consistent quality than surface water.
- The state Department of Environmental Services is likely to limit the amount of withdrawals the town can make from the Exeter River, the town's main water source, in the future.
- Having multiple sources will provide more security in the event of a drought or if something goes wrong with the surface water supplies.
- If approved, the Town is currently in line for receiving some bonding forgiveness from the state's Revolving Loan fund, which is estimated to amount anywhere from $1.0 to $1.5 million.

FINANCING:

The project costs include Well Improvements $775,000; Water Transmission and Distribution Main Improvements $1,093,000; and Groundwater Treatment Facility $4,482,000. Total project cost $6,350,000 will be financed through the following sources:

- Ratepayer fees of 4.88 to 5.33 million, depending on SRF principal forgiveness.
- The Town will issue a bond anticipation note to complete the design phase of the project and bond the remainder of the project when bids are received on the construction phase. The length of the bond will be 20 years.
- The Town will seek a State Revolving Fund (SRF) loan at more favorable interest rates than the general bond market. SRF loans are granted through the New Hampshire DES for qualifying water and wastewater projects. This project is ranked high on the list of DES's SRF water projects and will qualify to receive 30% forgiveness on a percentage of the loan.

WATER RATE IMPACT:

This project will be funded entirely by water users. The total obligation is estimated to be $4.88 to $5.33 Million. The impact for the average residential ratepayer portion of the project is estimated to be $4.36 to $4.77 per month. This translates to $52 to $57 per year.

PROPOSED TIMELINE:

2011 - 2012 – Final design
2012 - 2013 – Bidding, Construction and Startup