

February 7, 2013

Mr. James Wilson
South Shore Tri-Town Development Corporation
223 Shea Memorial Drive
South Weymouth, Massachusetts 02190

**RE: Executive Summary -
Southfield Sewer System – Phase 1 Build-out Assessment
Task 2 and Task 3 - Southfield Sewer Flow Assessment and Sewer Modeling**

Dear Mr. Wilson:

Please accept this executive summary in advance of the full report, which should be completed by the end of February 2013. The full report will include the results, conclusions, and recommendations from both Task 2 and Task 3 of our Contract scope of work.

BACKGROUND

- The South Shore Tri-Town Development Corporation (SSTTDC) is currently operating under a Memorandum of Agreement (MOA) with the Town of Weymouth, and a sewer extension permit from the Massachusetts Department of Environmental Protection (DEP), which allows for a total average daily wastewater flow to the Weymouth municipal sewer system of 187,000 gpd associated with up to 1,000 residential dwelling units and up to 650,000 square feet of commercial space at Southfield.
- Given flow restrictions in the Weymouth sewer system downstream from Southfield's existing sewer connection at Union Street, the sewer extension permit restricts the pumping rate from the existing Southfield pump station to 300 gpm.
- Although the 300 gpm pumping rate should preclude surcharging in the Weymouth sewer system, it will result in surcharging and backups within the Southfield collection system as development continues according to plan.
- Under this assignment, Environmental Partners was engaged to assess Southfield build-out rates, and their associated water consumption and sewer generation rates, in order to identify feasible alternatives for appropriate wastewater handling through Phase 1 of Southfield development.
- Environmental Partners used the following information from SSTTDC to evaluate the Southfield sewer system and make sewer flow projections:
 - Record drawings of the Southfield sewer system.
 - Building permit and certificate of occupancy permit information for the Southfield development.
 - Monthly water usage readings for Southfield customers for calendar year 2012.
 - Daily Southfield sewer pump station runtime information for November 2012 and December 2012.
 - Daily sewer flow meter records for November 2012 and December 2012.
 - The Weymouth sewer system model developed and obtained by the Town of Weymouth.

TASK 2. SOUTHFIELD SEWER FLOW ASSESSMENT

Pace of Construction

- The permitting, construction, and occupancy of residential housing units (and bedrooms) have been very steady since 2010. Evaluations of the data indicate an r-squared factor of 90% through December 2012 when using a natural log correlation.
- If the current rates are sustained, it is anticipated that building permits reaching the Phase 1 milestone of 1,000 residential housing units will be achieved by the 4th quarter of 2017 (+/- 1 year with a 10% factor of error). Refer to Figure 4.
- We understand that some ongoing delays in advancing Phase 1 components by LNR may flatten out the pace of development during 2013, but this could be recovered quickly, depending on market conditions and actual delays incurred. Given the uncertainty, we have not reflected any delays in our overall projections.
- At the current rate of development, the average time between building permits and occupancy permits is approximately 11 months for residential housing units.

Water Consumption

- Water metering has been implemented in a manner that allows for segregation of residential consumption from irrigation uses.
- Metered water consumption records to date indicate that actual residential unit water consumption is significantly lower (78.3 gpd) than what was projected in the FEIR (121.6 gpd).
- 2012 irrigation water use significantly increased the per unit consumption rate from 78.3 gpd to 95 gpd.
- If 2012 irrigation use patterns continue, the Phase 1A water use limit of 123,500 gpd is projected to be reached sometime beyond 2018. Without irrigation, the Phase 1A limit is expected to be reached even later (refer to Figures 14 and 15).
- Water usage projections indicated that the Phase 1 water use limit of 245,000 gpd will not be reached until well beyond December 2018, with or without irrigation usage (refer to Figures 14 and 15).

Sewer Flows

- The current estimated average daily sewer flow from new construction in Southfield is approximately 17,200 gpd, which is 1.1 times greater than the metered water consumption (November 2012 and December 2012 data only).
- The estimated average daily sewer flow from the Navy portion of Southfield is approximately 57,000 gpd, which is 70 times greater than the metered water consumption for the occupied Navy buildings. Daily flows from the Navy sewer system have been measured as high as 96,000 gpd after precipitation events. This sewer flow information indicates that there is a significant infiltration and inflow (I/I) situation associated with the old Navy sewer system.
- If the current average daily sewer flows from the Navy remain constant (57,000 gpd), daily average sewer flow projections for Southfield are anticipated to be between 150,000 gpd and 180,000 gpd by the end of December 2018. However, this projection could be significantly higher depending on future rain events, or could be decreased if I/I is reduced in the Navy system.

- I/I from the Navy system creates a one-for-one reduction in the sewer capacity available for new construction in Southfield, and steps should be taken to reduce I/I to the maximum extent practicable.
- One potentially quick and inexpensive method of eliminating I/I from the old Navy sewer system is to plug those sections of sewer that are no longer in use. If there are no active connections or users on a particular sewer branch, then plugging this branch at the connection point to an active sewer section will eliminate I/I contributions from that section. However, a cursory review of the existing Navy sewer infrastructure mapping indicates that this approach may not be as beneficial as anticipated. It all depends on which sections are contributing the most I/I flow.

TASK 3. SEWER MODELING

Southfield Sewer Pump Station

- Sewer modeling indicated that the existing Weymouth sewer system downstream of the Union Street connection point for Southfield can only accept sewer flows from the Southfield pump station at a maximum rate of 300 gpm. Pumping in excess of this rate is predicted to cause surcharges in the Weymouth sewer system, and this would require sewer system upgrades along Union Street.
- The existing Southfield sewer pumps are rated at 266 gpm, which is within the acceptable range for discharge to the Weymouth sewer system at Union Street. However, our modeling results indicate that if the pumping rate is limited to 266 gpm, the size of the existing wetwell would result in surcharging and overflows within Southfield as development continues. The information presented in Figure 21 indicates that unless there are changes made in the sewer system infrastructure, the potential for surcharging and overflows in Southfield could occur in early 2016.
- Several options were evaluated to address the limitations of the existing sewer pump station, including expanding the wetwell, installing a larger pump and increasing the capacity of the Weymouth sewer system, and splitting the pump station discharges to Weymouth via a second sewer connection on Main Street.
- Expanding the existing wetwell is the preferred solution, as this will accommodate both existing pumping rates and future Southfield Phase 1 flows at the lowest cost and implementation complexity. Our evaluation indicates that an additional usable volume of 3,500 gallons is needed and could be implemented for a capital cost of approximately \$75,000.

RECOMMENDATIONS

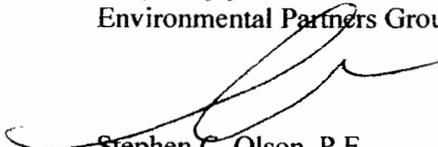
- It is recommended that SSTTDC begin the design and any associated permitting for wastewater pump station modifications immediately, so that the station is prepared to accept increasing wastewater flows by early 2016, by which time surcharging and overflow issues are anticipated to occur.
- An I/I study of the existing Navy sewer system should be undertaken immediately, in order to identify and begin reducing the excessive I/I flows that occur now, and which will limit future discharges from Southfield.
- With respect to both long-term water supply and wastewater management alternatives, it is apparent from Figures 4 and 5 that Phase 1 residential development will approach or reach maximum levels by the end of 2017, and occupancy by the end of 2018. If it is assumed that

commercial development will advance to a similar termination, then Phase 1B commercial building permits need to be in hand by the middle of 2015.

- Given the fact that Phase 2 development cannot proceed without permanent utility solutions in hand, it is recommended that SSTTDC move expeditiously to identify those solutions, since the design, permitting, and construction permanent utility solutions can take 3 to 5 years from planning to completion.
- Based on the water consumption projections, there may be room for a future high end water user while still remaining within the Phase 1 MOA limits. However, the projected use of commercial users should be evaluated on a case by case basis.

We plan to finalize the full engineering report by the end of the month. However, the conclusions and recommendations provided herein will not change. We are happy to be able to assist you with this important project, and hope that you find this information to be useful. If you require additional information or have any questions or comments on the information provided herein, please feel free to contact me directly at 617-657-0255 or sco@envpartners.com.

Very truly yours,
Environmental Partners Group, Inc.



Stephen C. Olson, P.E.
Senior Project Manager

Cc: Paul F. Gabriel, P.E., LSP, EPG