Town of Fairfield

Sullivan Independence Hall
725 Old Post Road
Fairfield, Connecticut 06824

Public Works Administration

TEL: (203) 256 - 3010
FAX: (203) 256 - 3080

To: Board of Selectmen
From: Joseph Michelangelo P.E., Director of Public Works
Date: August 20, 2014
Re: WPCA Capital Plan

The origin of the Town of Fairfield sanitary sewer system and wastewater treatment plant dates back to the late 1940's. Much of the infrastructure was installed from 1950-1980. The Water Pollution Control Facility (WPCF) is a division of the Department of Public Works. There is oversight by an appointed Town board, the Water Pollution Control Authority (WPCA). As you are aware, the WPCA operating budget is separated from the overall Town Budget.

The wastewater treatment plant is located on Richard White Way (formerly One Rod Highway), and is rated to treat 9.0 million gallons per day (MGD) on an average daily basis. The plant was designed to handle a peak rate of flows of 24 MGD. The plant flow first reached 90% of the rated flow (8.1 MGD) over a 6 month period in 2007. The plant flow has remained consistent at this level since, and generally exceeds the 90% threshold on most months. 90 % is the threshold that is written in our National Pollution Discharge Elimination

System permit (NPDES) that triggers the need to begin planning for the future needs of the system.

The wastewater treatment plant provides high quality tertiary treatment, with disinfection and nutrient removal. The treated sewage is discharged through a 36" diameter pipe approximately ½ mile off the coast of Fairfield into Long Island Sound. The discharge needs to be pumped during the twice daily high tides, but is otherwise discharges via gravity flow into the sound. The biosolids that are removed from the wastewater stream is co-mixed with wood chip material (from the Harvest New England site across the road) and composted into a material that is re-used for non-agricultural purposes. The most recent upgrade to the wastewater treatment plant was over a decade ago.

The disposal of this waste is obviously a primary need of any society. From a technological standpoint, there is not any function that the Town of Fairfield conducts that is any more advanced than converting sewage to high quality water able to be discharged to Long Island Sound. From the financial perspective, there is no single capital investment that a Town of our size has, other than possibly a High School, which is of the same value as a wastewater treatment plant.

The WPCA services a total of nearly 17,000 residential and commercial properties. Sanitary sewage is conveyed to the treatment plant through a 200 mile network of pipes which run mainly beneath the centerlines of our roads, but often times must make diversions through private property easements. Because of the age of our system, most of the sewer pipes predate the current standard PVC pipe. Much of the sewer system utilizes transite or vitrified clay pipe. Although completely rebuilding our system is impractical, the age of the pipe places additional maintenance and operational issues than would a newer system. Also, there is more of our sewer network off the roadway compared with most systems. This also

creates maintenance and operational issues. Where gravity flow does not permit, there are eight pump stations located at various sections of Town to “lift” the sewage to an elevation where it once again can flow by gravity. These pump station have complex mechanical and electrical components, and are designed for reliability and redundancy. The flow ultimately reaches the wastewater plant via two large trunk lines, also referred to as interceptors. These are akin to sewer super highway that collects and conveys sewage to the plant. Because these mainly flow by gravity from the highest points in Town to the lowest, these trunk lines often parallel watercourses and run along low lying areas.

The Town has separate sanitary and storm sewer systems. Sanitary sewers flow to the treatment plant. The catch basins along our roads are collected vial a completely separate system, and discharged to rivers, streams, lakes, and Long Island Sound. However, our sanitary system is subject to intrusion during wet weather from ground water and storm water. This is referred to as Inflow & Infiltration (I & I), and is the root of the peak flow issues at the plant and our system. This extraneous flow robs the capacity in the system and the plant which would otherwise be utilized to convey and treat waste. It also increases electrical, chemical, and labor costs. When an overflow or back up occurs in our sewer system, I & I is often involved in some way. I & I is not unique to Fairfield, and is inherent in nearly all sanitary sewer systems such as ours.

The majority of the un-sewered properties (approximately 4,000) in Fairfield are largely in the rural areas, especially Greenfield Hill. These lots utilize privately installed and maintained subsurface disposal systems (septic). When these tanks are pumped out, generally every 2-3 years, the material is brought to a wastewater treatment plant by pumping contractors for a fee. Unless there are widespread failures that create public health risks, there is no reason to extend sanitary sewers into areas that can support septic systems.

The Town's last Facilities Plan was completed in 1997. A Facilities Plan, synonymous with a Comprehensive Plan, is generally required in 20-year windows, or when a treatment plant has exceeded the 90% threshold previously mentioned. The Fairfield WPCA will soon begin this process. An engineering firm Wright Pierce has been selected by a WPCA subcommittee to perform this work. We are currently working with the consultant to finalize the complete scope of work and fee proposal. We will begin the work this fall, following final approval by CT DEEP.

There are many factors that need to be addressed in a comprehensive plan for the next 20-25 year period. Some of the objectives of the Facility Plan are to assess:

1. The existing infrastructure of the WPCF, 8 pump stations, and the Town's sewer system. A required component of the Facility Plan will be a study of the East Trunk Line, which conveys a significant portion of the Towns sewage flow and is located in the Rooster River/Ash Creek Flood Plain. This major interceptor conveys approximately 50% of the Towns wastewater flow, and is subject to numerous I & I problems. This excess flow either overburdens the wastewater treatment plant, or worse, causes sanitary sewer overflows at several locations in the collection system.
2. Project future development and growth, and the subsequent future needs and demands it places on the plant and the system.
3. Project future regulatory changes and permit limits which will affect our system.
4. Development of recommendations for equipment and structure replacements and upgrades. These should be quantifiable to enable the WPCA to program future projects for long term financial planning.

5. There are several areas of the Town where growth is expected, including Transit Oriented Development along the Metro North Corridor. Much of these development pressures are expected to be located and converge with some of the East Trunk Line issues.
6. As a critical facility, the Town's waste water treatment plant is located in the 100-year flood plain. There needs to be structural hardening to protect the facility from future storms. During Storm Sandy, access to the plant was difficult, and salt water intrusion dramatically affected the wastewater treatment process. Several of our pump stations are also location in flood prone area and need to be similarly hardened.

There are benefits to making a wastewater upgrade as inclusive as possible. The 20% reimbursement opportunity is generally available for comprehensive upgrades. If the projects are spread out as individual projects, they generally do not receive CWF reimbursement. Since the plant must operate during the upgrade, it is also benefited to perform all of the improvements simultaneously. To use an analogy, this avoids the I-95 highway construction scenario in which some portion of the freeway is invariable under construction. Items which are not addressed in the upgrade are not resolved; they are just deferred to another day. A major factor in the cost of the upgrade is if our current capacity of 9.0 MGD average daily flow and 24 MGD peak is adequate to address the needs of the community. If there is a need to expand the capacity of the plant, the project costs will expand.

The WPCF has several large pieces of rolling stock equipment that it utilizes to conduct its functions. These are a jet/vacuum truck, a tandem dump truck, and a pay loader. The combined value of these is approximately $700,000. They are in good condition and will not

need to be replaced for nearly a decade. For the purposes of this report, it is assumed they will be funded through future operation budgets and not included in these projections.

Essentially, operating a sanitary sewer system is much like the operation of a potable water system. It can even be compared to other utilities such as electricity or natural gas. The system should be designed to adequately pay for itself. Because municipalities often operated sanitary sewer systems, there is often a mix between the fees that are raised through sewer user rates and from ad velorem (property) taxes. A benefit of a user based system is that the necessary funds to operate the system are paid directly by the users. This avoids competing from the same overall funding sources with education, public safety, human services, etc. This methodology is supported by the U.S. EPA and CT DEEP, and one of the main reasons for mandating separate WPCAs several decades ago.

There are other benefits for a user based system. Properties that do not pay general taxation are often large users of the sanitary sewer system. Although the Town may receive some PILOT revenue from these properties, essentially the cost of their sanitary sewer service is largely unaccounted for.

As a precursor to the Facilities Plan, WPCF Superintendent Mike Finoia and myself have identified WPCA Conceptual Capital projects, which are listed at the end of this document. With the exception of the year one projects, there has not been detailed engineering work performed or cost estimations. The numbers are conceptual at this time, based on the size and age of the facilities, and cursory reviews. A goal of the Facilities Plan is to provide a more detailed scope of the improvements needed and more refined estimates. Other improvements to our 200 miles of sewer mains occur during any given year. These are accomplished through operation budget expenses. They are also funded from connections

from new users to our system. The current fee is $1,950 per bedroom. This has not been revised for nearly a decade and needs to be re-evaluated to properly account for costs.

The WPCA has not budgeted a surplus into their recent operating budgets. The surplus is only built up through any operating budget money that is un-expended. The current WPCA fund surplus will quickly be depleted following an ongoing project involving the clarifiers and the proposed FY 2015 projects. I have been working with CFO Robert Mayer to prepare a waterfall schedule for the WPCA to project their revenue needs in future years, and the effect on the sewer user rates.

WPCA Conceptual Projects

YEAR		Project	Cost in 2014 dollars $ Million
FY	15	Easton Pump Station / Force Main	1.4
		*Facilities Plan	0.8
		**Wastewater Plant Hardening	1.2
FY	16	***Electrical Co-Generation Upgrade	1.0
FY	17	Fairfield Beach Road Pump Station	1.2
FY	18	East Truck Line Rehabilitation / Relocation	5.0
FY	19	Pine Creek Pump Station	1.0
FY	20		
FY	21	**Wastewater Plant Upgrade/Expansion	20.0
FY	22	Mill River Pump Station	2.0
FY	23		
FY	24	Center St Pump Station	1.0
FY	25		
FY	26	West Trunk Line Rehabilitation	1.5
FY	27		
FY	28	Willow St Pump Station	0.8
FY	29	Toll House Pump Station	0.8
FY	30	Eastfield Pump Station	0.8
		TOTAL:	38.5

* Possible 55% Clean Water Fund Reimbursement

** Possible 20% Clean Water Fund Reimbursement

*** Possible CEFIA and DEEP grants available