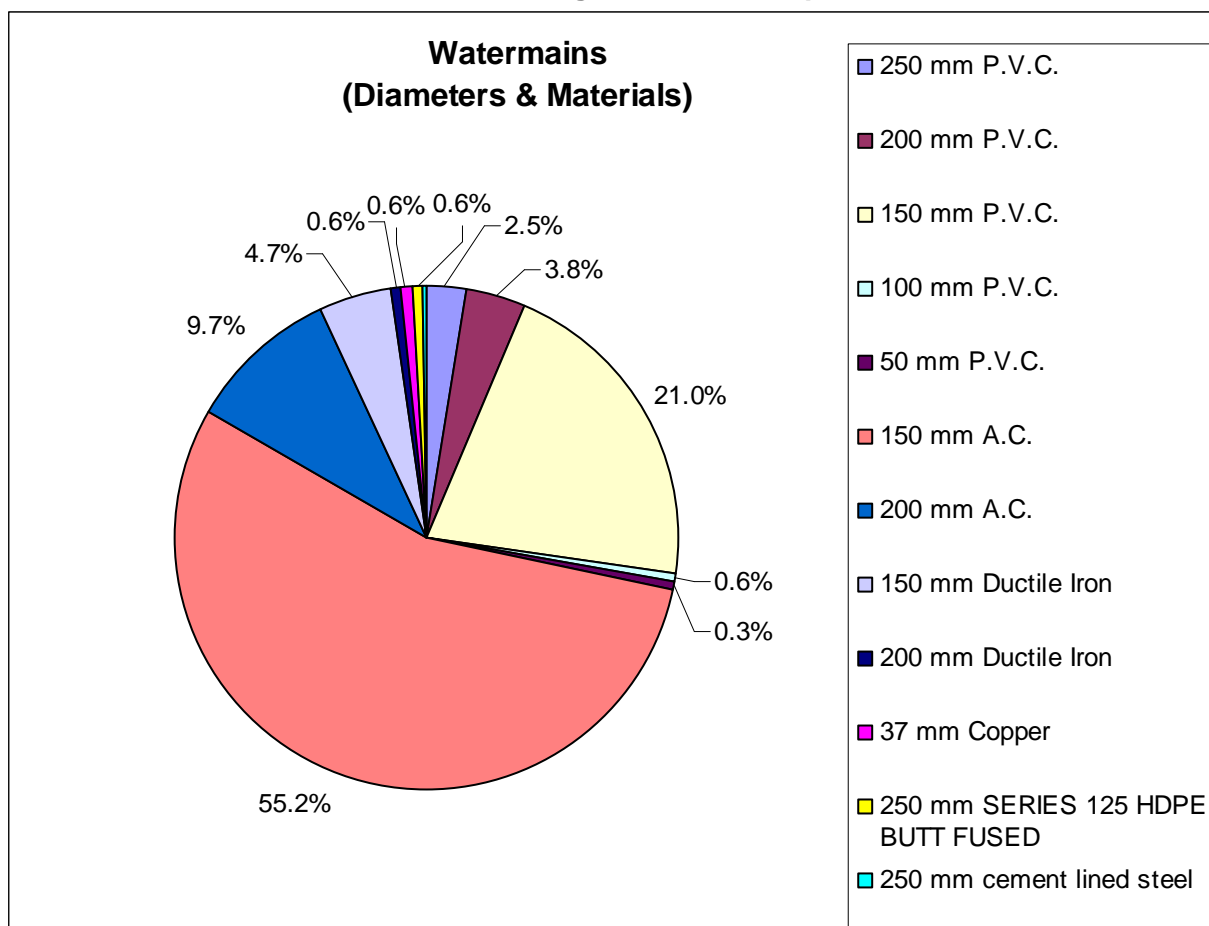


Asbestos Concrete. This pipe material has an Ideal Service Life of 70 years; however, asbestos concrete pipes have been known to fail earlier as compared to other industry standard materials such as PVC. Most of these asbestos concrete watermains are past the mid-point of their Ideal Service Life and planning for replacement or rehabilitation of these pipes should be a Township priority. The replacement value of Asbestos Concrete watermains in Poor or Fair condition is approximately \$2,352,000.

**Exhibit 14 – Percentage of Installed Pipe Material**



**Exhibit 15 – Current and Replacement Valuation of Water Distribution System**

Asset	Current Valuation Total	Replacement Valuation Total
Watermains	\$ 802,347.00	\$3,647,036.30
Hydrants	\$ 37,137.00	\$ 225,700.00
Valves	\$ 39,880.00	\$ 905,360.00
Water Services (19 mm copper)	\$ 148,692.00	\$ 272,679.00
Water Meters	\$ 232,048.00	\$ 257,775.00
<b>TOTAL</b>	<b>\$1,260,104.00</b>	<b>\$5,308,550.30</b>

**Exhibit 16 – Asset Unit Rates Use for Calculation of Replacement Valuation**

<b>Asset</b>	<b>Unit Rate</b>
Watermains	(see below)
Hydrants	\$3700.00/ea
Valves	(see below)
Water Services	\$50.00/m
Water Meters	\$491.00/ea
<b>WATERMAIN</b>	
<b>Material</b>	<b>Unit Rate</b>
250 mm PVC.	\$360.00/m
200 mm PVC.	\$300.00/m
150 mm PVC.	\$260.00/m
100 mm PVC.	\$330.00/m
50 mm PVC.	\$200.00/m
150 mm A.C.	\$ 260.00*
200 mm A.C.	\$ 300.00*
150 mm Ductile Iron	\$210.00/m
200 mm Ductile Iron	\$300.00/m
37 mm Copper	\$110.00/m
250 mm SERIES 125 HDPE BUTT FUSED	\$360.00/m
250 mm cement lined steel	\$ 360.00*
200 mm steel	\$ 300.00*

\*It is assumed that A.C. and steel pipes are to be replaced with PVC pipe, therefore, unit rates are for PVC pipe

<b>VALVES</b>	
<b>Size</b>	<b>Unit Rate</b>
39 mm	\$ 840.00
100 mm	\$1,360.00
150 mm	\$1,330.00
200 mm	\$1,930.00
250 mm	\$2,380.00

**Recommendations**

Condition assessment of in-service watermains can be costly and difficult at best. The Township should be annually reviewing its history of watermain breaks and continuing to compile new records of watermain breaks and any operational problems. This data should be entered into the Municipal GIS so that it can be analyzed for break patterns. Break records should include the location, time of year, pipe size, pipe material, observed soil conditions and cause of failure. Careful examination of these records will allow Township staff to make informed decisions with respect to watermain renewal or replacement activities. Trenchless technologies for watermain rehabilitation may also be investigated as opposed to more

expensive open cut watermain replacement. Opportunities to coordinate watermain rehabilitation with road reconstruction and other related capital projects should also be examined.

A summary of recommended water system Capital Projects and Planned Actions (repairs, rehabilitation or replacement) for the next 10 years is provided in Exhibit 17 below.

#### Exhibit 17 – Summary of Water System Capital Projects over a 10 Year Horizon

Description of Activity	Annual Expenditure	Priority Repairs in 2013/2014	Cumulative Expenditures Over Next 5 Years	Cumulative Expenditures Over Next 10 years
GIS Inventory & Maintenance	\$ 5,000	\$10,000	\$ 25,000	\$ 50,000
Condition Assessment	N/A	\$62,500	\$272,500	\$ 662,500
Capacity Assessment	\$ 5,000	N/A	\$ 25,000	\$ 50,000
Operations & Maintenance	TBD	TBD	TBD	TBD
Special Projects & Other	TBD	TBD	\$ 50,000	\$50,000
<b>Total Cost</b>	<b>\$10,000</b>	<b>\$72,500</b>	<b>\$372,500</b>	<b>\$812,500</b>

#### 4.2 Sanitary Sewer Collection System Report

The Sewage Treatment Plant is in Average condition overall with some major building systems past the mid-point of their Ideal Service Life, including process mechanical, building mechanical, electrical and structural/architectural systems. The Chemical Systems Building and Biosolids Dewatering Facility are in Good condition overall as these have been recently constructed and renewed. The South Side, North Side, Raglan Street and Mill Street pumping stations are also in Good condition overall since they have also recently been re-furbished.

Sanitary sewer mains are in Fair condition overall with the majority of these pipes past the mid-point of their Ideal Service Life. Maintenance holes and sanitary sewer laterals/services are also in Fair condition overall. Replacement of these appurtenances should coincide, where possible, with sanitary sewer rehabilitation.

Drawing No. 5 shows the location of all sanitary sewers with a condition rating of Poor (1-2), Fair (3-5), Average (6-7) and Good (8-10). It is important to note that approximately 86% of the sewer mains are constructed from Asbestos Concrete. This pipe material has an Ideal Service Life of 70 years; however, asbestos concrete pipes have been known to fail earlier as compared to other industry standard materials such as PVC. Planning for the rehabilitation or replacement of these pipes should be a consideration; however, the collecting of condition assessment information should be a higher priority in order to confirm their actual physical conditions. The replacement value of Asbestos Concrete sanitary sewers in Poor or Fair condition is approximately \$2,643,000.