# Water System
# Asset Management Program
# Newport, New Hampshire

May 24, 2019

Prepared by:

UNDERWOOD engineers

2382

# Table of Contents



# Tables



# Figures

# Appendices

**A. Financial Information**
- A-1. SRF Intended Use Plan Excerpts
- A-2. Excerpts from 2018 Water Rate Survey
- A-3. Customer Brochure

**B. Level of Service Matrix (LOM)**

**C. Attribute Tables and Summaries**
- C-1. Watermain Inventory Summary Tables
- C-2. Hydrant Inventory Table
- C-3. Asset Data Table (hard copy includes vertical assets only)
- C-4. Inventory Overview
- C-5. Ten-year Look Ahead
- C-6. Fifty-year Look Ahead
- C-7. One Hundred-year Look Ahead

**D. Instruction Sheets**

**E. System Maps**
- E-1. System Overview
- E-2. System by Pipe Diameter
- E-3. System by Pipe Material
- E-4. System by Age
- E-5. System by Impact of Failure
- E-6. System by Probability of Failure
- E-7. System by Criticality

# 1. Introduction

The Town of Newport engaged Underwood Engineers to develop an asset management program (AMP) for its water supply, storage and distribution system. The project has been funded by a $20,000 SRF grant. The Town will contribute a $20,000 match.

The framework of this AMP includes the following core components.

- Asset Inventory and Condition Assessment
  - What assets does the Town own?
  - Which are able to serve their purpose? Which are not?
  - What is their condition?
- Level of Service (LOS)
  - What are the Town's goals in operating and maintaining the system?
  - Goals should be specific, measurable, attainable, realistic, and timely (SMART)
- Criticality
  - Prioritize assets by their probability of failure versus their impact of failure.
- Minimum Life Cycle Cost (Practices)
  - Estimate costs needed to properly maintain, inspect, repair and, if necessary, replace assets in order to maintain the desired LOS.
- Long-Term Funding Strategy (Budget)
  - Review the current operating budget and rate structure.
  - Schedule estimated replacement costs out over the life of the assets.
  - Provide a framework for repair or replace decisions.
- Implementation and Communication Plan
  - Data
  - Planning tools
  - Management reporting
  - Public education
- Recommendations and next Steps

Note that all dollar values are in 2019 dollars. This allows for the selection and prioritization of projects. Inflation should be taken into account during the capital planning process.

# 2. Asset Inventory and Condition Assessment

Newport's water system provides service to over 1,600 customers. The main water source is Gilman Pond located in the neighboring Town of Unity. Raw water is treated at a slow sand filter plant, and is disinfected with chlorine. Sodium silicate is used to reduce taste and odor problems. The Pollards Mill Well facility was constructed in the mid-1960's to provide an additional water source. Storage facilities include a 300,000 gallon tank at the water treatment plant, and a 1.35 million gallon tank at the Summer Street facility. In addition, there is a 2.5 million gallon welded steel tank at the Summer Street facility, which was removed from service in 2000 but which has not been demolished.

Town-owned water facilities are summarized in **Table 1**.

**Table 1: Water System Summary**

| Main Component | Description |
|---|---|
| **Vertical Assets – Sources, Treatment, Storage and Pumping** | |
| Gilman Pond | Intake facilities built in 1895. Still in service. Safe yield of 0.5 MGD. |
| Slow Sand Filter Water Treatment Plant | Built in 1992; 0.7 MGD capacity. Includes 0.3 MG storage tank. |
| Chlorination Building | Originally built in 1955. Upgraded in the late 1980's to update disinfection equipment and add corrosion control facilities. In 1993, sodium silicate facilities were added. |
| Pressure Reducing Valve | Built in 1934. |
| Pollards Mill Well Facility | Built in 1966; 0.5 MGD capacity. |
| Summer Street Storage Facility | Precast concrete tank built in 2000; 1.35 MG. Abandoned 2.5 MG built in 1965. |
| **Horizontal Assets - Water Distribution Pipe** | |
| Distribution piping | Over 235,600 lf of distribution main (~45 miles). |
| Valves | 710 valves, including hydrant valves. |
| Hydrants | 241 hydrants. |

### *2.1. Condition Assessment*

For the most part, vertical assets are in serviceable condition. However, some shorter-lived assets are due for replacement or refurbishment.

Information regarding the horizontal assets, which include raw water mains, distribution mains, valves and hydrants was taken from a system study completed in 2009 by Underwood Engineers; and GIS information provided by the Town. The 2009 study included information on pipe material, diameter and approximate age. Town staff was able to provide general information on pipe break history. The cement-lined cast iron pipe installed in the mid-1960's is especially break-prone, while the older cast iron pipe installed in 1895 and 1909 has had comparatively few breaks.

Going forward, Town staff will use an online file to document incidents which can provide additional insight into pipe condition, including break records and customer complaints especially taste, odor and pressure issues.

### *2.2. Data History, Information Sources and Organization*

Documents used to assemble the water system asset inventory include the following.

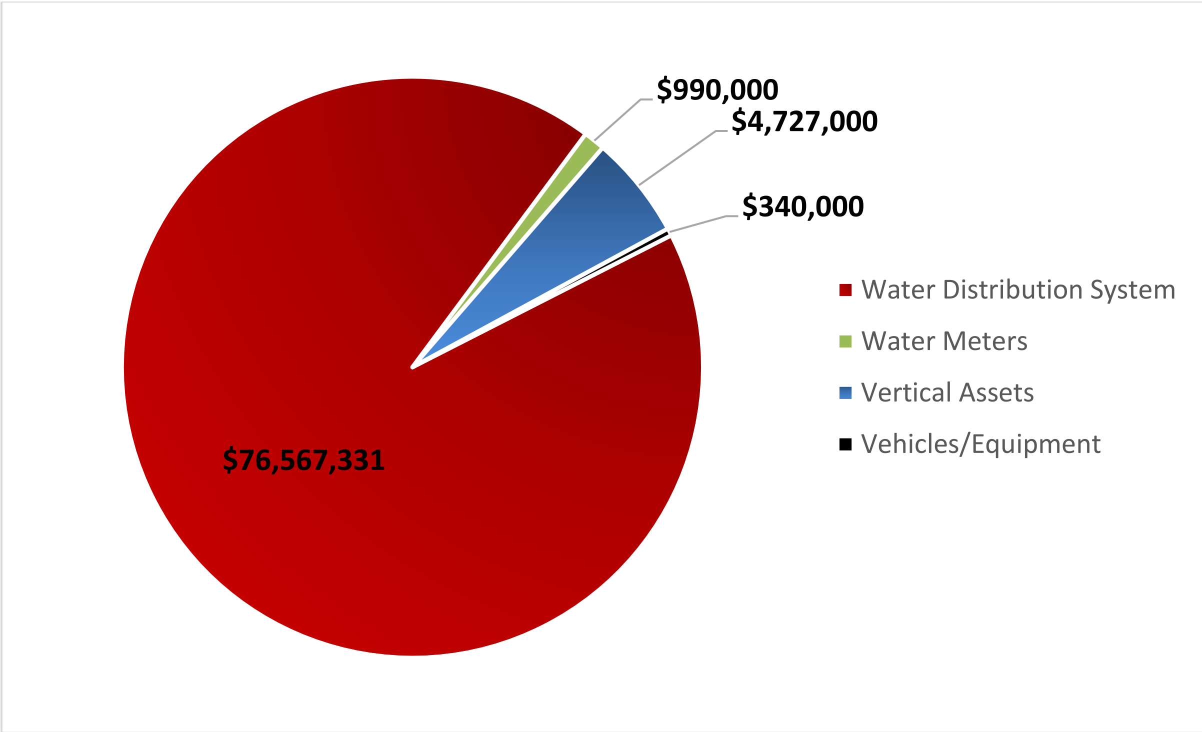
- GIS data collected by Underwood Engineers in the fall 2018 and winter of 2019.
- Comprehensive Water System Study, February 2009, Underwood Engineers.
- GIS data provided by the Town of Newport, originally assembled by CAI in 2009 and edited by Town staff over the years as needed.

The locations and lengths of water pipes were imported from the Town's water distribution system model and lined up within the road right-of-way based on field collected data. Where the two sets of field-collected data overlapped, the more recent was used.

### *2.3. Replacement Value of Water System*

The current replacement value of the water system assets is estimated to be nearly $82.6 million. That estimate is broken down between vertical assets and horizontal assets in **Figure 1** below. Horizontal assets constitute nearly 93% of the overall system assets with an estimated value of $76.6 million.

**Figure 1. Overall Replacement Value**



Details regarding the age and material of water distribution pipe is provided in **Table 2**. Note that over 85,000 feet of pipe is over 100 years old. In addition, over 30,000 feet of cement lined cast iron pipe installed in the 1960's has a significant break history, even though it is only about halfway through its estimated useful life.

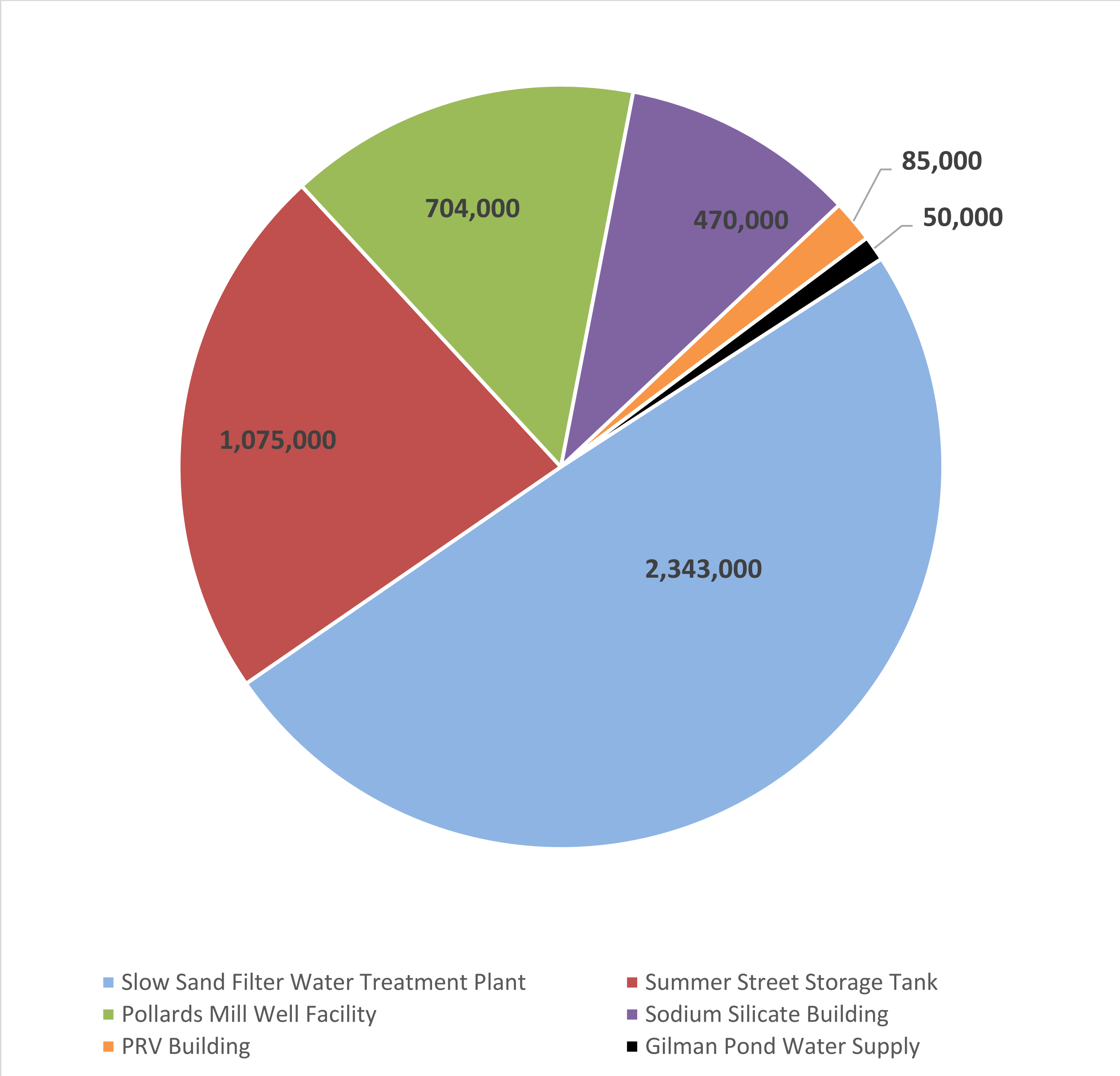
**Table 2. Water Distribution Pipe by Age and Material**

| Year Installed | Asbestos Cement | Cast Iron | Cement Lined Cast Iron | Ductile Iron | PVC | Other | Unknown | Grand Total |
|---|---|---|---|---|---|---|---|---|
| 1895 | | 42,706 | | 365 | | 512 | 1,447 | 45,030 |
| 1909 | | 40,414 | | | | | 323 | 40,736 |
| 1920 | | 2,586 | | | | | | 2,586 |
| 1922 | | 1,277 | | | | | | 1,277 |
| 1924 | | 2,118 | | | | 545 | | 2,662 |
| 1925 | | 1,386 | | | | 790 | | 2,175 |
| 1927 | | 2,428 | | | | | | 2,428 |
| 1928 | | 1,515 | | | | | | 1,515 |
| 1935 | | 1,269 | | | | | | 1,269 |
| 1950 | | 900 | 732 | | | | | 1,633 |
| 1955 | 16,114 | 6,074 | | | | | | 22,189 |
| 1960 | 6,992 | | | | | | | 6,992 |
| 1961 | 859 | | | | | 70 | | 929 |
| 1964 | 522 | | | | | 313 | | 835 |
| 1965 | 8,129 | | | | | | 800 | 8,929 |
| 1966 | 2,698 | | | | | | | 2,698 |
| 1967 | 4,847 | | 29,837 | 2,629 | | | | 37,313 |
| 1970 | 644 | | | | | | | 644 |
| 1971 | | | 1,159 | | | | | 1,159 |
| 1975 | 9,599 | | 4,518 | | 1,148 | 342 | | 15,607 |
| 1984 | | | | 276 | | | | 276 |
| 1985 | | | | 13,913 | 3,475 | 667 | | 18,055 |
| 1986 | | | | 659 | | | | 659 |
| 1994 | | | | 1,384 | | | | 1,384 |
| 1996 | | | | 2,339 | | | | 2,339 |
| 1998 | | | | 879 | | | | 879 |
| 2004 | | | | | 4,974 | | | 4,974 |
| 2005 | | | | 1,782 | | | | 1,782 |
| 2006 | | | | | 2,071 | | | 2,071 |
| 2015 | | | | | 415 | | | 415 |
| 2018 | | | | 4,151 | | | | 4,151 |
| **Grand Total** | **50,404** | **102,673** | **36,246** | **28,378** | **12,083** | **3,239** | **2,570** | **235,592** |

Replacement cost estimates are based on an all-inclusive number – meaning that engineering, design, permitting, contractor overhead, and restoration costs were all considered. Pipe replacements were assumed to include replacement of valves and hydrants as well. The unit cost of pipe replacement can vary depending of the size of the project. Typically, the larger the project, the lower the unit cost. For the purposes of this report a unit cost of $325 per linear foot was assumed.

The replacement value of vertical assets is summarized in **Figure 2** below.

**Figure 2. Replacement Value of Vertical Assets**



# 3. Level of Service

The Level of Service (LOS) provides specific goals for the operation, maintenance, and performance of water and water structure assets. The first step in formulating the LOS is to review potential opportunities for improvement identified during the Asset Inventory and Condition Assessment process.

### *3.1. Leaks and Water Main Breaks*

The Town's water system is aging and has experienced a series of leaks and water main breaks over the years. Although over 85,000 lf of pipe is over 100 years old, breaks frequently occur in the in the cement-lined cast iron (CLCI) pipe installed in the 1960's – nearly 30,000 feet.

Watermains by remaining useful life are shown in **Table 3**.

**Table 3. Pipe by Remaining Useful Life**

| Remaining Useful Life | Total |
|---:|---:|
| <= 0 | 46,525 |
| >0 and <= 10 | 41,301 |
| >10 and <= 20 | 22,762 |
| >20 and <= 50 | 43,096 |
| > 50 | 81,907 |
| **Grand Total** | **235,592** |

Altogether, approximately 87,000 lf of pipe will soon exceed its remaining useful life and 30,000 lf has a significant history of breaks.

### *3.2. Data and Follow-up*

As the Town's infrastructure ages, maintenance and upkeep continues to consume more staff time. An automated, streamlined system of data and follow-up would enable easier access to information for decision-making. The Town uses CAI's AxisGIS system, which allows staff to make edits to the Town's GIS files. In addition to the inventory files, an empty file will also be provided which staff can use to record leaks, breaks and other incidents.

This information should be updated on a regular basis and shared with the Board of Selectmen and the public so that they are aware of ongoing performance issues with the system.

### *3.3. Financial Resources*

In order to keep up with necessary asset renewals going forward, significant financial resources will be required. Over $30 million worth of assets, primarily watermains, will be due for replacement in the next ten years. The Town will need to build sufficient resources for asset renewals into its financial plan. Ultimately, the goal should be to work through the existing back log and incorporate asset renewals into the water utility's financial plan going forward in order to avoid a back log in the future.

As projects are evaluated during the capital improvement planning process, cost-saving measures may become apparent. These may include the following:

- Eliminate redundant watermains. There are several areas where multiple watermains run parallel to one another.
- Install cross-over lines on the Unity Road transmission main.
- Combining water main projects with other projects, such as roadway improvement projects or sewer projects.
- Using cost-reducing installation technologies, such as pipe-bursting, which is approximately two-thirds the cost of full replacement.

A Level of Service Matrix is provided in **Appendix B**, which addresses the Town's goals going forward.

# 4. Critical Assets and Priority Projects

In order to allocate scarce financial and physical resources in the most efficient possible way, it is necessary to systematically prioritize projects. For the purposes of this AMP, assets will be ranked by their criticality. Criticality is defined as probability of failure versus impact of failure.

A condition assessment was not performed for the water pipes or water structures. Probability of failure was surmised based on remaining useful life, which was surmised based on estimated age and material.

1. Very Low Risk-Asset is extremely reliable
2. Low Risk-Sporadic Failures possible
3. Moderate Risk-Possibility of Failure
4. High Risk-Asset sometimes fails to meet performance requirements.
5. Very High Risk-Asset is likely to fail or has failed to meet performance requirements.

An impact of failure score was assigned to each component based on the severity of consequences in the event of a break or malfunction. Factors such the effect on public health, potential number of customers impacted, lack of redundancy, and cost of repair were taken into account.

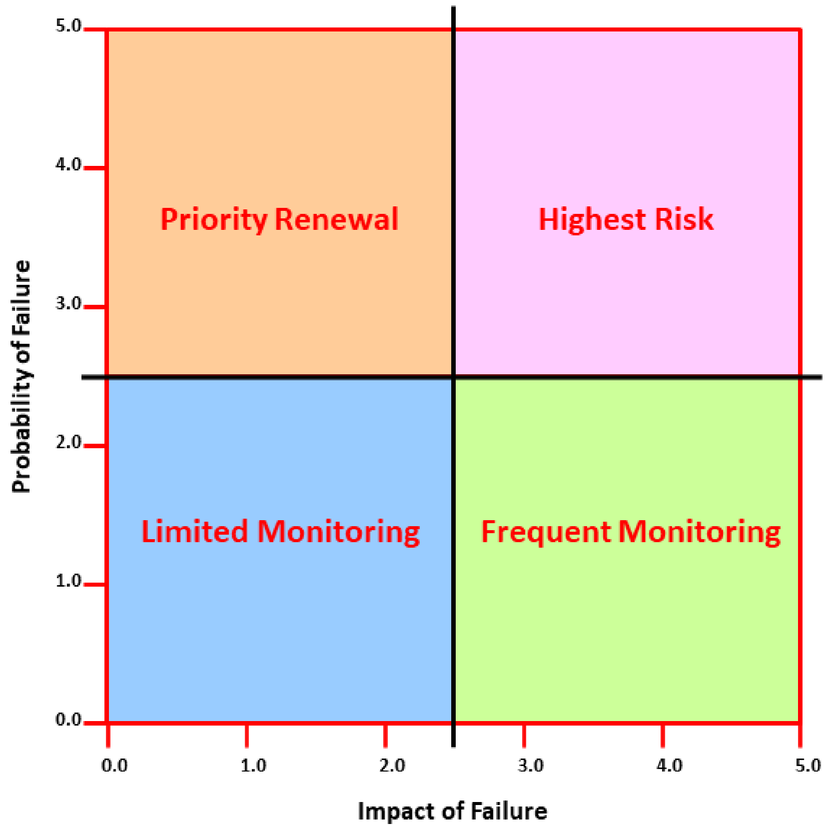
1. Very Low Impact- Public health and safety is very unlikely to be affected in the event of a failure. A small number of single-family residential customers would be inconvenienced. Repair cost is minimal.
2. Low Impact-Public health and safety are unlikely to be affected. A small number of single-family residential or small commercial customers would be inconvenienced. Repair cost is low.
3. Moderate Impact- Public health and safety are moderately likely to be affected. A large number of customers would be inconvenienced, or the impact on the customers affected would be serious. Repair cost is moderate to high.
4. High Impact-Moderate to high potential for public health and safety to be affected. A large number of customers would be inconvenienced, or the impact on the customers affected would be serious. Repair cost is high
5. Very High Impact- High potential for public health and public safety to be affected. A large number of customers would be inconvenienced, or the impact on the customers affected would be serious. Repair cost is very high

These factors taken together with the condition of the asset form the basis for the criticality of the asset. If an asset is in poor condition (has a high probability of failure), but is unlikely to have a significant impact in the event of a failure then it would be lower on the priority list than an asset in poor condition which would have a major impact in the event of a failure. The impact of failure versus the probability of failure can be summarized as follows:

- Highest Risk – high probability of failure and high impact of failure.
- Priority Renewal – high probability of failure and low impact of failure.
- Frequent Monitoring – low probability of failure and high impact of failure.
- Limited Monitoring – low probability of failure and low impact of failure.

See **Figure 3** for a visual representation of criticality scoring.

**Figure 3. Criticality Matrix**




Water mains are mapped by probability of failure (ie. condition), impact of failure and criticality in **Appendix E**.

It should be noted that the criticality of the Unity Road transmission mains, the WTP, and Pollards Mill Well are reduced if a new groundwater supply is established in an area that is not directly linked to Unity Road. Additionally, the criticality of the Unity Road transmission mains are reduced if cross-over lines are installed along the road at strategic locations.

## 5. Minimum Life Cycle Cost (Practices)

The Town completed a rate study update in June 2018. At that time, it was determined that working capital balances would become negative in the 2020-21, and a rate increase of 60% would be required to bring working capital balances to the lower end of the recommended range.

It should be noted that rates are a factor in qualifying for State Revolving Fund (SRF) loans. According to the "2018 Drinking Water State Revolving Fund Intended Use Plan", points are awarded as shown in **Table 4**. The 2018 New Hampshire Water and Wastewater Rates Dashboard indicates that the annual water bill for a typical household in Newport is $513.36 per year, and median household income is $58,193 per year. Since that survey was completed, the Town has raised rates by 10%, increasing the annual water bill to approximately $565.00 per year. This would result in an affordability ratio of approximately 0.97. Since Newport's MHI is lower than state-wide MHI, the Town may also qualify for subsidies.

The Water and Wastewater Rates Dashboard can be found at this link:
https://efc.sog.unc.edu/resource/new-hampshire-2018-water-and-wastewater-rates-dashboard

The Intended Use Plan can be found here:
https://www.des.nh.gov/organization/commissioner/pip/publications/documents/r-wd-18-12.pdf

**Table 4. Impact of Affordability on SRF Loan Application Evaluation**

| Affordability Ratio (Water Rate/MHI) | Priority Points |
|---|---|
| 2.00 or more | 15 |
| 1.6 to 1.99 | 11 |
| 0.8 to 1.5 | 7 |

Total water system replacement costs have been scheduled out each year for the next ten years in **Table 5**. The estimates for water main replacements are based on full replacement costs, and include such items as engineering, design and restoration. The scheduled replacement date is based on the estimated year of installation, and remaining useful life as discussed in Section 3. According to available data the estimated cost of needed replacements over the next ten years is approximately $31.0 million based on age and condition alone.

**Table 5. Estimated Replacement Costs - Ten Years**

| Water System Component | 2019-2028 |
|---|---:|
| Water Distribution System | $28,543,467 |
| Water Meters | $990,000 |
| Pollards Mill Well Facility | $604,000 |
| Slow Sand Filter Water Treatment Plant | $503,000 |
| Vehicles/Equipment | $142,000 |
| PRV Building | $85,000 |
| Gilman Pond Water Supply | $50,000 |
| Sodium Silicate Building | $38,000 |
| **Grand Total** | **$30,955,467** |

The most urgent projects can be determined by ranking projects by Criticality and Risk Score (Impact of Failure x Probability of Failure). See a summary in **Table 6** below. Additional details are provided in **Appendix C**.

**Table 6. Estimated Replacement Costs by Risk Score – Ten Years**

| Risk Score | Estimated Cost |
|---|---|
| 25.0 | $7,194,274 |
| 20.0 | $9,859,956 |
| 16.0 | $4,465,794 |
| 15.0 | $4,142,969 |
| 12.0 | $2,140,188 |
| 10.0 | $2,026,748 |
| 5.0 | $690,204 |
| 4.0 | $435,334 |
| **Grand Total** | **$30,955,467** |

This table includes approximately $13.5 million worth of transmission and distribution mains which run parallel to other pipes. If the redundant piping is abandoned the total financial need could be substantially reduced. However, there are costs associated with abandoning these mains (ex. transferring services or making new interconnections) which would reduce the cost savings. These costs are difficult to estimate accurately without additional information. Twenty percent (20%) is a reasonable starting assumption. Once this work is complete, renewals or replacements could be segmented out over a number of years in order to maintain a financially manageable capital improvements program. Since the transmission mains south of the golf course have relatively few tie-ins, it may be possible to use cost-reducing installation technologies, such as pipe bursting.

While there is a large immediate need, that need tails off after the first decade if adequate funds are allocated. The Town could fund early projects with SRF loans and build up reserves for future needs over time.

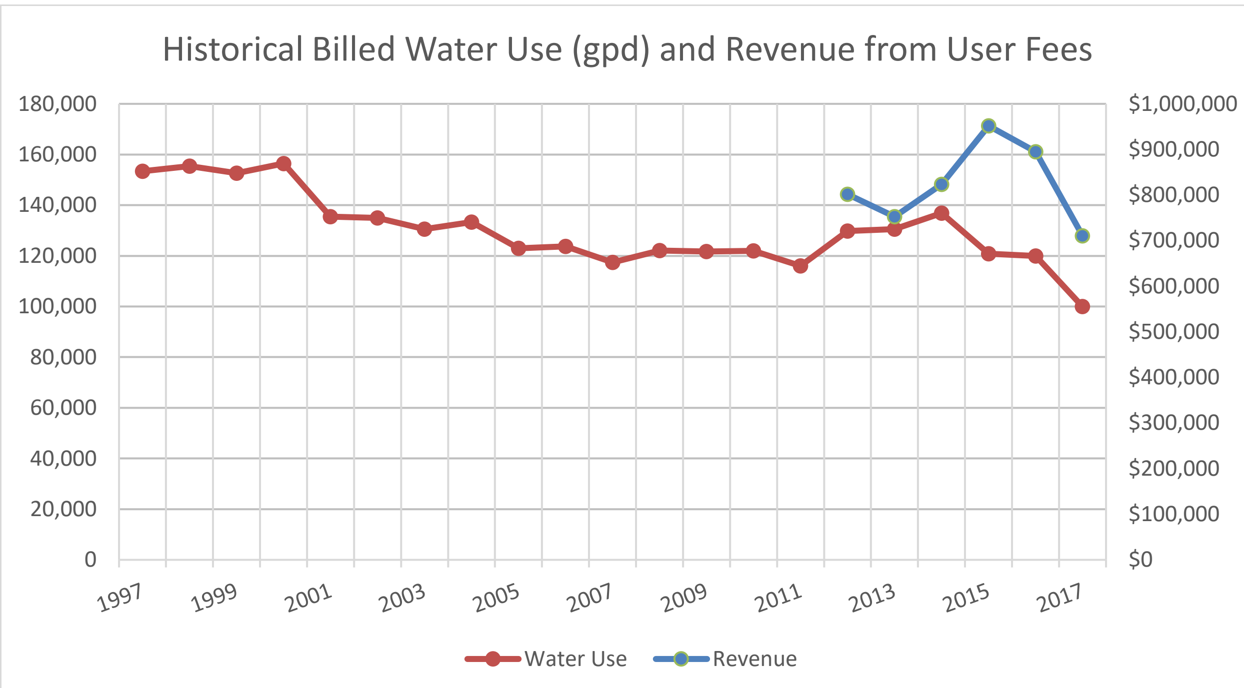
**Table 7. Estimated Asset Renewals per Year for the Next 50 Years**

| Decade | Estimated Cost |
|---|---|
| 2019-2028 | $30,955,467 |
| 2029-2038 | $8,216,384 |
| 2039-2048 | $9,614,985 |
| 2049-2058 | $5,977,480 |
| 2059-2068 | $4,076,111 |
| **2019-2068** | **$58,840,427** |

A rate study completed by the Town in 2018 indicates that until the recent 10% rate increase, water revenues have been trending downwards. See **Figure 4**. At the same time, the need for asset renewals has sharply increased as assets reach the end of their estimated useful lives or have experienced performance issues.

Approximately 45,000 feet of cast iron pipe installed in 1895 reached the end of its estimated useful life in 2010. Nearly 41,000 feet of cast iron pipe installed in 1909 will reach the end of its estimated useful life in 2024. In addition, approximately 30,000 feet of cement-lined cast iron pipe installed in the 1960's has a significant break history.

**Figure 4. Water Billed (gpd) and Revenue from User Fees (2018 Rate Study)**



## 6. Long Term Funding Plan (Budget)

The one-hundred-year replacement schedule in **Table 8** and **Figure 5** includes shorter-lived assets that will need to be replaced multiple times. For that reason, replacement costs over a 100-year time span would be somewhat greater than the replacement value of the assets as shown in **Figure 2**.

The 100-year replacement schedule reveals that water system asset renewal will be an ongoing need for the Town. One way for the Town to keep up with renewals is to borrow to fund asset renewal projects needed today; and then increase capital reserves over time.

It should be noted that **these costs are provided in 2019 dollars** to allow for the comparison and prioritization of projects. Inflation should be factored in for the purposes of future financial planning. As mentioned above, detailed information regarding pipe condition and performance should be collected. This would allow the Town to plan renewals based on the overall functionality of the asset rather than just its age.

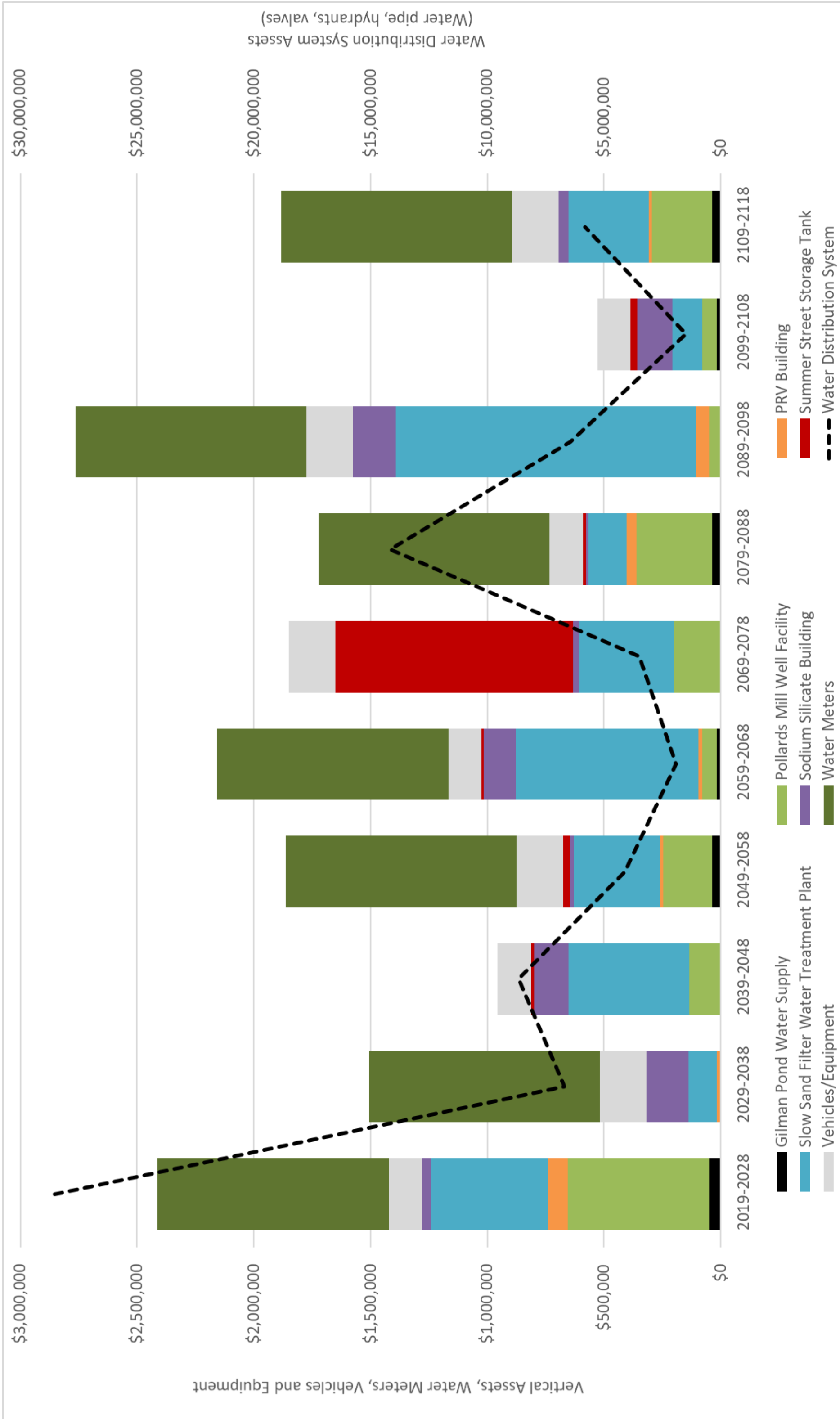
The Town will need to find a way to spread out the cost of addressing the $31 million backlog over a longer time period, while at the same time ensuring that future asset renewals are addressed in a timely manner. One possible scenario is outlined in **Table 8**. The suggested strategy is to combine the anticipated need for the first thirty years (approximately $48 million) and spread it out over that time period. After that, the need is reduced. The first thirty years will almost certainly require loan financing. After that, sufficient reserves can be set aside to address recurring needs.

**Table 8. Estimated Replacement Costs – Next 100 Years**

| Decade | Estimated Cost | Financial Forecast | $ per Year |
|---|---|---|---|
| 2019-2028 | $30,955,467 | $16,300,000 | $1,630,000 |
| 2029-2038 | $8,216,384 | $16,300,000 | $1,630,000 |
| 2039-2048 | $9,614,985 | $16,300,000 | $1,630,000 |
| 2049-2058 | $5,977,480 | $9,100,000 | $910,000 |
| 2059-2068 | $4,076,111 | $9,100,000 | $910,000 |
| 2069-2078 | $5,336,483 | $9,100,000 | $910,000 |
| 2079-2088 | $15,877,271 | $9,100,000 | $910,000 |
| 2089-2098 | $9,192,843 | $9,100,000 | $910,000 |
| 2099-2108 | $2,023,526 | $9,100,000 | $910,000 |
| 2109-2118 | $7,699,429 | $9,100,000 | $910,000 |
| **2019-2118** | **$98,969,979** | **$112,600,000** | |

By examining rates and completing an asset management plan, the Town has taken the first steps in preparing financially to address its aging water system, especially the pipe network. As mentioned earlier, it is possible to reduce the financial need by implementing cost-saving measures; and to reduce the criticality of the Unity Road transmission mains by developing a water supply which is independent of those facilities. In addition, it may be possible to receive a certain amount of SRF loan forgiveness.

**Figure 5. Estimated Replacement Costs – Next 100 Years**



Additional steps would include documenting pipe breaks and repairs, including the following information:

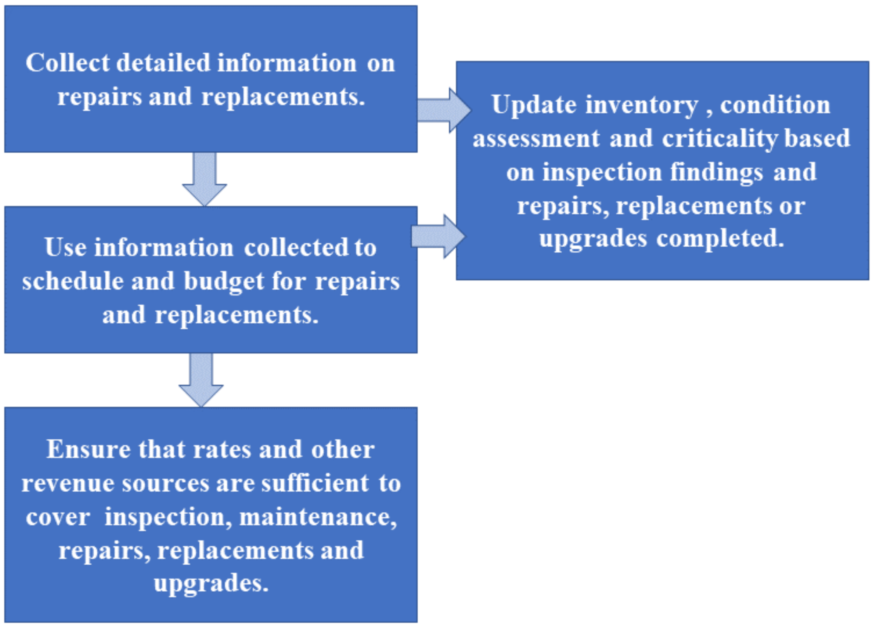
1. Location, length and material of pipe.
2. Failure mechanism, if it can be determined. Was it deterioration on the outside of the pipe? Deterioration on the inside of the pipe? An installation issue, such as improper bedding?
3. Total cost of the repair, including materials, overtime, cost of contractor, property damage, etc.
4. Number of man hours spent on the repair.
5. How many customers were affected and for how long? Was there a service interruption? Was there damage to private property, the roadway, or other facilities?
6. How much water was lost as a result of the break?

Collecting detailed information regarding pipe breaks and repairs would help the Town compute the total actual costs and make better predictions as to when assets should be renewed.

# 7. Implementation and Communication Plan

As discussed in Section 2, the Town's aging water system requires a comprehensive data collection effort to better schedule out replacements based on break and repair history. A schematic overview of the proposed plan is provided in **Figure 6** below.

**Figure 6. Implementation Flow Chart**




The Town's horizontal water system assets (pipes, valves and hydrants) have been mapped in ArcGIS. The GIS files include information on the age, material, condition and criticality of each component. This information will be stored and can be updated in AxisGIS and exported to Excel for further processing and evaluation. Vertical assets are items such as well facilities, which include numerous sub-components. Information associated with these assets has been assembled into a spreadsheet. Information from the all of the assets combined can be summarized in pivot tables within the spreadsheet in order to provide a comprehensive financial overview of the entire system.

The files assembled to date are a snap shot in time. They will be need to be updated as additional information about the system is gathered; and repairs, replacements and upgrades are made. The Town has been using AxisGIS and will continue to use that as the primary information gathering and storage medium.

The information assembled can be used as the basis for a staffing plan, operating budget and capital budget. It can also be used to generate reports, which can be used to educate and inform the Select Board and the public. A communication flow chart is provided in **Figure 7**.

One goal of the communication plan should be to detail the consequences of water main breaks and associated emergency repairs. The Board of Selectmen members and the public should be made aware of the full impact of such an event – not only in terms of the immediate cost of the repair, but of additional man hours and overtime, cost of damage to other facilities, cost of lost water, the number of customers affected and the length of the service disruption.

The Town's main method of communicating to customers is the annual report, which lists the number of breaks and repairs in addition to other activities. However, the public should also know the full of those repairs.

**Figure 7. Communication Flow Chart**

## 8. Conclusions and Recommendations

The total replacement cost of the Town's water system assets is estimated to be nearly $82.6 million as shown in **Figure 1**, which can be found in Section 2.3 of this report. At present, the Town does not have comprehensive condition information on the system. Therefore, condition assessment is based primarily on age. However, Town staff has observed that the cement-lined cast iron pipe installed in the 1960's appears to be more break-prone than other pipe in the system.

To keep up with immediate asset renewal needs, the Town will most likely need to borrow and build capital reserves simultaneously. The Town is currently in "catch-up mode" with a $31 million backlog of asset renewals. In order to address the backlog, the Town will need to increase rates significantly and borrow in the early decades. Once the backlog tails off, it is recommended that the Town begin to address asset renewals on a regular basis. One possible scenario is outlined in **Table 8**. Under this scenario, approximately $1.63 million (in 2019 dollars) would be set aside each year for thirty so that the Town can work through the initial backlog. After that, approximately $910,000 (in 2019 dollars) would be set aside each year to ensure that adequate resources are available to address asset renewals as the need arises. This will enable the Town to avoid sudden, large rate increases in the future in order to cover unaddressed capital needs.

Rate affordability should be evaluated to optimize potential loan forgiveness from NHDES. Since the long-term solution is neither straight-forward nor inexpensive, a detailed evaluation and capital improvement plan needs to be completed. It is understood that the wastewater collection and stormwater systems are in similar condition. Therefore, all these systems as well as road improvements will need to be mapped out in order to prioritize projects and identify overlapping needs.

It is recommended that the Town institute a comprehensive record-keeping program to collect detailed information on water main breaks. The ultimate goal is that the Town will be better able to identify which pipes should be scheduled for repair or replacement.

The Town already has a paper-based data system. Unfortunately, it is difficult to compile and share the information collected. The Town also needs to track certain items more closely, such as the true cost of emergency repairs. To start, an empty shapefile has been provided, which will allow staff to quickly and easily collect, summarize and transmit data. As the Town moves forward with its asset management program and staff becomes more comfortable, additional data collection mechanisms can be developed.

## APPENDIX A

## Financial Information

detailed work plan for the 10%, 2% and 15% setasides. In general, the 10% setaside supports monitoring, enforcement, laboratory certification, private well initiative, operator certification, engineering and plan review, as well as information management activities. Funding from this setaside ($140,000), along with the 15% setaside, will be used to promote asset management to improve compliance at NH's public water systems. Attachment B contains the budget that details how this and the 2% and 15% setasides will be used.

**4B (4). 15% Source Water Protection and Capacity Development**

A number of activities will be funded from the FFY18 15% setaside ($1,666,050) and the estimated prior year funds ($926,451), including capacity development and source water protection. Source water protection activities will include technical and financial (grants and contracts) assistance and performance of regulatory functions related to new well sitings. Other capacity development activities beyond source protection will also occur. It will also include tracking the progress of New Hampshire's current Capacity Development Program and the ongoing provision of technical assistance to improve small systems managerial, financial and technical capabilities. The state also plans to continue funding a highly successful leak detection contractor ($70,000 provided by this setaside and $50,000 provided by the 2% setaside) to work with systems committed to finding and fixing leaks as well as grants for asset management plans ($160,000 with an additional $140,000 provided through the 10% setaside). Solicitation for Local Source Water Protection Grant Program ($200,000) is open until November 1, 2017. Grant applications for all grants funded by the DWSRF are available on the NHDES website. Hard copies of these and contractual agreements funded by the setasides will be provided to EPA.

**4C. Transferring Funds from Setasides into Infrastructure Project Account**

NHDES reserves the right to transfer monies from setaside accounts into the infrastructure project account should the need arise.

## 5. PRIORITIZATION OF GRANTS AND FINANCIAL ASSISTANCE

The criteria for prioritizing source water protection and asset management grant applications are contained in the request for grant proposals to be provided to EPA. The assistance to help small community water systems develop record drawings will continue to be done on a first-in, first out basis. Use of a leak detection contractor will continue to occur on a first come, first served, readiness basis.

## 6. CRITERIA AND METHOD FOR DISTRIBUTION OF INFRASTRUCTURE PROJECT FUNDS

In FFY2018 the state must provide a minimum of 20% of the capitalization grant to subsidize infrastructure projects for disadvantaged systems but may provide up to 30%. To meet this goal, New Hampshire will fund projects in disadvantaged communities on a priority basis.

## 6A. Description of Process for Selection of Eligible Systems to Receive Assistance

The state of New Hampshire utilizes a ranking system to prioritize the order in which eligible projects will be financed. Projects are ranked based upon the relative impact of the project in achieving the objectives of the Safe Drinking Water Act and, in 2018, priority will continue to be given to projects in disadvantaged communities. In general, highest priority will be given to projects in disadvantaged communities that facilitate compliance with national primary drinking water regulations applicable to the system under title 1412 or otherwise significantly further the health protection objectives of this title (1452(a)(2)). Projects in need of improved capacity will also be given priority. Although, there is not a requirement to fund "green" projects. NHDES intends to award priority points for certain types of green projects identified in a system's energy or water use efficiency or sustainability plan.

Prior to funding any project, every effort is made to evaluate an applicant's financial, technical and managerial capacity prior to issuing a loan. This is accomplished by reviewing plans, designs, documents and compliance records, as well as completion of a capacity self-assessment form as a condition of the loan application. Loans will not be issued to those applicants lacking the necessary capacity to effectively own, operate and maintain their system(s). The priority ranking system that was used to produce the list in Section 9 is explained in the following subsections.

### 6A (1). Priority Ranking Formula

**Project priority points (P) will be derived using the following formula:**
**P= (A+B+C+D+E+F+G+H+I+J)**

Where:

- **A** = Existing violations of drinking water standards
- **B** = Existing deficiencies in the supply or storage of drinking water
- **C** = Existing deficiencies in treatment or design
- **D** = NHDES capacity development need
- **E** = System interconnection
- **F** = Affordability (ratio of annual water rate vs. median household income)
- **G** = Implements "green" recommendations from energy or water use efficiency or sustainability plan.
- **H** = Addresses critical infrastructure needs
- **I** = Asset Management (AM) program in place and project identified in an AM plan
- **J** = Lead component/service line replacement project

Eligible applicants for project funding include municipal or privately owned community water systems and non-profit organizations that operate public water systems that are non-community but serve a non-transient population such as: schools, hospitals and large work places. Seasonal or communities with less than 50% of households whose residents are permanent are not eligible for Category F and will not receive subsidization.

**Description of Factors**

Factors used in the formula are described and weighted below. Factors and points apply to the system applying for assistance. For projects where an interconnection is proposed, points can be awarded for the relief of problems in the satellite system(s).

| **A = Violations of National Drinking Water Standards** | | |
|---|---|---|
| Maximum Contaminant Levels (MCL) are established by the federal or state Safe Drinking Water Act (SDWA) for those contaminants which may be detrimental to public health. Exceedances of these levels in the last year (the last three years for secondary contaminants) at community public water systems, of contaminants that will be addressed by the project, carry the following weightings. Points are given for all of the following that apply to a system and will be addressed by the project: | | |
| **Condition** | | **Priority Points** |
| a. Total and fecal coliforms | | |
| | 1. No detections | 0 |
| | 2. 1-2 TCR assessments | 30 |
| | 3. Greater than 2 assessments | 40 |
| | 4. Boil order | 60 |
| b. Nitrate or emerging contaminant with do-not-drink health advisory/AGQS | | |
| | 1. No level above 1.0 mg/L (N) or HA/AGQS | 0 |
| | 2. Levels >5.0<10mg/L (N) | 26 |
| | 3. MCL violations (N) or HA exceedence/AGQS | 60 |
| c. Filtration or Disinfection related Treatment Techniques | | |
| | 1. No violations | 0 |
| | 2. 1-2 treatment technique violations | 26 |
| | 3. Greater than 2 violations | 52 |
| d. Chemical or Disinfection Byproducts MCL violations | | |
| | 1. No MCL violations | 0 |
| | 2. 1-2 MCL violations | 26 |
| | 3. Greater than 2 violations | 52 |
| e. Lead and Copper (At the 90th percentile) | | |
| | 1. Lead levels above .015 mg/l | 52 |
| | 2. Copper levels above 3.0 mg/l | 24 |
| | 3. Copper levels between 1.3 and 3.0 mg/l | 18 |
| f. Secondary Standards | | |
| | Any exceedance of a secondary MCL | 14 |

| B = Quantity Deficiencies or Insufficient Storage | |
|---|---|
| Quantity deficiencies are shortages due to limited water supply sources or insufficient storage within the distribution system to meet public need. The public health and compliance risks associated with quantity deficiencies include domestic need of adequate potable water for drinking and hygiene, and maintaining adequate pressure in lines to prevent back siphonage and cross-connections. The following priority points may be assigned only for current or recent (within last five years) unaddressed shortages. Projects related to future growth or expansions are not eligible for funding. | |
| **Condition** | **Priority Points** |
| Adequate quantity for the present (meets all current demand) | 0 |
| Continual shortage (daily) | 22 |
| Shortage of supply recognized by NHDES | 20 |
| Insufficient storage capacity/storage tank | 20 |
| Shortage during peak demands | 20 |
| Shortage during seasonal high use in a system with an implemented conservation plan | 18 |
| Shortage during seasonal high use in a system without an implemented conservation plan | 14 |

| C = Treatment/Design Deficiencies | |
|---|---|
| Design deficiencies are those which could be corrected by enlargement, repair, installation, or replacement of all or a portion of the system. Any combination of the following deficiencies has the potential to adversely affect a system's ability to continually provide drinking water that meets all standards. | |
| **Condition** | **Priority Points** |
| Incomplete surface water filtration or presence of groundwater under the influence of surface water | 22 |
| Confined space pumphouse/other safety issues | 18 |
| Non-optimized surface water filtration when compared with American Water Works Association composite correction criteria | 18 |
| Mandated chlorination of groundwater system | 14 |
| Distribution/plant capacity deficiencies (includes situations where current demand exceeds treatment capacity; pipe tuberculation; pressure issues; asbestos cement removal, high unaccounted for water) | 18 |
| Need to upgrade existing corrosion control treatment in order to meet action levels | 17 |
| Improper well construction | 16 |
| Inadequate water treatment wastewater disposal (backwash or sludge) | 14 |
| Other significant deficiencies (e.g. need for treatment of Arsenic, Iron, Manganese, Radon, Radionuclides; other deficiencies observed during a sanitary survey) | 14 |
| Backup power source | 5 |

| **D = Capacity Development** | |
|---|---|
| Public water systems in need of significant technical, managerial or financial assistance through the capacity development program are identified through a variety of mechanisms including sanitary surveys, referrals from contract operators, direct requests from the water system, customer complaints, and repeat enforcement and significant non-complier lists. Systems are notified of the recommended improvements in their sanitary survey report or technical assistance site visit reports and are entered into our capacity development tracking database. Systems on the capacity development list are typically very small systems serving less than 100 homes. | |
| Public water systems with capacity needs serving 1,000 people or less | 20 |

| **E = Consolidation** | |
|---|---|
| The project involves interconnection to a more viable public water system. | 20 |

| **F = Affordability** | |
|---|---|
| Affordability is an indicator of a rate payer's ability to afford rate increases that will result from a project. Affordability is determined by a ratio that compares the average water rate to the median household income of the community that is applying for funding. Below is a table which provides points based on this ratio. Only year round communities that are considered disadvantaged will be eligible for these points. The water rates are based on the most recent information compiled by NHDES in its 2018 water rate survey report or from information provided directly by the applicant. The median household income (MHI) is the income data compiled by the U.S. Census Bureau 2012-2016 American Community Survey. The affordability ratio is calculated by dividing the water rate by the community median household income times 100%. | |
| **Affordability Ratio (Water Rate/MHI)** | **Priority Points** |
| 2.00 or more | 15 |
| 1.6 to 1.99 | 11 |
| 0.8 to 1.5 | 7 |

| **G = "Green"** | |
|---|---|
| Projects that include energy or water efficiency improvements will be assigned points. In general, green projects include, but are not limited to, energy generation, leak repair, meter installations or upgrades, pump efficiency, water infiltration/storage projects, high efficiency pumps and motors, variable frequency drives, water main replacement or any other activities identified in a conservation plan. | 15 |

| **H = Critical Infrastructure** | |
|---|---|
| If the project upgrades, replaces or supplements critical infrastructure components such as sole sources of supply, storage tanks, transmission mains, river crossings, or other such infrastructure the failure of which could interrupt water service to the entire water system, or a significant portion thereof, then the project will be assigned ranking points. | 15 |

| I = Asset Management | |
|---|---|
| If the system has completed activities related to an active asset management program then the project will be assigned ranking points. | |
| **Condition** | **Priority Points** |
| Project is directly from the systems asset management plan | 10 |
| The system has implemented a complete asset management plan | 5 |
| The system has implemented some components of an asset management plan | 2 |
| The system has not completed any asset management implementation | 0 |

| J = Lead | |
|---|---|
| Any lead component or lead service line (all the way to the meter) replacement project | 50 |

**6A (2). Tie-Breaking Procedure**

When two or more projects score equally under the Project Ranking Formula, tie-breaking procedures will be utilized. The first tie-breaking procedure is related to long-term financing of the projects. A project that intends to use the DWSRF for long-term financing will receive the higher ranking. If both projects are to use the DWSRF for long-term financing, in order to direct financial resources where they will benefit the greatest number of people, and because the vast majority of New Hampshire's systems are either small or very small, (statewide, only 18 systems serve greater than 10,000 people) the project with the greater existing population served will receive the higher ranking.

**6A (3). Bypass Procedure**

Because of the need to apply quickly for available federal dollars and the unpredictability of when funds become available, projects that score high but cannot obtain authority to borrow before June 2019, may be temporarily by-passed. Also, a project on the fundable portion of the main list may be bypassed if it is determined that the project will not be ready to proceed for other reasons during the funding year or, if the cost of the project will prevent the state from meeting the grant conditions requiring that 15% of the grant be used to fund projects in small systems, and that 20% be used to subsidize loans to disadvantaged communities. Any applicant whose project is to be bypassed will be given written notice by NHDES. It is the department's intent to work with these systems to assist them in getting ready to proceed. Funds which become available due to the utilization of the bypass procedure will be treated in the same way as additional allotments.

**6A (4). Emergency Projects**

Projects necessary to alleviate emergency situations that result in an imminent threat to public health, such as: the total loss of water supply or loss of a major component due to a natural or unforeseen disaster which could not have been prevented by the applicant (e.g. tornado, flood, severe weather, fire, collapse, emerging contaminant that is acute in nature for some population, etc.), or other water emergencies which could not have been prevented by exercise of reasonable care by the applicant, can be immediately elevated to the top of the priority list at the discretion of the department.

### 6A (5). Refinancing Existing Loans

The DWSRF may be used to buy or refinance debt obligations for DWSRF eligible projects not currently financed through the DWSRF. Debt obligations for private systems are not eligible for refinancing under the DWSRF. The long-term debt must have been incurred after July 1, 1993, to be eligible for refinancing. DWSRF monies cannot be used to refinance loans for the purchase of land. Priority for refinancing will go to systems having the highest user rate. Consideration for these applications will be entertained only after projects addressing public health protection and compliance have been funded. If funded, the refinanced project must have complied with all federal and state requirements for the DWSRF program including applicable Davis-Bacon Act and the American Iron and Steel provision requirements.

### 6B. Impact of Funding Decisions on the Long Term Financial Health of the DWSRF

The rate structure for loans will encourage short-term loans; thereby freeing up funds for more loans. Financial modeling indicates that even with the measures being put into place to address disadvantaged communities; reduce ULOs, the integrity of the fund will be maintained and growth will occur.

### 6C. Relationship to State Program Goals and Objectives

NHDES places priority on categories of projects that meet departmental goals as stated in the long- and short-term goals of the IUP (Section 2). In general, the resolution of imminent threat to public health by addressing acute contaminants at disadvantaged communities is paramount, followed by the resolution of such issues elsewhere. Other compliance issues, improved capacity and promotion of “green” projects are also goals supported by New Hampshire’s prioritization approach.

## 7. ASSISTANCE TO SMALL SYSTEMS

A minimum of 15% of the total amount available for assistance from the fund must be made available to provide infrastructure loan assistance to systems serving fewer than 10,000 people. Accordingly, New Hampshire intends to dedicate at least $1,666,050 for loans to eligible small systems for eligible infrastructure projects.

## 8. DISADVANTAGED COMMUNITY/SYSTEM PROGRAM

New Hampshire will provide at least 20%, not to exceed 30%, of available funding in the form of loan subsidies to disadvantaged communities. The percentage of principal forgiveness will be adjusted as needed, as provided in 8D below, to ensure that this goal is met and, if necessary, bypass provisions will be utilized.

### 8A. Definition

A disadvantaged community or system is defined as a community public water system or community that serves residents whose median household income (MHI) is less than the statewide MHI (Attachment E) based on the most recent census data and/or income survey. If an applicant for DWSRF assistance meets the definition of "disadvantaged" and if the resulting project user rate (which is the total of the existing rate in addition to the rate that results from the new project) exceeds the statewide affordability criteria (see 8C), it may be eligible for subsidies from the Disadvantaged Community/System Program. Subsidies will be available in the form of principal forgiveness. This program only applies to infrastructure projects.

### 8B. Limitations to Disadvantaged Program Assistance

To qualify for disadvantaged program assistance, at least 50% of the residential units served by the water system must be occupied at least six months of the year by a population meeting the disadvantaged income criterion (i.e. Project MHI < Statewide MHI). A project requesting interim financing will also not be eligible for disadvantaged system assistance.

### 8C. Affordability Criteria and Terms of Financial Assistance

Affordability of a proposed project considers both the resulting user rate (based on usage of 71,996 gallons per household per year) and the MHI of the community system or community in which the system exists. An affordable project is one that results in user rates that do not exceed 0.8% of the system or town MHI. For the purpose of determining the level of subsidy given the applicant through the Disadvantaged Community/System Program, the following process is followed:

Communities or systems requesting a loan that have an MHI less than the statewide MHI (based on the most recent census data and/or income survey), which for New Hampshire is $68,485 using the 2012 - 2016 American Community Survey data, are identified and considered disadvantaged. Provided they score enough points to be funded using the previously described prioritization ranking methodology, they will be given a subsidy in the form of principal forgiveness to bring the resulting user rate closer to being considered "affordable." The level of subsidy is determined by using an Affordability Index, which serves to measure the impact of a project on a disadvantaged community. The index is calculated by dividing the project user rate by the community or community system's MHI. Loans, rates and terms for this program will be the same as those for standard project loans.

**Disadvantaged System Assistance**

| Affordability Index*<br>(project user rate / community or water system's MHI) | Minimum Principal Forgiveness |
|---|---|
| 0.8 to < 1.50 | 10% |
| 1.50 to < 2.00 | 15% |
| ≥ 2.00 | 20% |

*See Attachment E for community MHI figures used in the calculations.

Community systems that are county owned are eligible for forgiveness as long as the county MHI is below the statewide MHI. The level of subsidy will be determined based on the chart below.

**County Owned Community Systems**
**Disadvantaged System Assistance**

| Median Household Income (MHI) | Amount of Principal Forgiveness |
|---|---|
| $68,485-$50,000 | 10% |
| Below $50,000 | 15% |

**8D. Amount of Funding to be Provided to Disadvantaged Communities/Systems**

NHDES intends to reserve 20% of the DWSRF capitalization grant to subsidize eligible projects at community water systems in disadvantaged communities. Subsidy will be provided in the form of principal forgiveness. To meet this goal, the amount of subsidy for a project will be determined at the time of the loan agreement in accordance with the table above. The New Hampshire DWSRF program reserves the right to increase the principal forgiveness percentages in the Disadvantaged System Assistance table in section 8C, above, in order to meet the 20% disadvantaged subsidy goal. If necessary, each category of principal forgiveness in the tables above will be increased by an equal amount to ensure that the total amount of loan forgiveness under the 2018 PPL meets the amount required by the federal grant (i.e., 20%of the capitalization grant amount).

**8E. Identification of Systems to Receive Assistance**

Projects have been prioritized using the system described in section 6A and identified on the project priority list as eligible for assistance from the Disadvantaged Community/System Program.

**8F. Long Term Effect of Subsidies on the DWSRF**

The anticipated net long-term effect of the allocation of funds for financial assistance to Disadvantaged Communities/Systems, as proposed, will be to reduce the amount of funds available to the standard project fund in the amount of $2,221,400.

# EXHIBIT 4

WATER AND SEWER USAGE AS BILLED
ANNUAL SUMMARY
1997-2017

| | | WATER | | | | | SEWER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TOTAL | GENERAL | % | RUGER | % | TOTAL | GENERAL | % | RUGER | % |
| 1997 | 1 | 45,832 | 34,563 | 75.4% | 11,269 | 24.6% | 36,701 | 28,999 | 79.0% | 7,702 | 21.0% |
| 1997 | 2 | 52,993 | 38,234 | 72.1% | 14,759 | 27.9% | 39,629 | 29,961 | 75.6% | 9,668 | 24.4% |
| 1997 | 3 | 54,612 | 40,208 | 73.6% | 14,404 | 26.4% | 41,608 | 32,463 | 78.0% | 9,145 | 22.0% |
| 1997 | TOTAL | 153,437 | 113,005 | 73.6% | 40,432 | 26.4% | 117,938 | 91,423 | 77.5% | 26,515 | 22.5% |
| 1998 | 1 | 45,058 | 32,290 | 71.7% | 12,768 | 28.3% | 36,378 | 26,610 | 73.1% | 9,768 | 26.9% |
| 1998 | 2 | 63,743 | 45,247 | 71.0% | 18,496 | 29.0% | 48,833 | 35,868 | 73.5% | 12,965 | 26.5% |
| 1998 | 3 | 46,574 | 35,143 | 75.5% | 11,431 | 24.5% | 33,585 | 26,064 | 77.6% | 7,521 | 22.4% |
| 1998 | TOTAL | 155,375 | 112,680 | 72.5% | 42,695 | 27.5% | 118,796 | 88,542 | 74.5% | 30,254 | 25.5% |
| 1999 | 1 | 50,019 | 37,519 | 75.0% | 12,500 | 25.0% | 38,525 | 29,454 | 76.5% | 9,071 | 23.5% |
| 1999 | 2 | 55,437 | 42,543 | 76.7% | 12,894 | 23.3% | 41,460 | 32,347 | 78.0% | 9,113 | 22.0% |
| 1999 | 3 | 47,184 | 33,402 | 70.8% | 13,782 | 29.2% | 36,292 | 26,268 | 72.4% | 10,024 | 27.6% |
| 1999 | TOTAL | 152,640 | 113,464 | 74.3% | 39,176 | 25.7% | 116,277 | 88,069 | 75.7% | 28,208 | 24.3% |
| 2000 | 1 | 57,681 | 42,356 | 73.4% | 15,325 | 26.6% | 44,335 | 32,579 | 73.5% | 11,756 | 26.5% |
| 2000 | 2 | 60,664 | 45,733 | 75.4% | 14,931 | 24.6% | 45,782 | 35,132 | 76.7% | 10,650 | 23.3% |
| 2000 | 3 | 38,116 | 28,069 | 73.6% | 10,047 | 26.4% | 29,583 | 22,433 | 75.8% | 7,150 | 24.2% |
| 2000 | TOTAL | 156,461 | 116,158 | 74.2% | 40,303 | 25.8% | 119,700 | 90,144 | 75.3% | 29,556 | 24.7% |
| 2001 | 1 | 47,321 | 35,585 | 75.2% | 11,736 | 24.8% | 38,873 | 30,028 | 77.2% | 8,845 | 22.8% |
| 2001 | 2 | 36,710 | 28,756 | 78.3% | 7,954 | 21.7% | 29,058 | 22,567 | 77.7% | 6,491 | 22.3% |
| 2001 | 3 | 51,422 | 40,689 | 79.1% | 10,733 | 20.9% | 41,043 | 31,927 | 77.8% | 9,116 | 22.2% |
| 2001 | TOTAL | 135,453 | 105,030 | 77.5% | 30,423 | 22.5% | 108,974 | 84,522 | 77.6% | 24,452 | 22.4% |
| 2002 | 1 | 39,389 | 30,253 | 76.8% | 9,136 | 23.2% | 32,296 | 24,885 | 77.1% | 7,411 | 22.9% |
| 2002 | 2 | 51,549 | 40,554 | 78.7% | 10,995 | 21.3% | 40,048 # | 30,735 | 76.7% | 9,313 | 23.3% |
| 2002 | 3 | 44,087 | 33,793 | 76.7% | 10,294 | 23.3% | 34,319 | 25,887 | 75.4% | 8,432 | 24.6% |
| 2002 | TOTAL | 135,025 | 104,600 | 77.5% | 30,425 | 22.5% | 106,663 | 81,507 | 76.4% | 25,156 | 23.6% |
| 2003 | 1 | 39,835 | 32,596 | 81.8% | 7,239 | 18.2% | 32,650 | 26,717 | 81.8% | 5,933 | 18.2% |
| 2003 | 2 | 46,346 | 37,460 | 80.8% | 8,887 | 19.2% | 39,015 | 30,126 | 77.2% | 8,887 | 22.8% |
| 2003 | 3 | 44,424 | 34,778 | 78.3% | 9,646 | 21.7% | 35,786 | 26,140 | 73.0% | 9,646 | 27.0% |
| 2003 | TOTAL | 130,605 | 104,834 | 80.3% | 25,772 | 19.7% | 107,451 | 82,983 | 77.2% | 24,466 | 22.8% |
| 2004 | 1 | 39,063 | 32,178 | 82.4% | 6,885 | 17.6% | 33,386 | 26,501 | 79.4% | 6,885 | 20.6% |
| 2004 | 2 | 50,688 | 40,037 | 79.0% | 10,651 | 21.0% | 40,749 | 30,098 | 73.9% | 10,651 | 26.1% |
| 2004 | 3 | 43,555 | 35,618 | 81.8% | 7,937 | 18.2% | 36,317 | 28,380 | 78.1% | 7,937 | 21.9% |
| 2004 | TOTAL | 133,306 | 107,833 | 80.9% | 25,473 | 19.1% | 110,452 | 84,979 | 76.9% | 25,473 | 23.1% |
| 2005 | 1 | 40,079 | 29,953 | 74.7% | 7,709 | 19.2% | 34,657 | 26,948 | 77.8% | 7,709 | 22.2% |
| 2005 | 2 | 42,178 | 32,115 | 76.1% | 7,647 | 18.1% | 35,171 | 27,524 | 78.3% | 7,647 | 21.7% |
| 2005 | 3 | 40,765 | 30,315 | 74.4% | 8,034 | 19.7% | 34,922 | 26,888 | 77.0% | 8,034 | 23.0% |
| 2005 | TOTAL | 123,022 | 92,383 | 75.1% | 23,390 | 19.0% | 104,750 | 81,360 | 77.7% | 23,390 | 22.3% |
| 2006 | 1 | 39,620 | 29,264 | 73.9% | 7,940 | 20.0% | 34,657 | 26,717 | 77.1% | 7,940 | 22.9% |
| 2006 | 2 | 42,820 | 33,536 | 78.3% | 6,807 | 15.9% | 35,171 | 28,364 | 80.6% | 6,807 | 19.4% |
| 2006 | 3 | 41,277 | 31,111 | 75.4% | 7,758 | 18.8% | 34,922 | 27,164 | 77.8% | 7,758 | 22.2% |
| 2006 | TOTAL | 123,717 | 93,911 | 75.9% | 22,505 | 18.2% | 104,750 | 82,245 | 78.5% | 22,505 | 21.5% |
| 2007 | 1 | 37,762 | 29,085 | 77.0% | 6,269 | 16.6% | 32,608 | 26,339 | 80.8% | 6,269 | 19.2% |
| 2007 | 2 | 40,960 | 31,049 | 75.8% | 7,502 | 18.3% | 33,902 | 26,400 | 77.9% | 7,502 | 22.1% |
| 2007 | 3 | 38,656 | 29,665 | 76.7% | 6,583 | 17.0% | 31,769 | 25,186 | 79.3% | 6,583 | 20.7% |
| 2007 | TOTAL | 117,378 | 89,799 | 76.5% | 20,354 | 17.3% | 98,279 | 77,925 | 79.3% | 20,354 | 20.7% |

# EXHIBIT 4

WATER AND SEWER USAGE AS BILLED
ANNUAL SUMMARY
1997-2017

| | | WATER | | | | | SEWER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TOTAL | GENERAL | % | RUGER | % | TOTAL | GENERAL | % | RUGER | % |
| 2008 | 1 | 36,702 | 27,133 | 73.9% | 7,707 | 21.0% | 32,893 | 25,186 | 76.6% | 7,707 | 23.4% |
| 2008 | 2 | 39,916 | 29,724 | 74.5% | 7,161 | 17.9% | 34,225 | 27,064 | 79.1% | 7,161 | 20.9% |
| 2008 | 3 | 45,426 | 36,921 | 81.3% | 8,505 | 18.7% | 36,594 | 28,089 | 76.8% | 8,505 | 23.2% |
| 2008 | TOTAL | 122,044 | 93,778 | 76.8% | 23,373 | 19.2% | 103,712 | 80,339 | 77.5% | 23,373 | 22.5% |
| 2009 | 1 | 38,067 | 30,360 | 79.8% | 6,038 | 15.9% | 30,427 | 24,389 | 80.2% | 6,038 | 19.8% |
| 2009 | 2 | 46,249 | 36,573 | 79.1% | 9,520 | 20.6% | 37,811 | 28,291 | 74.8% | 9,520 | 25.2% |
| 2009 | 3 | 37,370 | 29,507 | 79.0% | 6,833 | 18.3% | 29,820 | 22,987 | 77.1% | 6,833 | 22.9% |
| 2009 | TOTAL | 121,686 | 96,440 | 79.3% | 22,391 | 18.4% | 98,059 | 75,668 | 77.2% | 22,391 | 22.8% |
| 2010 | 1 | 37,583 | 29,612 | 78.8% | 6,880 | 18.3% | 30,767 | 23,887 | 77.6% | 6,880 | 22.4% |
| 2010 | 2 | 39,461 | 32,628 | 82.7% | 6,833 | 17.3% | 39,516 | 32,683 | 82.7% | 6,833 | 17.3% |
| 2010 | 3 | 44,955 | 35,891 | 79.8% | 9,064 | 20.2% | 46,177 | 37,113 | 80.4% | 9,064 | 19.6% |
| 2010 | TOTAL | 121,999 | 98,131 | 80.4% | 22,777 | 18.7% | 116,459 | 93,682 | 80.4% | 22,777 | 19.6% |
| 2011 | 1 | 36,798 | 29,335 | 79.7% | 7,463 | 20.3% | 38,762 | 31,299 | 80.7% | 7,463 | 19.3% |
| 2011 | 2 | 36,872 | 28,619 | 77.6% | 8,253 | 22.4% | 33,206 | 24,953 | 75.1% | 8,253 | 24.9% |
| 2011 | 3 | 42,329 | 31,557 | 74.6% | 10,772 | 25.4% | 30,895 | 20,123 | 65.1% | 10,772 | 34.9% |
| 2011 | TOTAL | 115,999 | 89,511 | 77.2% | 26,488 | 22.8% | 102,863 | 76,375 | 74.2% | 26,488 | 25.8% |
| 2012 | 1 | 39,657 | 29,270 | 73.8% | 10,480 | 26.4% | 42,242 | 31,762 | 75.2% | 10,480 | 24.8% |
| 2012 | 2 | 40,165 | 29,466 | 73.4% | 10,699 | 26.6% | 33,467 | 22,768 | 68.0% | 10,699 | 32.0% |
| 2012 | 3 | 49,966 | 33,398 | 66.8% | 16,568 | 33.2% | 34,071 | 17,503 | 51.4% | 16,568 | 48.6% |
| 2012 | TOTAL | 129,788 | 92,134 | 71.0% | 37,747 | 29.1% | 109,780 | 72,033 | 65.6% | 37,747 | 34.4% |
| 2013 | 1 | 43,678 | 30,204 | 69.2% | 13,474 | 30.8% | 38,110 | 24,636 | 64.6% | 13,474 | 35.4% |
| 2013 | 2 | 41,473 | 30,005 | 72.3% | 11,468 | 27.7% | 33,406 | 21,938 | 65.7% | 11,468 | 34.3% |
| 2013 | 3 | 45,391 | 27,199 | 59.9% | 18,192 | 40.1% | 39,227 | 21,035 | 53.6% | 18,192 | 46.4% |
| 2013 | TOTAL | 130,542 | 87,408 | 67.0% | 43,134 | 33.0% | 110,743 | 67,609 | 61.1% | 43,134 | 38.9% |
| 2014 | 1 | 50,322 | 32,326 | 64.2% | 17,996 | 35.8% | 38,169 | 20,173 | 52.9% | 17,996 | 47.1% |
| 2014 | 2 | 42,892 | 27,360 | 63.8% | 18,200 | 42.4% | 38,484 | 20,284 | 52.7% | 18,200 | 47.3% |
| 2014 | 3 | 43,659 | 29,712 | 68.1% | 15,851 | 36.3% | 42,443 | 26,592 | 62.7% | 15,851 | 37.3% |
| 2014 | TOTAL | 136,873 | 89,398 | 65.3% | 52,047 | 38.0% | 119,096 | 67,049 | 56.3% | 52,047 | 43.7% |
| 2015 | 1 | 43,960 | 31,097 | 70.7% | 14,128 | 32.1% | 28,397 | 14,269 | 50.2% | 14,128 | 49.8% |
| 2015 | 2 | 42,192 | 30,976 | 73.4% | 11,803 | 28.0% | 35,264 | 23,461 | 66.5% | 11,803 | 33.5% |
| 2015 | 3 | 34,700 | 25,026 | 72.1% | 9,400 | 27.1% | 38,838 | 29,438 | 75.8% | 9,400 | 24.2% |
| 2015 | TOTAL | 120,852 | 87,099 | 72.1% | 35,331 | 29.2% | 102,499 | 67,168 | 65.5% | 35,331 | 34.5% |
| 2016 | 1 | 37,710 | 26,530 | 70.4% | 11,362 | 30.1% | 31,470 | 20,108 | 63.9% | 11,362 | 36.1% |
| 2016 | 2 | 44,251 | 31,107 | 70.3% | 14,661 | 33.1% | 37,902 | 23,241 | 61.3% | 14,661 | 38.7% |
| 2016 | 3 | 38,037 | 27,211 | 71.5% | 11,225 | 29.5% | 32,358 | 21,133 | 65.3% | 11,225 | 34.7% |
| 2016 | TOTAL | 119,998 | 84,848 | 70.7% | 37,248 | 31.0% | 101,730 | 64,482 | 63.4% | 37,248 | 36.6% |
| 2017 | 1 | 34,558 | 26,330 | 76.2% | 8,228 | 23.8% | 24,534 | 16,306 | 66.5% | 8,228 | 33.5% |
| 2017 | 2 | 34,586 | 28,931 | 83.6% | 5,655 | 16.4% | 27,844 | 22,189 | 79.7% | 5,655 | 20.3% |
| 2017 | 3 | 30,823 | 26,231 | 85.1% | 4,592 | 14.9% | 29,084 | 24,492 | 84.2% | 4,592 | 15.8% |
| 2017 | TOTAL | 99,967 | 81,492 | 81.5% | 18,475 | 18.5% | 81,461 | 62,986 | 77.3% | 18,475 | 22.7% |

WATER FUND
BALANCE SHEET AND INCOME STATEMENT
July 1, 2011 to June 30, 2017

**STATEMENT OF NET POSITION**

| | June 30, 2012 | June 30, 2013 | June 30, 2014 | June 30, 2015 | June 30, 2016 | June 30, 2017 |
|---|---|---|---|---|---|---|
| CASH & INVESTMENTS | 230,973 | 364,083 | 497,856 | 581,757 | 609,256 | 686,924 |
| ACCOUNTS RECEIVABLE: | 330,029 | 355,167 | 407,331 | 402,754 | 378,706 | 307,033 |
| OTHER CURRENT ASSETS | 8,486 | 14,843 | 32,418 | 37,469 | 60,809 | 73,504 |
| INTERGOVERNMENTAL RECEIVABLE | 126,471 | 109,659 | 92,847 | 78,929 | 65,172 | 54,310 |
| FIXED ASSETS (NET) | 2,575,794 | 2,458,009 | 2,338,811 | 2,219,188 | 2,127,979 | 2,036,115 |
| TOTAL ASSETS | 3,271,753 | 3,301,761 | 3,369,263 | 3,320,097 | 3,241,922 | 3,157,886 |
| MISC CURRENT LIABILITIES | 332,008 | 339,124 | 312,732 | 202,783 | 157,888 | 130,809 |
| NET PENSION LIABILITY | | | | 253,072 | 325,554 | 428,456 |
| LONG-TERM DEBT | 483,796 | 404,393 | 313,888 | 264,997 | 153,448 | 117,241 |
| TOTAL LIABILITIES | 815,804 | 743,517 | 626,620 | 720,852 | 636,890 | 676,506 |
| NET DEFERRED INFLOWS (OUTFLOWS) OF RESOURCES | | | | (37,703) | (3,101) | 89,453 |
| NET POSITION | 2,455,949 | 2,558,244 | 2,742,643 | 2,561,542 | 2,601,931 | 2,570,833 |
| WORKING CAPITAL | 237,480 | 394,969 | 624,873 | 819,197 | 890,883 | 936,652 |

**STATEMENT INCOME, EXPENSES AND CHANGES IN NET POSITION**

| Year Ended | June 30, 2012 | June 30, 2013 | June 30, 2014 | June 30, 2015 | June 30, 2016 | June 30, 2017 |
|---|---|---|---|---|---|---|
| REVENUES: | | | | | | |
| USER FEES | 710,821 | 823,536 | 951,779 | 894,734 | 801,983 | 752,811 |
| INTERGOVERNMENTAL | 6,572 | 5,974 | 5,377 | 4,779 | 4,182 | 3,584 |
| MISCELLANEOUS | 3,890 | 2,741 | 625 | 1,132 | 19,593 | 1,864 |
| INTEREST | 9,832 | 10,212 | 276 | 285 | 761 | 1,881 |
| TOTAL REVENUE | 731,115 | 842,463 | 958,057 | 900,930 | 826,519 | 760,140 |
| EXPENSES: | | | | | | |
| OPERATIONS | 637,884 | 604,604 | 639,628 | 663,913 | 659,578 | 669,578 |
| INTEREST | 20,465 | 17,779 | 14,833 | 12,022 | 9,455 | 7,213 |
| DEPRECIATION | 120,950 | 117,785 | 119,197 | 119,625 | 117,097 | 114,447 |
| TOTAL EXPENSE | 779,299 | 740,168 | 773,658 | 795,560 | 786,130 | 791,238 |
| CHANGE IN NET POSITION | (48,184) | 102,295 | 184,399 | 105,370 | 40,389 | (31,098) |
| NET POSITION, BEGINNING (Restated June 30, 2012 and 2015) | 2,504,133 | 2,455,949 | 2,558,244 | 2,456,172 | 2,561,542 | 2,601,931 |
| NET POSITION, ENDING | 2,455,949 | 2,558,244 | 2,742,643 | 2,561,542 | 2,601,931 | 2,570,833 |

AWWARF RECOMMENDATIONS RESERVES:

| | |
|---|---|
| OPERATING EXPENSES (12 MOS) | 760,140 |
| DEBT SERVICE | 43,420 |
| 5% REVENUES | 37,641 |
| RANGE HIGH | 841,201 |
| OPERATING EXPENSES (6 MOS) | 380,070 |
| DEBT SERVICE | 43,420 |
| 5% REVENUES | 37,641 |
| RANGE LOW | 461,131 |

## LEVEL OF SERVICE

### Level of Service (LOS) Goals

How do we want the system to perform in the long run?

**System Reliability**

- Analyze the system to determine if assets should be repaired, replaced or reconfigured. For example, can parallel transmission mains be eliminated if a new drinking water source is developed?
- Collect information on watermain breaks, including the impact of outages on customers, and the true cost of repairs. This information allows for informed repair or replace decisions.
- Ensure that financial resources are available to maintain appropriate staffing levels, and to provide staff with the tools and equipment needed to properly maintain the system.
- Ensure that financial resources are available to fund needed asset renewals in a timely manner.

**Customer Service**

- Timely response to customer concerns and complaints.
- Effective recordkeeping and follow-up.
- Accurate billing and cost allocation. Keeping water meters in good working order is essential.
- Keeping customers informed about the condition of the system and asset renewal needs.

## ASSET MANAGEMENT STRATEGIES

**Keys to Successful AM**

- **Keep it simple**
- **Form a living document**

The following techniques are used to help keep Asset Management a successful on-going process.

- Continually updating the asset inventory and condition of assets over time.
- Update Level of Service Goals over time. Keep consistent with desired performance and customer expectations.
- Continue to improve data collection techniques. Collect information on the condition and performance of assets.
- Repair or replace assets that have a high probability of failure and high consequence of failure.

UNDERWOOD engineers


**Brochure produced by:**
**May 2019**

**Portsmouth, NH**
**Phone: 603.436.6192**
**Concord, NH**
**Phone: 603.230.9898**


THE SUNSHINE TOWN NEWPORT, N.H.

# WATER ASSET MANAGEMENT PROGRAM

## INFO YOU SHOULD KNOW

### What is Asset Management?

Asset Management (AM) planning is a decision-making tool that helps managers determine how to operate and maintain their systems at the lowest cost while maintaining the desired level of service. It consists of the following:

**Asset Inventory and Condition Assessment—**What water system components does the Town own and what condition are they in?

**Level of Service Goals–** What does the Town need to accomplish to deliver the desired level of service to customers?

**Critical Assets and Priority Projects—** Prioritize asset renewals based on the assets importance to the system and its probability of failure.

**Minimum Lifecycle Cost—** Determine the resources needed to operate the system. Are staffing levels adequate? Is staff training and supervision sufficient? Do staff have the tools and supplies they need to properly operate and maintain the system?

**Long-term Funding Strategy–** Are adequate resources available to complete necessary capital projects, including assets renewals?

**Implementation Plan—**What actions are needed to ensure that the asset management plan is continuously updated and maintained?

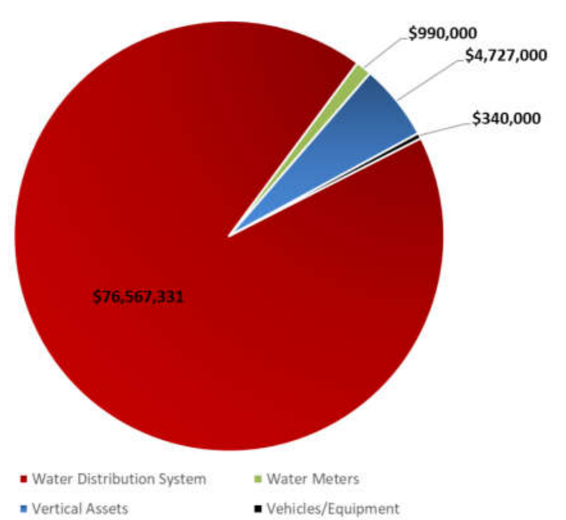
**Communication Plan—**How will information be shared with the Board of Selectmen and the Public so that they understand the true condition and needs of the water system?

## NEWPORT WATER SYSTEM ASSET INVENTORY

### TOTAL ESTIMATED REPLACEMENT VALUE OF WATER SYSTEM ASSETS

## $82.6 MILLION

| Water System Componenet | Estimated Replacement Cost |
|---|---|
| Water Distribution System | $76,567,331 |
| Slow Sand Filter Water Treatment Plant | $2,343,000 |
| Summer Street Storage Tank | $1,075,000 |
| Water Meters | $990,000 |
| Pollards Mill Well Facility | $704,000 |
| Sodium Silicate Building | $470,000 |
| Vehicles/Equipment | $340,000 |
| PRV Building | $85,000 |
| Gilman Pond Water Supply | $50,000 |
| **Grand Total** | **$82,624,331** |




## OVERALL SYSTEM CONDITION

**The Town of Newport currently has two water supplies.**

- The main water source, Gilman Pond, is located in the Town of Unity. Surface water is treated by a slow-sand filter plant which was built in 1992.
- The Pollards Mill well facility serves as a backup to the main water supply and was built in the late 1960's. It is in need of an upgrade.

**Both the Town's water supplies rely on transmission mains that are over 100 years old.**

- There are two transmission mains from the Gilman Pond water supply to the Pressure Reducing Facility (PRF) on Unity Road. Both of these mains are over 100 years old.
- There are three transmission mains from the PRF to the main service area. Two of the three are over 100 years old.
- The useful life of pipe ranges from about 75 to 120 years, depending on the material, installation conditions, pressures and other factors.

**The Town's distribution mains range in age from over 100 years old to less than one year.**

- While age is not the only indicator of condition, it is typically a factor in pipe failures.
- The Town does have approximately 30,000 feet of cement-lined cast iron pipe installed in the 1960's, which has a significant break history even though it is not near the end of its estimated useful life.

**The Town's water meters are approximately 30 years old and due for replacement.**

| Age of Pipe | Length | Percent |
|---|---|---|
| Greater than 100 years old | 85,766 | 36% |
| Between 50 and 100 years old | 95,430 | 41% |
| Between 20 and 50 years old | 41,002 | 17% |
| Less than 20 years old | 13,393 | 6% |
| **Grand Total** | **235,592** | **100%** |

# APPENDIX B

## Level of Service Matrix

## APPENDIX B: LEVEL OF SERVICE GOALS

| Goal | Actions | Numerical Target and Timeframe |
|---|---|---|
| Collect information on unplanned incidents such as water main breaks or customer complaints. | Record tasks in AxisGIS and download and review on a monthly basis. | Update as needed. |
| | | Download information monthly to review and quantify hours spent on certain items. In particular, time spent finding and repairing water main leaks or breaks. |
| Regularly inform Town Manager, Selectmen, and general public on the condition and performance of the system. | Combine downloaded information into a management report. | Quarterly or as needed for DPW Director and Town Manager.<br>Annually for Select Board and general public. |
| Address the back-log of asset renewals. | Prepare a detailed Capital Improvement Plan for the Water System to map out improvements, identify cost saving opportunities, increase redundancy in terms of supply, and reduce the criticality of the Unity Road transmission mains.<br><br>Include a financial analysis which evaluates rate sufficiency and affordability; and examines opportunities for loan forgiveness.<br><br>Determine an amount to be set aside in capital reserves annually in order to address existing and future capital improvement needs. | Complete by January 2020.<br><br>Update with annual progress reports thereafter.<br><br>Ensure that adequate reserves are being put aside annually. |
| Ensure that rates are adequate | Perform a rate sufficiency study; adjust rates as needed. | Once every five years |
| Coordinate infrastructure projects | Complete wastewater and stormwater asset management programs.<br><br>Coordinate needed upgrades with roadway improvement projects. | By November 2019. |

# APPENDIX C

## Attribute Tables and Summaries

**ASSET DATA TABLE**

| Asset Description | Type | Subcomponent/Asset ID | Year Installed | Replacement Cost | Useful Life | End Useful Life | Remaining Useful Life |
|---|---|---|---|---|---|---|---|
| Gilman Pond Water Supply | Intake Screen | Intake Screen | 1895 | $ 15,000 | 40 | 1935 | -84 |
| Gilman Pond Water Supply | Process Piping & Valves | Intake Valve Vault | 1992 | $ 35,000 | 30 | 2022 | 3 |
| Slow Sand Filter Water Treatment Plant | WTP Storage | 300,000 gal Clearwell | 1992 | $ 400,000 | 75 | 2067 | 48 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Sand filter beds and pipe gallery structure | 1992 | $ 750,000 | 100 | 2092 | 73 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Concrete block walls | 1992 | $ 150,000 | 75 | 2067 | 48 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Wood roof trusses | 1992 | $ 75,000 | 75 | 2067 | 48 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Asphalt shingle roof | 1992 | $ 50,000 | 25 | 2017 | -2 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Metals - grating/railings/stairs | 1992 | $ 30,000 | 60 | 2052 | 33 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Boiler | 1992 | $ 25,000 | 30 | 2022 | 3 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Duct work | 1992 | $ 25,000 | 40 | 2032 | 13 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Exhaust fans (4) | 1992 | $ 12,000 | 30 | 2022 | 3 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Louvers (5) | 1992 | $ 10,000 | 30 | 2022 | 3 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Hot water heaters (5) | 1992 | $ 10,000 | 30 | 2022 | 3 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Supply lines/pressure tanks/backflow preventer | 1992 | $ 25,000 | 40 | 2032 | 13 |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Sump pump | 1992 | $ 1,000 | 10 | 2002 | -17 |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Slow sand filter media | 1999 | $ 75,000 | 25 | 2024 | 5 |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Pump 1 | 1992 | $ 15,000 | 25 | 2017 | -2 |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Pump 2 | 1992 | $ 15,000 | 25 | 2017 | -2 |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Tank | 1992 | $ 50,000 | 75 | 2067 | 48 |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Flow Meter | 1992 | $ 10,000 | 10 | 2002 | -17 |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Level Sensor Equipment | 1992 | $ 25,000 | 20 | 2012 | -7 |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 4-inch PVC underdrain | 1992 | $ 25,000 | 60 | 2052 | 33 |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 8-inch PVC underdrain header | 1992 | $ 10,000 | 60 | 2052 | 33 |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 12-inch DI raw water distribution header | 1992 | $ 25,000 | 60 | 2052 | 33 |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | Pipe gallery | 1992 | $ 75,000 | 60 | 2052 | 33 |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Turbidimeter | 1992 | $ 5,000 | 10 | 2002 | -17 |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Process Control Panel | 1992 | $ 30,000 | 25 | 2017 | -2 |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Level Transmitters (5) | 1992 | $ 25,000 | 15 | 2007 | -12 |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Flow Meters (4) | 1992 | $ 30,000 | 15 | 2007 | -12 |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Eye wash alarm | 1992 | $ 5,000 | 20 | 2012 | -7 |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Fire alarm | 1992 | $ 5,000 | 20 | 2012 | -7 |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | Generator | 1992 | $ 100,000 | 25 | 2017 | -2 |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | Automatic Transfer Switch | 1992 | $ 30,000 | 25 | 2017 | -2 |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | 1000 gal Propane Tank (buried) | 1992 | $ 25,000 | 25 | 2017 | -2 |
| Slow Sand Filter Water Treatment Plant | Site Electrical | Electrical Feed | 1992 | $ 200,000 | 50 | 2042 | 23 |
| Sodium Silicate Building | Sodium Silicate Building | Metal Roof | 1993 | $ 12,000 | 50 | 2043 | 24 |
| Sodium Silicate Building | Sodium Silicate Building | Wood roof trusses | 1993 | $ 10,000 | 60 | 2053 | 34 |
| Sodium Silicate Building | Sodium Silicate Building | Brick Walls | 1955 | $ 50,000 | 75 | 2030 | 11 |
| Sodium Silicate Building | Sodium Silicate Building | Concrete vault | 1955 | $ 100,000 | 75 | 2030 | 11 |
| Sodium Silicate Building | Sodium Silicate Building | Concrete addtion | 1993 | $ 100,000 | 75 | 2068 | 49 |
| Sodium Silicate Building | Sodium Silicate Building | Metal railings/stairs | 1993 | $ 25,000 | 40 | 2033 | 14 |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate feed pump 1 system | 1993 | $ 8,000 | 15 | 2008 | -11 |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate bulk tank | 1993 | $ 20,000 | 35 | 2028 | 9 |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate day tank | 1993 | $ 10,000 | 35 | 2028 | 9 |
| Sodium Silicate Building | Process Piping | Process Piping | 1993 | $ 25,000 | 50 | 2043 | 24 |
| Sodium Silicate Building | Process Valves | Process Valves | 1993 | $ 30,000 | 50 | 2043 | 24 |
| Sodium Silicate Building | Site Electrical | Electrical Feed | 1993 | $ 80,000 | 50 | 2043 | 24 |

**ASSET DATA TABLE**

| Asset Description | Type | Subcomponent/Asset ID | Impact of Failure | Probability of Failure | Risk Score | Criticality | Condition |
|---|---|---|---|---|---|---|---|
| Gilman Pond Water Supply | Intake Screen | Intake Screen | 5.0 | 5.0 | 25.0 | Highest Risk | |
| Gilman Pond Water Supply | Process Piping & Valves | Intake Valve Vault | 5.0 | 4.0 | 20.0 | Highest Risk | |
| Slow Sand Filter Water Treatment Plant | WTP Storage | 300,000 gal Clearwell | 5.0 | 2.0 | 10.0 | Frequent Monitoring | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Sand filter beds and pipe gallery structure | 3.0 | 1.0 | 3.0 | Frequent Monitoring | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Concrete block walls | 3.0 | 2.0 | 6.0 | Frequent Monitoring | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Wood roof trusses | 4.0 | 2.0 | 8.0 | Frequent Monitoring | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Asphalt shingle roof | 2.0 | 5.0 | 10.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Metals - grating/railings/stairs | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Boiler | 5.0 | 4.0 | 20.0 | Highest Risk | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Duct work | 3.0 | 3.0 | 9.0 | Highest Risk | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Exhaust fans (4) | 3.0 | 4.0 | 12.0 | Highest Risk | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Louvers (5) | 1.0 | 4.0 | 4.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Hot water heaters (5) | 1.0 | 4.0 | 4.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Supply lines/pressure tanks/backflow preventer | 1.0 | 3.0 | 3.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Sump pump | 1.0 | 5.0 | 5.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Slow sand filter media | 3.0 | 4.0 | 12.0 | Highest Risk | |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Pump 1 | 2.0 | 5.0 | 10.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Pump 2 | 2.0 | 5.0 | 10.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Tank | 3.0 | 2.0 | 6.0 | Frequent Monitoring | |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Flow Meter | 1.0 | 5.0 | 5.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Level Sensor Equipment | 3.0 | 5.0 | 15.0 | Highest Risk | |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 4-inch PVC underdrain | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 8-inch PVC underdrain header | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 12-inch DI raw water distribution header | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | Pipe gallery | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Turbidimeter | 2.0 | 5.0 | 10.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Process Control Panel | 1.0 | 5.0 | 5.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Level Transmitters (5) | 1.0 | 5.0 | 5.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Flow Meters (4) | 1.0 | 5.0 | 5.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Eye wash alarm | 1.0 | 5.0 | 5.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Fire alarm | 1.0 | 5.0 | 5.0 | Priority Renewal | |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | Generator | 5.0 | 5.0 | 25.0 | Highest Risk | |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | Automatic Transfer Switch | 5.0 | 5.0 | 25.0 | Highest Risk | |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | 1000 gal Propane Tank (buried) | 3.0 | 5.0 | 15.0 | Highest Risk | |
| Slow Sand Filter Water Treatment Plant | Site Electrical | Electrical Feed | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Sodium Silicate Building | Sodium Silicate Building | Metal Roof | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Sodium Silicate Building | Sodium Silicate Building | Wood roof trusses | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Sodium Silicate Building | Sodium Silicate Building | Brick Walls | 2.0 | 3.0 | 6.0 | Priority Renewal | |
| Sodium Silicate Building | Sodium Silicate Building | Concrete vault | 2.0 | 3.0 | 6.0 | Priority Renewal | |
| Sodium Silicate Building | Sodium Silicate Building | Concrete addtion | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Sodium Silicate Building | Sodium Silicate Building | Metal railings/stairs | 2.0 | 3.0 | 6.0 | Priority Renewal | |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate feed pump 1 system | 4.0 | 5.0 | 20.0 | Highest Risk | |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate bulk tank | 4.0 | 4.0 | 16.0 | Highest Risk | |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate day tank | 4.0 | 4.0 | 16.0 | Highest Risk | |
| Sodium Silicate Building | Process Piping | Process Piping | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Sodium Silicate Building | Process Valves | Process Valves | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Sodium Silicate Building | Site Electrical | Electrical Feed | 2.0 | 2.0 | 4.0 | Limited Monitoring | |

| ASSET DATA TABLE | | | COST OF CRITICAL ASSET REPLACEMENTS - FIRST TEN YEARS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 |
| **Asset Description** | **Type** | **Subcomponent/Asset ID** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2026** | **2027** | **2028** |
| Gilman Pond Water Supply | Intake Screen | Intake Screen | $ 15,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Gilman Pond Water Supply | Process Piping & Valves | Intake Valve Vault | $ - | $ - | $ - | $ 35,000 | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Storage | 300,000 gal Clearwell | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Sand filter beds and pipe gallery structure | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Concrete block walls | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Wood roof trusses | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Asphalt shingle roof | $ 50,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Metals - grating/railings/stairs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Boiler | $ - | $ - | $ - | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Duct work | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Exhaust fans (4) | $ - | $ - | $ - | $ 12,000 | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Louvers (5) | $ - | $ - | $ - | $ 10,000 | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Hot water heaters (5) | $ - | $ - | $ - | $ 10,000 | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Supply lines/pressure tanks/backflow preventer | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Sump pump | $ 1,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Slow sand filter media | $ - | $ - | $ - | $ - | $ - | $ 75,000 | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Pump 1 | $ 15,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Pump 2 | $ 15,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Tank | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Flow Meter | $ 10,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Level Sensor Equipment | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 4-inch PVC underdrain | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 8-inch PVC underdrain header | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 12-inch DI raw water distribution header | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | Pipe gallery | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Turbidimeter | $ 5,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Process Control Panel | $ 30,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Level Transmitters (5) | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Flow Meters (4) | $ 30,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Eye wash alarm | $ 5,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Fire alarm | $ 5,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | Generator | $ 100,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | Automatic Transfer Switch | $ 30,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | 1000 gal Propane Tank (buried) | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Slow Sand Filter Water Treatment Plant | Site Electrical | Electrical Feed | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Sodium Silicate Building | Sodium Silicate Building | Metal Roof | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Sodium Silicate Building | Sodium Silicate Building | Wood roof trusses | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Sodium Silicate Building | Sodium Silicate Building | Brick Walls | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Sodium Silicate Building | Sodium Silicate Building | Concrete vault | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Sodium Silicate Building | Sodium Silicate Building | Concrete addtion | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Sodium Silicate Building | Sodium Silicate Building | Metal railings/stairs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate feed pump 1 system | $ 8,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate bulk tank | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 20,000 |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate day tank | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 10,000 |
| Sodium Silicate Building | Process Piping | Process Piping | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Sodium Silicate Building | Process Valves | Process Valves | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Sodium Silicate Building | Site Electrical | Electrical Feed | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |

| | | | COST OF ASSET REPLACEMENTS - NEXT 100 YEARS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ASSET DATA TABLE** | | | **0 to 10** | **10 to 20** | **20 to 30** | **30 to 40** | **40 to 50** | **50 to 60** | **60 to 70** | **70 to 80** | **80 to 90** | **90 to 100** | **0 to 100** |
| **Asset Description** | **Type** | **Subcomponent/Asset ID** | **2019-2028** | **2029-2038** | **2039-2048** | **2049-2058** | **2059-2068** | **2069-2078** | **2079-2088** | **2089-2098** | **2099-2108** | **2109-2118** | **2019-2118** |
| Gilman Pond Water Supply | Intake Screen | Intake Screen | $ 15,000 | $ - | $ - | $ - | $ 15,000 | $ - | $ - | $ - | $ 15,000 | $ - | **$ 45,000** |
| Gilman Pond Water Supply | Process Piping & Valves | Intake Valve Vault | $ 35,000 | $ - | $ - | $ 35,000 | $ - | $ - | $ 35,000 | $ - | $ - | $ 35,000 | **$ 140,000** |
| Slow Sand Filter Water Treatment Plant | WTP Storage | 300,000 gal Clearwell | $ - | $ - | $ - | $ - | $ 400,000 | $ - | $ - | $ - | $ - | $ - | **$ 400,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Sand filter beds and pipe gallery structure | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 750,000 | $ - | $ - | **$ 750,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Concrete block walls | $ - | $ - | $ - | $ - | $ 150,000 | $ - | $ - | $ - | $ - | $ - | **$ 150,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Wood roof trusses | $ - | $ - | $ - | $ - | $ 75,000 | $ - | $ - | $ - | $ - | $ - | **$ 75,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Asphalt shingle roof | $ 50,000 | $ - | $ 50,000 | $ - | $ - | $ 50,000 | $ - | $ 50,000 | $ - | $ - | **$ 200,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Structural | Metals - grating/railings/stairs | $ - | $ - | $ - | $ 30,000 | $ - | $ - | $ - | $ - | $ - | $ 30,000 | **$ 60,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Boiler | $ 25,000 | $ - | $ - | $ 25,000 | $ - | $ - | $ 25,000 | $ - | $ - | $ 25,000 | **$ 100,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Duct work | $ - | $ 25,000 | $ - | $ - | $ - | $ 25,000 | $ - | $ - | $ - | $ 25,000 | **$ 75,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Exhaust fans (4) | $ 12,000 | $ - | $ - | $ 12,000 | $ - | $ - | $ 12,000 | $ - | $ - | $ 12,000 | **$ 48,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Mechanical | Louvers (5) | $ 10,000 | $ - | $ - | $ 10,000 | $ - | $ - | $ 10,000 | $ - | $ - | $ 10,000 | **$ 40,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Hot water heaters (5) | $ 10,000 | $ - | $ - | $ 10,000 | $ - | $ - | $ 10,000 | $ - | $ - | $ 10,000 | **$ 40,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Supply lines/pressure tanks/backflow preventer | $ - | $ 25,000 | $ - | $ - | $ - | $ 25,000 | $ - | $ - | $ - | $ 25,000 | **$ 75,000** |
| Slow Sand Filter Water Treatment Plant | WTP Building - Plumbing | Sump pump | $ 1,000 | $ 1,000 | $ 1,000 | $ 1,000 | $ 1,000 | $ 1,000 | $ 1,000 | $ 1,000 | $ 1,000 | $ 1,000 | **$ 10,000** |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Slow sand filter media | $ 75,000 | $ - | $ - | $ 75,000 | $ - | $ 75,000 | $ - | $ - | $ 75,000 | $ - | **$ 300,000** |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Pump 1 | $ 15,000 | $ - | $ 15,000 | $ - | $ - | $ 15,000 | $ - | $ 15,000 | $ - | $ - | **$ 60,000** |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Pump 2 | $ 15,000 | $ - | $ 15,000 | $ - | $ - | $ 15,000 | $ - | $ 15,000 | $ - | $ - | **$ 60,000** |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Recycle Tank | $ - | $ - | $ - | $ - | $ 50,000 | $ - | $ - | $ - | $ - | $ - | **$ 50,000** |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Flow Meter | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | **$ 100,000** |
| Slow Sand Filter Water Treatment Plant | WTP Process Equipment | Level Sensor Equipment | $ 25,000 | $ - | $ 25,000 | $ - | $ 25,000 | $ - | $ 25,000 | $ - | $ 25,000 | $ - | **$ 125,000** |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 4-inch PVC underdrain | $ - | $ - | $ - | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ 25,000 | **$ 50,000** |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 8-inch PVC underdrain header | $ - | $ - | $ - | $ 10,000 | $ - | $ - | $ - | $ - | $ - | $ 10,000 | **$ 20,000** |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | 12-inch DI raw water distribution header | $ - | $ - | $ - | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ 25,000 | **$ 50,000** |
| Slow Sand Filter Water Treatment Plant | Process Valves & Piping | Pipe gallery | $ - | $ - | $ - | $ 75,000 | $ - | $ - | $ - | $ - | $ - | $ 75,000 | **$ 150,000** |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Turbidimeter | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | $ 5,000 | **$ 50,000** |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Process Control Panel | $ 30,000 | $ - | $ 30,000 | $ - | $ - | $ 30,000 | $ - | $ 30,000 | $ - | $ - | **$ 120,000** |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Level Transmitters (5) | $ 25,000 | $ 25,000 | $ - | $ 25,000 | $ 25,000 | $ - | $ 25,000 | $ 25,000 | $ - | $ 25,000 | **$ 175,000** |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Flow Meters (4) | $ 30,000 | $ 30,000 | $ - | $ 30,000 | $ 30,000 | $ - | $ 30,000 | $ 30,000 | $ - | $ 30,000 | **$ 210,000** |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Eye wash alarm | $ 5,000 | $ - | $ 5,000 | $ - | $ 5,000 | $ - | $ 5,000 | $ - | $ 5,000 | $ - | **$ 25,000** |
| Slow Sand Filter Water Treatment Plant | Monitoring & Control | Fire alarm | $ 5,000 | $ - | $ 5,000 | $ - | $ 5,000 | $ - | $ 5,000 | $ - | $ 5,000 | $ - | **$ 25,000** |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | Generator | $ 100,000 | $ - | $ 100,000 | $ - | $ - | $ 100,000 | $ - | $ 100,000 | $ - | $ - | **$ 400,000** |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | Automatic Transfer Switch | $ 30,000 | $ - | $ 30,000 | $ - | $ - | $ 30,000 | $ - | $ 30,000 | $ - | $ - | **$ 120,000** |
| Slow Sand Filter Water Treatment Plant | Standby Generator and Fuel Storage | 1000 gal Propane Tank (buried) | $ 25,000 | $ - | $ 25,000 | $ - | $ - | $ 25,000 | $ - | $ 25,000 | $ - | $ - | **$ 100,000** |
| Slow Sand Filter Water Treatment Plant | Site Electrical | Electrical Feed | $ - | $ - | $ 200,000 | $ - | $ - | $ - | $ - | $ 200,000 | $ - | $ - | **$ 400,000** |
| Sodium Silicate Building | Sodium Silicate Building | Metal Roof | $ - | $ - | $ 12,000 | $ - | $ - | $ - | $ - | $ 12,000 | $ - | $ - | **$ 24,000** |
| Sodium Silicate Building | Sodium Silicate Building | Wood roof trusses | $ - | $ - | $ - | $ 10,000 | $ - | $ - | $ - | $ - | $ - | $ 10,000 | **$ 20,000** |
| Sodium Silicate Building | Sodium Silicate Building | Brick Walls | $ - | $ 50,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ 50,000 | $ - | **$ 100,000** |
| Sodium Silicate Building | Sodium Silicate Building | Concrete vault | $ - | $ 100,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ 100,000 | $ - | **$ 200,000** |
| Sodium Silicate Building | Sodium Silicate Building | Concrete addtion | $ - | $ - | $ - | $ - | $ 100,000 | $ - | $ - | $ - | $ - | $ - | **$ 100,000** |
| Sodium Silicate Building | Sodium Silicate Building | Metal railings/stairs | $ - | $ 25,000 | $ - | $ - | $ - | $ 25,000 | $ - | $ - | $ - | $ 25,000 | **$ 75,000** |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate feed pump 1 system | $ 8,000 | $ 8,000 | $ - | $ 8,000 | $ 8,000 | $ - | $ 8,000 | $ 8,000 | $ - | $ 8,000 | **$ 56,000** |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate bulk tank | $ 20,000 | $ - | $ - | $ - | $ 20,000 | $ - | $ - | $ 20,000 | $ - | $ - | **$ 60,000** |
| Sodium Silicate Building | Chemical Feed System | Sodium Silicate day tank | $ 10,000 | $ - | $ - | $ - | $ 10,000 | $ - | $ - | $ 10,000 | $ - | $ - | **$ 30,000** |
| Sodium Silicate Building | Process Piping | Process Piping | $ - | $ - | $ 25,000 | $ - | $ - | $ - | $ - | $ 25,000 | $ - | $ - | **$ 50,000** |
| Sodium Silicate Building | Process Valves | Process Valves | $ - | $ - | $ 30,000 | $ - | $ - | $ - | $ - | $ 30,000 | $ - | $ - | **$ 60,000** |
| Sodium Silicate Building | Site Electrical | Electrical Feed | $ - | $ - | $ 80,000 | $ - | $ - | $ - | $ - | $ 80,000 | $ - | $ - | **$ 160,000** |

**ASSET DATA TABLE**

| Asset Description | Type | Subcomponent/Asset ID | Year Installed | Replacement Cost | Useful Life | End Useful Life | Remaining Useful Life |
|---|---|---|---|---|---|---|---|
| Pollards Mill Well Facility | Pump Building - Structural | Frost wall & footer | 1967 | $ 25,000 | 75 | 2042 | 23 |
| Pollards Mill Well Facility | Pump Building - Structural | Floor slab | 1967 | $ 10,000 | 75 | 2042 | 23 |
| Pollards Mill Well Facility | Pump Building - Structural | Brick walls | 1967 | $ 30,000 | 75 | 2042 | 23 |
| Pollards Mill Well Facility | Pump Building - Structural | Concrete slab roof | 1967 | $ 35,000 | 75 | 2042 | 23 |
| Pollards Mill Well Facility | Pump Building - Structural | Membrane roof | 1967 | $ 25,000 | 40 | 2007 | -12 |
| Pollards Mill Well Facility | Pump Building - Mechanical | Electric Heater | 1967 | $ 2,000 | 30 | 1997 | -22 |
| Pollards Mill Well Facility | Pump Building - Mechanical | Louvers (1) | 1967 | $ 2,000 | 30 | 1997 | -22 |
| Pollards Mill Well Facility | Pump Building - Plumbing | Water supply lines | 1967 | $ 5,000 | 40 | 2007 | -12 |
| Pollards Mill Well Facility | Process Valves & Piping | Process Valves & Piping | 1967 | $ 30,000 | 60 | 2027 | 8 |
| Pollards Mill Well Facility | Gravel Packed Well | Well #1 | 1967 | $ 100,000 | 60 | 2027 | 8 |
| Pollards Mill Well Facility | Well | Vertical Turbine Pumps1 | 1967 | $ 50,000 | 35 | 2002 | -17 |
| Pollards Mill Well Facility | Standby Generator & ATS | Standby Generator | 1967 | $ 100,000 | 30 | 1997 | -22 |
| Pollards Mill Well Facility | Standby Generator & ATS | Automatic Transfer Switch | 1967 | $ 30,000 | 30 | 1997 | -22 |
| Pollards Mill Well Facility | Standby Generator & ATS | 1000 gal Propane Tank (buried) | 1967 | $ 25,000 | 30 | 1997 | -22 |
| Pollards Mill Well Facility | Monitoring & Control | Pump Control Panel | 1967 | $ 30,000 | 20 | 1987 | -32 |
| Pollards Mill Well Facility | Monitoring & Control | Security System | 1967 | $ 5,000 | 20 | 1987 | -32 |
| Pollards Mill Well Facility | Site Electrical | Electrical Feed | 1967 | $ 200,000 | 50 | 2017 | -2 |
| Summer Street Storage Tank | Water Storage Tank | Concrete water storage tank | 2000 | $ 1,000,000 | 75 | 2075 | 56 |
| Summer Street Storage Tank | Valve Vault | Vault structure | 2000 | $ 10,000 | 60 | 2060 | 41 |
| Summer Street Storage Tank | Valve Vault | Process Piping | 2000 | $ 20,000 | 75 | 2075 | 56 |
| Summer Street Storage Tank | Valve Vault | Process Valves | 2000 | $ 15,000 | 40 | 2040 | 21 |
| Summer Street Storage Tank | Site Electrical | Site Electrical | 2000 | $ 30,000 | 50 | 2050 | 31 |
| PRV Building | PRV Vault | PRV Vault | 1934 | $ 25,000 | 75 | 2009 | -10 |
| PRV Building | PRV Building | PRV Building | 1934 | $ 15,000 | 75 | 2009 | -10 |
| PRV Building | Process Valves & Piping | Process Valves & Piping | 1934 | $ 30,000 | 60 | 1994 | -25 |
| PRV Building | Controls | Controls | 1934 | $ 15,000 | 15 | 1949 | -70 |
| Vehicles/Equipment | Chevy Pickup | W-1 | 2009 | $ 40,000 | 20 | 2029 | 10 |
| Vehicles/Equipment | Chevy 1-Ton Dump | W-2 | 2017 | $ 45,000 | 20 | 2037 | 18 |
| Vehicles/Equipment | Dodge Utility Trk | W-3 | 2017 | $ 40,000 | 20 | 2037 | 18 |
| Vehicles/Equipment | Case Backhoe | W-4 | 2001 | $ 45,000 | 20 | 2021 | 2 |
| Vehicles/Equipment | Sullivan Air Comp | W-5 | 1993 | $ 20,000 | 20 | 2013 | -6 |
| Vehicles/Equipment | SRECO Sewer Rodder | W-6 | 1989 | $ 7,000 | 20 | 2009 | -10 |
| Vehicles/Equipment | Ray-Tech Infrared | W-7 | 1991 | $ 25,000 | 20 | 2011 | -8 |
| Vehicles/Equipment | Obm Sewer Jetter | W-8 | 2013 | $ 40,000 | 20 | 2033 | 14 |
| Vehicles/Equipment | John Deere Loader | W-9 | 1999 | $ 45,000 | 20 | 2019 | 0 |
| Vehicles/Equipment | Sylvan Seabreeze Sealite | W-10 | 2013 | $ 3,000 | 20 | 2033 | 14 |
| Vehicles/Equipment | Ford Ltd. Crown Victoria | W-11 | 2011 | $ 30,000 | 20 | 2031 | 12 |
| Water Meters | Water Meters | Water Meters | 1989 | $ 990,000 | 15 | 2004 | -15 |

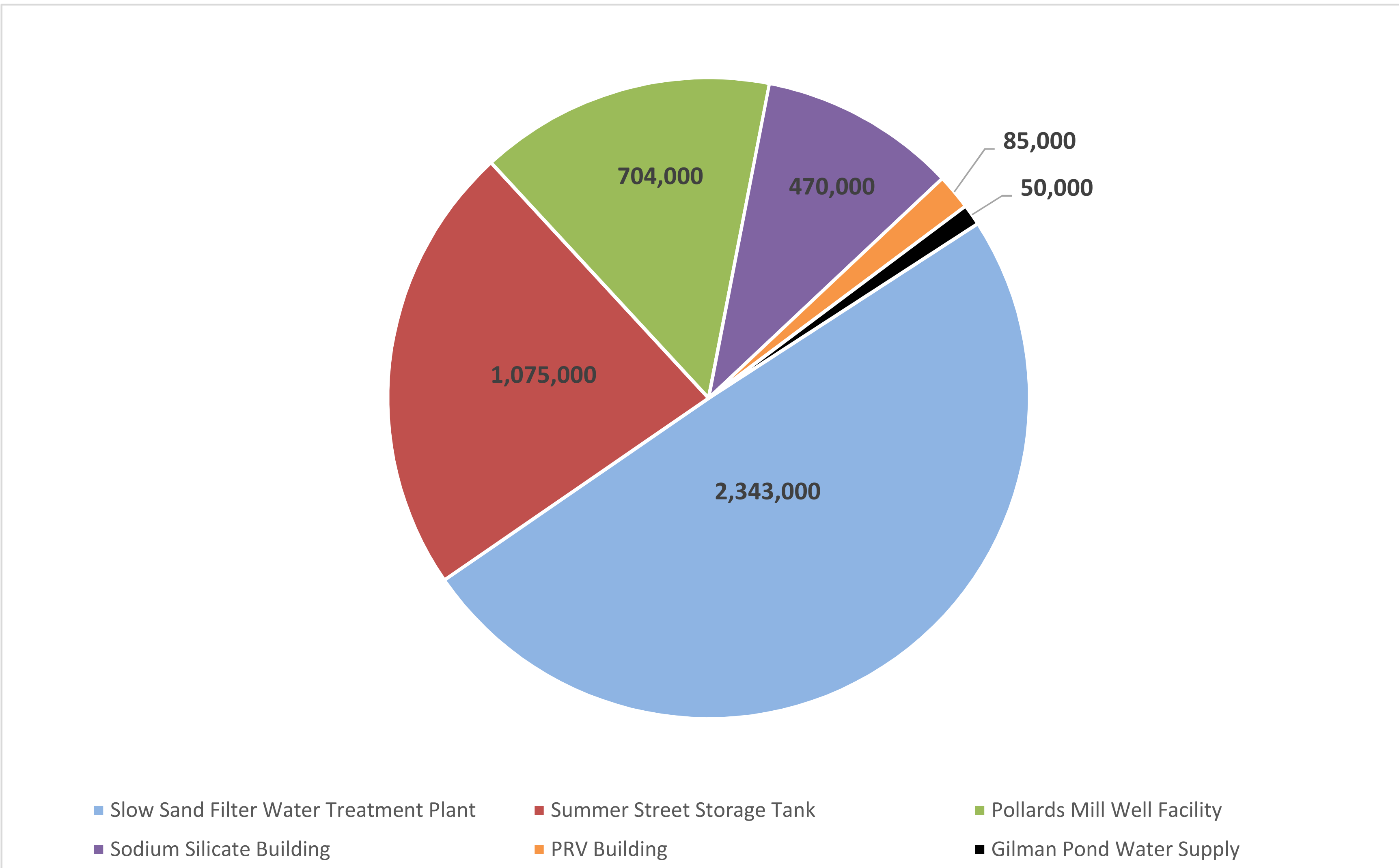
**ASSET DATA TABLE**

| Asset Description | Type | Subcomponent/Asset ID | Impact of Failure | Probability of Failure | Risk Score | Criticality | Condition |
|---|---|---|---|---|---|---|---|
| Pollards Mill Well Facility | Pump Building - Structural | Frost wall & footer | 3.0 | 2.0 | 6.0 | Frequent Monitoring | |
| Pollards Mill Well Facility | Pump Building - Structural | Floor slab | 2.0 | 2.0 | 4.0 | Limited Monitoring | |
| Pollards Mill Well Facility | Pump Building - Structural | Brick walls | 3.0 | 2.0 | 6.0 | Frequent Monitoring | |
| Pollards Mill Well Facility | Pump Building - Structural | Concrete slab roof | 3.0 | 2.0 | 6.0 | Frequent Monitoring | |
| Pollards Mill Well Facility | Pump Building - Structural | Membrane roof | 1.0 | 5.0 | 5.0 | Priority Renewal | |
| Pollards Mill Well Facility | Pump Building - Mechanical | Electric Heater | 1.0 | 5.0 | 5.0 | Priority Renewal | |
| Pollards Mill Well Facility | Pump Building - Mechanical | Louvers (1) | 1.0 | 5.0 | 5.0 | Priority Renewal | |
| Pollards Mill Well Facility | Pump Building - Plumbing | Water supply lines | 1.0 | 5.0 | 5.0 | Priority Renewal | |
| Pollards Mill Well Facility | Process Valves & Piping | Process Valves & Piping | 1.0 | 4.0 | 4.0 | Priority Renewal | |
| Pollards Mill Well Facility | Gravel Packed Well | Well #1 | 3.0 | 4.0 | 12.0 | Highest Risk | |
| Pollards Mill Well Facility | Well | Vertical Turbine Pumps1 | 2.0 | 5.0 | 10.0 | Priority Renewal | |
| Pollards Mill Well Facility | Standby Generator & ATS | Standby Generator | 2.0 | 5.0 | 10.0 | Priority Renewal | |
| Pollards Mill Well Facility | Standby Generator & ATS | Automatic Transfer Switch | 2.0 | 5.0 | 10.0 | Priority Renewal | |
| Pollards Mill Well Facility | Standby Generator & ATS | 1000 gal Propane Tank (buried) | 2.0 | 5.0 | 10.0 | Priority Renewal | |
| Pollards Mill Well Facility | Monitoring & Control | Pump Control Panel | 2.0 | 5.0 | 10.0 | Priority Renewal | |
| Pollards Mill Well Facility | Monitoring & Control | Security System | 2.0 | 5.0 | 10.0 | Priority Renewal | |
| Pollards Mill Well Facility | Site Electrical | Electrical Feed | 2.0 | 5.0 | 10.0 | Priority Renewal | |
| Summer Street Storage Tank | Water Storage Tank | Concrete water storage tank | 5.0 | 1.0 | 5.0 | Frequent Monitoring | |
| Summer Street Storage Tank | Valve Vault | Vault structure | 1.0 | 2.0 | 2.0 | Limited Monitoring | |
| Summer Street Storage Tank | Valve Vault | Process Piping | 4.0 | 1.0 | 4.0 | Frequent Monitoring | |
| Summer Street Storage Tank | Valve Vault | Process Valves | 5.0 | 2.0 | 10.0 | Frequent Monitoring | |
| Summer Street Storage Tank | Site Electrical | Site Electrical | 5.0 | 2.0 | 10.0 | Frequent Monitoring | |
| PRV Building | PRV Vault | PRV Vault | 5.0 | 5.0 | 25.0 | Highest Risk | |
| PRV Building | PRV Building | PRV Building | 3.0 | 5.0 | 15.0 | Highest Risk | |
| PRV Building | Process Valves & Piping | Process Valves & Piping | 4.0 | 5.0 | 20.0 | Highest Risk | |
| PRV Building | Controls | Controls | 5.0 | 5.0 | 25.0 | Highest Risk | |
| Vehicles/Equipment | Chevy Pickup | W-1 | 2.0 | 4.0 | 8.0 | Priority Renewal | |
| Vehicles/Equipment | Chevy 1-Ton Dump | W-2 | 3.0 | 3.0 | 9.0 | Highest Risk | |
| Vehicles/Equipment | Dodge Utility Trk | W-3 | 4.0 | 3.0 | 12.0 | Highest Risk | |
| Vehicles/Equipment | Case Backhoe | W-4 | 3.0 | 4.0 | 12.0 | Highest Risk | |
| Vehicles/Equipment | Sullivan Air Comp | W-5 | 3.0 | 5.0 | 15.0 | Highest Risk | |
| Vehicles/Equipment | SRECO Sewer Rodder | W-6 | 3.0 | 5.0 | 15.0 | Highest Risk | |
| Vehicles/Equipment | Ray-Tech Infrared | W-7 | 3.0 | 5.0 | 15.0 | Highest Risk | |
| Vehicles/Equipment | Obm Sewer Jetter | W-8 | 3.0 | 3.0 | 9.0 | Highest Risk | |
| Vehicles/Equipment | John Deere Loader | W-9 | 3.0 | 5.0 | 15.0 | Highest Risk | |
| Vehicles/Equipment | Sylvan Seabreeze Sealite | W-10 | 2.0 | 3.0 | 6.0 | Priority Renewal | |
| Vehicles/Equipment | Ford Ltd. Crown Victoria | W-11 | 2.0 | 3.0 | 6.0 | Priority Renewal | |
| Water Meters | Water Meters | Water Meters | 3.0 | 5.0 | 15.0 | Highest Risk | |

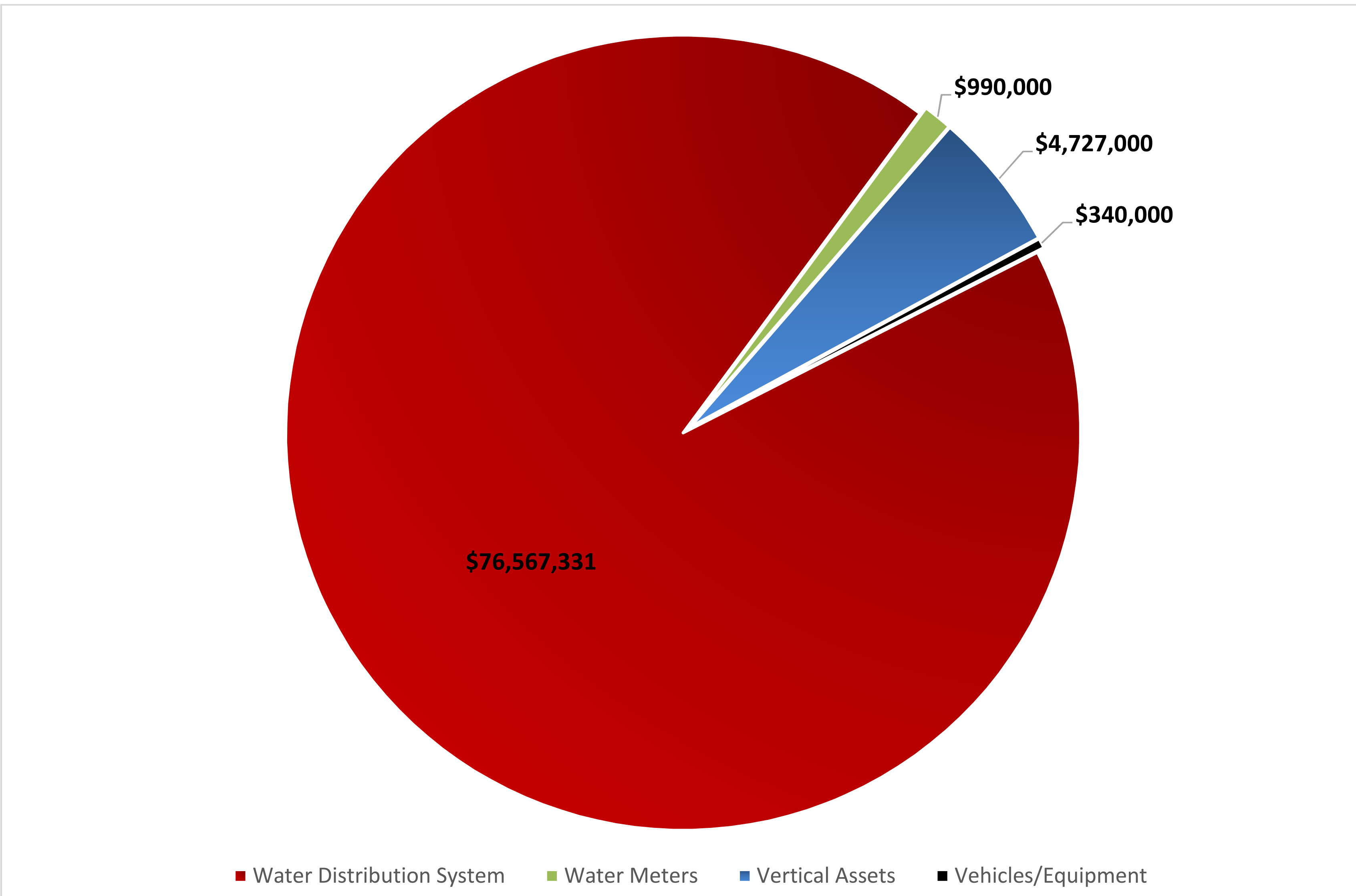
| ASSET DATA TABLE | | | COST OF CRITICAL ASSET REPLACEMENTS - FIRST TEN YEARS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 |
| **Asset Description** | **Type** | **Subcomponent/Asset ID** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2026** | **2027** | **2028** |
| Pollards Mill Well Facility | Pump Building - Structural | Frost wall & footer | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Pump Building - Structural | Floor slab | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Pump Building - Structural | Brick walls | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Pump Building - Structural | Concrete slab roof | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Pump Building - Structural | Membrane roof | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Pump Building - Mechanical | Electric Heater | $ 2,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Pump Building - Mechanical | Louvers (1) | $ 2,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Pump Building - Plumbing | Water supply lines | $ 5,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Process Valves & Piping | Process Valves & Piping | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 30,000 | $ - |
| Pollards Mill Well Facility | Gravel Packed Well | Well #1 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 100,000 | $ - |
| Pollards Mill Well Facility | Well | Vertical Turbine Pumps1 | $ 50,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Standby Generator & ATS | Standby Generator | $ 100,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Standby Generator & ATS | Automatic Transfer Switch | $ 30,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Standby Generator & ATS | 1000 gal Propane Tank (buried) | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Monitoring & Control | Pump Control Panel | $ 30,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Monitoring & Control | Security System | $ 5,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Pollards Mill Well Facility | Site Electrical | Electrical Feed | $ 200,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Summer Street Storage Tank | Water Storage Tank | Concrete water storage tank | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Summer Street Storage Tank | Valve Vault | Vault structure | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Summer Street Storage Tank | Valve Vault | Process Piping | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Summer Street Storage Tank | Valve Vault | Process Valves | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Summer Street Storage Tank | Site Electrical | Site Electrical | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| PRV Building | PRV Vault | PRV Vault | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| PRV Building | PRV Building | PRV Building | $ 15,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| PRV Building | Process Valves & Piping | Process Valves & Piping | $ 30,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| PRV Building | Controls | Controls | $ 15,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Vehicles/Equipment | Chevy Pickup | W-1 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Vehicles/Equipment | Chevy 1-Ton Dump | W-2 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Vehicles/Equipment | Dodge Utility Trk | W-3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Vehicles/Equipment | Case Backhoe | W-4 | $ - | $ - | $ 45,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Vehicles/Equipment | Sullivan Air Comp | W-5 | $ 20,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Vehicles/Equipment | SRECO Sewer Rodder | W-6 | $ 7,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Vehicles/Equipment | Ray-Tech Infrared | W-7 | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Vehicles/Equipment | Obm Sewer Jetter | W-8 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Vehicles/Equipment | John Deere Loader | W-9 | $ 45,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Vehicles/Equipment | Sylvan Seabreeze Sealite | W-10 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Vehicles/Equipment | Ford Ltd. Crown Victoria | W-11 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Meters | Water Meters | Water Meters | $ 990,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |

| | | | COST OF ASSET REPLACEMENTS - NEXT 100 YEARS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ASSET DATA TABLE** | | | **0 to 10** | **10 to 20** | **20 to 30** | **30 to 40** | **40 to 50** | **50 to 60** | **60 to 70** | **70 to 80** | **80 to 90** | **90 to 100** | **0 to 100** |
| **Asset Description** | **Type** | **Subcomponent/Asset ID** | **2019-2028** | **2029-2038** | **2039-2048** | **2049-2058** | **2059-2068** | **2069-2078** | **2079-2088** | **2089-2098** | **2099-2108** | **2109-2118** | **2019-2118** |
| Pollards Mill Well Facility | Pump Building - Structural | Frost wall & footer | $ - | $ - | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ 25,000 | **$ 50,000** |
| Pollards Mill Well Facility | Pump Building - Structural | Floor slab | $ - | $ - | $ 10,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ 10,000 | **$ 20,000** |
| Pollards Mill Well Facility | Pump Building - Structural | Brick walls | $ - | $ - | $ 30,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ 30,000 | **$ 60,000** |
| Pollards Mill Well Facility | Pump Building - Structural | Concrete slab roof | $ - | $ - | $ 35,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ 35,000 | **$ 70,000** |
| Pollards Mill Well Facility | Pump Building - Structural | Membrane roof | $ 25,000 | $ - | $ - | $ - | $ 25,000 | $ - | $ - | $ - | $ 25,000 | $ - | **$ 75,000** |
| Pollards Mill Well Facility | Pump Building - Mechanical | Electric Heater | $ 2,000 | $ - | $ - | $ 2,000 | $ - | $ - | $ 2,000 | $ - | $ - | $ 2,000 | **$ 8,000** |
| Pollards Mill Well Facility | Pump Building - Mechanical | Louvers (1) | $ 2,000 | $ - | $ - | $ 2,000 | $ - | $ - | $ 2,000 | $ - | $ - | $ 2,000 | **$ 8,000** |
| Pollards Mill Well Facility | Pump Building - Plumbing | Water supply lines | $ 5,000 | $ - | $ - | $ - | $ 5,000 | $ - | $ - | $ - | $ 5,000 | $ - | **$ 15,000** |
| Pollards Mill Well Facility | Process Valves & Piping | Process Valves & Piping | $ 30,000 | $ - | $ - | $ - | $ - | $ - | $ 30,000 | $ - | $ - | $ - | **$ 60,000** |
| Pollards Mill Well Facility | Gravel Packed Well | Well #1 | $ 100,000 | $ - | $ - | $ - | $ - | $ - | $ 100,000 | $ - | $ - | $ - | **$ 200,000** |
| Pollards Mill Well Facility | Well | Vertical Turbine Pumps1 | $ 50,000 | $ - | $ - | $ 50,000 | $ - | $ - | $ - | $ 50,000 | $ - | $ - | **$ 150,000** |
| Pollards Mill Well Facility | Standby Generator & ATS | Standby Generator | $ 100,000 | $ - | $ - | $ 100,000 | $ - | $ - | $ 100,000 | $ - | $ - | $ 100,000 | **$ 400,000** |
| Pollards Mill Well Facility | Standby Generator & ATS | Automatic Transfer Switch | $ 30,000 | $ - | $ - | $ 30,000 | $ - | $ - | $ 30,000 | $ - | $ - | $ 30,000 | **$ 120,000** |
| Pollards Mill Well Facility | Standby Generator & ATS | 1000 gal Propane Tank (buried) | $ 25,000 | $ - | $ - | $ 25,000 | $ - | $ - | $ 25,000 | $ - | $ - | $ 25,000 | **$ 100,000** |
| Pollards Mill Well Facility | Monitoring & Control | Pump Control Panel | $ 30,000 | $ - | $ 30,000 | $ - | $ 30,000 | $ - | $ 30,000 | $ - | $ 30,000 | $ - | **$ 150,000** |
| Pollards Mill Well Facility | Monitoring & Control | Security System | $ 5,000 | $ - | $ 5,000 | $ - | $ 5,000 | $ - | $ 5,000 | $ - | $ 5,000 | $ - | **$ 25,000** |
| Pollards Mill Well Facility | Site Electrical | Electrical Feed | $ 200,000 | $ - | $ - | $ - | $ - | $ 200,000 | $ - | $ - | $ - | $ - | **$ 400,000** |
| Summer Street Storage Tank | Water Storage Tank | Concrete water storage tank | $ - | $ - | $ - | $ - | $ - | $ 1,000,000 | $ - | $ - | $ - | $ - | **$ 1,000,000** |
| Summer Street Storage Tank | Valve Vault | Vault structure | $ - | $ - | $ - | $ - | $ 10,000 | $ - | $ - | $ - | $ - | $ - | **$ 10,000** |
| Summer Street Storage Tank | Valve Vault | Process Piping | $ - | $ - | $ - | $ - | $ - | $ 20,000 | $ - | $ - | $ - | $ - | **$ 20,000** |
| Summer Street Storage Tank | Valve Vault | Process Valves | $ - | $ - | $ 15,000 | $ - | $ - | $ - | $ 15,000 | $ - | $ - | $ - | **$ 30,000** |
| Summer Street Storage Tank | Site Electrical | Site Electrical | $ - | $ - | $ - | $ 30,000 | $ - | $ - | $ - | $ - | $ 30,000 | $ - | **$ 60,000** |
| PRV Building | PRV Vault | PRV Vault | $ 25,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ 25,000 | $ - | $ - | **$ 50,000** |
| PRV Building | PRV Building | PRV Building | $ 15,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ 15,000 | $ - | $ - | **$ 30,000** |
| PRV Building | Process Valves & Piping | Process Valves & Piping | $ 30,000 | $ - | $ - | $ - | $ - | $ - | $ 30,000 | $ - | $ - | $ - | **$ 60,000** |
| PRV Building | Controls | Controls | $ 15,000 | $ 15,000 | $ - | $ 15,000 | $ 15,000 | $ - | $ 15,000 | $ 15,000 | $ - | $ 15,000 | **$ 105,000** |
| Vehicles/Equipment | Chevy Pickup | W-1 | $ - | $ 40,000 | $ - | $ 40,000 | $ - | $ 40,000 | $ - | $ 40,000 | $ - | $ 40,000 | **$ 200,000** |
| Vehicles/Equipment | Chevy 1-Ton Dump | W-2 | $ - | $ 45,000 | $ - | $ 45,000 | $ - | $ 45,000 | $ - | $ 45,000 | $ - | $ 45,000 | **$ 225,000** |
| Vehicles/Equipment | Dodge Utility Trk | W-3 | $ - | $ 40,000 | $ - | $ 40,000 | $ - | $ 40,000 | $ - | $ 40,000 | $ - | $ 40,000 | **$ 200,000** |
| Vehicles/Equipment | Case Backhoe | W-4 | $ 45,000 | $ - | $ 45,000 | $ - | $ 45,000 | $ - | $ 45,000 | $ - | $ 45,000 | $ - | **$ 225,000** |
| Vehicles/Equipment | Sullivan Air Comp | W-5 | $ 20,000 | $ - | $ 20,000 | $ - | $ 20,000 | $ - | $ 20,000 | $ - | $ 20,000 | $ - | **$ 100,000** |
| Vehicles/Equipment | SRECO Sewer Rodder | W-6 | $ 7,000 | $ - | $ 7,000 | $ - | $ 7,000 | $ - | $ 7,000 | $ - | $ 7,000 | $ - | **$ 35,000** |
| Vehicles/Equipment | Ray-Tech Infrared | W-7 | $ 25,000 | $ - | $ 25,000 | $ - | $ 25,000 | $ - | $ 25,000 | $ - | $ 25,000 | $ - | **$ 125,000** |
| Vehicles/Equipment | Obm Sewer Jetter | W-8 | $ - | $ 40,000 | $ - | $ 40,000 | $ - | $ 40,000 | $ - | $ 40,000 | $ - | $ 40,000 | **$ 200,000** |
| Vehicles/Equipment | John Deere Loader | W-9 | $ 45,000 | $ - | $ 45,000 | $ - | $ 45,000 | $ - | $ 45,000 | $ - | $ 45,000 | $ - | **$ 225,000** |
| Vehicles/Equipment | Sylvan Seabreeze Sealite | W-10 | $ - | $ 3,000 | $ - | $ 3,000 | $ - | $ 3,000 | $ - | $ 3,000 | $ - | $ 3,000 | **$ 15,000** |
| Vehicles/Equipment | Ford Ltd. Crown Victoria | W-11 | $ - | $ 30,000 | $ - | $ 30,000 | $ - | $ 30,000 | $ - | $ 30,000 | $ - | $ 30,000 | **$ 150,000** |
| Water Meters | Water Meters | Water Meters | $ 990,000 | $ 990,000 | $ - | $ 990,000 | $ 990,000 | $ - | $ 990,000 | $ 990,000 | $ - | $ 990,000 | **$ 6,930,000** |

| Row Labels | Sum of Replacement Cost |
|---|---|
| Slow Sand Filter Water Treatment Plant | 2,343,000 |
| Summer Street Storage Tank | 1,075,000 |
| Pollards Mill Well Facility | 704,000 |
| Sodium Silicate Building | 470,000 |
| PRV Building | 85,000 |
| Gilman Pond Water Supply | 50,000 |
| **Grand Total** | **4,727,000** |



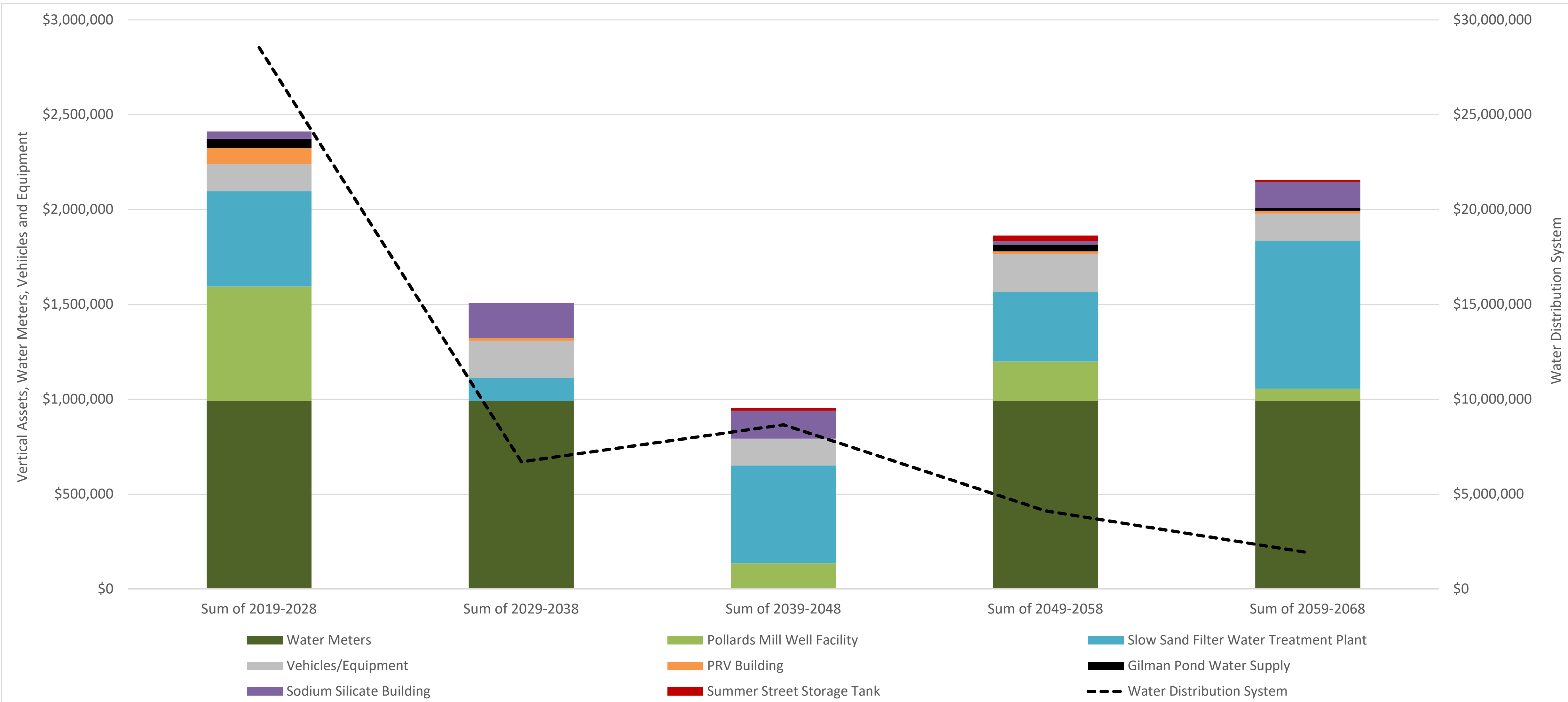
| Row Labels | Sum of Replacement Cost |
|---|---|
| Water Distribution System | $76,567,331 |
| Water Meters | $990,000 |
| Vertical Assets | $4,727,000 |
| Vehicles/Equipment | $340,000 |
| **Grand Total** | **$82,624,331** |



| Row Labels | Sum of 2019-2028 |
|---|---|
| Water Distribution System | $28,543,467 |
| Water Meters | $990,000 |
| Pollards Mill Well Facility | $604,000 |
| Slow Sand Filter Water Treatment Plant | $503,000 |
| Vehicles/Equipment | $142,000 |
| PRV Building | $85,000 |
| Gilman Pond Water Supply | $50,000 |
| Sodium Silicate Building | $38,000 |
| Summer Street Storage Tank | $0 |
| **Grand Total** | **$30,955,467** |

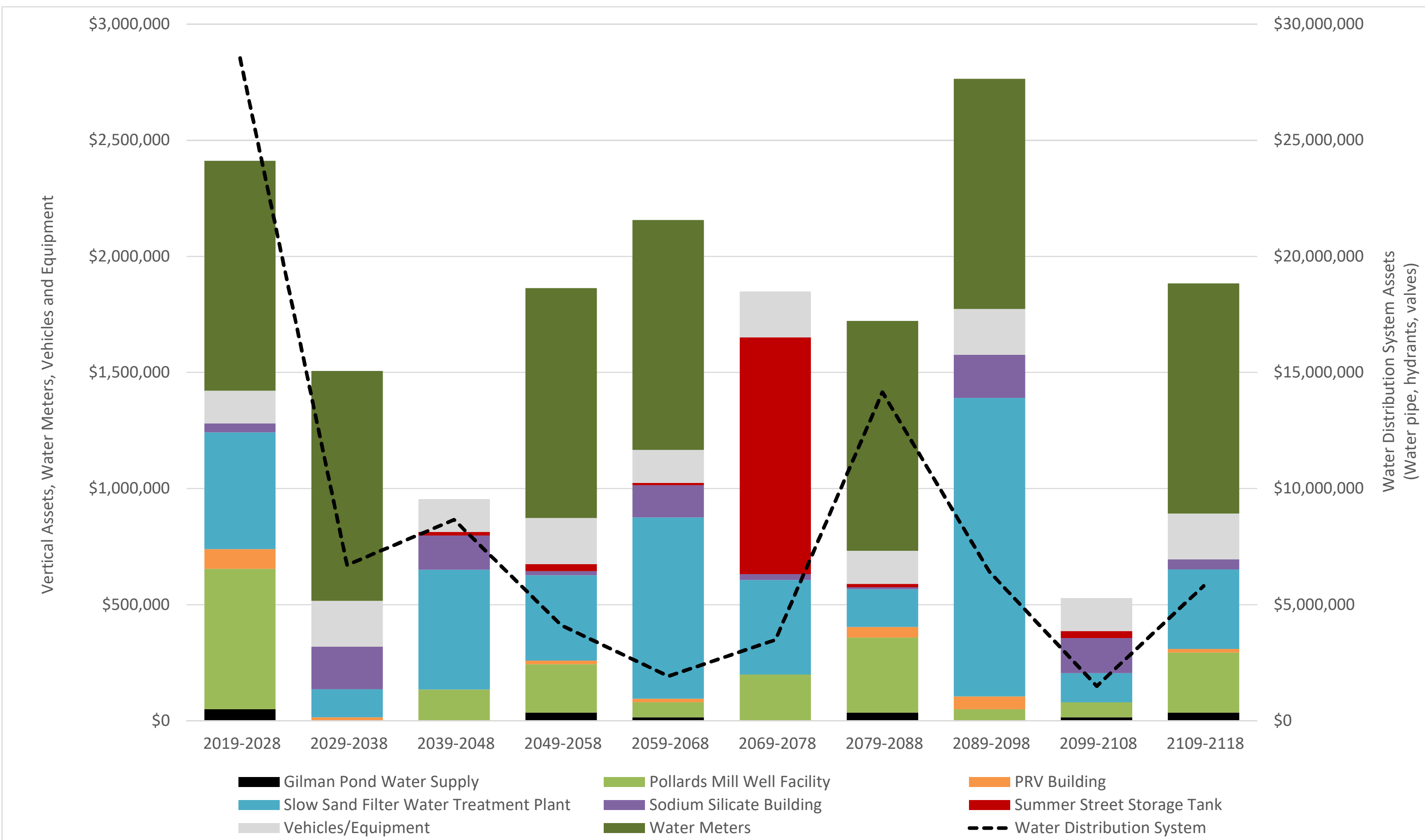
| Row Labels | Sum of 2019-2028 |
|---|---|
| **25.0** | **$7,194,274** |
| Gilman Pond Water Supply | $15,000 |
| PRV Building | $40,000 |
| Slow Sand Filter Water Treatment Plant | $130,000 |
| Water Distribution System | $7,009,274 |
| **20.0** | **$9,859,956** |
| Gilman Pond Water Supply | $35,000 |
| PRV Building | $30,000 |
| Slow Sand Filter Water Treatment Plant | $25,000 |
| Sodium Silicate Building | $8,000 |
| Water Distribution System | $9,761,956 |
| **16.0** | **$4,465,794** |
| Sodium Silicate Building | $30,000 |
| Water Distribution System | $4,435,794 |
| **15.0** | **$4,142,969** |
| PRV Building | $15,000 |
| Slow Sand Filter Water Treatment Plant | $50,000 |
| Water Distribution System | $2,990,969 |
| Vehicles/Equipment | $97,000 |
| Water Meters | $990,000 |
| **12.0** | **$2,140,188** |
| Pollards Mill Well Facility | $100,000 |
| Slow Sand Filter Water Treatment Plant | $87,000 |
| Water Distribution System | $1,908,188 |
| Vehicles/Equipment | $45,000 |
| **10.0** | **$2,026,748** |
| Pollards Mill Well Facility | $440,000 |
| Slow Sand Filter Water Treatment Plant | $85,000 |
| Water Distribution System | $1,501,748 |
| **5.0** | **$690,204** |
| Pollards Mill Well Facility | $34,000 |
| Slow Sand Filter Water Treatment Plant | $106,000 |
| Water Distribution System | $550,204 |
| **4.0** | **$435,334** |
| Pollards Mill Well Facility | $30,000 |
| Slow Sand Filter Water Treatment Plant | $20,000 |
| Water Distribution System | $385,334 |
| **Grand Total** | **$30,955,467** |

| | Column Labels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Values** | **Water Distrit** | **Water Meters** | **Pollards Mill Well Facility** | **Slow Sand Filter Water Treatment Plant** | **Vehicles/Equipment** | **PRV Building** | **Gilman Pond Water Supply** | **Sodium Silicate Building** | **Summer Street Storage Tank** | **Grand Total** |
| Sum of 2019-2028 | $28,543,467 | $990,000 | $604,000 | $503,000 | $142,000 | $85,000 | $50,000 | $38,000 | $0 | $30,955,467 |
| Sum of 2029-2038 | $6,709,384 | $990,000 | $0 | $121,000 | $198,000 | $15,000 | $0 | $183,000 | $0 | $8,216,384 |
| Sum of 2039-2048 | $8,659,985 | $0 | $135,000 | $516,000 | $142,000 | $0 | $0 | $147,000 | $15,000 | $9,614,985 |
| Sum of 2049-2058 | $4,114,480 | $990,000 | $209,000 | $368,000 | $198,000 | $15,000 | $35,000 | $18,000 | $30,000 | $5,977,480 |
| Sum of 2059-2068 | $1,920,111 | $990,000 | $65,000 | $781,000 | $142,000 | $15,000 | $15,000 | $138,000 | $10,000 | $4,076,111 |




| **Values** | |
|---|---|
| Sum of 2019-2028 | $30,955,467 |
| Sum of 2029-2038 | $8,216,384 |
| Sum of 2039-2048 | $9,614,985 |
| Sum of 2049-2058 | $5,977,480 |
| Sum of 2059-2068 | $4,076,111 |
| Sum of 2019-2068 | $58,840,427 |

| | Column Labels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Values | Gilman Pond Water Supply | Pollards Mill Well Facility | PRV Building | Slow Sand Filter Water Treatment Plant | Sodium Silicate Building | Summer Street Storage Tank | Water Distribution System | Vehicles/Equipment | Water Meters | |
| 2019-2028 | $50,000 | $604,000 | $85,000 | $503,000 | $38,000 | $0 | $28,543,467 | $142,000 | $990,000 | $30,955,467 |
| 2029-2038 | $0 | $0 | $15,000 | $121,000 | $183,000 | $0 | $6,709,384 | $198,000 | $990,000 | $8,216,384 |
| 2039-2048 | $0 | $135,000 | $0 | $516,000 | $147,000 | $15,000 | $8,659,985 | $142,000 | $0 | $9,614,985 |
| 2049-2058 | $35,000 | $209,000 | $15,000 | $368,000 | $18,000 | $30,000 | $4,114,480 | $198,000 | $990,000 | $5,977,480 |
| 2059-2068 | $15,000 | $65,000 | $15,000 | $781,000 | $138,000 | $10,000 | $1,920,111 | $142,000 | $990,000 | $4,076,111 |
| 2069-2078 | $0 | $200,000 | $0 | $406,000 | $25,000 | $1,020,000 | $3,487,483 | $198,000 | $0 | $5,336,483 |
| 2079-2088 | $35,000 | $324,000 | $45,000 | $163,000 | $8,000 | $15,000 | $14,155,271 | $142,000 | $990,000 | $15,877,271 |
| 2089-2098 | $0 | $50,000 | $55,000 | $1,286,000 | $185,000 | $0 | $6,428,843 | $198,000 | $990,000 | $9,192,843 |
| 2099-2108 | $15,000 | $65,000 | $0 | $126,000 | $150,000 | $30,000 | $1,495,526 | $142,000 | $0 | $2,023,526 |
| 2109-2118 | $35,000 | $259,000 | $15,000 | $343,000 | $43,000 | $0 | $5,816,429 | $198,000 | $990,000 | $7,699,429 |
| | $185,000 | $1,911,000 | $245,000 | $4,613,000 | $935,000 | $1,120,000 | $81,330,978 | $1,700,000 | $6,930,000 | $98,969,978 |




| Values | |
|---|---|
| 2019-2028 | $30,955,467 |
| 2029-2038 | $8,216,384 |
| 2039-2048 | $9,614,985 |
| 2049-2058 | $5,977,480 |
| 2059-2068 | $4,076,111 |
| 2069-2078 | $5,336,483 |
| 2079-2088 | $15,877,271 |
| 2089-2098 | $9,192,843 |
| 2099-2108 | $2,023,526 |
| 2109-2118 | $7,699,429 |
| 2019-2118 | $98,969,978 |

# APPENDIX D

## Instruction Sheets

## FIELD DATA COLLECTION

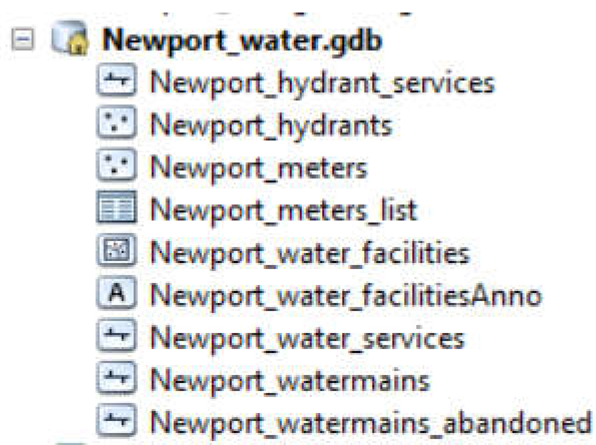
Field data will be completed using the AxisGIS system. The following files have been provided to the Town as part of their Asset Management Program.

## ArcMAP FILES

*File Geodatabases*:

The following "Newport_water" File Geodatabase contains the Town's water system inventory information has been provided as listed in Figure D-2 below.

**Figure D- 1. List of Feature Classes stored in Newport_Water_System File Geodatabase**



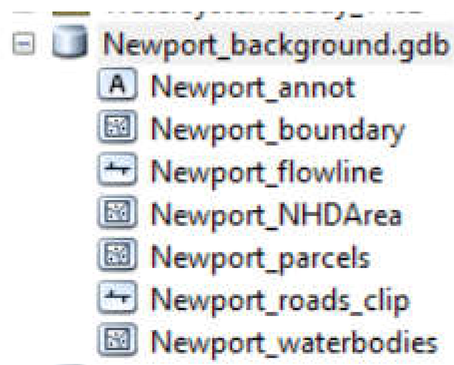

The main file is the "Newport_watermains" feature class. This file contains the bulk of the information on the Town's water system inventory, such as estimated age, material, remaining useful life, etc.

The information came from a variety of sources including a system-wide report completed in 2009, field data collected in 2009, field data collected in 2018-2019, and staff review comments.

This geodatabase has been provided to the Town in electronic format and may be uploaded to the Town's AxisGIS account.

Several "background" files have been provided as well, including such items as town boundaries, water bodies, roads and parcels. These are stored in the "Newport_Background" file geodatabase and are listed below.

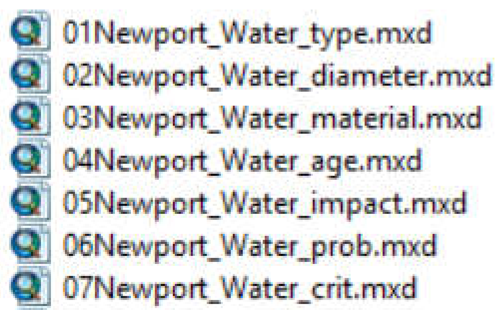
**Figure D- 2. List of Feature Classes stored in Newport_Background File Geodatabase**




*Map (mxd) files and Layer files:*

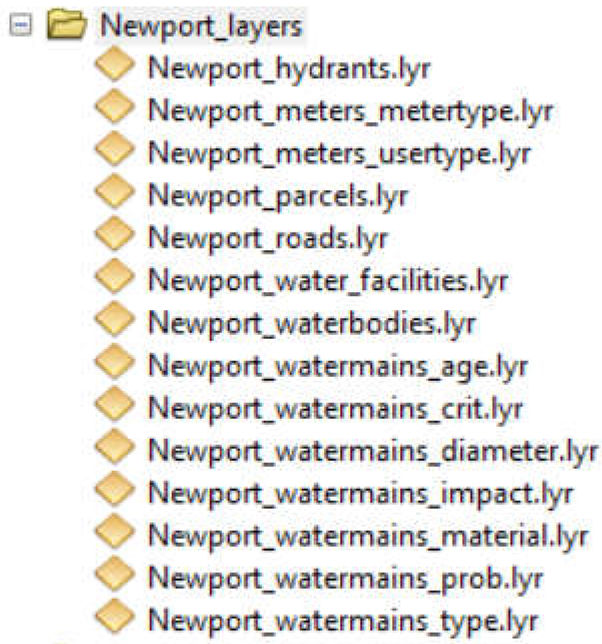
The data is displayed in .mxd files. The various maps (or .mxd files) display the data in various ways. Paper versions have been provided in Appendix E, and are listed below.

**Figure D- 3. List of Map Files**




Each of the maps has different symbology. For instance, Map E2 displays the water system by pipe diameter and Map E4 displays the water system by the year installed. Layer files enable the user to quickly change the parameters shown on the map. The layer files provided are listed in Figure D-4 below.

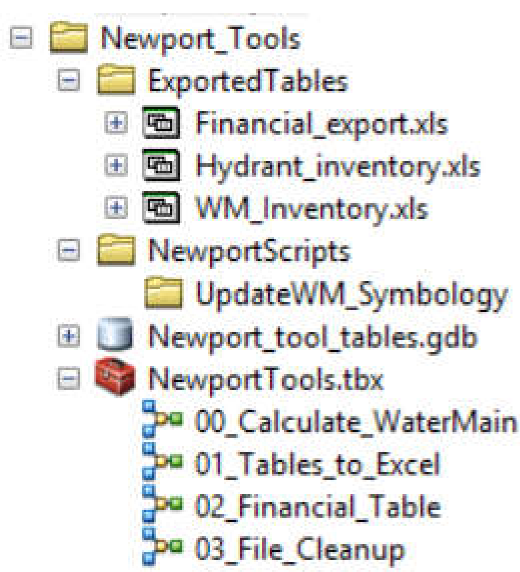
**Figure D- 4.  List of Layer Files**




*Tools and Scripts:*

Various tools have been provided to allow the Town to easily update and export data from the "Newport_watermains" feature class and other files as desired.  These are listed in Figure D-5.

**Figure D- 5.  List of Tools and Scripts**

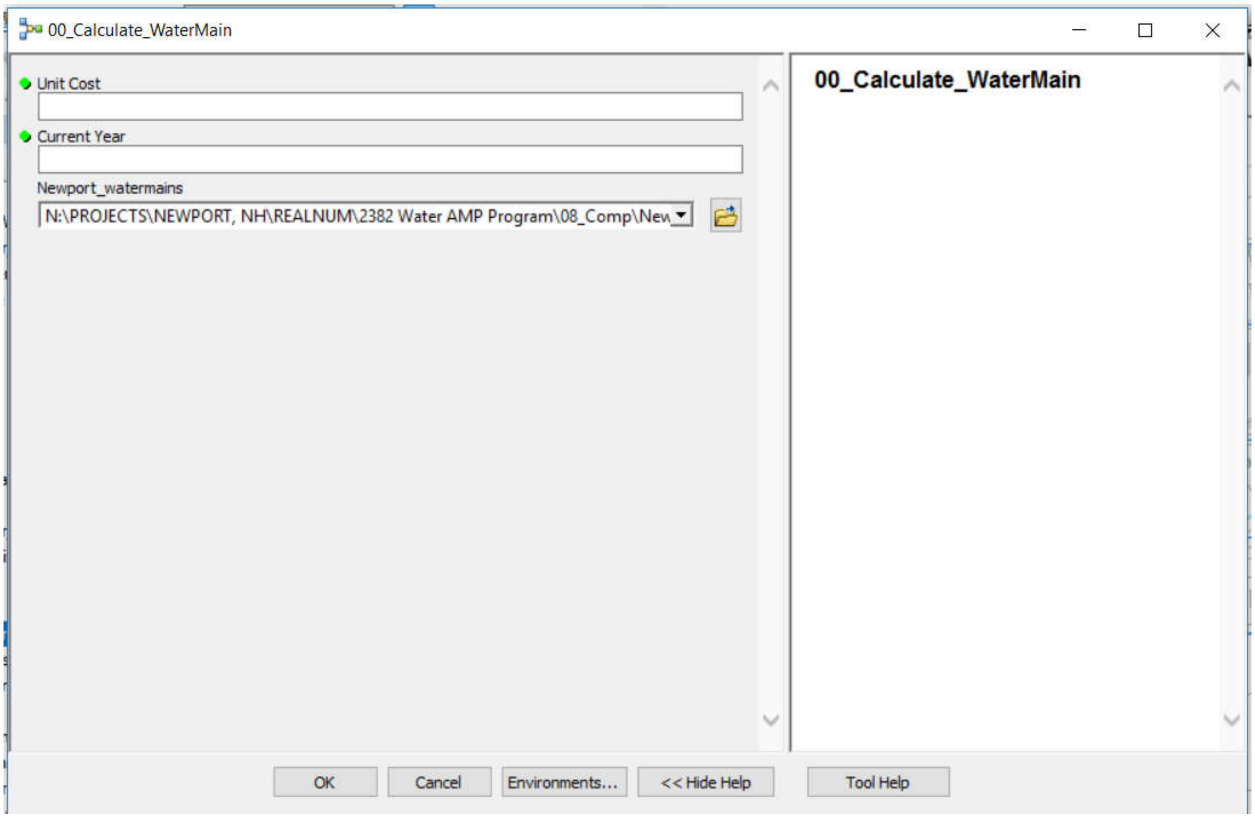


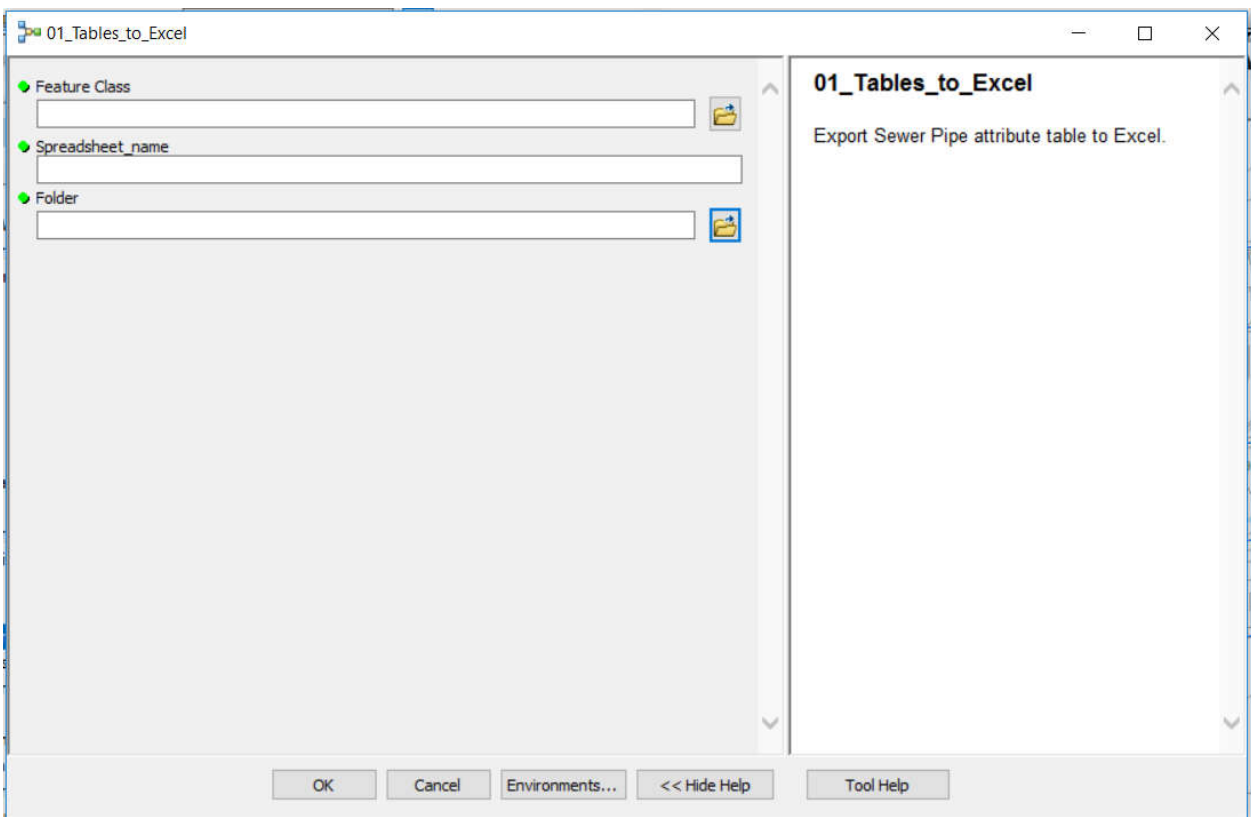

Field names, descriptions and types for the watermain feature class are provided in Table D-1 below.

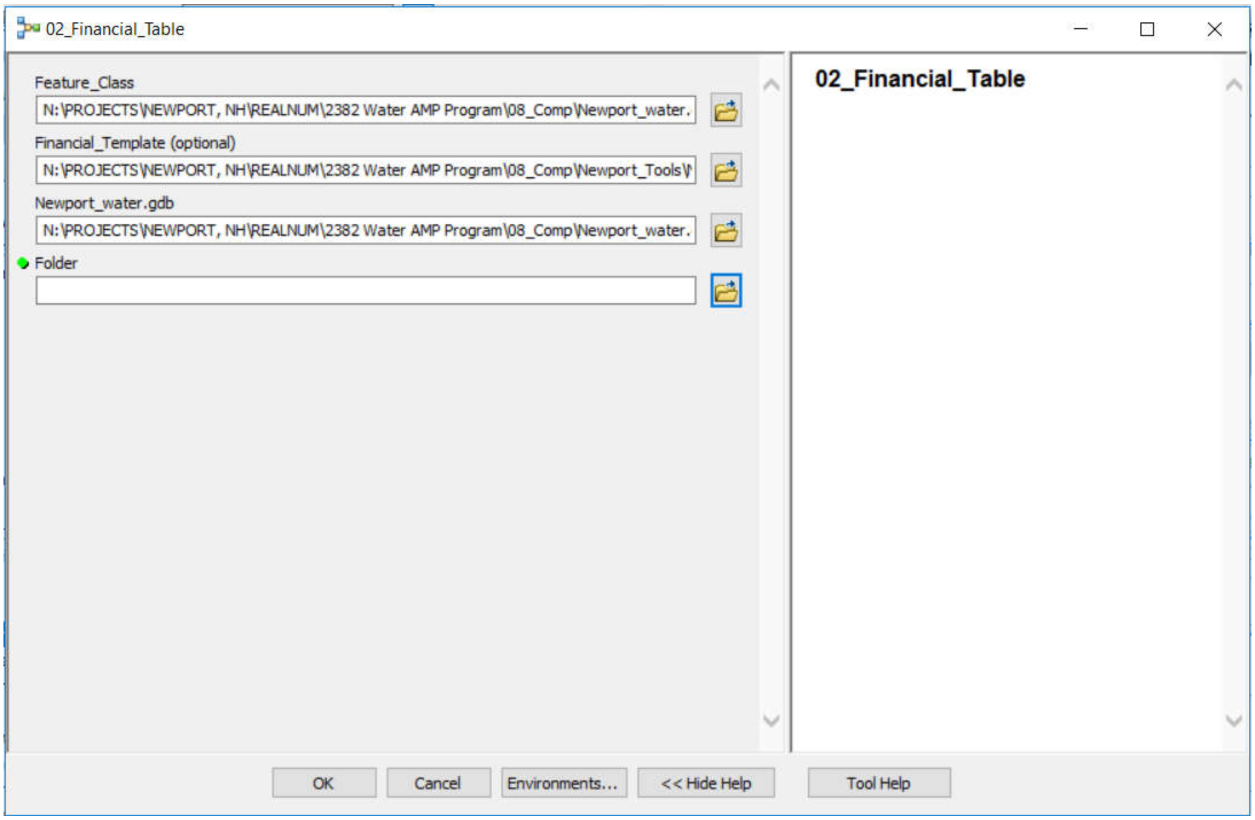
**Table D- 1. Water Pipe Feature Class Fields**

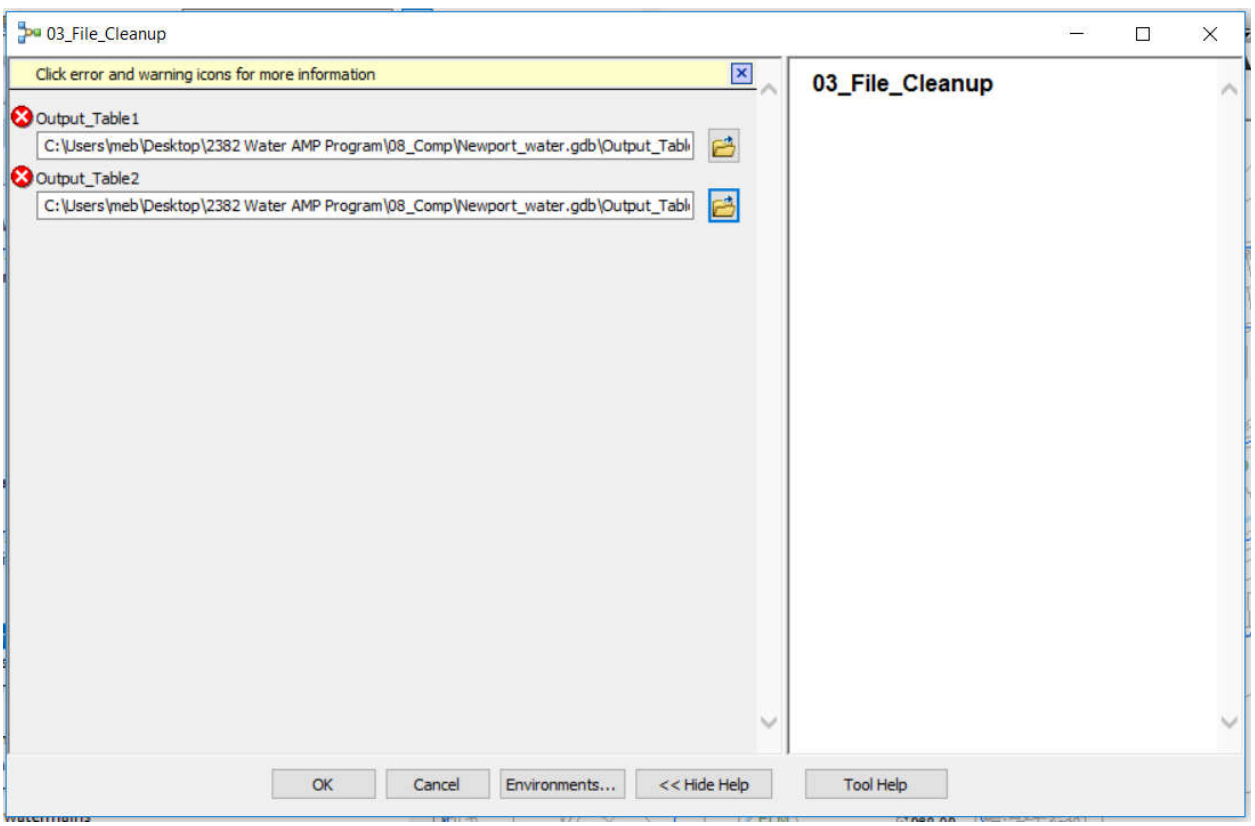
| Name | Alias | Type | Length |
|---|---|---|---|
| OBJECTID | OBJECTID | OID | 4 |
| Shape | Shape | Geometry | 0 |
| Pipe_ID | Pipe_ID | String | 10 |
| Remarks | Remarks | String | 254 |
| Street | Street | String | 254 |
| Loc_descr | Loc_descr | String | 254 |
| Year_txt | Year_txt | String | 254 |
| Diameter | Diameter | Double | 8 |
| Material | Material | String | 254 |
| Model_len | Model_len | Double | 8 |
| Source | Source | String | 254 |
| Comment1 | Comment1 | String | 254 |
| Comment2 | Comment2 | String | 254 |
| Shape_Length | Shape_Length | Double | 8 |
| Rec_Comm | Rec_Comm | String | 255 |
| Type | Type | String | 50 |
| Year_in | Year_in | SmallInteger | 2 |
| U_life | Estimated Useful Life | SmallInteger | 2 |
| EU_life | EU_life | SmallInteger | 2 |
| RU_life | RU_life | SmallInteger | 2 |
| Impact | Impact of Failure | Double | 8 |
| Prob | Probability of Failure | Double | 8 |
| Cond_Score | Condition Score | Double | 8 |
| Risk_Score | Risk Score | Double | 8 |
| Crit | Criticality | String | 50 |
| Repl_year | Replacement Year | SmallInteger | 2 |
| Repl_cost | Replacement Cost | Double | 8 |
| Cap_plans | Cap_plans | String | 250 |
| Redundancy | Redundancy | String | 250 |

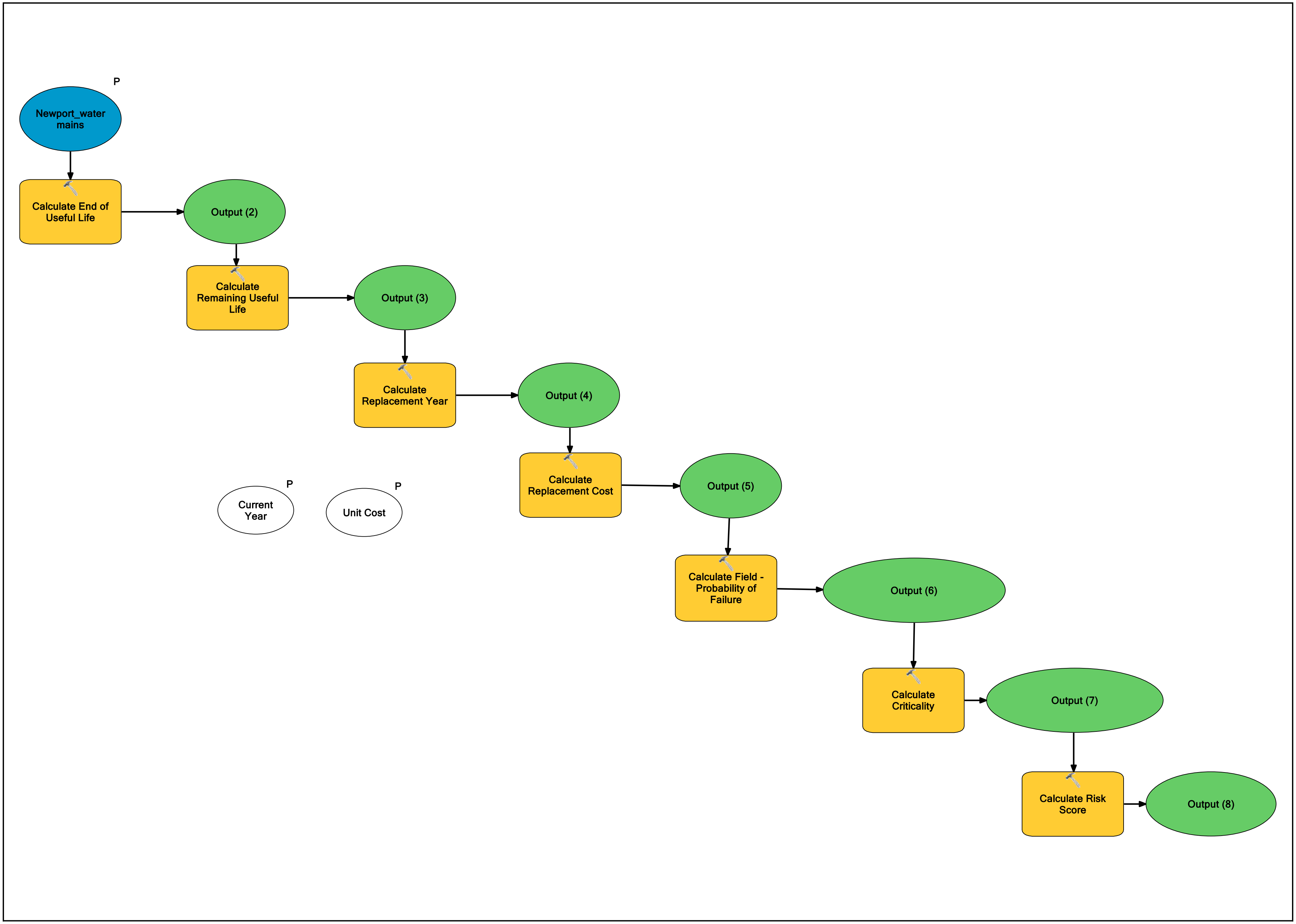
Tools have been provided which enable the user to quickly update certain fields or export data to Excel spreadsheets. Screenshots of tool interfaces and Tool Diagrams are provided below.


00_Calculate_WaterMain
Unit Cost
Current Year
Newport_watermains
N:\PROJECTS\NEWPORT, NH\REALNUM\2382 Water AMP Program\08_Comp\New
00_Calculate_WaterMain
OK
Cancel
Environments...
<< Hide Help
Tool Help

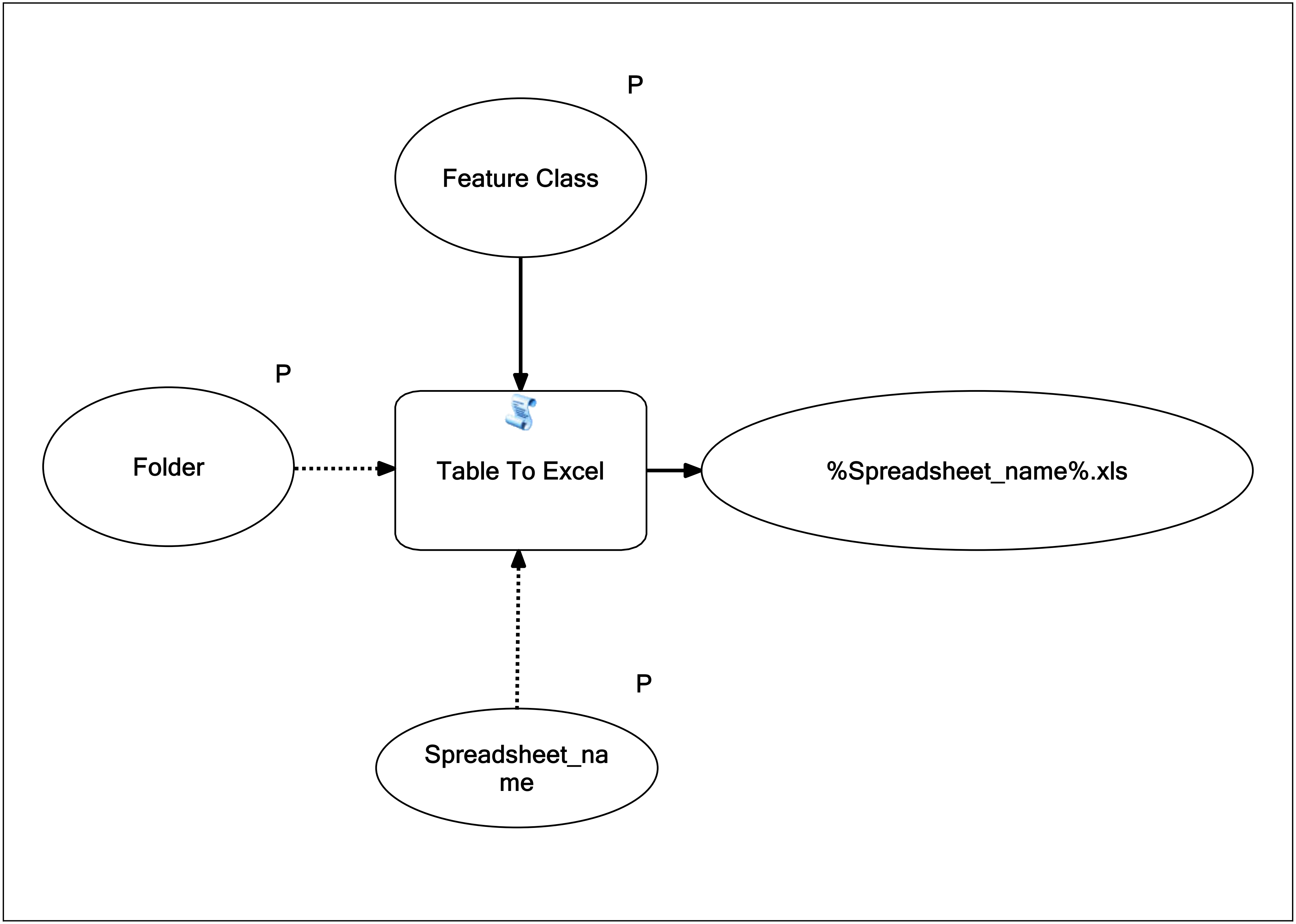

01_Tables_to_Excel
Feature Class
Spreadsheet_name
Folder
01_Tables_to_Excel
Export Sewer Pipe attribute table to Excel.
OK
Cancel
Environments...
<< Hide Help
Tool Help


02_Financial_Table
Feature_Class
N:\PROJECTS\NEWPORT, NH\REALNUM\2382 Water AMP Program\08_Comp\Newport_water.
Financial_Template (optional)
N:\PROJECTS\NEWPORT, NH\REALNUM\2382 Water AMP Program\08_Comp\Newport_Tools\
Newport_water.gdb
N:\PROJECTS\NEWPORT, NH\REALNUM\2382 Water AMP Program\08_Comp\Newport_water.
Folder
02_Financial_Table
OK
Cancel
Environments...
<< Hide Help
Tool Help

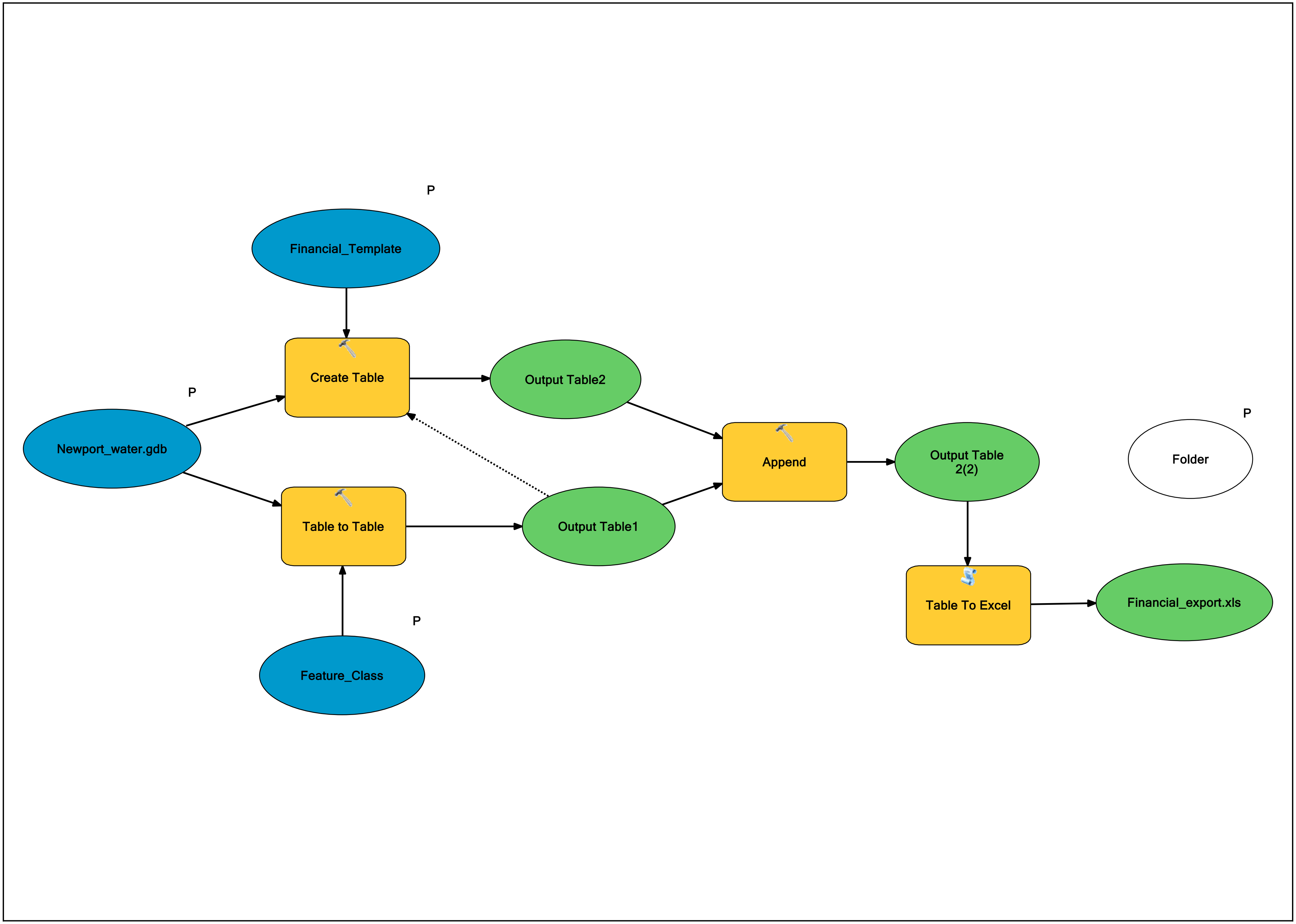

03_File_Cleanup
Click error and warning icons for more information
Output_Table1
C:\Users\meb\Desktop\2382 Water AMP Program\08_Comp\Newport_water.gdb\Output_Tabl
Output_Table2
C:\Users\meb\Desktop\2382 Water AMP Program\08_Comp\Newport_water.gdb\Output_Tabl
03_File_Cleanup
OK
Cancel
Environments...
<< Hide Help
Tool Help



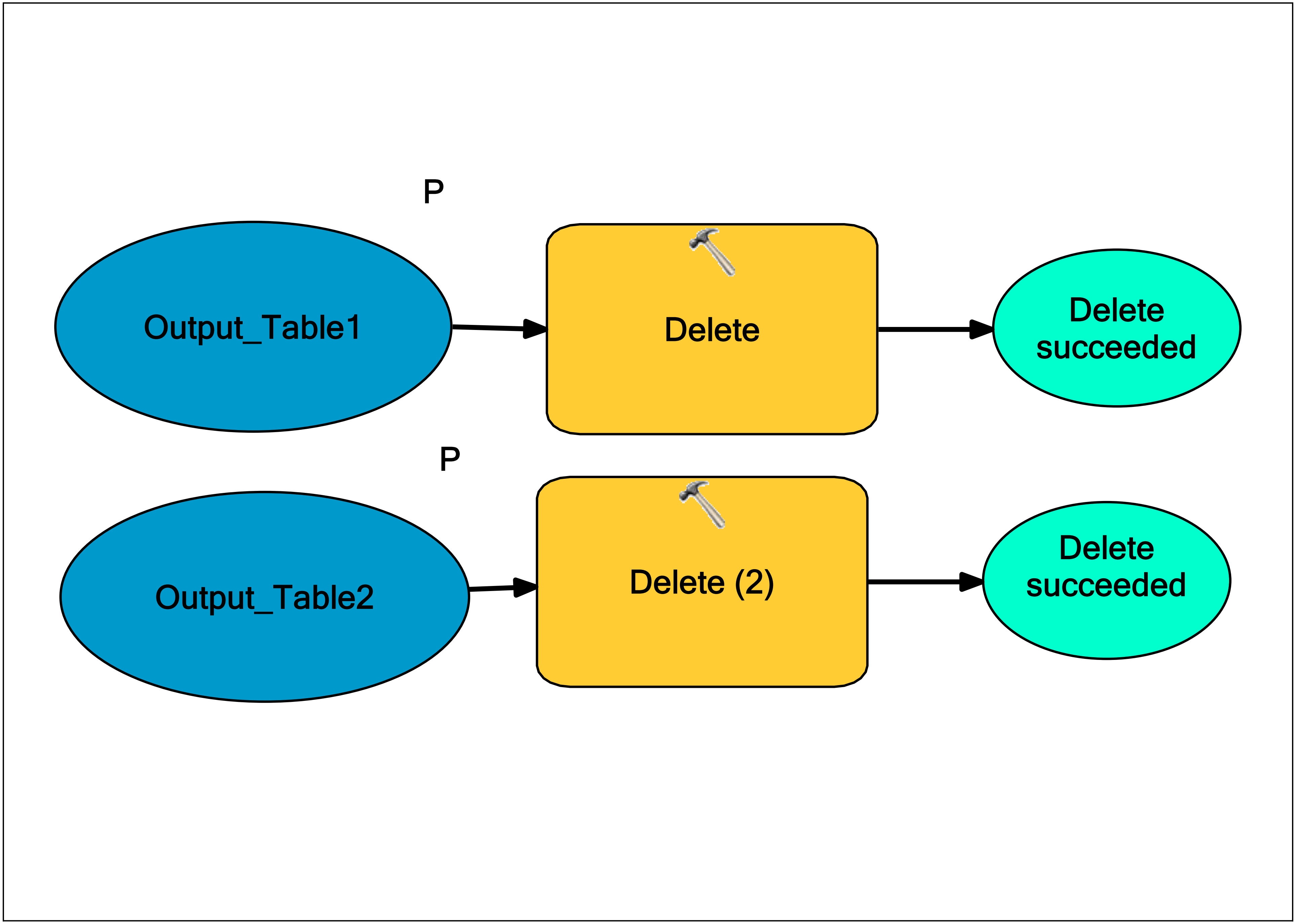

**00_Calculate_WaterMain**




**01_Tables_to_Excel**




**02_Financial_Table**




**03_File_Cleanup**

## FINANCIAL PLANNING AND INVENTORY SPREADSHEET

The Financial Planning and Inventory Spreadsheet has been provided to assist the Town with long-term planning. An explanation of the spreadsheet and how it works has been provided below.

**Asset Data Table**: This tab contains information on the vertical asset subcomponents (ie. pumps, wells, storage tanks, treatment facilities, building components, etc.) and each water main segment.

The first 13 columns are listed are similar to the feature class fields listed in Tables D-1 and D-2 above. They are listed below.

Asset Description
Type
Subcomponent/Asset ID
Year Installed
Replacement Cost
Useful Life
End Useful Life
Remaining Useful Life
Impact of Failure
Probability of Failure
Risk Score
Criticality
Condition

Replacement Schedule: These 20 columns are normally hidden. Formulas in these cells schedule out the year replacements are due, up to 20 replacements. This assumes that no assets with a useful life of less than 5 years will be included. If the Town wants to schedule out assets with useful lives less than five years, the spreadsheet can be modified to accommodate that.

Estimated Cost of Replacements Over Ten Years - formula computes the estimated cost of replacements each year for the next ten years. Note that the years in the headings are automatically recalculated when cell "A2" (Year 1) is revised.

Estimated Cost of Replacements Over One-hundred Years - formula computes the estimated cost of replacements each decade for the next one hundred years. Note that the ten-year time frames in the headings are automatically recalculated when cell "A2" (Year 1) is revised.

**Inventory Overview**: This tab totals up the estimated replacement cost for the entire system using a pivot table and pivot chart. In some cases, the assets have been grouped into broader categories (ie. vertical assets).

**Ten-Year Look Ahead**: This tab contains the following pivot tables, which detail replacement costs for the next ten years.

- A summary of estimated replacement costs over the next ten years by year.
- A summary of estimated replacement costs over the next ten years by risk score.

If the "Data Table" is modified, then this summary table can be updated simply by clicking the "Analyze" tab at the top of the spreadsheet and then clicking "Refresh". If records are added to or removed from the "Data Table", then choose "Change Data Source" to make sure all records are included.

**Fifty-Year Look Ahead**: This tab includes a pivot chart of replacement costs over the next five decades. It can be updated in the same manner as the “Ten-Year Detail” and all other pivot tables and charts in the spreadsheet.

**One Hundred-Year Look Ahead**: This tab includes a table and a bar chart which summarize replacement costs for the next hundred years by decade.

## ASSET DATA TABLE FORMULA SUMMARY

Columns G through M contain formulas to compute such parameters as “Remaining Useful Life” for vertical assets. These same parameters are computed for water mains using Tools in ArcGIS.

Columns N through BB contain formulas which schedule out replacement costs for both horizontal and vertical assets over a time span of 100 years to assist in financial planning.

Column G: End of Useful Life

Equal to Year Installed + Useful Life

Column H: Remaining Useful Life

Equal to End of Useful Life – Current Year (Cell A2)

Column I: Impact of Failure

Assigned by user.

Column J: Probability of Failure

If there is no Condition Score (Column M) then Probability of Failure is computed based on Remaining Useful Life as shown in Table D-3.

If there is a Condition Score, then Probability of Failure equals the Condition Score.

**Table D- 2. Probability of Failure (Condition) Score Based on Remaining Useful Life**

| Condition Score | General Description |
|---|---|
| 5.0 | Remaining Useful Life <= 0 |
| 4.0 | Remaining Useful Life > 0 and <= 10 |
| 3.0 | Remaining Useful Life > 10 and <= 20 |
| 2.0 | Remaining Useful Life > 20 and <= 50 |
| 1.0 | Remaining Useful Life > 50 |

Column K: Risk Score

Probability of Failure x Impact of Failure

Column L: Criticality

If Probability of Failure and Impact of Failure are both >= 2.5, then "Highest Risk".

If Probability of Failure >= 2.5 and Impact of Failure < 2.5, then "Priority Renewal"

If Probability of Failure < 2.5 and Impact of Failure >= 2.5, then "Frequent Monitoring"

If Probability of Failure and Impact of Failure < 2.5, then "Limited Monitoring"

Column M: Condition Score

The Condition Score of an asset is assigned by Town staff and overrides its Remaining Useful Life in determining its Probability of Failure. For instance, if an asset has twenty (20) years of remaining useful life, its Probability of Failure Score will be 3. However, if the asset is in poor condition, and is assigned a Condition Score of 5, the Condition Score will override the calculated Probability of Failure Score. It's Probability of Failure will be 5, not 3.

Column N: First replacement

If End of Useful Life is less than the Current Year, then first replacement is scheduled to occur in the current year. Otherwise, First Replacement = End of Useful Life.

Column O-AG: Subsequent replacements

If the prior replacement is "0", then "0". If the prior replacement + Current Useful Life falls outside the 100-year time frame, then "0".

If neither of these is true (ie. the next replacement falls between Year 1 and Year 100), then the replacement is scheduled for the prior replacement + Current Useful Life.

Column AH - AQ: Schedule out replacement cost for the next ten years -

Compare the year in the header row to the scheduled replacements for a given asset. If there's a match then populate the cell with the replacement cost.

Column AR - BA: Schedule out replacement cost for the next hundred years -

Compare the year in the upper header row (ie. beginning of ten-year period) and the lower header row (ie. the end of the ten-year period) to the scheduled replacements for a given asset. If there's a match then populate with the replacement cost.

Column BB: Sum Columns AR through BA to determine replacement costs for the next 100 years.

# APPENDIX E

## Water System Maps

APPENDIX E1
WATER SYSTEM OVERVIEW
NEWPORT, NH
UNDERWOOD engineers
MAY 24, 2019
Legend
Hydrants
Watermains by Type
Transmission Main
Water main
Raw water main
River crossing
Abandoned watermains
Hydrant services
Water services
Water Facilities by Status
In service
Abandoned
N
1 inch = 1,000 feet
0 500 1,000 2,000 3,000 4,000 Feet
Summer St Storage Tank 2
Summer St Storage Tank 1
Old Reservoir
Pollard's Mill Well Facility
PRV Building
Chlorination Building
Unity Road Storage Tank (Clearwell)
Water Treatment Facility
Newport
Unity

APPENDIX E2
WATER SYSTEM OVERVIEW
NEWPORT, NH
UNDERWOOD engineers
MAY 24, 2019
Legend
Hydrants
Watermains by Diameter
< 4
4
6
8
10
12
Unknown
Abandoned watermains
Hydrant services
Water services
Water Facilities by Status
In service
Abandoned
1 inch = 1,000 feet
Feet
0 500 1,000 2,000 3,000 4,000
N
Summer St Storage Tank 2
Summer St Storage Tank 1
Old Reservoir
Pollard's Mill Well Facility
PRV Building
Chlorination Building
Unity Road Storage Tank (Clearwell)
Water Treatment Facility
Newport
Unity


APPENDIX E3
WATER SYSTEM OVERVIEW
NEWPORT, NH
UNDERWOOD engineers
MAY 4, 2019
Legend
Hydrants
Watermains by Material
Asbestos Cement
Asbestos Cement (unverified)
Cast Iron
Cement Lined Cast Iron
Cement Lined Cast Iron (unverified)
Ductile Iron
Copper
Cement Lined Galvanized
Galvanized
Cement Lined Steel (unverified)
PVC
PVC (unverified)
Unknown
Abandoned watermains
Hydrant services
Water services
Water Facilities by Status
In service
Abandoned
N
1 inch = 1,000 feet
0 500 1,000 2,000 3,000 4,000 Feet
Summer St Storage Tank 2
Summer St Storage Tank 1
Old Reservoir
Pollard's Mill Well Facility
PRV Building
Chlorination Building
Unity Road Storage Tank (Clearwell)
Water Treatment Facility
Newport
Unity


APPENDIX E4
WATER SYSTEM OVERVIEW
NEWPORT, NH
UNDERWOOD engineers
MAY 4, 2019
Legend
Hydrants
Watermains by Year Installed
1890-1899
1900-1909
1920-1929
1930-1939
1940-1949
1950-1959
1960-1969
1970-1979
1980-1989
1990-1999
2000-2009
2010-2019
Unknown
Abandoned watermains
Hydrant services
Water services
Water Facilities by Status
In service
Abandoned
N
1 inch = 1,000 feet
0 500 1,000 2,000 3,000 4,000
Feet
Summer St Storage Tank 2
Summer St Storage Tank 1
Old Reservoir
Pollard's Mill Well Facility
PRV Building
Chlorination Building
Unity Road Storage Tank (Clearwell)
Water Treatment Facility
Newport
Unity


APPENDIX E5
WATER SYSTEM OVERVIEW
NEWPORT, NH
UNDERWOOD engineers
MAY 4, 2019
Summer St Storage Tank 2
Summer St Storage Tank 1
Old Reservoir
Pollard's Mill Well Facility
PRV Building
Chlorination Building
Unity Road Storage Tank (Clearwell)
Water Treatment Facility
Newport
Unity
Legend
Hydrants
Watermains by Impact of Failure
5 - Very high (system-wide)
4 - High (large sections)
3 - Moderate (large users)
2 - Low (comercial, dense residential)
1 - Very low (low density residential)
Abandoned watermains
Hydrant services
Water services
Water Facilities by Status
In service
Abandoned
N
1 inch = 1,000 feet
0 500 1,000 2,000 3,000 4,000
Feet

# APPENDIX E6

**WATER SYSTEM OVERVIEW
NEWPORT, NH**

UNDERWOOD engineers

MAY 4, 2019


APPENDIX E7
WATER SYSTEM OVERVIEW
NEWPORT, NH
UNDERWOOD engineers
MAY 4, 2019
Summer St Storage Tank 2
Summer St Storage Tank 1
Old Reservoir
Pollard's Mill Well Facility
PRV Building
Chlorination Building
Unity Road Storage Tank (Clearwell)
Water Treatment Facility
Newport
Unity
Legend
Hydrants
Criticality
Highest Risk
Priority Renewal
Frequent Monitoring
Limited Monitoring
Abandoned watermains
Hydrant services
Water services
Water Facilities by Status
In service
Abandoned
N
1 inch = 1,000 feet
Feet
0 500 1,000 2,000 3,000 4,000