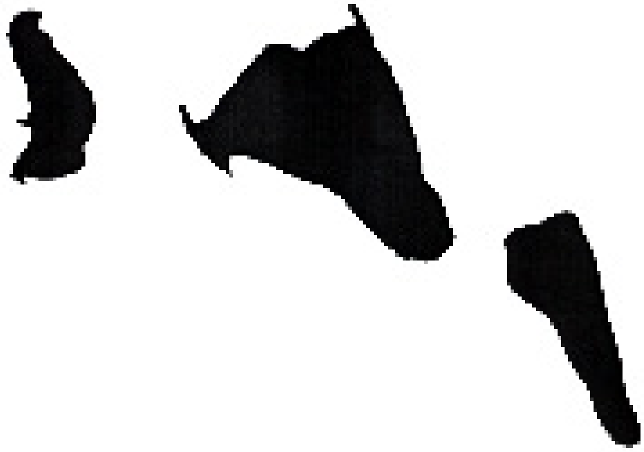

Three Lakes Water Association

COMPREHENSIVE WATER SYSTEM PLAN

SEPTEMBER 2023

DAVID EVANS
AND ASSOCIATES INC.

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COMPREHENSIVE

WATER SYSTEM PLAN

THREE LAKES WATER ASSOCIATION

SNOHOMISH COUNTY, WASHINGTON

SEPTEMBER 2023

David Evans and Associates, Inc.

This report was prepared under the supervision of a Registered Professional Engineer.

Prepared by: William Gibbs

Approved by: Rodney Langer

Date: SEPT 12, 2023

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CHAPTER 1

DESCRIPTION OF WATER SYSTEM

1.1 OWNERSHIP AND MANAGEMENT

The Three Lakes Water Association (Association) owns and operates a Group A Water System located in Snohomish County Washington. The Association is privately owned and operated and is dedicated to providing safe and reliable drinking water to the members within the Association's service area. The system is registered as a non-profit corporation and is owned by the members of the community. The system is regulated by the Washington State Department of Health (DOH) and is formally identified as:

Three Lakes Water Association
Snohomish County
System ID No. 881506

A copy of the current Water Facilities Inventory (WFI) Report is included in Appendix B.

The administration of the system is led by the Manager, who reports directly to the Association's Board of Trustees. There are eight positions on the Board with each Trustee elected from Association members. The Board has additional responsibilities such as setting rates, hiring the system operator and directing improvements and operation of the system.

Three Lakes is considered a "municipal" water supplier, under the 2003 State Municipal Water Law, even though they are a private corporation providing water to its members. This distinction, for all similar private purveyors, was the subject of litigation and court decision in 2010.

1.2 AUTHORIZATION

Recognizing the need for establishing a uniform process to identify present and future Association needs and setting forth a means for meeting those needs in an efficient manner, the Association Board Members have authorized David Evans and Associates, Inc. (DEA) to proceed with the studies required to prepare this updated *Comprehensive Water System Plan*.

This plan brings together information regarding the existing water system and data from future projections into an organized document. This document will be used for the planning and prioritization of improvements within the Association's service area.

In 2018, the Association Board authorized CHS Engineers (merged with DEA in 2020) to complete a limited extension update (LUE) of the 2013 *Comprehensive Water System Plan* (WSP). The LUE documented the Association's activities and impacts on the WSP in order to extend the term of the plan to meet DOH requirements for extension of the approval term for the WSP from six years to ten years (i.e., an additional four years). This plan updates the 2013 plan, as well as integrates and updates material from the 2019 LUE to prepare a fully updated WSP.

1.3 SYSTEM BACKGROUND AND CHARACTERISTICS

1.3.1 Historical Water Systems Development

The Three Lakes Water Association is located in Snohomish County approximately five miles northeast of the City of Snohomish as indicated on Figure 1.1. The Association was formed in 1964 and initially served 125 customers. The original system consisted of a single tap to the City of Everett water supply, a pump station, a 53,000 gallon steel standpipe (water reservoir, with tall, narrow dimensions), and approximately 63,600 LF of 6" asbestos cement (AC) and cast iron water main.

In 1988 a new 121,800-gallon steel standpipe was constructed adjacent to the original standpipe. The Association's first water system plan was completed in 1996. At that time, the Association had grown to 590 total connections and the system encompassed approximately 101,900 LF of water line with 116 fire hydrants.

In 1996 the Association was still operating with a single booster station and a single tap on the City of Everett's Transmission Main No. 3. The total storage volume was 194,000 gallons.

The 1996 *Comprehensive Water System Plan* recommended various improvement projects including an additional connection to Everett's supply system, a new booster station, new water main segments to complete loops within the system, and the replacement of smaller mains with 8" ductile iron (DI) pipe. In addition, the plan recommended the acquisition of land for a new standpipe.

Many of these projects were completed including the booster station and two water main projects which completed loops within the system. In addition, the Association acquired land for a new standpipe in 2003.

The Association completed an update to the water system plan in 2005. At that time, the Association had 697 customers. The 2005 Comprehensive Plan recommended upgrading Booster Pump Station #1, upgrading the existing reservoir and constructing an additional reservoir, replacing approximately

33,500 lineal feet of water main, constructing two pressure reducing stations, constructing an office building for daily operations and monthly meetings, applying for an SRF drinking water loan for the additional reservoir, preparing a cross-connection control plan, developing an emergency response plan, operation and management plan and updating the comprehensive plan.

Many of the capital improvement plans were completed, including all storage upgrades, replacing 3,000 lineal feet of water main, preparing a cross-connection control plan and the emergency response plan, and submitting a loan application for the additional reservoir.

In 2010, the Association completed construction of a 228,000 gallon standpipe, to replace the two existing standpipes. Also in 2010, the Association adjusted its service area boundary, in a cooperative effort with the Snohomish County PUD.

In 2011, the Association executed a service area change agreement with the PUD and Roosevelt Water Association. This agreement addressed inclusion of a gap between the three purveyors in Roosevelt's service area. However, the agreement provides for Three Lakes to serve that area if development in Three Lakes extends into that area.

The Association completed an update to the water system plan in 2013. At that time, the Association had 762 customers, the 2013 plan recommended replacing approximately 86,630 lineal feet of water main, construction of approximately 16,100 lineal feet of new water main, replacement of water meters, creation of a Water Shortage Response Plan, creation of an Operation and Management Manual, creation of a Revised Coliform Monitoring Plan, updating the Cross Connection Control Program, reviewing and updating the Emergency Response Plan, and securing a new franchise agreement with Snohomish County.

Since the 2013 WSP, the Association has completed the following projects:

- Replaced approximately 7,273 feet of 6" asbestos cement (AC) water main with ductile iron (DI) pipe
- Extended the distribution system to serve three developments including nearly 60 residential lots
- Installed radio-read heads for all customer service meters
- Replaced over 80% of customer service meter measuring chambers
- Constructed the Association's first office/shop building
- Completed a *Water Shortage Response Plan*
- Completed an *Operation and Management Manual*
- Completed a *Continuity of Operations Plan*
- Revised the *Coliform Monitoring Plan*
- Updated the *Water Quality Monitoring Program*
- Updated the *Cross Connection Control Program*
- Reviewed and updated the *Emergency Response Plan*
- Completed an *Asset Management Inventory*

- Secured a new Franchise Agreement with Snohomish County
- Secured a long-term lease for hosting wireless communication facilities on the Association Standpipe and adjacent property
- Completed a comprehensive *Rate Study* and subsequent annual reviews.

Two staff members obtained Cross Connection Control Specialist (CCS) certification. One advanced from no certification to become a Water Distribution Manager 2 and is currently the Assistant Manager. The most recently hired staff member has been encouraged to obtain CCS certification within one year of hire.

The 2019 LUE restated the same recommendations as the 2013 WSP with the addition of recommending an update to the WSP.

The Association's existing retail water service area is illustrated in Figure 1.2. Copies of the two most recent service area change agreements are included in Appendix C. The Association also has a letter from the PUD confirming denial of service to an adjacent property, also included in Appendix C. The owner of the subject property (parcel 280706-001-009-00) has approached the Association for service. The required easements have been secured and the Association began to provide water service to the subject parcel in September 2022. This area is shown as a parcel "served by agreement" but the "agreement" only consists of the PUD's letter and the acceptance of an application for service by the Association.

1.3.2 Topography

The Association's current service area encompasses approximately 5,100 acres of land. The area is mainly rural in nature with a few clustered housing developments interspersed between larger undeveloped parcels. There are also many smaller lots along the shoreline of each of the three lakes as shown on Figure 1.2. The local topography is comprised of predominantly gentle slopes with elevations ranging from 300 feet to 720 feet. The majority of the Association lies between 500 feet and 600 feet. The standpipe is located on 58th Street S.E. (Wishon Road), as shown in Figure 1.2, with a base elevation of 673.50 feet.

1.3.3 Climate

The climate of the Three Lakes area is typical of the Puget Sound region. The Pacific Ocean air masses are relatively mild, producing moderate summer and winter temperatures. Local precipitation is generally heavy in the winter, moderate in the fall and spring, and light in the summer. The average annual rainfall is approximately 47.8 inches with winter averages of about 6.49 inches per month and summer averages of about 1.97 inches per month. The average annual air temperature is about 51° Fahrenheit (F) with average high and low winter temperatures of 48° F and 34° F, respectively, and average high and low summer temperatures of 75° F and 51° F, respectively.

Climatic data used in this report was obtained from the Western Regional Climate Center division of the Atmospheric Sciences Center of the Desert Research Institute. The Institute maintains weather records from Station #455525, which is located in the City of Monroe, approximately seven miles southeast of the Association.

1.3.4 Surface Waters

The Three Lakes Water Association is entirely within Snohomish County just outside the City of Snohomish. Within the service area of the Association, there are three lakes. These lakes, from west to east, are Panther Lake, Flowing Lake, and Storm Lake. These are freshwater lakes with public access.

1.3.5 Neighboring Purveyors

The neighboring purveyors are generally described below and are indicated on Figure 1.3. The Three Lakes Water Association is generally bordered on the north, west, and east by Snohomish County PUD water systems, and on the south by the Roosevelt Water Association. There are also numerous smaller private water associations in the area. Recent service area coordination efforts have eliminated all gaps and overlaps around the service area perimeter. There is a system abutting the north service area boundary mapped as Northwest Improvement Company in the North Snohomish County Coordinated Water System Plan. A search of the DOH Sentry database reveals no water system with that name. However, "Northwest" is listed as a wholesale customer in the City of Everett Comprehensive Water Plan referenced below. As discussed above, one parcel in the PUD service area is served by the Association.

In addition to the smaller systems located outside the Association, there is also a small private system surrounded by the Association. As shown in Figure 1.3, the Panther Lake Community Water System is located just north of Panther Lake. This is a private water system, which operates from wells located within its boundary.

There is one known Group B water system in the Association's service area.

1.3.6 Ordinances

The Three Lakes Water Association has no formal ordinances for the operation of the Association and the water system. The regulations pertaining to the administration and operation of the system are contained within the Association articles of incorporation, bylaws and policies adopted by the Trustees. In addition, all decisions made by the Board members during regular meetings are recorded in the meeting minutes. A copy of the articles of incorporation and the bylaws is included in Appendix C.

1.4 INVENTORY OF EXISTING FACILITIES

The Association's existing water system includes the following facilities and connections and is further illustrated in Figure 3.1.

1.4.1 Sources

The Three Lakes Water Association purchases all of its water from the City of Everett. The Association's original tap on the City of Everett Transmission Main #3 is located at the north end of the system on 171st Avenue S.E., north of Dubuque Road. A second tap on the City of Everett Transmission Main #5 is located at the southern end of the system, also located on 171st Avenue S.E.

1.4.2 Storage

Storage is provided by one standpipe on 58th St. S.E. just east of 171st Avenue S.E. The welded steel standpipe has a capacity of 228,200 gallons and was completed in December 2010.

1.4.3 Distribution System

An inventory of the water mains and distribution piping within the water system is presented in Table 1.1.

TABLE 1.1
Inventory of Water System

Water Main Size and Material	*Linear Feet*
2" Plastic (PVC)	5,528
2" HDPE	1046
4" Ductile Iron	430
6" Asbestos Cement	74,677
6" Cast Iron	1,069
6" Ductile Iron	10,087
8" Ductile Iron	33,831
10" Ductile Iron	5,979
Total Length (feet)	132,645
Total Length (miles)	25.1
Gate Valves	183
Fire Hydrants	*143*
Blow-offs	*25*
Air/Vacuum or Air Release Valves	*21*
Pressure Reducing Valve Stations	*2*
Listening Stations	*1*
Pressure Testing Stations	*5*
Sample Stations	*20*

1.4.4 Booster Pump Stations

The water system's original booster pump station (BPS #1) is comprised of a single pump originally rated at 620 gallons per minute (gpm) at 329 feet Total Dynamic Head (TDH). The pump has been replaced at least twice prior to 2020, with lower capacity units. It was recently replaced with a vertical mounted pump assembly rated at 350 gpm at 335 feet TDH as a target duty point. The pump has been tested at approximately 375 gpm at 360 feet TDH. The pump is fed by a connection to the City of Everett's Transmission Main #3 which has an operating pressure range of 6 to 11 psi. The pump discharges to system pressure, governed by the water level in the standpipe and local flow demands. The pump is controlled by an automated system, integrated with float level or pressure sensing controls in the standpipe and the other booster pump station. Normal operating conditions utilize the pressure transducers. Communication between the sites is via internet-based cable service. The system calls for the pump based on the set water level points. There is presently no standby power generator at this station. The Association has initiated a project to add a propane-fueled onsite standby generator at this site, planned for completion later in 2023.

Booster Pump Station #2 was completed in June of 2005. This booster pump station has two pumps originally rated at 500 gpm at 200 feet TDH. The pumps have been recently replaced with units rated at 350 gpm at 300 feet TDH each. The pumps have been tested at approximately 370 gpm at 266 feet TDH. If both pumps are operating, they are capable of delivering a combined 550 gpm. The change in capacity is a result of changes in the pressure in the City of Everett supply main serving this station. The pumps will vary in capacity in response to the available pressure in the Everett main. Both pumps are operated in response to water level in the standpipe. Activation of the three pumps in both stations is rotated sequentially, with additional pumps called on if standpipe water level continues to fall. There is a propane fueled standby power generator at this station.

1.4.5 Connections

As of the end of December 2021, there were 863 residential and seven commercial service connections to the water system. The Association had an additional five members that were not yet connected to the water system. As of the end of December 2022, the Association served 865 residential connections and four non-users with no change in the count of commercial members.

1.4.6 Interties

The System is connected to the City of Everett water system by interties/service connections at two locations. There are no interties with any other water purveyors.

1.5 RELATED PLANS

The following is a list of planning documents, with a brief summary of each, that have been reviewed and have an impact on the development of this Comprehensive Water System Plan.

A. City of Everett 2020 Comprehensive Water Plan

The City of Everett Comprehensive Water Plan provides existing and future planning data relating to the Association's source of supply and water quality. As the sole supplier of water for the Association, the Association relies on Everett to plan for adequate facilities to meet the future demands of all purveyors that purchase water from the City.

The subject plan lists the Association as the City's 11th largest wholesale customer and indicates that Everett has anticipated demand as follows for

Three Lakes[1]: The demands are presented as average day demands for years 2030 and 2040 and a peaking factor of 1.76 is used for all City wholesale customers to forecast the maximum day demand on the City water system.

- 10 years (2030) – 0.26 million gallons per day (mgd) average day demand
- 10 years (2030) – 0.46 mgd maximum day demand
- 20 years (2040) – 0.29 mgd average day demand
- 20 years (2040) – 0.52 mgd maximum day demand

Everett forecasts it has adequate capacity at its water filtration plant to meet maximum day demand through 2030 but anticipates a deficiency to meet such demand by 2040. Additional treatment capacity will be necessary to meet the forecast demand. The Everett plan indicates it has adequate water rights for annual and maximum day demands for all its customers through year 2040 and adequate rights for the forecast maximum day demand for "buildout" conditions by year 2100. Everett notes that in the most extreme of buildout scenarios for year 2040 it may not have adequate rights for annual water demands but will continue to monitor the need to request approval for a pending water right application.

B. Snohomish County Comprehensive Plan, 2020

The Snohomish County Comprehensive Plan provides existing and future development and planning data for all areas located within the Association. This data includes growth rates, zoning designations and land use forecasting.

Consistency: The Association's comprehensive water plan must be consistent with the adopted plans, regulations and policies of Snohomish County per the 2003 Municipal Water Law (MWL). This plan has been prepared to provide service to existing development and development allowed under current land use and zoning designations of the County as discussed herein. Where the water system exists or is extended, such extensions and service shall be provided at appropriate levels of service. Additionally, the population and growth forecasts used by the County have been reviewed and compared to growth patterns in the Association's history (as measured by water system connections) for development of the water demand forecast presented in Chapter 2. The Association requested confirmation of such consistency from the County. A copy of the completed Local Government Consistency Review Checklist is included in Appendix A.

The Snohomish County Comprehensive Plan was updated in 2020. The Future Land Use designation for all the Association's service area remains Rural Residential with a density of one unit per five acres.

[1] See Appendix A for updated review of supply available for the Association.

C. North Snohomish County Coordinated Water System Plan, 2010

The North Snohomish County Coordinated Water System Plan (adopted 2011, with map update in 2018) provides existing and future development planning data for the Association and all water purveyors which lie within unincorporated Snohomish County. Data includes growth rates, zoning and land use policies.

D. Snohomish County PUD Water System Plan (Draft), February 2022

The Snohomish County PUD Water System Plan provides existing and future planning data relating to the PUD's source of supply, water quality and service areas. The PUD serves much of the area abutting the Association's service area.

E. Roosevelt Water Association Water System Plan, 2007, 2014 Update and 2020 Limited Water System Plan Update

The Roosevelt Water System Plan provides existing and future planning data relating to the Roosevelt's source of supply, water quality and service areas. Roosevelt serves the area abutting the Association's southern service area boundary.

1.6 COMMENTS FROM AGENCIES AND ADJACENT PURVEYORS

Copies of the September 2023 version of this plan and earlier drafts (only to Snohomish County and City of Everett) were sent to the following organizations for review and comment:

TABLE 1.2
Distribution List

Organization	Mailing Address	Comments YES	Comments NO
Washington State Department of Health Richard Rodriguez and PJ Wilkerson	NW Regional Office PO Box 47800, MS K17-12 Olympia, WA 98504		
Snohomish County Health Department - Drinking Water Program	3020 Rucker Avenue, Suite 104 Everett, WA 98201		
Snohomish County Planning Department Terri Strandberg	3000 Rockefeller Ave, M/S 604 Everett, WA 98201		
Snohomish County PUD Brant Wood	M/S LS P.O. Box 1107 Everett, WA 98206-1107		
Snohomish County Fire Marshal's Office Michael McCrary and Lori Burke	3000 Rockefeller Ave, M/S 604 Everett, WA 98201		
City of Everett Public Works Souheil Nasr, P.E.	3200 Cedar Street Everett, WA 98201		
Roosevelt Water Association Janelle MacDicken	P.O. Box 345 Snohomish, WA 98291		
Panther Lake Community Water System	4015 – 165th Ave SE Snohomish, WA 98290		

A summary of all comments received, and response given is included in Appendix A.

The Association's membership was invited to participate in development of this plan. Notice was first provided at the annual membership meeting in October 2022. An outline of the planning process and goals were presented. Members were asked to review the Association website to review draft chapters as they were posted in the months to follow, and that elements of the plan would likely be discussed at the monthly Board meetings, which are open to members. Draft chapters were posted periodically as the plan was drafted. One member provided input and the input was of an encouraging nature with appreciation for the planning process and the work of the Association Board and staff.

Members were notified by mail of a meeting specifically for them to provide input on the draft plan and ask any questions. That meeting was held on June 13,

2023. One member attended in addition to the Board and staff. Input received pertained only to general questions and general support for the long-range planning process. Minutes of that meeting are included in Appendix A.

This plan will be presented to the Association Board of Trustees for adoption on September 12, 2023.

The WSP was provided to the following parties for review and comment. Responses are presented as an update to Appendix A.

- Washington State Department of Health
- Snohomish County Health and Planning Departments
- City of Everett
- Snohomish County PUD
- Roosevelt Water Association
- Panther Lake Community Water System

1.7 EXISTING SERVICE AREA CHARACTERISTICS

The Association's service area lies entirely within unincorporated Snohomish County. The area is mainly rural in nature having a mixture of small residential lots spread among larger undeveloped lots. The highest concentration of small residential lots is located along the shoreline of each lake and within small cluster developments.

The area encompassing the Three Lakes Water Association is predominantly designated as R-5 *Rural Residential Land Use* by Snohomish County. This designation is from current Snohomish County zoning map dated October 10, 2021. The designation allows for a density of one house per five-acre lot. The minimum lot size in R-5 is 200,000 square feet although there are provisions in the Snohomish County Code for Rural Cluster development which allows for smaller lot sizes but retains the maximum density and lot yield allowed by the R-5 designation. There is one small area west of Storm Lake Road that is designated as *Rural Business*. Per the Snohomish County Code, *Rural Business* is defined as a zone that permits small-scale retail sales and services. These businesses must be located along county roads on small parcels and are intended to serve the immediate rural residential population.

1.8 RETAIL SERVICE AREA

The Association's water service area has been established by agreement with neighboring purveyors as part of the North Snohomish County Coordinated Water System Plan and supporting efforts.

The Association has previously designated its service area as its "retail service area" as required under the 2003 MWL and supporting regulations. This WSP update does not change the prior designation.

Per RCW 43.20.260, municipal water suppliers have a duty to provide service to all new connections within their retail service area if the following thresholds are met:

1. The supplier has sufficient capacity to serve water in a safe and reliable manner.
2. The service request is consistent with adopted local plans and development regulations.
3. The supplier has sufficient water rights to provide service.
4. Service can be provided in a timely and reasonable manner.

The basis for meeting each threshold is summarized as follows, with specific determination to be made with each application for service.

Capacity of the system is discussed in detail in Chapter 3. A key objective of water system planning is to reasonably anticipate and provide capacity for growth in the system. Based on the needs identified from development of this water system plan, the Association has prepared a capital improvement plan (Chapter 8) for implementation to maintain system capacity for those that desire service in the future.

The Association has prepared this plan to support full development of the retail service area at the land use currently adopted by Snohomish County. Applications for new water service are individually reviewed for consistency with the WSP. However, it is presumed that applications for service for new development are being reviewed by the local land use authority for conformance with appropriate development regulations.

The Association presently purchases all of its water from the City of Everett. Water right sufficiency is not directly applicable to the Association. However, the Association does regularly review its existing and forecast demand with the City of Everett (through comprehensive plan updates), that are presumed to be not inconsistent with the supplier’s water rights. Additional discussion is included in Chapter 2.

The Association provides water service to new connections following review of application for service. The application describes the service desired. The location and type of proposed development, particularly relative to the existing distribution system, influence the level of detailed review necessary under the Association’s developer extension procedure (see Chapter 7). Additional service area policies are discussed below.

1.9 SERVICE AREA AGREEMENTS

The Association executed an “Agreement for Establishing Water Utility Service Area Boundaries” in the mid-1990s as part of the process to develop the North

Snohomish County Coordinated Water System Plan. The Association and Snohomish County PUD executed a service area change agreement in September 2010. An additional service area change agreement between the Association, the PUD and Roosevelt Water association was executed in 2011. The Association also has a statement of the PUD service denial for an immediately adjacent parcel. The Association has agreed to provide service to that parcel, subject to its adopted policies and procedures for water service. (Copies of the agreements and letter are included in Appendix C.)

1.10 SERVICE AREA POLICIES

The Association's bylaws are the source of authority for the Board of Trustees to establish policies for water service. The Board has prepared several policies regarding the financial, human resources and technical management of the Association and system. Membership begins with purchase of a share in the Association, typically one per tax parcel. When service is provided, members execute a water service agreement acknowledging the terms and condition for water service. If construction of additional distribution facilities is required prior to service, such work is completed under the terms of the Associations *Developer Extension Manual*. The following is a brief summary of key service area policies.

1.10.1 Wholesaling Water

The Three Lakes Water Association does not wholesale water to adjacent water districts or associations.

1.10.2 Wheeling Water

The Three Lakes Water Association does not transfer water to adjacent water districts or associations.

1.10.3 Annexation

The service area has been established by agreement with surrounding purveyors (i.e., outside the perimeter) and Snohomish County, under the North Snohomish County Coordinated Water System Plan. The Association's service area presently adjoins adjacent purveyors at all points around the perimeter. Any changes to the service area around the perimeter would require mutual agreement with the adjoining purveyor.

As indicated in Section 1.9, the Association has agreed to provide service to a single parcel outside its declared service area.

The Association, if approached, may consider service to the small area in the interior of the Association's service area that is presently served by Panther Lake Community Water System. Such service would be accomplished by absorbing or consolidating that system with the Three Lakes system, by direct connection from 50th, 44th or 42nd Streets along the west sided of 171st, and ideally with a loop connection north to Dubuque (upstream of the system PRV). This may allow a third connection to the western part of the existing Three Lakes system, with an additional pressure reducing valve station. The condition of the Panther Lake distribution system is unknown. The Panther Lake system is served by one or more wells, but it is presumed the Association would not utilize those resources. The well source(s) likely have minimal capacity with respect to the Three Lakes system demands, and the Association would not likely take on the additional responsibility associated with groundwater wells as a source of supply for such a small source.

There have been no substantive discussions between the two purveyors on this topic in recent years. Advantages for the Panther Lake system may be a more reliable system or source of supply and economy of scale for operational costs. Similarly, the advantage for the Association would be increased economy of scale with the addition of customers. A financial evaluation would need to be completed to confirm the value and liabilities of the system, and what one-time connection charges, if any beyond the cost of a member share, would be appropriate for the customers transferring to the Association as new members. A significant factor in that analysis will be the condition and need for upgrade of their system or elements thereof.

To complete the consolidation, a revised water service area declaration would need to be filed with Snohomish County, to support update of the North Snohomish County Coordinated Water System Plan. Additionally, an amendment to this plan would be necessary to update the designation of the Association's retail water service area and to describe additional capital improvements associated with that system.

1.10.4 Direct Connection and Satellite/Remote Systems

Requests for connection to the Association's existing system are administered through a developer extension (DE) process as further described in Section 1.11.1. As described in Section 1.8 above, the Association has committed to serve development within its service area, subject to certain conditions. Under the North Snohomish County Coordinated Water System Plan, individual wells can only be allowed in the Association's service area if the Association cannot provide water service in a "timely and reasonable manner", as defined in that Plan and at RCW 70.116.060. This restriction does not apply to single-family residences on existing lots.

No satellite or remote systems exist at this time within the Association service area. Service is generally feasibly available from the existing system to all areas within the Association's service area. However, some locations are relatively distant from existing facilities and some parties seeking water service may not have the resources necessary to construct facilities, without support from other properties that may benefit from such extensions. Additionally, it may be advantageous to serve such new development, at least for some time, with a remote distribution system directly connected to a new intertie with one of the Everett transmission mains, but not connected to the existing distribution system. If this situation arises within the retail service area, Three Lakes would own and operate the remote system as if it were part of the current system. Modification of water quality monitoring plans would be necessary. All policies applicable to the current system as described in this Plan and the By-laws and policies of the Association would be applicable to the remote system(s) as well.

The Association does not anticipate the need to consider management of satellite systems or seek approval as a satellite management agency.

1.10.5 Design and Performance Standards

The Association requires all water system designs to be prepared by a Washington State licensed professional engineer and to meet all local and State guidelines. The Association's design and performance standards are discussed in Chapter 3. Technical specifications, standard details, and related requirements are presented in the Association's *Developer Extension Manual*. See Chapter 7 for further discussion.

1.10.6 UGA and Water Service Extension

No part of the Association is within an urban growth area (UGA) established by Snohomish County.

For extensions, the developer is solely responsible for all costs associated with expanding the water system beyond its present locations and/or capacities. The Association may participate based upon its own determination for the benefit of the system.

1.10.7 Oversizing

In all cases, the developer is solely responsible for all costs associated with expanding the water system beyond its present capacity if the expansion is so required to meet the water demands of the proposed development. The Association may participate in further oversizing based upon its own determination for the benefit of the system.

1.10.8 Latecomers Agreements

The Association's *Developer Extension Manual* includes acknowledgement that it will consider agreements regarding reimbursement of construction costs by developers who construct facilities that benefit property owned by other parties.

The Manual is not specific about the terms of such agreement so it is presently anticipated that details will apply on a case-by-case basis until a policy is developed in the future.

1.10.9 Cross-Connection Control Policy

The Association adopted a cross-connection control program in 2007. The cross-connection control program was updated in 2018, and again in March 2022. The updates were of a "housekeeping" nature and did not change the substance of the program. A copy of the current version is included in Appendix E.

1.11 CONDITIONS OF SERVICE

Persons requesting any type of connection to the Association's system must follow the Association's developer extension standards and the current Policies and Procedures as adopted by the Board of Trustees, including the submittal of the appropriate application and fees. The specific conditions for connecting to and obtaining water service are detailed in the Association's *Developer Extension Manual*. An outline of the developer extension process, including schedules of current connection fees, is included in the following sections.

1.11.1 Developer Extension Process

Developers or persons requesting service from the Association must first request a Certificate of Water Availability. The fee for this certificate is $100.00 per connection. If the subject property is not presently served by the water system, the interested party must complete an application for developer extension. Review of the application leads to determination of the conditions for service. Once those are identified, the Certificate of Water Availability can be issued, subject to the conditions. If a system extension is necessary for service, the next step is to follow the requirements in the *Developer Extension Manual*. This manual outlines the developer extension process from the point of application to agreement, plan review and then through completion of construction and closeout administrative matters. The key points in this process are listed below.

A. Application for Connection to Water System

Prior to entering into an agreement with the Association, an applicant must complete an application form with attachments and submit it to the Association with the applicable review fees. Upon receipt of the application and recommendations by the Association's engineer, the Association Board determines:

1. If they will proceed with an agreement and if there are any special requirements.

2. What deposit amount will be required, after the Applicant has determined who will do the engineering (the applicant's engineer or the Association's consulting engineer).

B. Completion of Developer Extension Agreement

Upon the Board's approval, the applicant is notified to complete the Developer Extension Agreement and submit a minimum deposit. This deposit covers the estimated costs for all work to be performed by the Association's consultants regarding the project. The estimated engineering fees are based on the work to review and approve plans prepared by the developer's engineer or the costs associated with the preparation of plans by the Association's engineer. All costs above the deposit amount are charged to the developer.

Completion of the above step leads to engineering design and review, resulting in construction plans, which are subject to approval by the Association Manager prior to construction.

C. Construction

All construction is monitored by the appointed Association inspector and/or Association personnel. Construction of the water system is required to meet all Association General Design and Construction Standards and Material Specifications, Construction Methods, and Standard Details as well as the standards of the applicable county and state agencies. All connections must meet cross-connection control standards as outlined in the Association's Cross-Connection Control Policy.

The applicant is responsible for all costs including permits, design, review, construction, inspection, testing and all connection charges.

1.11.2 Applicable Fees and Connection Charges

The process of connecting to the Association's system includes various fees and charges which are outlined below. The fees include administration fees, engineering fees, permit fees, inspection fees and site facilities and general facilities charges. The current charges, in the general order of occurrence, are as follows.

A. Certificate of Water Availability
$100.00 fee per connection.

B. Administration - Design/Review Deposit

Application review fee of $750 and first half of the Developer Extension Fee as a deposit for engineering design/review.

C. General Facilities Charge

The General Facilities Charge is $13,000 per equivalent residential unit (ERU) per the Association's current connection charge study. This figure will be updated following completion of this Plan.

D. Site Facilities Charge (a.k.a. Meter Fee)

The meter fee for each new connection varies by meter size and is shown below.

Meter Size	Charge
5/8"	$3,900.00
1"	$4,550.00
1 ½"	$5,850.00
2"	$7,800.00

Meters to be installed where the water service and connection to the main has been installed by a developer through a developer extension process are charged as specified below.

Meter Size	Charge
5/8"	$500.00
1"	$700.00
1 ½"	$900.00
2"	$1,100.00

E. Share Transfer Fee

Each new Association member is required to pay a $500.00 fee for a Water Share. If a share already exists for the property, customers are required to pay $100.00 for the transfer of the water share.

F. Bi-Monthly Rates

The following bi-monthly rates were charged to all connected members, effective thru June 30, 2023.

Meter Size	Charge
5/8"	$147.00
1"	$220.50
1 ½"	$294.00
2"	$514.50
no meter	$24.21

The following bi-monthly rates are effective July 1, 2023.

Meter Size	Charge
5/8”	$151.00
1”	$226.50
1 ½”	$302.00
2”	$528.50
no meter	$24.21

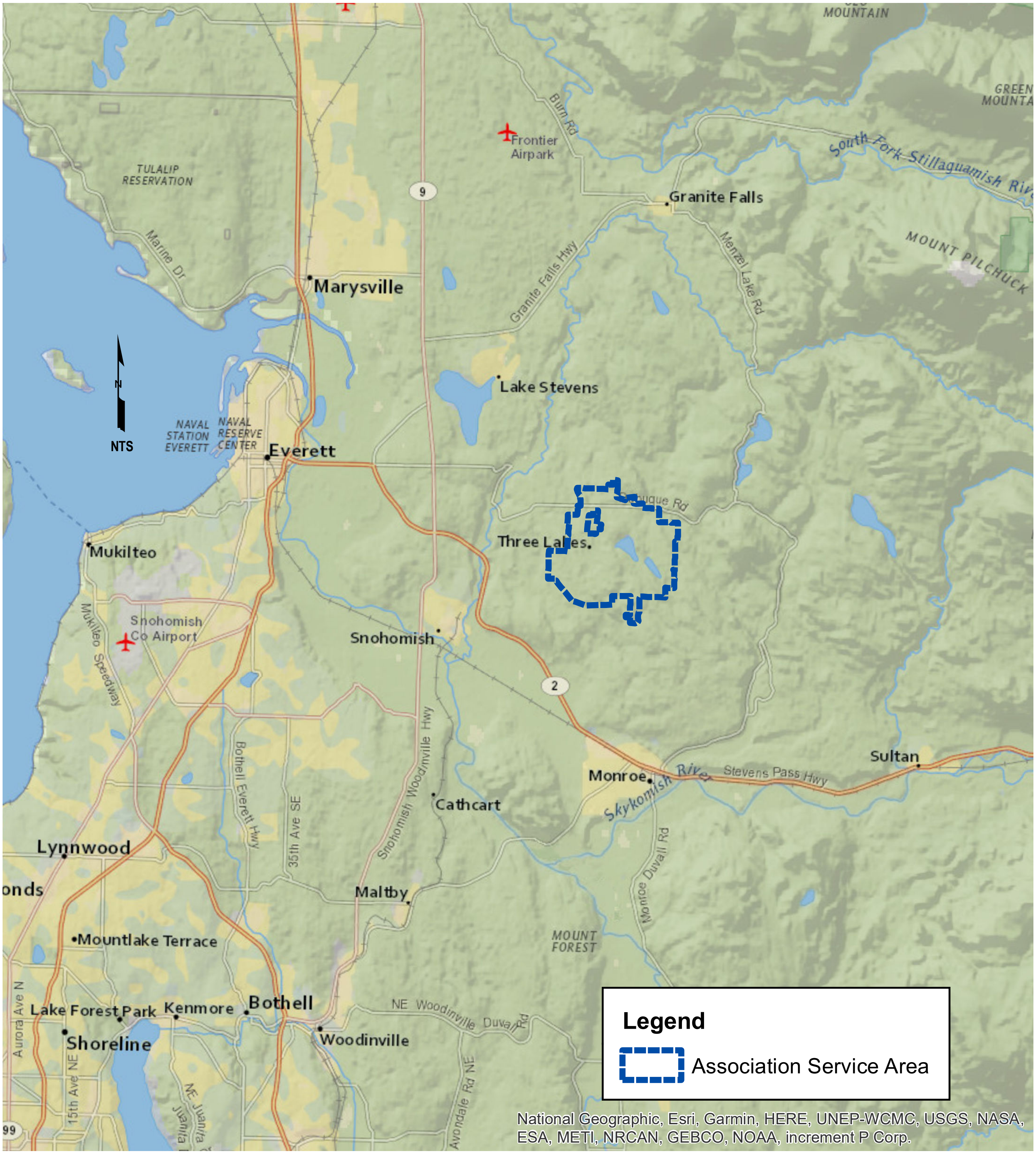
In addition to the bi-monthly charge, a tiered commodity charge is also assessed for water usage in excess of 600 cubic feet per month (for a 5/8” meter, with higher thresholds for larger meters). For a member with a 5/8” meter, the cost per 100 cubic feet is $2.70 for between 600 cubic feet and 1,200 cubic feet, $2.95 between 1,201 and 1,800, $3.20 between 1,801 and 2,400, $3.45 between 2,401 and 3,000 and $3.80 over 3,000 cubic feet. For the larger meters, the same cost per 100 cubic feet applies, but to different bands of total usage. The Association’s revenue policy states the full rate schedule in detail. The commodity charges noted above are in effect July 1, 2023.

A minimum charge of $24.21 is assessed to customers who are members of the Association but have no meter (i.e., “non-users”), to support repair and replacement of the system.

The Association reviews its actual financial activity and status following the end of each fiscal year (ends June 30) and considers the need for increases in its rates and charges to meet anticipated future operating and capital needs, with new charges typically effective the following July 1st.

1.12 COMPLAINTS

Currently, all complaints pertaining to the water system are referred directly to the Association Manager. The Manager initially investigates all complaints and advises the Board of Trustees if applicable. The Association keeps a record of past complaints through the Manager’s monthly report and the minutes of the monthly board meetings.



DAVID EVANS AND ASSOCIATES INC.

Three Lakes Water Association
Comprehensive Water System Plan
FIGURE 1.1
VICINITY MAP

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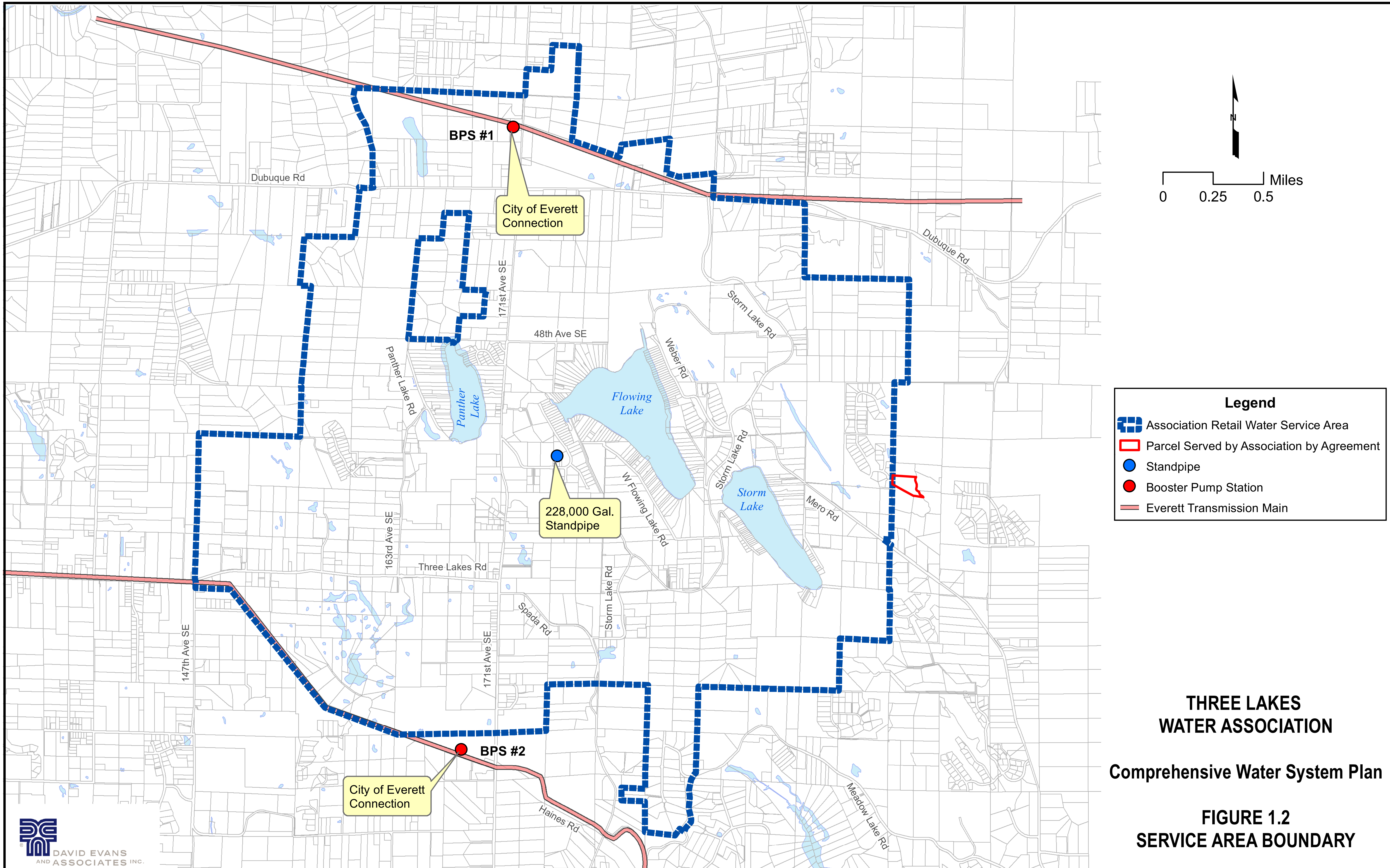
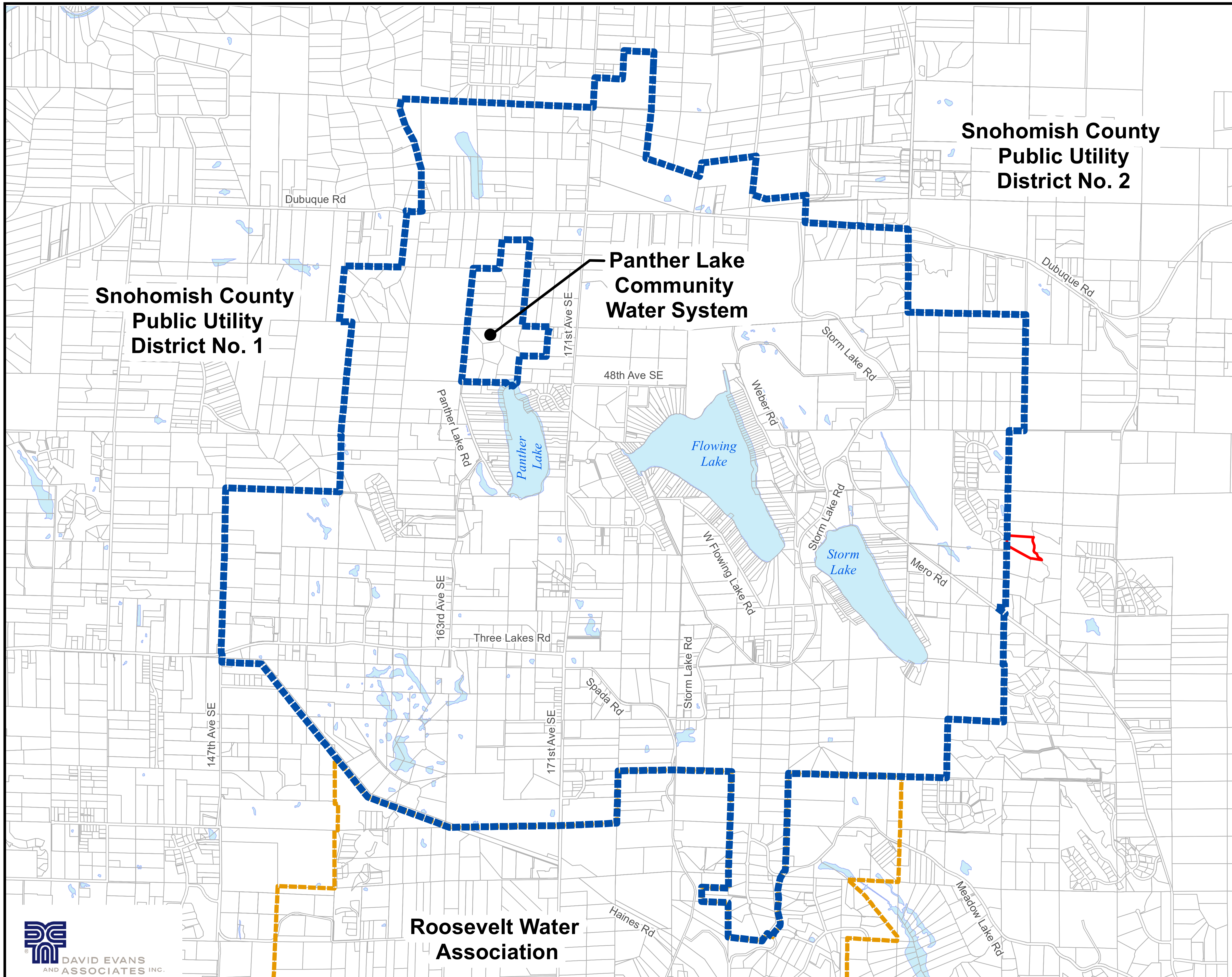


THREE LAKES WATER ASSOCIATION

Comprehensive Water System Plan

FIGURE 1.2
SERVICE AREA BOUNDARY



THREE LAKES WATER ASSOCIATION

Comprehensive Water System Plan

FIGURE 1.3
NEIGHBORING PURVEYORS

CHAPTER 2 – PLANNING DATA AND WATER DEMAND FORECASTING

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CHAPTER 2

PLANNING DATA AND WATER DEMAND FORECASTING

This chapter presents basic planning data essential for the assessment of the Three Lakes Water Association water system. In order to assess future water demands, it is necessary to evaluate the current state of the existing water system and to determine future needs based on the foreseeable demographic trends over the next 20 years. This is accomplished by determining local population trends and the projected land use which may impact the capacity and placement of future system improvements.

The water system analysis includes the study of historical growth and water demands for the system and population projections based on the available land use designations. The land use projections are based on the current land use designations from Snohomish County. These projections are used to determine the potential population and ultimate development of the Association's service area.

2.1 EXISTING CONDITIONS

The Three Lakes Water Association serves approximately eight square miles of rural residential land located entirely within unincorporated Snohomish County. Many of the existing parcels already have existing residential homes; however, the Association also encompasses many larger rural lots, which have the potential to be subdivided. The potential density achievable by redevelopment of these undeveloped parcels is outlined in Section 1.7. The Association's customers are made up of almost exclusively residential connections.

As of the end of December 2022, there were 865 residential and seven commercial service connections to the water system. The Association has an additional four members that are not connected to the water system.

2.1.1 Current Residential Population

As described above, the Association's service boundary encompasses a portion of rural area east of the City of Snohomish. Population projections have been prepared from source materials put forth by the United States Census Bureau and the Comprehensive Plan created by Snohomish County Planning and Development Services. Previous plans have used data from the Washington State Office of Financial Management (OFM) and the Puget Sound Regional Council (PSRC). The above sources do not identify data specific to the Association's service area. Therefore, an analysis of the available Census data has been conducted to estimate the actual population served by the Association.

The 2010 and 2020 U.S. Census Bureau population data is provided by census tracts which are further divided into blocks and sub-blocks. The Association covers portions of three census tracts: 523.01, 523.02 and 522.06 as illustrated in Figure 2.1.

The previous population projection utilized the year 2010 census data, as presented by the Office of Financial Management, for all census blocks within the Association's boundary. Spatial comparisons of the total census block area as compared to the census block area within the Association water service area were utilized to generate the percentage of the total census block population and housing units within the Association's water service area. The current population estimate uses the same methodology, but the 2020 census data.

From this data, the estimated population in the Association's service area as of the end of year 2010 was 2,140 people. Utilizing data from the 2020 Census it was estimated that there are approximately 2,733 people living within the Association's retail water service area. Block-level housing and population data was used to determine an estimated population density of 2.7 persons per household. Table 2.1 summarizes prior historical population estimates for the service area.

TABLE 2.1
Historical Population

Year	*Population Estimate*
1996*	1,425
2004*	1,767
2010**	2,140
2020**	2,733

**Population estimate as reported in the 2005 Water System Plan.*

*** Population estimated based on 2010 and 2020 census information.*

Estimated population is population within service area, not population served.

Per the County's 2020 Growth Monitoring Report (GMR), the County-wide annual population growth rate for non-UGA regions from 2011 to 2035 was forecast to be 0.603%. If population density does not change during the forecast period, the housing will have the same growth rate. In February 2022, the County adopted long-range growth targets in support of its comprehensive plan update process. Growth targets were identified for year 2044 for UGA and non-UGA areas. The forecast annual growth for non-UGA regions from 2020 to 2044 was forecast to be 0.302%.

The Association's records for new connections from 2011 to 2022 show a compounded annual growth rate of 1.36%. That rate was influenced by completion of two plats of 20 lots or more that had been in process for many years prior to completion and development. Omitting the significant growth in

2016 and 2017, the compounded annual growth in that same period decreased to 0.597%. The Association's actual rate of growth in recent years is below the 1.5% annual rate forecast in the 2013 WSP.

Information pertaining to population projections is further discussed in Section 2.2.2.

2.1.2 Total Service Connections

All connections are metered with meter sizes ranging from 3/4 x 5/8-inch to 2-inch. As of the end of the calendar year for years ending 2020 through 2022 the Association had 866, 870, and 872 service connections, respectively. There was an additional varying number of members not yet connected to the system each year.

2.1.3 Water Use Data Collection

DOH requires that public water systems collect water use data for use in forecasting demand, system planning, evaluating conservation program success and other objectives (WUE Guidebook). The Association is collecting data as summarized in Table 2.2.

The Association's current data collection and storage procedures provide for collecting more than the required data.

The volume of water purchased from Everett Public Utilities (Everett) is provided bi-monthly by the City. Association staff have access to the Everett meters to monitor daily supply volumes. Individual customer service meters are read by Association staff on a bi-monthly basis. Usage readings are input into the Association's billing system by the Office Administrator who generates bi-monthly billings.

Discrepancies between supply volume and the Association's water sales are compared and logged on a bi-monthly basis. The Association also reads the master supply meters daily (weekdays) and reads them if there is unusual daily usage which might suggest a leak in the system. The Association also logs these daily readings for reference in finding the maximum day usage.

TABLE 2.2
Water Use Data Collection Requirements

Type of Data	*Units*	*Required Action*	*Current Practice*
Source Meter Readings			
Source of Supply Meter Readings	CCF	Collect: Monthly and annual totals	Read daily (weekdays). Daily usage logged
Emergency Interties- Amount Imported	CCF	Collect: Monthly totals	N/A
Wholesale- Amount Purchased	CCF	Collect: Monthly totals	N/A
Peak Day/Peak Month	CCF	Collect: Each year's peak month total	Peak month(s) determined from supply data
Non-Revenue Water			
Unaccounted-For Water	CCF	Collect: Annual totals	Bi-monthly and annual totals tracked
Accounted-For Water	CCF	Collect: Annual totals	Bi-monthly and annual totals tracked
Service Meter Readings			
Single-Family	Total CCF used by this customer class	Collect: Monthly totals*	Measured bi-monthly, monthly totals estimated
Multi-Family	Total CCF used by this customer class	Collect: Monthly totals*	N/A
Commercial/ Government/Industrial	Total CCF used by this customer class	Collect: Monthly totals*	Measured bi-monthly, monthly totals estimated
Population Served	ERUs and connections	Collect: Annual totals	Annual totals tracked
Economic Data	Existing water rates for each customer class	Review existing water rates for each customer class	Rates reviewed annually for each customer class
Conservation Data	Report type of measure and level of implementation	Collect: Once per year	Conservation program reviewed annually

** Monthly totals may be estimated if water system billing is less frequent*

2.1.4 *Equivalent Residential Unit*

An equivalent residential unit (ERU) is a unit of measure used to equate non-residential water use to the amount of water consumed by a typical single-family residence. This allows the Association to plan under a common usage category. For example, a commercial establishment with a single restroom facility would most likely use much less water than the average single-family residence. In this case, the commercial connection would count as a fraction of an ERU. However, the daily summer usage by the County campground can equate to that of nearly four residential homes or more. In this case, the campground connection would be counted as four ERUs, based on water usage.

The Association's annual water demands vary in response to a multitude of factors including, but not limited to, climatic and economic conditions. For this report, the calculation of the value representing the average usage per ERU was performed by evaluating the annual metered usage per connection from 2006 through 2022. With so few commercial connections among so many single-family residential services, this analysis included all metered usage. Records for commercial accounts have only been available since about mid-2009. The range of average metered usage is from 165 to 215 gpd per connection. The average for the past five years is 181 gpd, the same as the average for the past 10 years. For the purpose of projecting future water demands for this WSP update, the Association will use 200 gpd/ERU. The higher value is to account for the growth in ADD/ERU in recent years, and to bolster the system forecast against an increase in accessory dwelling units (ADUs) anticipated to be constructed in the system going forward.

Table 2.3 summarizes water supply and consumption and the total number of ERUs for the Association at the close of 2022. This is the base year for forecasting throughout this Plan.

The Association has occasional water leaks or situations during maintenance when they are filling, testing, or flushing water lines. Although this volume is unpredictable because of many unknowns, the Association is expected to keep the non-revenue water volumes as low as possible. The Association classifies this distribution system leakage and unmetered water utilized by the Association (fire flow testing, mainline flushing, firefighting, etc.) as non-revenue water. Distribution system leakage is calculated by taking the difference between the purchased water volume from Everett and the volume used (metered to customers or used directly by the Association) for any given unit of time. Another factor contributing to distribution system leakage is the possible inaccuracy of water meters relating to individual customer meters. This problem is being addressed by a meter replacement program, which replaces older service meters.

Table 2.3 summarizes the current count of connections and ERUs by customer class. Table 2.4 illustrates the percentage of distribution system leakage from 1995 through 2022. This distribution system leakage is reported as a percentage of the total amount of water purchased from the City of Everett.

Table 2.4 illustrates an ongoing condition of significant amounts of distribution system leakage. Unfortunately, many of the Association's water mains are located along rural roads with unimproved shoulders and, therefore, leaks in the distribution system may go unlocatable for days.

The Association has completed WUE annual reports since 2010.

As seen in Table 2.4, the Association continues to exceed 10% distribution loss. The Association completed a Water Loss Control Action Plan (WLCAP) in 2014. The primary outcome of that plan has been replacement of all customers meters in the system. All meters have since been converted to radio-read technology, for safety, efficiency, and accuracy. The battery life for the radio units is anticipated to be eight to ten years. As part of that process, all meters with a history of more than 40,000 cubic feet registered were replaced. Over 80% of the metering chambers were replaced as part of this upgrade. The Association monitors water use daily including monitoring of usage overnight. Changes in low-period demand may reflect a system water leak. The Staff proactively evaluates the system to discern if there is a new leak.

TABLE 2.3
Total Service Connections and ERUs

Customer Class	*Connections*	*ERUs*
Single Family Residential	865	873
Commercial	7	10
Total	**872**	**883**

Quantities as of December 2022

As stated above, 200 gpd/ERU was used for the planning number for average day demand by the Association. For this system, ERUs and connections are nearly the same metric, given the very limited non-residential uses. There are a total of 17 connections billed at greater than one ERU. The average day demand/ERU is slightly below the demand used for planning purposes in the 2013 WSP.

TABLE 2.4
Annual Water Use

Year	*Purchased Water (gallons)*	*Billed Water (gallons)**	*Difference (gallons)*	*Dist. System Leakage*	*ERUs***	*ADD/ ERU (gpd)*
1996	51,663,038	48,231,571	3,431,467	6.6%	585	226
1997	49,266,126	45,497,878	3,768,247	7.6%	596	209
1998	64,016,413	49,705,507	14,310,906	22.4%	616	221
1999	54,944,953	46,118,585	8,826,368	16.1%	623	203
2000	47,422,059	46,117,253	1,304,806	2.8%	646	196
2001	44,703,464	42,663,074	2,070,389	4.6%	652	179
2002	50,503,483	45,333,252	5,170,231	10.2%	656	189
2003	62,111,003	52,115,339	9,995,663	16.1%	659	217
2004	61,602,825	50,516,217	11,086,608	17.9%	688	201
2005	57,036,191	46,116,423	10,919,768	19.1%	697	181
2006	70,648,320	52,832,026	17,816,294	25.2%	724	200
2007	66,665,959	51,449,859	15,216,100	22.8%	736	192
2008	65,914,343	49,297,127	16,617,216	25.2%	756	179
2009	69,721,573	57,608,316	12,113,257	17.4%	760	208
2010	63,419,280	49,467,701	13,951,579	22.0%	763	178
2011	60,318,121	48,115,989	12,202,132	20.2%	762	173
2012	64,741,447	51,557,562	13,183,885	20.4%	769	184
2013	59,457,405	51,227,631	8,229,774	13.8%	773	182
2014	60,502,317	49,534,892	10,967,425	18.1%	774	175
2015	65,786,638	55,172,744	10,613,894	16.1%	777	195
2016	62,742,472	49,755,856	12,986,616	20.7%	782	174
2017	74,355,344	53,151,973	21,203,371	28.5%	807	180
2018	59,602,398	51,725,020	7,877,377	13.2%	859	165
2019	59,823,604	53,001,403	6,822,201	11.4%	872	167
2020	63,271,794	55,228,483	8,043,311	12.7%	877	173
2021	73,713,149	60,376,952	13,336,137	18.1%	881	188
2022	90,534,173	69,365,479	21,168,694	23.4%	883	215
5-Year Average				15.8%		181
10-year average				17.6%		181

**Billed Water Usage for 2010 through 2022 includes total authorized consumption.*

*** ERU counts listed earlier than 2017 are based solely on number of connections. ERU counts listed earlier than 2012 are based on a prior system of connection counts and is likely incorrect by a few connections.*

The water use records were reviewed and ADD system-wide was determined as well as the maximum daily demand (MDD in gpd). The supply readings were evaluated for the 2006-2022 period. Data associated with leaks or operations not associated with typical demand was omitted. If the data was for more than one day, the peak readings were escalated by 5 to 10% to approximate the maximum day values. The results are presented in Table 2.5. The ratio of maximum day to average day of 2.10 was selected for use in the Association's demand forecast. This value just exceeds the 10-year average.

TABLE 2.5
Maximum to Average Day Ratio for 2006-2022

Year	Ratio MDD/ADD
2006	2.65
2007	1.68
2008	1.95
2009	2.09
2010	1.81
2011	2.02
2012	2.50
2013	2.35
2014	2.41
2015	2.22
2016	1.78
2017	1.72
2018	2.18
2019	2.02
2020	2.08
2021	2.18
2022	1.72
5-yr average	2.04
10-yr average	2.07

1. Flows are in gallons per day (gpd), ADD is Average Day Demand, and MDD is Maximum Day Demand.

2. Ratio of MDD to ADD estimated from supply meter readings during high demand periods.

3. Five-year average is over the years of 2018 through 2022.

2.2 COMMUNITY AND WATER USAGE PROJECTIONS

2.2.1 Projected Land Use

The area within the service boundary of the Association is located completely within Snohomish County and is subject to the comprehensive land use plans and zoning codes of the County. The existing zoning is grouped by rural residential and rural business as illustrated by Figure 2.2.

Figure 2.3 depicts the proposed future land use within the boundary of the Three Lakes Water Association per the current Snohomish County Comprehensive Plan. As illustrated by the comparison of Figures 2.2 and 2.3, the land use throughout the Association is not projected to significantly change. The titles of the specific land uses may be changing; however, the maximum density allowances are not.

The existing water service area and the retail water service area, including one parcel served by agreement, are discussed in Sections 1.7 and 1.8 of this Plan.

2.2.2 Projected Population

As discussed in previous sections, the Association's service area covers a rural residential area approximately five miles east of the City of Snohomish. The service area lies entirely within unincorporated Snohomish County.

As explained in Section 2.1.1, new connections from 2010 to 2022 show a compounded annual growth rate of 1.36%, but that rate was influenced by completion of two large plats. Since completion of those plats, the annual growth rate has dropped to less than 0.45%. The County has targeted a County-wide population for non-rural areas in 2044 and the corresponding population growth rate from 2020 to 2044 is 0.302% annually. Considering the pattern of growth in the system, excluding the impact of two large projects, the projected rate of development and population growth in the Association service area is forecast to be 0.6%.

A review of the current number of lots within the Association's service area indicates there are approximately 1,189 existing lots, with approximately 423 lots that are greater than five acres in size and approximately 127 lots greater than 10 acres. Lots larger than five acres may be subdivided, subject to County land use regulations. Irregular increases in connections from the development of large plats may occur at times contributing to the overall average growth rate, but no information is available to specifically plan for such anomalies. The growth forecast within the 20-year planning period is approximately 117 additional residential units, for a total of 990 residential units, which is within the available capacity of the existing service area.

There are an undetermined number of developed properties with private well water supply in the Three Lakes service area. It is generally anticipated that some of those properties will connect to the Association's system, but no separate estimate of those connections has been made. Any such connections are included in the annual growth rate of 0.6% discussed above.

The population projection for the Association is presented in Table 2.6.

TABLE 2.6
Population Projection

Year	*Population*
2023	2,358
2024	2,372
2025	2,386
2026	2,400
2027	2,415
2028	2,429
2033	2,503
2038	2,579
2043	2,657

Projected Population is based on population served, not population within Association boundary.

2.2.3 *Projected Non-Residential Water Needs*

As of December 2022, there were only seven commercial water accounts. The number of commercial accounts has not changed over the past few years and is not expected to change as the future land use within the service area is expected to remain primarily zoned as Rural Residential.

Of the seven commercial accounts, five are minimal users, which typically use less than half the water of an average residential customer. The most significant commercial water user is the County campground. The campground accounts for approximately 79% of the total commercial water use within the Association.

2.2.4 *Projected Non-Revenue Water*

As discussed in Section 2.1.4 above, the Association's non-revenue water varies from 10% to 20% with a tendency to the higher end of the range. From this historical data it was determined that a non-revenue water percentage of 20% would be used for the forecast.

2.2.5 *Water Rates and Rate Impacts on Water Demand*

The Association bills each customer in a bi-monthly billing cycle. The customer's bill reports the previous meter reading and the current reading with the difference shown as the current usage amount. The total amount due includes the base water charge plus any commodity charges for use over the base amount. The bill also shows consumption history for the same billing period in the previous year and the previous period.

The current water rate structure includes the base rate, which is billed by meter size, and a tiered commodity usage as described in Section 1.11 of this plan. Un-connected members pay a fixed base rate for system repair and replacement.

Future rate increases are further discussed in Chapter 9.

2.2.6 Water Demand Forecasting

Water demand forecasting is the culmination of the information presented in this chapter. In summary, historical water use records were analyzed for the period 1996 through 2022. From this data, the average day demand for one ERU was determined to be 200 gpd for planning purposes.

The total number of single-family residences at the Association year-end 2022 is the base line for the demand forecast for the single-family residence class. Residential connections are represented by an ADD of 200 gpd/ERU. Demands for all non-residential and new residential connections beyond 883 ERUs shall also be represented by 200 gpd.

Population and connection growth rates were estimated based on the Association's historical growth, and the County's Growth Management Report (GMR), as discussed above. The annual increase in non-residential ERUs was reviewed for the past sixteen years and the current amount of non-residential ERUs was determined to remain unchanged for the planning period. Table 2.7 summarizes the Association's projected growth rates by customer class.

TABLE 2.7
Projected Growth Rate by Customer Class

Customer Class	*Forecast Annual Growth Rate (%)*
Single Family Residential	0.6%
Non-residential	0.0%

The current land use and zoning codes were also analyzed to determine if the existing land use could support the projected growth in connections.

The final step in the demand forecasting is the calculation of the projected average day demands (ADD), maximum day demands (MDD), and peak hour demands (PHD) based on the information in this chapter.

As shown in Table 2.5 the 5-year MDD/ADD average ratio was 2.04 and the 10-year average was 2.07. Using this data, the forecast ratio was set to 2.10, which is higher than the value of 1.7 as recommended in the DOH *Water System Design Manual* and the same value as used in the 2013 WSP. The peak hour demand (PHD) expressed in gallons per minute (gpm) is determined from DOH Equation 3-1: (MDD/1440)[(C)(N)+F] +18. The factor "C" is 1.6 and "F" is 225, for systems with more than 500 ERUs. N is the number of ERUs, including a count of ERUs that account for distribution system leakage. The resulting ratio of PHD to MDD, with appropriate unit conversion, is approximately 2.07. The ratio decreases gradually to 2.03 in year 2043.

Table 2.8 illustrates the Association's forecasted demands assuming no benefit from future conservation efforts. The upper portion of the table illustrates the projected usage per day. These are presented for each customer class. The lower portion provides the projected average day, maximum day, and peak hour demands in million gallons per day and gallons per minute.

Table 2.9 presents the Association's forecasted demands with the same growth rates as indicated in Table 2.8. However, the figures in this table reflect the impact of projected additional water savings from ongoing conservation efforts. These conservation efforts include a projected decrease in the MDD/ADD ratio, from 2.1 for 2023 to 1.9 by 2033 and a reduction of the distribution system leakage estimate by 0.5% per year, to an estimated value of 15.0% in year 2033 Based on review of recent trends it seems unlikely to that the Association would experience sustained further reduction in ADD per ERU over time. However ongoing CIP projects to replace and repair the existing pipes can reduce the system leakage, and education programs to reduce peak usage are anticipated to help the system reduce overall use.

The 2013 WSP indicated a forecast ERU count of 930 for 2022. The actual count for 2022 was 883, about 5.1% lower than previously forecast. In addition, the average annual use per ERU for the period 2011-2022 was 181 gpd/connection, 11.3% lower than the value of 204 gpd used for the 2013 WSP forecast. However, the average use per ERU in 2022 was 215, which results in a higher system demand for 2022 than was anticipated in the 2013 WSP.

TABLE 2.8

Projected Water Demand 2023 – 2043
(Without Additional Projected Savings)

Type	2023	2024	2025	2026	2027	2028	2029
Single-Family Residential ERUs	878	884	889	894	900	905	910
Single-Family Residential Demand	175,648	176,701	177,762	178,828	179,901	180,981	182,067
Commercial ERUs	10	10	10	10	10	10	10
Commercial Demand	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Dist. System Leakage	35,530	35,740	35,952	36,166	36,380	36,596	36,813
Total ERUs	**888**	**894**	**899**	**904**	**910**	**915**	**920**
ADD (mgd)	**0.213**	**0.214**	**0.216**	**0.217**	**0.218**	**0.220**	**0.221**
MDD (mgd)	**0.409**	**0.411**	**0.413**	**0.416**	**0.418**	**0.421**	**0.423**
MDD (gpm)	**284**	**285**	**287**	**289**	**291**	**292**	**294**
Total PHD (gpm)	**587**	**590**	**593**	**596**	**599**	**602**	**605**
Type	**2030**	**2031**	**2032**	**2033**	**2038**	**2043**	
Single-Family Residential ERUs	916	921	927	932	961	990	
Single-Family Residential Demand	183,159	184,258	185,363	186,476	192,137	197,971	
Commercial ERUs	10	10	10	10	10	10	
Commercial Demand	2,000	2,000	2,000	2,000	2,000	2,000	
Dist. System Leakage	37,032	37,252	37,473	37,695	38,827	39,994	
Total ERUs	**926**	**931**	**937**	**942**	**971**	**1,000**	
ADD (mgd)	**0.222**	**0.224**	**0.225**	**0.226**	**0.233**	**0.240**	
MDD (mgd)	**0.426**	**0.428**	**0.431**	**0.433**	**0.447**	**0.460**	
MDD (gpm)	**296**	**297**	**299**	**301**	**310**	**319**	
Total PHD (gpm)	**608**	**611**	**614**	**617**	**633**	**650**	

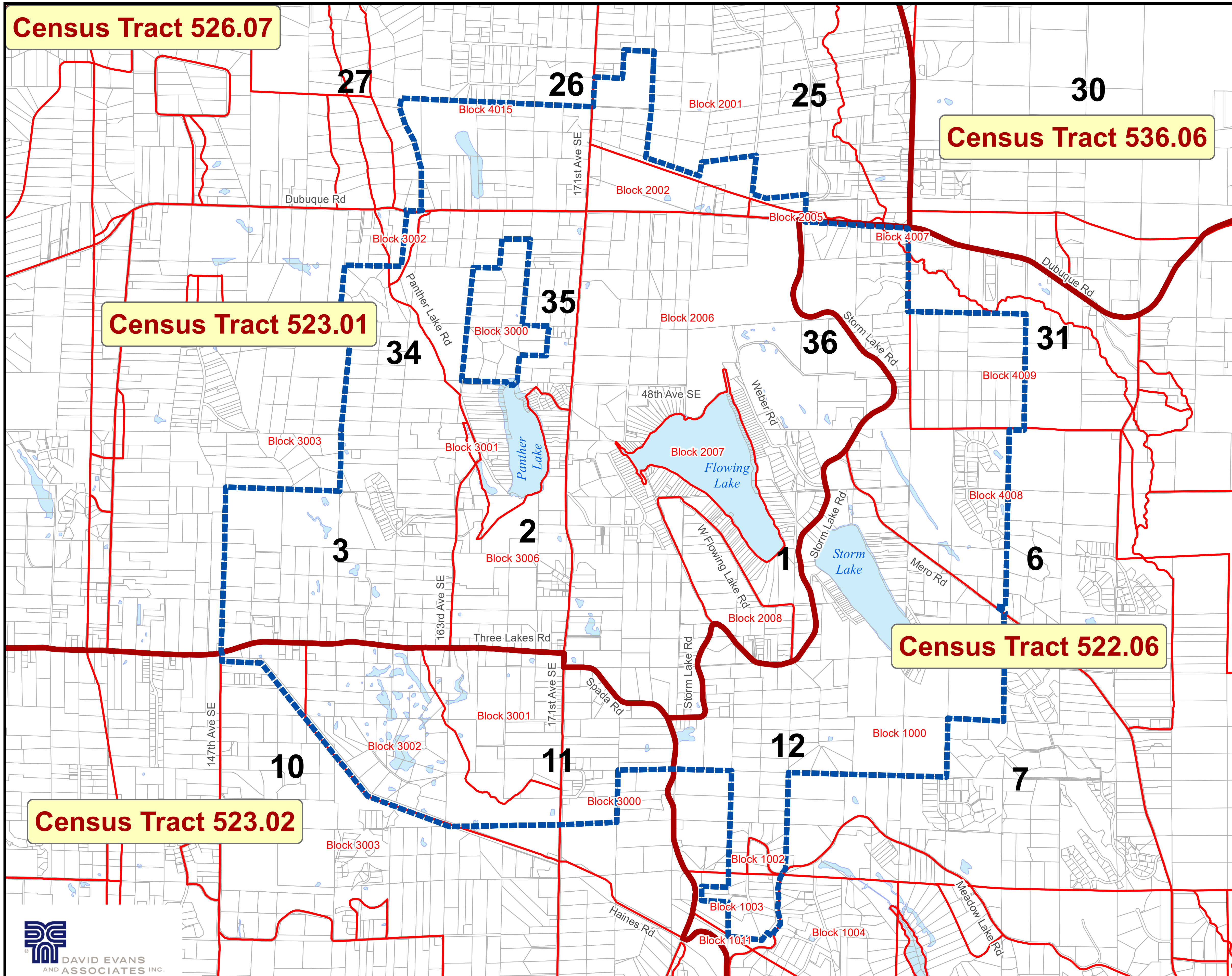
1. *Flow in gallons per day for each customer class/category*

TABLE 2.9

Projected Water Demand 2023 – 2043
(With Additional Projected Savings, flow increase per capita through 2043)

Type	2023	2024	2025	2026	2027	2028	2029
Single-Family Residential ERUs	878	884	889	894	900	905	910
Single-Family Residential	175,648	176,701	177,762	178,828	179,901	180,981	182,067
Commercial ERUs	10	10	10	10	10	10	10
Commercial	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Dist. System Leakage	35,530	34,847	34,155	33,453	32,742	32,022	31,291
Total ERUs	**888**	**894**	**899**	**904**	**910**	**915**	**920**
ADD (mgd)	**0.213**	**0.214**	**0.214**	**0.214**	**0.215**	**0.215**	**0.215**
MDD (mgd)	**0.409**	**0.407**	**0.404**	**0.402**	**0.400**	**0.398**	**0.396**
MDD (gpm)	**284**	**282**	**281**	**279**	**278**	**276**	**275**
Total PHD (gpm)	**587**	**584**	**581**	**577**	**574**	**570**	**567**
Type	**2030**	**2031**	**2032**	**2033**	**2038**	**2043**	
Single-Family Residential ERUs	916	921	927	932	961	990	
Single-Family Residential	183,159	184,258	185,363	186,476	192,137	197,971	
Commercial ERUs	10	10	10	10	10	10	
Commercial	2,000	2,000	2,000	2,000	2,000	2,000	
Dist. System Leakage	30,551	29,801	29,041	28,271	29,121	29,996	
Total ERUs	**926**	**931**	**937**	**942**	**971**	**1,000**	
ADD (mgd)	**0.216**	**0.216**	**0.216**	**0.217**	**0.223**	**0.230**	
MDD (mgd)	**0.393**	**0.391**	**0.389**	**0.386**	**0.398**	**0.410**	
MDD (gpm)	**273**	**272**	**270**	**268**	**276**	**285**	
Total PHD (gpm)	**563**	**560**	**556**	**552**	**566**	**581**	

1. *Flow in gallons per day for each customer class/category*



N

0 0.25 0.5 Miles

Legend

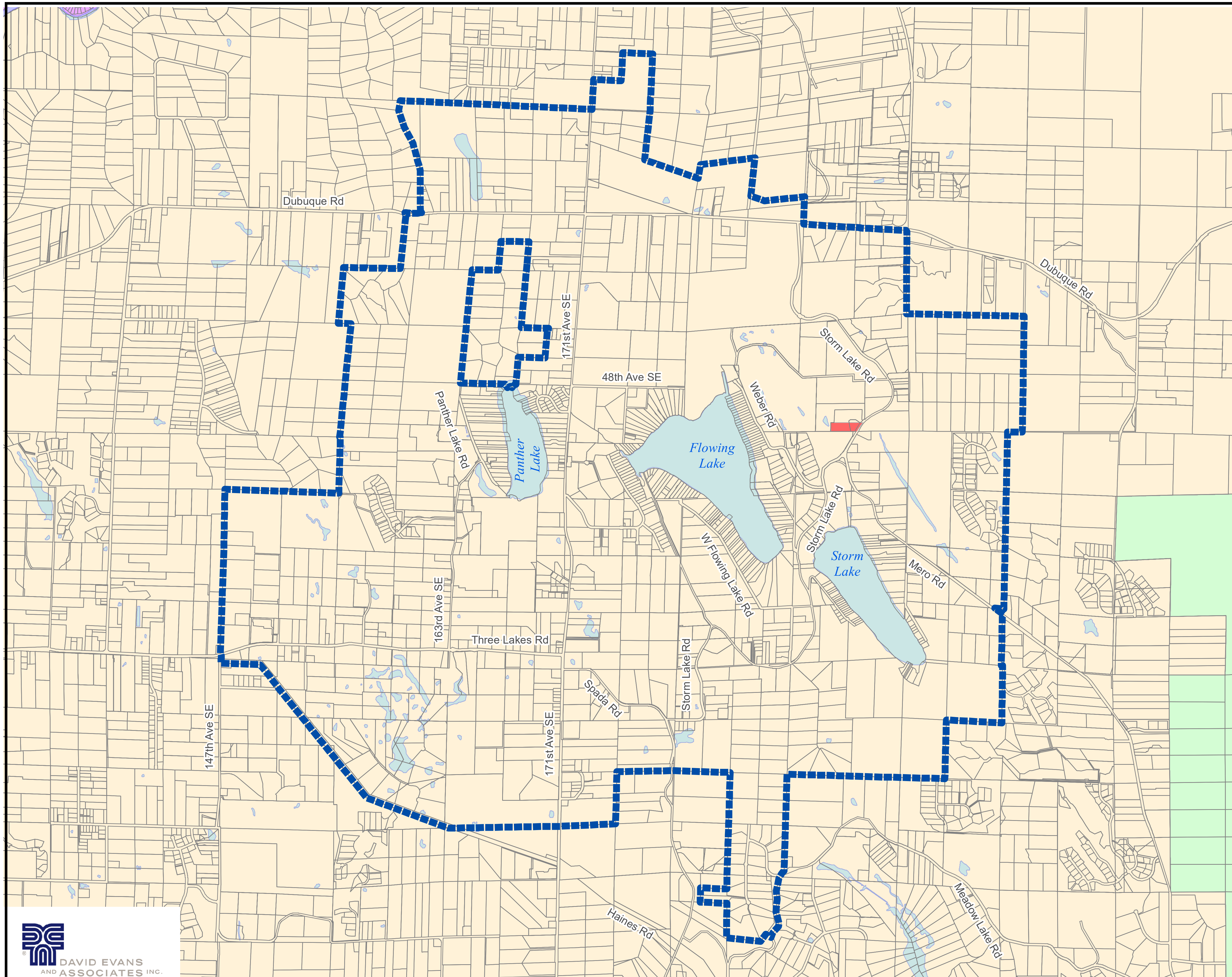
- Association Retail Water Service Area
- Census Tracts
- Census Blocks

DAVID EVANS AND ASSOCIATES INC.

THREE LAKES WATER ASSOCIATION

Comprehensive Water System Plan

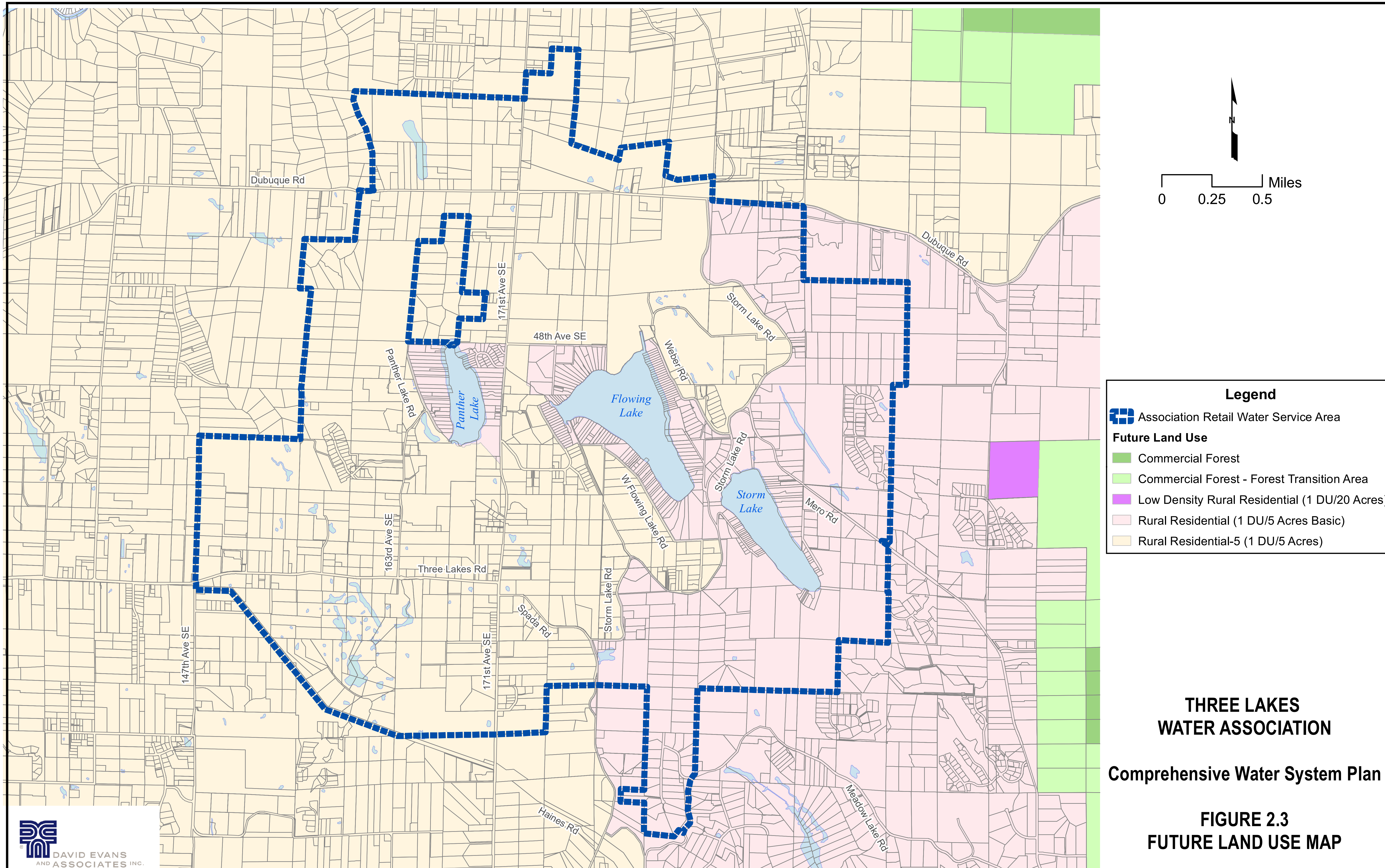
FIGURE 2.1
CENSUS TRACTS



THREE LAKES WATER ASSOCIATION

Comprehensive Water System Plan

FIGURE 2.2
EXISTING ZONING MAP



THREE LAKES WATER ASSOCIATION

Comprehensive Water System Plan

FIGURE 2.3
FUTURE LAND USE MAP

CHAPTER 3 – SYSTEM ANALYSIS

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CHAPTER 3

SYSTEM ANALYSIS

The purpose of this chapter is to evaluate and determine if the existing facilities within the Three Lakes water system are capable of supplying a sufficient quantity and quality of water to the Association's members while meeting the existing and projected demands of the system. In this section, five primary planning elements are discussed as follows:

- system design standards
- water quality
- system description and analysis
- summary of system deficiencies, and
- selection and justification of proposed improvements

The design standards identify the design criteria that apply to Three Lakes Water Association's system and facilities. The design and water quality standards for Group A public water systems are summarized in Chapter 246-290 WAC. These standards provide a set of minimum design and performance criteria for new water utilities and for all existing utilities planning to install capital facilities for expansion purposes. System description and analysis includes a description of the general condition of each system component and an analysis of the physical capacity of each component. The summary of system deficiencies identifies the improvements needed for the water system to meet present and future demands. The selection and justification for proposed improvements analyzes and discusses the improvements necessary to eliminate existing and anticipated deficiencies.

3.1 PERFORMANCE AND DESIGN STANDARDS

The system analysis criterion includes consideration of adequate water quality and supply and the sizing of storage and distribution facilities. The design criteria are based on historical Association records, recommended design standards by the Washington State Department of Health, the *North Snohomish County Coordinated Water System Plan* (CWSP) and other accepted standards normally used in the design and construction of water facilities.

The Washington State Department of Health's *Water System Design Manual* dated June 2020 was utilized for this system analysis. The primary design criteria include maintaining 30 psi in the distribution system during all normal demand conditions including peak hourly demand. In addition, system pressure of 20 psi is to be maintained under maximum day demand combined with fire flow conditions.

3.1.1 Abbreviations

In this report, several common technical terms and expressions have been abbreviated. These terms and their abbreviations are presented here.

ADD	Average Day Demand (gallons/day/ERU)
cfs	cubic feet per second
DOH	Washington State Department of Health
ERU	Equivalent Residential Unit
fps	feet per second
gal	gallon(s)
g/d/conn	gallons per day per connection
gpd	gallons per day
gpm	gallons per minute
MDD	Maximum Day Demand (gallons/day/ERU)
MSL	mean sea level
MGD	million gallons per day
PHD	Peak Hour Demand (gpm)
ppm	parts per million
psi	pounds per square inch

3.1.2 Reference Datum

The planning of facilities in this study is based on the National Geodetic Vertical Datum (NGVD) of mean sea level at elevation zero.

3.1.3 Period of Design

In the planning of water facilities, it is necessary to design facilities, which can provide for projected system demands through a specific period in time. This portion of time is known as the *period of design* and, for this plan, the period spans from the date of this plan to the year 2043. Specific planning years include the years 2023, 2028, 2033, 2038 and 2043.

In planning facilities with capacities adequate for the next 20 years, it should be noted that these requirements do not need to be fulfilled initially. A more realistic approach to the development and improvement of water system facilities is a plan which reflects the phasing of improvements such that capacity is provided ahead of the actual need for increased capacity as the system expands.

3.1.4 Water Quality Parameters

The Washington State Department of Health relies on the Safe Drinking Water Act (SDWA), various publications, agencies and the utility itself to develop and establish water quality and design criteria. Chapters 246-290-200 and 246-290-300 WAC provide the various criteria allowed by DOH. These chapters provide that:

(1) Purveyors shall ensure that good engineering criteria and practices are used in the design and construction of all public water systems, such as those set out in:

- Department guidance on design for Group A public water systems
- The most recently State or locally adopted edition of the *International Building Code (IBC), International Fire Code (IFC) and the Uniform Plumbing Code* (UPC)
- The most recently published edition of *Recommended Standards for Water Works, A Committee Report of the Great Lakes - Upper Mississippi River Board of State Public Health and Environmental Managers*
- Standard specifications of the American Public Works Association (APWA), the American Society of Civil Engineers (ASCE), the American Water Works Association (AWWA), or the American Society for Testing and Materials (ASTM)
- Design criteria, such as contained in current college texts and professional journal articles, acceptable to the Department
- Chapter 173-160 WAC Minimum Standards for Construction and Maintenance of Water Wells
- The latest edition of the PNWS-AWWA *Cross-Connection Control Manual*, or the University of Southern California (USC) *Manual of Cross-Connection Control*.

(2) In addition, purveyors of new or expanding public water systems shall consider and use, as appropriate, the following design factors:

- Historical water use
- Community versus seasonal or recreational uses of water
- Local conditions and/or regulations
- Community expectations
- Public Water System Coordination Act considerations where appropriate
- Provisions for systems and component reliability in accordance with WAC 246-290-420
- Wind pressures, seismic risk, snow loads, and flooding
- Other information as required by the State Department of Health.

3.1.5 Demand Factors: ADD, MDD and PHD

The Association's water demand forecasts are illustrated in Tables 2.8 and 2.9. The demand forecasts are represented in terms of the projected number of ERUs multiplied by the ADD. Typical water demands will vary yearly in response to climate changes and, in some cases, economic conditions. Utilizing the usage records for individual service meters and the monthly billing reports provided by the City of Everett, the calculation of the demands per ERU were determined as described in Chapter 2 and as summarized in Table 3.1.

For planning purposes, a volume of 200 gallons per day per ERU has been chosen as the planning ADD/ERU value. A ratio of MDD to ADD of 2.10 has been selected. Therefore, the MDD per ERU value for water system planning is 420 gpd/ERU. The forecast system wide MDD ranges from 284 gpm in 2023 to 319 gpm in 2043. The forecast PHD for the Association ranges from 587 gpm in 2023 to 650 gpm in 2043.

TABLE 3.1
Water Demand Factors and Projections

ADD/ERU		200						
		2023	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
ERU		888	894	899	904	910	915	920
ADD	**gpd**	175,648	176,701	177,762	178,828	179,901	180,981	182,067
	gpm	122	123	123	124	125	126	126
	mgd	0.176	0.177	0.178	0.179	0.180	0.181	0.182
MDD	**gpd**	408,589	411,013	413,452	415,905	418,373	420,855	423,353
	gpm	284	285	287	289	291	292	294
	mgd	0.409	0.411	0.413	0.416	0.418	0.421	0.423
PHD	**gpm**	587	590	593	596	599	602	605
		2030	**2031**	**2032**	**2033**	**2038**	**2043**	
ERU		926	931	937	942	971	1,000	
ADD	**gpd**	183,159	184,258	185,363	186,476	192,137	197,971	
	gpm	127	128	129	129	133	137	
	mgd	0.183	0.184	0.185	0.186	0.192	0.198	
MDD	**gpd**	425,866	428,393	430,936	433,494	446,516	459,934	
	gpm	296	297	299	301	310	319	
	mgd	0.426	0.428	0.431	0.433	0.447	0.460	
PHD	**gpm**	608	611	614	617	633	650	

3.1.6 Storage Requirements

There are four components of storage that must be reviewed when designing a water system: operational, equalizing, standby and fire suppression storage. Additionally, any component of dead storage must also be analyzed. Chapter 9 of the DOH *Water System Design Manual* provides recommendations and equations for determining the quantities of each component. Each of the five components is detailed below.

A. Operational Storage

Operational storage (OS) is the volume of a reservoir reserved for supplying system demands during times that the system supply is not delivering water.

B. Equalizing Storage

Equalizing storage (ES) provides water during periods of heavy consumption. It allows the use of smaller, more economical pumps and places less demand on the water source. Supply transmission mains can also be designed smaller because they do not have to supply peak demands.

The volume of storage required for equalizing purposes depends upon the peak hour demand and the rate of supply from the sources. The DOH manual sets forth a procedure for determining the required equalizing storage utilizing the typical variables historically found in most systems.

DOH Equation 7-1 relates supply (pumping) capacity with PHD to determine an applicable ES volume.

Equation 7-1:

ES = (PHD - Qs)(150 min) where

PHD = Peak Hourly Demand (gpm)
Qs = sum of all installed and active sources of supply (gpm)

C. Standby Storage

Standby storage (SB) is defined as the storage necessary to augment the available supply in the event that the system's source is out of service for a period of time. The Association has a single source of water supply but benefits from service from two City of Everett transmission mains and the City's water treatment facility. The original booster station is connected to the City's Transmission Main #3 at the north end of the service area. The second connection is to the City's Transmission Main #5 located at the south end of the service area.

Both booster pump stations will be supported by onsite generators with completion of a generator project at BPS #1 in 2023. The Association's network is robust and reliable in its ability to access City of Everett water. This additional connection enables the Association's system to be considered a multiple-source system.

Standby storage is determined by application of DOH WSDM Equation 7-2.

Equation 7-2:

$SB = (N)(SB_i)(T_d)$ where

N = Number of ERUs based on the ERU_{MDD} value
SB_i = Locally adopted unit SB volume in gallons per day per ERU (number of ERUs based on the ERU_{MDD} value).
T_d = Number of days selected to meet water system-determined standard of reliability.

Consistent with prior DOH design guidance, the volume of SB in the case the system lost its largest source but still had some supply was also considered. Utilizing the prior multi-source system equation of $(2(ADD)(ERUs) - 1440(Q_s\text{-}Q_L))$, where Q_s is total supply and Q_L is the largest source of supply, the system does not require SB, as the capacity of any single pump is greater than the MDD for the forecast period.

DOH recommends that SB be at least 200 gallons per ERU.

D. Fire Suppression Storage

The fourth component of required storage is the amount required for fire suppression storage (FSS). The fire flow rates required within a purveyor's boundaries are generally determined by the local fire jurisdiction and are calculated on an individual risk basis. The maximum flow for the highest risk structures can determine the maximum flow requirement for the purveyors. Among the factors evaluated are type of construction, area, and number of stories, exposures, and internal fire protection services.

Fire flow rates for the Association are set forth by the Snohomish County Fire Marshal. The determination of the FSS storage volume is determined by DOH Equation 7-3, which multiplies the required rate by the required duration.

Equation 7-3:

$FSS = (FF)(t_m)$ where

FF = required fire flow rate
t_m = required duration

E. Dead Storage

Dead storage (DS) is the volume of water not available for the system such as the lower volume in a standpipe.

3.1.7 Fire Flow Rate and Duration

Fire protection is of primary importance in all communities. In most circumstances, fire flow requirements impose the greatest demands on a water system, as the required flows can be one to two times the projected peak hour demands. Fire flow requirements are presented in WAC 246-293-640, the CWSP, and in Snohomish County Code and standards adopted therein. The referenced WAC does not require fire flow in rural areas. However, the CWSP and the International Fire Code (IFC), adopted by the County, are applicable in the Association service area with a requirement for 750 gpm for 120 minutes, under most conditions.

Correspondence with the County fire officials (see Appendix A) confirms the use of 750 gpm fire flow for a duration of 60 minutes. The analysis of available and required storage volume presented below is based on the longer requirement, as some structures in the service area may need the longer duration. The effect is that, for most uses in the service area, the Association is prepared to provide more storage volume for fire suppression, or as discussed below, some standby storage.

Fire flow requirements for certain structures may be higher or lower depending on building-specific conditions. Under the referenced standards, fire flow requirements are a minimum of 1,000 gpm for a period of two hours for all single-family residences under 3,600 square feet. All commercial buildings and residences larger than 3,600 square feet are governed by size and type of structure. These standards are presented in Appendix B of the International Fire Code, which is included in Appendix D.

Considering the above information, the system was analyzed with 750 gpm as the maximum required fire flow.

It should be noted that the County Code does not specify fire flow requirements for existing portions of the system. However, the hydraulic analyses conducted for the update of this plan have considered the available fire flows for the entire system.

3.1.8 Distribution System Pressure

Water systems shall be designed to maintain a minimum residual pressure of 30 psi under PHD conditions, excluding fire flow demand. This pressure shall be maintained at the meter or the property line if no meter is present. A residual pressure of 20 psi shall be maintained under the combined fire flow and MDD conditions.

The size of new water lines shall be as necessary to provide the minimum required fire flow and/or PHD, whichever is greater. New mains shall also be sized for a maximum velocity of eight fps. The maximum pressure at the point of a member connection should be 80 psi. Pressures on the member side of the service meter are regulated by the member.

3.1.9 Minimum Pipe Size/Looping

Water mains shall be a minimum of 8-inch diameter if providing fire flow, or larger in accordance with this plan. Water mains not providing fire flow may be smaller under certain conditions and as approved by the Manager. Fire hydrant laterals shall be a minimum of 6-inch for runs up to 150 feet. Laterals of 150 feet and longer shall be a minimum of 8-inch. An engineering analysis shall be completed for any extension of the system. This analysis shall consider the specific hydraulic conditions and fire flow requirements for the development.

Water mains within a development and the system should be “looped” where feasible and/or designed with multiple connections to the existing water distribution system in accordance with this plan. Water line extensions shall be continued through or along the property being developed for potential future connection or extension.

3.1.10 Valve and Hydrant Spacing

Fire hydrants shall be located in accordance with the most current requirements of the Snohomish County Code and the Snohomish County Fire Marshal. The Code currently requires fire hydrants to be spaced at a maximum of 500 feet. Any hydrant branch exceeding 50 feet in length shall be 8-inches in diameter.

In-line system valves shall be located at all tee locations and a minimum of every 700 feet.

3.2 WATER QUALITY ANALYSIS

All Group A public water systems must comply with the provisions of the Federal Safe Drinking Water Act (SDWA). The Washington State water quality provisions are contained in Chapter 246-290 WAC and generally incorporate the SDWA requirements. Water supplied to the members of Three Lakes Water Association is purchased from the City of Everett, which maintains the water quality of the source water.

The City utilizes the Sultan River as its source of supply. Water from the river is retained in Spada Lake Reservoir, which, in turn, supplies the Chaplain

Reservoir. Water from this reservoir is treated and then transmitted though five large pipelines, which flow toward the City. The Association taps two of these transmission mains as their sources of supply.

As the supplier of water, the City of Everett is required to provide the Association with water meeting or exceeding all State and Federal water quality standards. To ensure this standard is met, the Association takes routine water samples and participates in a regional lead and copper sampling program which is managed by the City of Everett. Participation in the program meets the Association's lead and copper sampling requirement as currently required by DOH. The water samples for the lead and copper program are taken within the Association service area and then sent to the City for analysis. The most recent sample was collected in the Association in August 2021 and will continue as required every three years. The compliance date for the federal Lead and Copper Rule Revisions (LCRR) is October 2024. The Association is hopeful that the future LCRR requirements can be accomplished in a similar manner, but is prepared to develop an individual process if directed by DOH to remain in compliance.

The Association also takes two coliform monitoring samples each month per the approved Coliform Monitoring Plan. These samples are forwarded to a local lab for analysis. The testing results are provided to the Association and DOH. When performing the coliform testing, the Association also takes chlorine residual samples at the two sample locations and the residual amount is noted on the lab slip. A copy of the Association's Coliform Monitoring Plan is included in Appendix F.

In addition to the above sampling, the Association is required to take daily chlorine residual samples and asbestos samples once every nine years. The Association completed the asbestos sample in October 2020. The results indicated detected levels well below the reporting level.

Everett fluoridates its water supply and is responsible for water quality monitoring applicable to that measure.

In January 2006, the Environmental Protection Agency (EPA) published the Stage 2 Disinfectants and Disinfection Byproduct Rule (Stage 2 Rule), requiring water systems to meet disinfection byproduct maximum contaminant levels (MCLs) at each disinfection byproduct monitoring site in the distribution system to better protect public health. Water systems are required to conduct an Initial Distribution System Evaluation (IDSE) to identify locations in the distribution system that have the highest Total Trihalomethane (TTHM) and highest Haloacetic Acid (HAA5) concentrations and also complete an IDSE report. The Association completed the IDSE Standard Monitoring Plan and submitted to EPA on September 26, 2006. The Association is in current compliance with the EPA requirements. Quarterly sampling began in May 2012 and that frequency continued through February 2022. Sampling is presently required annually in

November and the WQMS is reviewed each year to confirm if the reduced frequency of annual sampling is still in effect. All results to date have been satisfactory.

3.3 SYSTEM DESCRIPTION AND ANALYSIS

The Association's major facilities and distribution system are described in the following sections and are illustrated in Figure 3.1.

3.3.1 Source of Supply

The Association purchases all its water from the City of Everett. The arrangement is essentially as a wholesale customer and a long-standing member of the Everett Water Utilities committee, operating without an official contract document. The City has provided assurance that it has capacity to supply the Association at least until the year 2043, at the demands anticipated in this plan (see letter in Appendix A). As stated previously, the Association is served by two taps onto the City's transmission main system.

The portions of the City's water supply system, which are directly related to the operation of the Three Lakes Water Association, are the Everett Transmission Lines #3 and #5 and the source and treatment system. The transmission mains convey water from the filtration plant at Chaplain Reservoir to the City of Everett's distribution system. Along the route various water purveyors, including the Association, have taps on these mains to supply their systems.

Transmission Line #3 is a 48" line, which extends from the filtration plant and crosses the Snohomish River into Everett. The Association has a 6-inch tap and 4-inch turbine meter on Transmission Line #3. This supplies BPS #1 at the north end of the Association.

Transmission Line #5 also begins at the filtration plant and extends to the City's distribution system. During lower demand periods, Transmission Line #5 is fed by gravity from the clear-well at the Everett Water Filtration Plant. Under higher demand periods (> 50 MGD in the #5 line) the pipeline is fed from the standpipe at the Everett Water Filtration Plant. The Association has an 8-inch connection and a 6-inch turbine meter on this 36" transmission line. This connection feeds BPS #2 which is located at the southern end of the Association.

<u>Everett Public Utilities Water and Filtration Charges</u>

The City of Everett's cost of water supply to the Association includes three charges each month per section 14.16.713 of the City of Everett Municipal Code. These charges are applicable for connections east of the Snohomish River. These three charges are as follows:

Charge	2021	2022	2023	2024
Meter-each	$407.23	$407.23	$463.00	$527.00
Water-ccf	$0.6848	$0.6848	$0.7788	$0.8868
Filtration-ccf	$0.8987	$0.9206	$0.9530	$0.9860

These rates are effective January 1 each year. The water charges include a 20% surcharge and are assessed to all wholesale customers served outside the city limits of Everett, east of the Snohomish River. The filtration and meter charges are exempt from this surcharge.

Future year charges have been set through 2024 by the City of Everett. An allowance for future increases has been considered in the financial analysis presented in Chapter 9.

Source Capacity Analysis

Both City of Everett connections are in good condition and are expected to be adequate to supply the Association through the 20-year planning period. The capacity of each connection separately is greater than the Association's current projected MDD and the combined capacity (one pump for each connection) is greater than the projected year 2043 PHD. The capacity of each Association booster pump station is described in Section 3.3.5 below.

The Association is not aware of any circumstances that would limit the City's ability to provide the necessary quantity of water to meet the projected needs of the Association. Therefore, the source capacity of the Association is not foreseen to be a limiting factor in the growth of the Association. Further information regarding source of supply can be found in the Everett 2020 *Comprehensive Water Plan*.

3.3.2 Water Treatment

As described in Section 3.2, Everett performs all water treatment and primary water quality monitoring of the water distributed by the Association.

Water Treatment Capacity Analysis

The Everett 2020 *Comprehensive Water Plan* does not specifically mention a water treatment capacity analysis. However, the plan does call for various improvements to the existing Everett Water Filtration Plant.

3.3.3 Storage

The Association has a 228,000-gallon steel standpipe located in the central part of the distribution system, as illustrated on Figure 3.1.

Water is supplied to the standpipe by the Association's two booster pump stations. Submersible pressure transducers in the standpipe sense water level to initiate pump operations. Pump calls are alternated between the three booster pumps located within the two stations.

Storage Capacity Analysis

The water storage requirements for the Association are described in the following sections. Where applicable, equations from the DOH *Water System Design Manual* were used to determine the required storage capacities and each element of storage is detailed and quantified below. The relative equations are further detailed in Section 3.1.6 of this plan and Table 3.3 summarizes the total required storage volumes for the Association.

Operational storage (OS) is defined as the volume of water available to meet system demands when water is not being supplied by both of the separate City of Everett taps. There is no required amount of operational storage by regulation; however, system restrictions such as those imposed by pump capabilities often dictate the need for operational storage. The standpipe relies on the booster pumps' supply from the City's regional supply system. The difference between the pump on and pump off setting is about 3.75 vertical feet. This equates to 8,800 gallons of OS in the standpipe.

Equalizing storage (ES) is supplemental storage, which is utilized when system demands are higher than the source capacity. The amount of ES generally increases each year as the system expands. Equation 7-1 from the DOH manual was used to determine the ES volumes of the system for each planning year. With the Association's large, combined station pumping capacity, the required amount of ES is deemed to be zero through 2043.

Standby storage (SB) volumes for a multiple source system are determined by considering a reduction or loss of supply for the system. This volume generally increases each year as the system expands and daily demands increase. DOH Equation 7-2 was used to evaluate the Association's SB requirements and these values are presented in Table 3.2.

Based on current capacity of two sources, forecast demand and application of DOH Equation 7-2, the system requires addition of approximately 333,000 gallons of SB storage immediately, with that number growing to approximately 389,000 in 2043. This is over three times the total available storage above 20 psi in the existing standpipe, not including other storage considerations.

DOH also recommends a minimum of 200 gallons/ERU of SB volume. For 2023, that recommended volume exceeds 177,000 gallons and this value increases to 200,000 by year 2043. The existing standpipe provides about 110,000 gallons of SB (total available at 20 psi less OS), if FSS is considered nested with SB.

Nesting of FSS with SB is discussed further below. Consideration of this minimum indicates a forecast deficit of 90,000 gallons of storage capacity by 2043.

The existing standpipe was sized based on prior DOH requirements that allowed consideration of the benefits of multiple sources of supply for the system. The Association recognizes that ultimately the system has a single source of supply (Everett's supply and treatment facilities). Nonetheless, the system can be considered as a multi-source system for interruptions in supply that impact redundant elements of the supply system (e.g., only one transmission main or Association booster pump station out of service). Such interruptions are perceived to be more likely than a full interruption in supply from Everett's source or treatment facility. If the system is considered a multi-source system and the highest capacity Everett transmission main or Association pump station is not available, the other main and station have capacity exceeding the MDD for the system throughout the planning period. Therefore, the SB volume requirement drops to zero, setting aside the DOH minimum volume for SB as referenced above. In this context, the system storage is focused on FSS with a surplus volume of over 20,000 gallons. Alternatively, presuming a total loss of supply is not concurrent with the need for fire flow, the system has storage capacity for about 125 gallons per ERU in 2023, decreasing to about 110 gallons per ERU in 2043.

This issue was reviewed with the Association Board during the design of the current standpipe and again for development of this plan. Consideration was given to addition of storage volume at the only relatively high point in the service area (not the current standpipe location) but given the probable small number of connections at that higher area, and the significant amount of dead storage already in the system, the Association generally prefers not to add additional storage volume. Other high points in the system are located outside the central area of the system and assuring adequate turnover of the volume in storage, without significant looping of distribution mains, would prove challenging and/or costly.

Ultimately the Association considers the cost of additional storage for SB volume, whether elevated, standpipe or pumped, to be very expensive relative to the benefit in the context of a system that has two independent sources of supply from the City of Everett. Each source can meet the system needs on its own, for most of the planning period, and can be readily upgraded to keep pace with demand. The risk of a simultaneous interruption in supply from both sources is very low and presumed to be the result of a regional challenge or catastrophic event. As described below, there are other significant improvements to be made, over time, in the system and financial resources will be directed to that work.

Fire Suppression Storage (FSS) is a function of the volume and the duration of a required fire flow. State and local ordinances address fire flow requirements. In rural areas there can be a range of required flow, from nothing to several thousand gallons per minute for large commercial structures. Snohomish County Code appears to be the most restrictive with respect to the predominately single-family development in the service area. The current County Code requires 750 gpm for 60 minutes for single-family residences in the rural area. However, based on the potential need for longer duration at some locations, and consistent with prior versions of the IFC, the Association has chosen to use 120 minutes for planning purposes. The planned amount of fire flow storage is as follows.

FSS Volume = 750 gpm x 120 min. = 90,000 gallons

This volume is effectively twice the volume required by County code. An alternative view is that the system has about 45,000 gallons of FSS and about 65,000 gallons concurrently available for SB.

Dead Storage (DS) is that volume not available to the water system at adequate pressure. Due to the existing service connections in the immediate vicinity of the standpipe site, the volume of dead storage in the Three Lakes system is significant.

Table 3.2 summarizes the Association's required storage volumes considering the requirement to meet minimum pressures at every service connection and a minimum residual of 20 psi during an emergency situation. As indicated above, the system is deficient in storage capacity based on current DOH requirements.

The Association does not plan to add additional storage capacity, within the next ten years at least. The Association has an additional parcel adjacent to the current standpipe, but no site planning has been completed for use of that property, for a standpipe or other purposes.

The existing standpipe is about 13 years old and in good condition. The exterior paint is in good condition and at the time of the last interior inspection (2018), the interior coating was also in good condition. The Association plans to complete the next interior inspection by 2026.

TABLE 3.2
Storage Capacity Analysis

	2023	***2028***	***2033***	***2038***	***2043***
Required Storage Volumes					
Operational Storage	8,800	8,800	8,800	8,800	8,800
Equalizing Storage	0	0	0	0	0
Standby Storage	443,938	456,958	471,238	485,518	499,798
Fire Suppression Storage	90,000	90,000	90,000	90,000	90,000
Total Required Storage	**542,738**	**555,758**	**570,038**	**584,318**	**598,598**
Total Required Storage*	**452,738**	**465,758**	**480,038**	**494,318**	**508,598**
Available Storage Volumes					
Total Storage Available	228,000	228,000	228,000	228,000	228,000
Less Dead Storage (20 psi)	108,600	108,600	108,600	108,600	108,600
Less Dead Storage (30 psi)	162,900	162,900	162,900	162,900	162,900
Available – Emergency Svc.	119,400	119,400	119,400	119,400	119,400
Available – Normal Svc.	65,100	65,100	65,100	65,100	65,100
Available minus Required					
Emergency - Surplus/(Deficit)*	**(333,338)**	**(346,358)**	**(360,638)**	**(374,918)**	**(389,198)**
Normal - Surplus/(Deficit)	**56,300**	**56,300**	**56,300**	**56,300**	**56,300**

All values in gallons.
** Indicates values with FSS nested with SB.*

3.3.4 Telemetry

The Association's automated control and telemetry system has evolved from a simple single-pump call system to a more advanced control system. The Association can operate three booster pumps on a rotating lead/lag/lag cycle. Programmable logic controller (PLC) units are located at each booster station and the standpipe. The automated control system is centrally located at the Association Office.

Submersible pressure transducers within the standpipe sense water level and at select setpoints initiate a call for the lead pump (which is rotated between each pump call). Should there be a failure of this pressure transducer level monitoring system, a secondary float system within the standpoint is available for redundant level sensing. Should the demand be higher than the capacity of the lead pump, a second pump is called to work in conjunction with the lead pump. Likewise, a third pump is also available. If a pump in the rotation is called and the pump is out of service or fails during service, the next pump in the rotation is automatically called for service.

BPS #2 is supported by an onsite standby power generator to ensure service to its members is not interrupted during power outages. The standby system also supplies power for the PLC units at the station. Improvements at BPS #1 are in progress to complete addition of standby power equipment by fall of 2023.

In addition, the PLC unit which relays information regarding the standpipe levels calls is equipped with standby battery power units and a small standby power unit for essential functions at the standpipe site. The standpipe site is also supported by a small standby power generator for continued telemetry system functions and minimal additional power supply for other uses at this site.

Future upgrades of the system will be required as software and hardware are improved, and current programs require update or replacement.

3.3.5 Distribution System

The Association's distribution system is a two-zone system connected to two booster stations and a single standpipe. Submersible pressure transducers in the standpipe call for pumps when water level drops and the booster pumps supply the system demands while filling the standpipe. The western portion of the system is isolated as a lower pressure zone (Pressure Zone 2), by two pressure reducing valve (PRV) stations, one on Dubuque Road and one on Three Lakes Road (see Figure 3.1).

The lowest pressures within the existing distribution system are located at the base of the standpipe. The highest pressures exist at BPS #2 and at the lowest elevations of Pressure Zone 2. BPS #2 is located approximately 240 feet in elevation below the high level of the standpipe; thus, the system pressure at the station is relatively high. However, the first service connection is located approximately 1,070 feet away, north along 171st, at an elevation 70 feet higher than the booster station.

The eastern portion of the distribution system (Pressure Zone 1) is generally well looped; however, there are about 10 pipe runs which are substantive dead-end runs. Unfortunately, the development of the area has resulted in many dead-end roads and the distance and surrounding topography generally limit the creation of loops. Within Pressure Zone 2 there are about 11 substantive dead-end pipe runs. With future development there will be the opportunity for extension and eventual looping of several such runs, in both pressure zones.

An inventory of the Association's distribution system is included in Section 1.4 and a map of the water system, including appurtenances, is included as Figure 3.1.

Evidence from maintenance and routine inspections suggests that the overall system is in acceptable condition. The majority of system repairs are conducted on radial breaks in the aging asbestos cement (AC) mains and leaks in older small lines. As of August 2023, approximately 56% of the system remains as AC pipe material. The system is periodically assessed by a professional leak detection service, particularly when a substantive leak is detected from water use data but is not evident from detailed field reconnaissance.

The Manager coordinates all system repairs and service line taps. In addition, the Manager coordinates reading the service meters and performs inspections of construction projects.

All water system "as built" records are kept as paper records and all such plans have been scanned for electronic storage and access. The system maintains CAD and GIS mapping and data records which include the locations of all facilities and available data for each asset.

Fire Hydrants

The Association has fire hydrants throughout the service area; however, there are many areas where hydrant spacing is greater than the requirements of the Snohomish County Code. The current Code requires hydrant spacing of 600 feet or less for hydrants serving single-family dwellings and duplexes. However, it should be noted that the County requirements are for new portions of a water system and are not specific to existing portions of the system.

The Association's fire hydrant coverage throughout the service area can be considered marginal to adequate for its rural environment. As stated above, in many areas the spacing does not meet the standards of the current county code; however, this is true with many rural communities.

Booster Pump Stations

The pump at BPS #1 is in good condition, except for the roof. The roof at BPS #1 is nearing the end of its useful life. The original horizontal-mount pump was replaced in 2021 with a vertical mounted pump assembly rated at 350 gpm at 335 feet TDH as a target duty point. The pump has been tested at approximately 375 gpm at 360 feet TDH. The station itself is small but functional. The tap onto the City of Everett's transmission main at BPS #1 is considered to be in good condition. However, inlet pressure is relatively low (10 psi or less). A project is in progress to add a standby generator for reliability by the fall of 2023.

The construction of BPS #2 was completed in May of 2005. The CMU building houses two pumps. The pumps have been recently replaced with units rated at 350 gpm at 300 feet TDH each. The pumps have been tested at approximately 370 gpm at 266 feet TDH or 550 gpm for both pumps working simultaneously.

The redundancy built into the station allows the Association to continuously supply water in the event of a pump failure at this site or at BPS #1. This station includes a standby generator for continued service during power outages.

Hydraulic Capacity Analysis

The existing water system was analyzed with the computer software program Bentley WaterGEMS from Haestad Methods, Inc. This program integrates the network analysis methods from the Kentucky Pipe software program (KYPIPE) with the graphical interface of AutoCAD. Using the mathematical model representing the Association's water system, evaluations were performed for both the existing conditions and the projected future demands. These analyses were performed to determine existing and future deficiencies within the Association. Additionally, alternative improvement plans were tested via the model to evaluate the optimal hydraulic solution.

The existing model (pipe diameter, length, roughness coefficient, junction demand and elevation, etc.) has been updated with each water system plan revision. In this model, the water demands are distributed across the model nodes for the system in relative proportion to demand as determined from the four meter-reading areas. The demands of the base model generally mimic the current average daily demands of the system. Global demand factors were applied to the base demand model to simulate the existing or projected demands for MDD, MDD with fire flow (MDDFF) or PHD. A roughness coefficient of 130 was initially assumed for all pipes. Boundary conditions such as normal/minimum supply pressure were also entered in the model.

Computer modeling was performed for MDD, MDDFF and PHD conditions for all planning years. The MDD demands were modeled; however, the results of the MDD with fire flow and PHD modeling were studied more closely as the PHD demands are higher than the ADD and MDD demands. Select data regarding modeling input and output data is included in Appendix G and a schematic of the system model is illustrated in Figure 3.2. The following provides a summary of the modeling process and the results.

Separate scenarios were created by globally increasing the demands of the model to simulate the demand conditions for years 2023, 2033 and 2043.

The results of the modeling analyses for the MDD, MDDFF and PHD demands, for all planning years, indicated that the existing distribution system is capable of supporting the projected system demands under the current and forecast conditions, with the exception of fire flow for several areas within the system. MDD and PHD demands were analyzed for supply only from BPS #1 (one pump) and MDDFF was analyzed for supply only from BPS #1 (one pump) and for supply from only one pump at BPS #2. BPS#1 was selected for the MDD and PHD conditions analysis because the path for supply from the station to the existing standpipe is all 6” AC pipe, whereas the supply from BPS #2 is a combination of 10” DI and 6” AC pipe (i.e., higher capacity).

Fire flows were modeled under the projected MDD conditions for each planning year. The Association’s fire flow criterion is 750 gpm for all areas. In all scenarios, fire flows were limited by low system pressure rather than velocity exceeding 10 feet per second.

Table 3.3 summarizes the results of the modeling and indicates the highest and lowest pressures and highest velocities in the system.

TABLE 3.3
Hydraulic Capacity Analysis - Summary of Results

	2023 - Ex.	2023 - w/CIP	2033	2043
MDD (P>30 psi, V<8 ft/s) **- BPS #1 Supply**				
Lowest Pressure (psi)	42	42	42	42
(at Node Number)	J-57, J-55, J-5, J-450	J-57, J-55, J-5, J-450	J-57, J-55, J-5, J-450	J-57, J-55, J-5, J-450
Highest Pressure (psi)	157	157	157	157
(at Node Number)	J890	J890	J890	J890
Highest Velocity (ft/s)	4.9	5.4	5.4	5.4
(at Pipe Number)	326	326	326	326
PHD (P>30 psi, V<8 ft/s) **- BPS #1 Supply**				
Lowest Pressure (psi)	42	42	42	42
(at Node Number)	J-57, J-55, J-5, J-450	J-55, J-5, J-450	J-57, J-55, J-5, J-450	J-5
Highest Pressure (psi)	155	155	154	153
(at Node Number)	J890	J890	J890	J890
Highest Velocity (ft/s)	5.0	5.4	5.4	5.4
(at Pipe Number)	326	326	326	326
MDD with FF (P>20 psi, V<10 ft/s) **- BPS #1 Supply**				
Deficient FF Nodes (count)	29	28	29	29
Lowest Pressure (psi)	20	20	20	20
(at Node Number)	J540, J-29, J750, J-35	J540, J-29, J750	J540, J-29, J750, J-35	J-35, J540, J750, J-29, J250
Highest Pressure (psi)	153	157	152	157
(at Node Number)	J890	J890	J890	J890
Highest Velocity (ft/s)	8.7	8.8	8.7	8.8
(at Pipe Number)	340(1) & 730	730	340(1)	340(1)
MDD with FF (P>20 psi, V<10 ft/s) **- BPS #2 Supply**				
Deficient FF Nodes (count)	60	33	33	46
Lowest Pressure (psi)	20	20	20	20
(at Node Number)	J70, J-35, J540, J750, J-29, J250	J70, J-35, J540, J750, J-29, J250	J70, J-35, J540, J750, J-29, J250	J70, J-35, J540, J750, J-29, J250
Highest Pressure (psi)	157	157	155	155
(at Node Number)	J890	J890	J890	J890
Highest Velocity (ft/s)	8.9	8.9	8.9	8.9
(at Pipe Number)	730	730	730	730

P = pressure, V = velocity

3.4 SYSTEM DEFICIENCIES / PROPOSED SOLUTIONS

The following system deficiencies have been identified from the preceding system analysis.

3.4.1 Source of Supply

The Association's supply of water is provided by the City of Everett. Review of the City's current *Comprehensive Water Plan* indicates that the supply of water available at the Water Filtration Plant (WFP) is adequate through approximately 2030[1]. After that, the demand begins to exceed the existing capacity and will be approximately 9,002 gpm (approximately 13 MGD) deficient under the City's entire 2040 demands. The City is aware of the potential deficit and has begun to evaluate the options for expansion of the WFP. Nonetheless, the City has confirmed it can provide adequate supply for the Association through the 20-year planning period (see letter in Appendix A).

The Association's system is supplied by two taps from Everett's system. Each tap should be capable of supplying the Association's maximum day demand, assuming the other station or Everett transmission main is not available for service through the planning period. Both stations have a capacity of 350 gpm which exceeds the MDD forecast for year 2043.

Increased capacity at BPS #1 and BPS #2 can be deferred beyond year 2043, However, as discussed below, a new booster pump station is recommended (#3) for expansion of the system and enhanced reliability for supply. BPS #3 will ideally be located generally near the intersection of Dubuque and Storm Lake Roads. The new station should have two pumps, one as standby, with capacity to meet the year 2043 MDD (to be reviewed at time of design) with allowance for future capacity increase. Eight-inch supply lines should be adequate, west along Dubuque and south along Storm Lake Road, for eventual connection to the existing system. The inlet pressure will be higher at this location, with lower ground elevation, and the hydraulic grade line of Everett's transmission main will be slightly higher than at BPS #1, thus reducing the static head to transfer supply into the Association's system. Further evaluation will be necessary to determine the preferred location of the station in context of available property and how much development occurs in that portion of the service area. There may be lower demand in that area since some large parcels are now owned by Snohomish County and will be managed as park property.

3.4.2 Water Treatment

All water treatment is provided by the City of Everett. See the capacity discussion immediately above.

[1] Per Table 4-3, p. 4-4, Everett 2020 Comprehensive Water System Plan, 2020.

No treatment improvements by the Association are warranted.

Per- and polyfluoroalkyl substances (PFAS) are a contaminant of concern in potable water systems. In 2014 the City of Everett monitored its water supply per the EPA's Unregulated Contaminant Rule 3 (UCMR 3) and PFAS compounds were not detected in the City's water supply at that time. The City is monitoring the water supply quarterly per EPA UCMR 5 for an expanded list of PFAS compounds. Because of the protected nature of the City of Everett's drinking water, there are no sources of PFAS in Everett's watershed. Activities like fire-fighting training, manufacturing, and agriculture are prohibited within its watershed. Therefore, the Association does not anticipate that PFAS will be a contaminant of concern. Nonetheless, the Association plans to continue to monitor the City's water quality efforts and results, to support planning for attention to this potential group of contaminants.

3.4.3 Storage

As described in Section 3.3.3, the Association has a 228,000-gallon standpipe. The standpipe base is at elevation 673.5 feet and the overflow is 97 feet above the base, establishing a maximum hydraulic grade line at elevation 770.5 feet. It is in good condition and interior and exterior coatings are anticipated to have a useful life of more than 10 years.

The standpipe provides sufficient dead storage to maintain 30 psi to service connections at ground level adjacent to the standpipe site. Analysis of the required versus available storage as presented in Table 3.3 reveals the system is deficient due to recent changes in requirements for standby storage volume evaluation.

No storage capacity improvements are recommended at this time, but such is noted for consideration beyond 10 years.

There is one significant portion of the service area that is not presently served by the distribution system and that may support development at an elevation higher than 673 feet. That area is on a ridge southwest of Storm Lake, with ground elevation reaching approximately 720 feet. That area is now part of the Snohomish County park system. There are presently no long-range plans for the development of this park. For this system analysis, it is presumed that there will be no significant development at the high ground of this area. Therefore, there are no water capital improvements planned for service. Conditions and means of service will need to be determined in context of the proposed improvements and water supply needs at such time as that information is available.

3.4.4 Telemetry

The system automated control and telemetry system was recently upgraded with new hardware and software, for continuous monitoring and control from a computer workstation at the Association office and via secure connection from operators' laptops or mobile devices. Communication between remote sites has been moved from leased phone lines to the local cable internet service.

Periodic upgrades of hardware and software will be necessary.

3.4.5 Distribution System

General Distribution

The Association has initiated a project to replace a significant portion of 6" AC water main with DI water main. Preconstruction and construction loan funding has been secured for the project, for implementation in the next three to four years. Approximately 14,000 feet of main will be replaced from BPS #1 south along 171st Ave SE to Three Lakes Road and east from 171st Ave SE along 58th St SE to the standpipe site. Two additional segments are included in the project: a 500-foot-long segment on 163rd Ave SE crossing Panther Creek and a 900-foot-long segment on 62nd St SE west of 181st Ave SE.

Following completion of the 171st Ave SE project described above, nearly 59,300 feet of AC main in the system will remain, or approximately 45%. The Association plans to continue to implement projects to replace AC main. Project areas will be prioritized where breaks and leaks are more frequent occurrences.

In addition, work is planned to replace pipes smaller than 6" diameter. Typically, such lines will be replaced with DI pipe or HDPE if pipe smaller than 4" diameter will be adequate for the local service needed.

The distribution system will also be expanded as necessary to serve new development. Such system extensions will be completed by property owners or developers as necessary for the service needed, per the standards identified in the Associations Developer Project Manual (see Chapter 7). Typically, such extensions will be 8" diameter main with fire hydrants and other appurtenances as appropriate in the project area.

The EPA requires systems to complete lead service line assessments. The Association has begun the research and review of its files in support of this assessment to be ready to submit the required information by the EPA's deadline of October 2024. As of July 2023, the Association has completed its initial inventory to be in compliance but continues to further investigate and refine the inventory to reduce the unknown variables.

Blowoff Assembly and Fire Hydrant Maintenance and Replacement

The Association maintains approximately 143 fire hydrants around the system. All fire hydrants and their lateral isolation valves have been tested for proper operation. In conjunction with flushing, as well as valve and dead-end main maintenance activities, proactive efforts to operate and confirm the proper operational status of the Association's fire hydrants are ongoing. The Association has set an annual budget to repair or replace fire hydrants, as appropriate for each existing assembly. The Association operators have received training on how to evaluate and repair fire hydrants and have secured the tools necessary to work on most of their existing models. Hydrant deficiencies are addressed shortly after they are identified.

Hydraulic Modeling – System Pressure and Fire Flow

As stated in Section 3.3.5, the Association's system pressures through the planning period are projected to be adequate at all locations, for forecast MDD and PHD conditions.

Regarding fire flows, a review of the Association's current system indicated that the system could not meet the current fire flow standard of 750 gpm at about 20% to 22% of the modeled nodes, depending on the supply scenario and demand forecast. An effort was completed as part of the analysis for the 2013 WSP to address a similar set of identified fire flow deficiencies. Six scenarios were evaluated to identify potential projects to address local deficiencies. That effort concluded that significant improvements would be necessary to address current FF deficiencies and that such work would not be the focus of the improvements identified in that WSP. That analysis has not been updated in support of this Plan, because the same outcome is generally anticipated. As the existing AC mains are replaced, they will be replaced with 8" DI pipe, thus increasing the system capacity and gradually increasing fire flow capacity in the system.

Booster Stations

BPS #1 is limited due to having only one installed pump. The pump and power equipment were upgraded in 2021 and 2022 and a generator will be installed in the fall of 2023. The station has capacity to meet MDD beyond year 2043. BPS #1 needs a new roof. The BPS #1 structure housing was constructed well ahead of current seismic resilience design practice and codes. The structure should be evaluated for seismic resiliency and upgrades should be planned for future completion.

BPS #2 is in good condition, with two pumps available for operation. Even if only one pump is in service, it has capacity for MDD beyond 2043. Both pumps, one motor and a soft starter have been recently replaced. The other motor and soft starter will be replaced at such time as the existing equipment fails.

Planning for a third station (BPS #3) with a new intertie to the Everett Transmission Main #3, near the intersection of Dubuque and Storm Lake Roads, is recommended. This will be motivated in part by the completion of the County's plans for use of the large undeveloped park properties in the area, and the anticipated need for service on Storm Lake Road south of Dubuque Road.

3.4.6 Other Improvements

In the event the Panther Lake Community Water system were to be consolidated with the Three Lakes System, there are several potential projects to be evaluated and implemented as appropriate. Potential projects include:

- connection to the Three Lakes distribution system at one or more locations along or west of 171st Ave and at Dubuque Road east of the system PRV station
- metering of all service connections, if not done already
- third supply connection to Pressure Zone 2 with PRV from the west side of the Panther Lake system to 51st SE
- decommission existing well(s) and control and treatment systems
- replace distribution system elements in marginal to poor condition
- add fire hydrants if adequate flow available
- add or relocate sampling stations.

The Association has an operations and administration headquarters ("office/shop") building at the standpipe property. Association meetings may be conducted at this building, but meetings have been held virtually since the start of the COVID 19 pandemic. The office information system network will need to be upgraded or replaced as hardware and software becomes obsolete. The roof will need to be replaced as the cost of maintenance increases with its age.

The Association owns a buildable parcel of land immediately north and east of the standpipe parcel. The Association plans to develop all or a portion of this parcel for a vehicle garage and expanded materials storage space. As noted above, additional storage could be located at one of these properties, but additional planning and feasibility review is necessary.

The Association member billing system will need to be upgraded or replaced for compatibility with future operating system and/or hardware upgrades.

The Association maintains nearly 900 water meters ranging from 5/8" to 2". The Association's goal is to replace meter measuring chambers prior to reaching registered volume of 40,000 cubic feet. The Association has replaced all the metering chambers in the system since 2013, well ahead of the original schedule.

The Association began a program in 2011 to establish an automated meter reading system. The motivation for this effort was safety and the long-range benefits are accuracy and efficiency and to promote conservation. All member meters are now radio read. The units installed through 2015 (about 26% of the total) are anticipated to have a 10-year battery life, whereas the units installed thereafter are anticipated to have a 15-year life. Replacement of the battery and meter register assembly is required. A plan to replace the battery and register unit has been prepared for implementation in 2024 and 2025 and then from 2031 through 2038.

The current facilities have some means of detection of unauthorized entry but additional measures of monitoring each BPS and the standpipe and office/shop property are planned.

The Association has begun to develop an asset management program starting with an inventory of water system assets (i.e., pipe, valves, hydrants, etc.) and these assets are mapped in a geographic information system (GIS). Additional details can be added to the GIS data and the Association desires a data collector to allow field locating assets to add to or refine the database.

The system operators utilize three service trucks for operations and administration. The recommended service life of these vehicles is 15 years, and each should be replaced at that frequency.

This plan will need to be updated in ten years, or sooner if regulations, land use or other substantive factors warrant review and update of this long-range plan.

3.5 PROPOSED IMPROVEMENT PROJECTS

Table 3.4 lists the projects that are recommended to correct the existing and anticipated system deficiencies. The projects are listed in order by category as presented from the information in this chapter. The extent of the projects in relation to all recommended improvements is further described in Chapter 8.

TABLE 3.4
Capital Projects and Planning Efforts

ID	*Capital Improvement*	*Project Description*
I. SUPPLY / TREATMENT		
A	BPS	BPS #3 with standby generator (at same time as H or I). Secure property for station in vicinity of Dubuque Road and Storm Lake Road intersection.
B	BPS	BPS #2 - replace one motor and soft starter.
C	BPS	BPS #1 - complete generator and replace roof.
D	BPS	BPS #1 - evaluate building for seismic resiliency
AA	PFAS	PFAS monitoring and action planning.
II. STORAGE		
E	Storage	Standpipe - recoat exterior.
F	Storage	Standpipe - recoat interior.
G	Storage	Additional storage - consider additional storage facility - capacity, location to be determined.
III. TRANSMISSION/DISTRIBUTION		
H	8" Water Main	Construct approximately 4,800 linear feet of 8" main along Dubuque Road from BPS #3 to the intersection of 171st Ave SE (potentially at same time as A).
I	8" Water Main	Construct approximately 6,300 linear feet of 8" main along Storm Lake Road from BPS #3 to the existing system, south of 48th St SE (potentially at same time as A).
J	8" Water Main	Replace approximately 14,000 linear feet of existing AC water main with 8" DI water main from BPS #1 south along 171st Ave SE to Three Lakes Road, and along 58th Ave SE (Wishon Road) from 171st Ave SE to the Standpipe site, in three phases.
K	8" Water Main	Replace approximately 900 linear feet of existing AC water main with 8" DI water main on 62nd St SE from existing 8" DI main to 181st Ave SE (potentially with Phase 2 or 3 of J).
L	8" Water Main	Replace approximately 500 linear feet of existing AC water main with 8" DI water main along 163rd Ave SE at the roadway crossing of Panther Creek (project is in response to County project to replace two existing culverts with a bridge or box culvert, potentially with Phase 2 or 3 of J).
M	AC Water Main Replacement	Replace approximately 59,300 linear feet of existing AC water main pipe with DI mains (multi-phase project).

N	Small Diameter Main Replacement	Replace approximately 1,800 linear feet of existing 2-inch PVC with 4" DI main east of 153rd Ave SE. Replace approximately 1,250 linear feet of existing 2-inch PVC with 4" DI main east and north of Panther Lake Road. Replace approximately 630 linear feet of existing 2-inch PVC with 4" DI main north from 181st Ave SE near Flowing Lake. Replace approximately 540 feet of existing 2" PVC with 4" DI main north of Storm Lake Road, at 184th Dr SE.
O	Blowoff and Fire Hydrant Replacement	Install blowoff assemblies at end of dead-end mains and replace existing fire hydrant assemblies as necessary (10-year program).
IV. OTHER		
P	Lead Service Line Assessment	Complete assessment of potential for or location of lead service lines in system and services.
Q	Telemetry System Upgrade	Update Association's telemetry system (software and hardware updates).
R	Office Network Upgrade	Upgrade or replace office network system.
S	Customer Billing System	Upgrade or replace customer billing system.
T	Asset Management Program	Build GIS database and asset management tools, including GPS data collector.
U	Enhance Security Measures	Enhance security systems at reservoir and booster pump stations.
V	Meter Register Replacement Program	Replace existing meter register/battery assembly on 10 or 15 year cycle, based on type of installed register.
W	Vehicles & Equipment	Replace three service trucks (15 year life cycle), trailer, small tractor
X	Office/Shop Building	Replace roof
Y	Garage	Expand use of office/standpipe site to include four-bay garage, with site improvements
Z	Water System Plan Update	Update the 2023 Water System Plan

3.6 REVIEW OF ALLOWABLE CONNECTIONS

In review of the analyses presented throughout this chapter, the Association’s system is considered to be in good working order and capable of supporting the expected growth of the area through the planning period, with the proposed improvements completed as recommended herein.

Therefore, the Association's facilities are projected to be capable of supporting the estimated growth of up to 1,000 connections as projected for the year 2043. The Capital Improvement Plan presented in Chapter 8 describes proposed improvement projects, which further enhance the existing system thus reinforcing its ability to meet the demands presented by the anticipated growth.

TABLE 3.5
Water System Capacity – By Component 2023

Component	*ERU Capacity*[1]	*Gallons or gpd*[2] *Capacity*
Source (MDD capacity)	No maximum capacity	No maximum capacity
Treatment	No treatment provided	No treatment provided
Equalizing Storage	No maximum capacity	Not required[3]
Standby Storage	No maximum capacity	Not required[4]
Transmission	>1,000[5]	adequate
Water Rights (Qa and Qi)	n/a[6]	n/a[6]
Water System Service Capacity (ERUs)	>1,000	adequate

1 - ERU based on 200 gpd/ERU for ADD, 420 gpd/ERU for MDD

2 - GPD = gallons per day

3 - Source capacity exceeds forecast PHD through 2043 - no ES required.

4 - System has been evaluated as a multi-source system - supply capacity with one BPS out of service exceeds MDD through 2044. Minimum standby volume recommendation of 200 gallons/ERU is not fully applied but is available ranging from 125 to 111 gpd/ERU from 2023 to 2043.

5 - Transmission and pumping capacity is adequate through year 2043 with forecast ERU count of 1000.

6 - Association holds no water rights but is included in City of Everett long-range supply planning.

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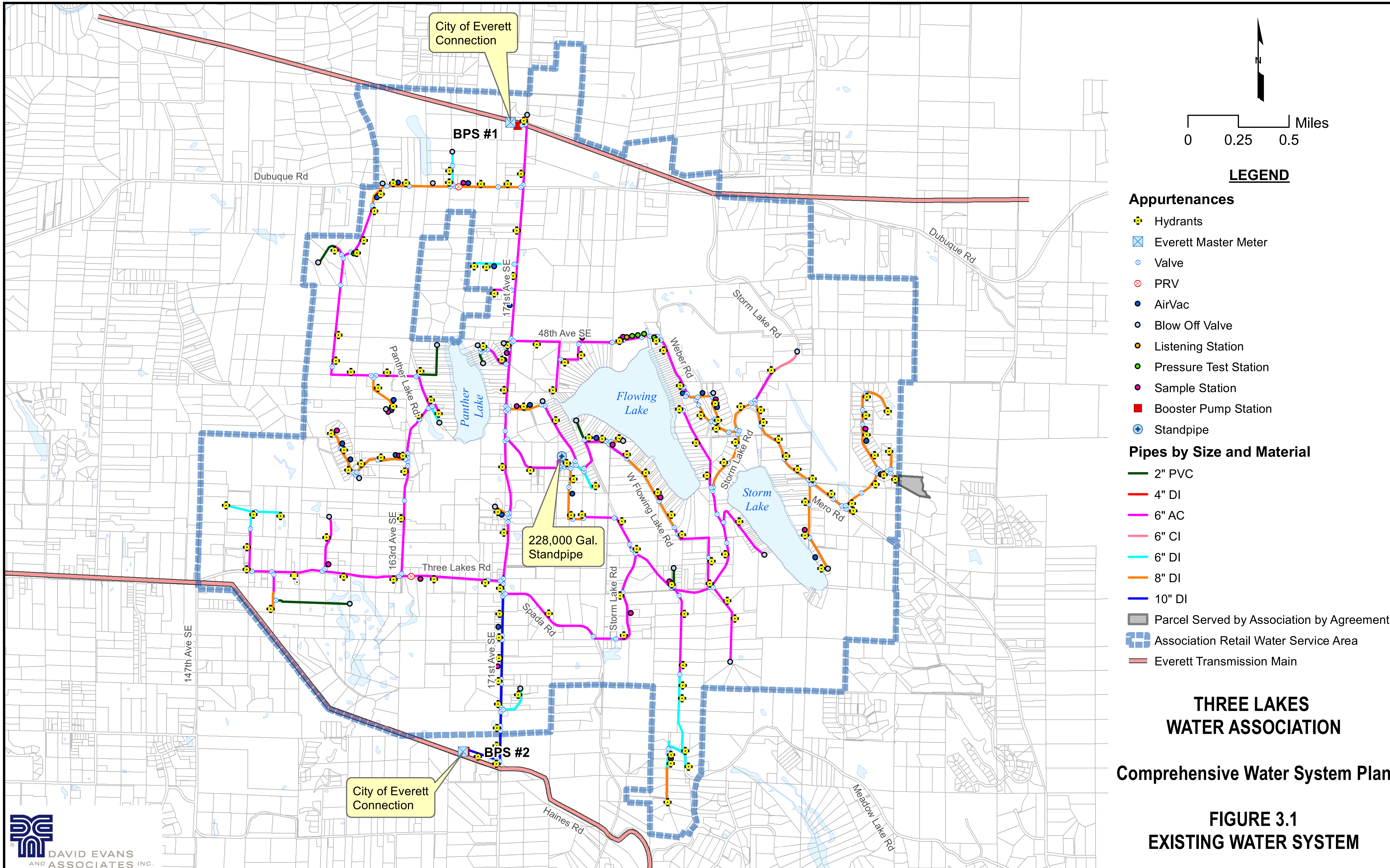
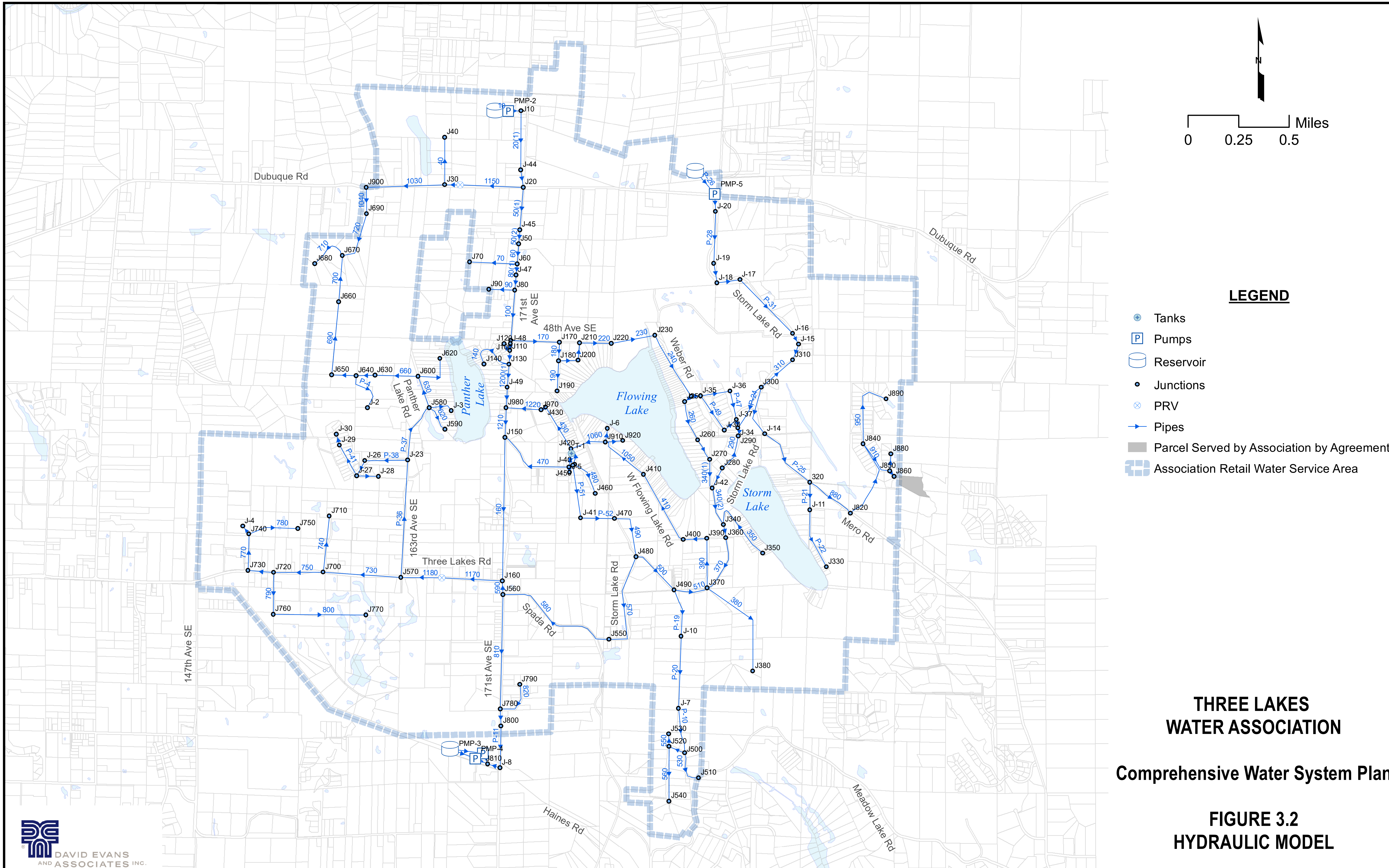


THREE LAKES WATER ASSOCIATION

Comprehensive Water System Plan

FIGURE 3.1
EXISTING WATER SYSTEM



THREE LAKES WATER ASSOCIATION

Comprehensive Water System Plan

FIGURE 3.2
HYDRAULIC MODEL

CHAPTER 4 – WATER USE EFFICIENCY PROGRAM, WATER RIGHTS ANALYSIS, SYSTEM RELIABILITY AND INTERTIES

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CHAPTER 4

WATER USE EFFICIENCY PROGRAM, WATER RIGHTS ANALYSIS, SYSTEM RELIABILITY AND INTERTIES

4.1 WATER USE EFFICIENCY PROGRAM DEVELOPMENT AND IMPLEMENTATION

A water use efficiency (a.k.a., conservation) program should include components of long-term conservation measures and peak use management. Short-term emergency response plans, which are associated with drought and other emergency conditions of water shortage, are not considered conservation.

The water conservation program is intended to promote efficient water use, protect water as a valuable resource, reduce per-capita consumption, and save Association funding by deferring capital investments otherwise necessary for increased system capacity. In addition, programs should satisfy utility growth requirements, ensure sufficient water for current and future members and, finally, promote a regional approach to conservation.

Washington State adopted the “Municipal Water Law” (MWL, 2E2SHB 1338) in 2003. This law amended and clarified sections of the RCW pertaining to public water systems, including requirements for specific water conservation efforts. WAC 246-290 was amended effective January 22, 2007, to include the final rules developed from the Municipal Water Law. The rules require development of a water use efficiency (WUE) program, including WUE planning requirements, WUE goal setting and performance reporting, distribution system leakage (DSL) monitoring, and correction as required. More specific directions are presented in DOH Publication #331-375, *Water Use Efficiency Guidebook*.

Following implementation of the MWL by DOH, some parties challenged the application of the new rules to privately-owned water purveyors. The challenges resulted in lawsuits, eventually reaching the Washington Supreme Court. That court ruled that the MWL applies to privately-owned water purveyors and that all Group A community water systems with 15 or more residential connections are defined as “municipal water suppliers”, for purposes of the MWL, at a minimum.

Three Lakes Water Association did adopt a WUE goal in December 2008, with supporting conservation measures. The WUE goal established in 2008 was to reduce annual ADD by 0.5 percent per year from 2009 to 2012. The ADD baseline was 192 gpd/ERU. The Association filed WUE Annual Reports for years 2008, 2010, and 2011. The WUE goal was not achieved in 2009 but was exceeded in 2010 and 2011. The 2013 WSP extended the WUE goals for two years, through 2014. The WUE goal was achieved in years 2012-2019, except for 2015.

4.1.1 Water Conservation Program

The Association's previous and continuing conservation program includes source and system metering, including usage-based consumption charges, coordination with City of Everett on their conservation programs and distribution of seasonal educational materials.

1. Source Meters

The Association has two metered source connections. One is located off of the City of Everett's Transmission Main #3 on 171st Avenue S.E., north of Dubuque Road, and the second is off of the City of Everett's Transmission Main #5 also on 171st Avenue S.E. The source meters are read by the Association on a daily basis (weekdays), or more frequently during periods of higher demand or unusual operating conditions.

2. Service Meters

All water service connections in the Association have been metered since 1964. Each member meter is read bi-monthly and meter water usage is the basis for monthly service charges.

3. System Leak Detection and Repair

The Association has taken the following measures to minimize leaks on both the supply-side (Association) and demand-side (member).

- Monitoring/Repair

  The Association monitors daily system demand at the source meters every weekday, excluding holidays, and monitors seven days a week during unusual demand conditions through SCADA capabilities. Significant increases in demand are reviewed in context of operating conditions (e.g., warmer weather, flushing operations, etc.) to confirm an explanation for the increase. If no operational reasons are apparent, the system is reviewed for leaks. Similarly, the idle pump time during the hours from 10:00 p.m. to 6:00 a.m. are monitored every weekday, excluding holidays. Higher demand over a 24-hour period in conjunction with a shorter idle pump time during the typical hours of low consumption can also be an indication of a new system leak. When leaks are suspected, and if there have been no member complaints or alerts, the system is inspected. If the location of the leak cannot be located, professional leak detection options are investigated. Efforts to find and repair the deficiency continue until the leak is found. Leaks are repaired as soon as feasible.

  The Manager has adjusted some of the meter read routes to correlate several with the various areas supplied by a single main (i.e., no loop) to support data analysis for sub-areas of the distribution system.

- Leak Adjustment Policy
  The Association encourages accountability for leaks beyond the service meter but also offers assistance for members who discover leaks in their systems, which have contributed to a large billing. As soon as the bi-monthly meter read data is obtained, members with an unusually high usage compared to previous billing periods are contacted in an effort to notify a member of a potential leak in their system so they can repair the leak and conserve the resource. The member is informed about the leak adjustment policy at this time and how the policy best serves them if they react quickly to resolve the potential issue. The Association offers a reduction in the previous billing to members who act quickly to repair leaks. The member must submit a written request for a leak adjustment to the Manager. Typically, the Association has charged members the base meter fee plus half of the commodity charge for the water use which was greater than the average usage for the three previous billing cycles. Communication continues with the members contacted to confirm that the leak was properly addressed.

- Meter Testing/Replacement
  Source meters are owned and maintained by the City of Everett. Member meters are owned and maintained by the Association. Historically, the Association has worked to replace both the chamber and the manual register with completely new manual read service meters on a 10 to 13-year cycle. With the implementation and installation of radio read service meters from 2012 to 2017, the Association committed to replacing the chambers before a meter reaches 80,000 cubic feet registered and retaining the radio read register if still in working order. The radio read register batteries have a manufacturer's estimated lifespan of 8-to-10-years under normal circumstances and the full register must be replaced when the battery fails. To date, the Association has experienced limited register and/or battery failure. The chamber will continue to deliver water to the member however, the data is not recoverable from the point of failure. As the estimated lifespan has passed for the oldest radio read registers, an increased rate of register failures is soon expected. It may be appropriate to consider performing interim meter reads for the purpose of identifying and addressing non-registering meters and/or failed batteries. Meters with very low total volume may remain in service longer, if otherwise in satisfactory condition. If the Association or a member is concerned about the accuracy or condition of a meter, it will be evaluated and likely tested or replaced.

- Non-revenue Water Tracking
  The percentage and volume of unauthorized water use are generated by comparing source meter quantities with billed water usage on a bi-monthly basis. Any significant abnormalities in water use are evaluated by the

Manager. The Association determines DSL following each billing cycle. The Manager documents water used for flushing (proactively or following main repairs), fire flows, etc. Such use is based on estimates of flow rates for a measured or estimated duration. On days when flushing activities occur, the flushing volume is considered and validated as part of the analysis of the daily system demand. The analysis is also performed as a precaution to confirm that the flushing activities did not appear to advance a system weakness and/or leakage.

- Water Main Repair and Replacement Program
  The original distribution system was installed in 1964, using asbestos cement (AC) pipe. The system is in relatively good condition, but leaks are occurring more often, particularly in certain segments of the original system. It is not clear why recent leaks are in these concentrated areas, but potential causes are the installation practices of the original contractor or the quality control for a particular load of pipe. As leak patterns are observed, the Association considers the merits of spot repair versus main replacement. A long-term main replacement program is presented in Chapter 8.

4. Conservation Pricing

System connections are served by a metered supply line typically serving a 5/8-inch meter which is considered a single ERU. Larger services and meters can be requested, at higher connection and monthly service charges. All charges for larger services are calculated based on an ERU multiplier. This charge structure encourages use of the smallest meter appropriate for the anticipated demands. Monthly service charges include a base amount of water supply each billing period, with five tiers of higher volume usage charges, to promote water use efficiency.

The water rate structure was comprehensively evaluated in the water rate study initiated after completion of the 2013 WSP. The rates are reviewed annually based on the financial results and water use for the prior fiscal year, for consideration of increased rates effective the next fiscal year.

5. Public Outreach

The Association promotes conservation to its members in several ways. The bylaws stipulate that the primary purpose of water supply is for domestic uses. The annual CCR includes a message encouraging conservation and is posted on the Association's website and mailed to new shareholders once they become a member. A newsletter is mailed to all members in the April billing which also references how members can access the CCR. The newsletter introduces the concept of water use efficiency, indicates that there are established goals, and presents the overall savings since the goals were initially established in 2008. Under the MWL, members are advised on progress toward achieving the

Association's WUE goals. As described below, an irrigation calendar is distributed each spring. The Association plans to display conservation promotional messages on its vehicles.

6. Joint Programs

The City of Everett, as part of its WUE measures, provides a suggested outdoor water use calendar to the Association. The Association distributes the calendar to its members enclosed within the April billing and posts a PDF version on the Association's website.

4.1.2 Goals

The conservation objectives for a typical water system should be the reduction of water consumption on a daily, monthly, seasonal, and/or annual basis. The Association's primary conservation goal has been to reduce annual system-wide average day demand. As described above and as evident in the water use data summarized in Chapter 2, the Association has made progress relative to their prior goals, but reductions are diminishing. Therefore, this plan considers revised goals with the focus on reducing peak day use and reducing DSL.

A key effort includes reduction of the quantity of DSL. As indicated in Chapter 2, the Association continues to forecast a leakage factor of 20 percent. Recent efforts have reduced the average over the past five years to less than 16 percent, but last year's value was again over 20 percent. Two significant, hard to locate leaks were found in 2022 and early 2023 and it is hoped these were the primary reason for the higher value in 2022. The Association continues to actively monitor the system and water use data to detect leaks and addresses them as soon as practical. Therefore, one goal is to reduce DSL over the next ten years.

While ADD/ERU has reduced since conservation efforts began in 2008, the value has stabilized, and recently slightly increased. The Association has reasonably adequate average day supply availability, provided the Everett system is operating under normal conditions, but the Association has limited pumping and internal supply capacity to meet maximum day supply. Therefore, an additional goal is to enhance the member education program to consider how water use is managed by members during high demand periods. The objective is to have members reduce use during peak day periods and peak hour periods, particularly by managing their irrigation practices during these times.

The Association has established revised goals, following a public forum on June 13, 2023, as follows:

- Reduce DSL from 20 percent by 0.5 percent per year for ten years (2023-2033) to achieve a leakage value of 15 percent or less by 2033
- Reduce the MDD/ADD ratio from 2.10 to 1.90 by year 2033

Projected system savings are summarized below in Table 4.1.

TABLE 4.1
Measurable Outcomes For System With Water Use Efficiency Program

	Maximum Day Demand (MDD)			Average Day Demand (ADD)		
Year	**Without Conservation (mgd)**	**With Conservation (mgd)**	**Savings (mgd)**	**Without Conservation (mgd)**	**With Conservation (mgd)**	**Savings (mgd)**
2023	0.409	0.409	0.000	0.213	0.213	0.000
2024	0.411	0.407	0.004	0.214	0.214	0.001
2025	0.413	0.404	0.009	0.216	0.214	0.002
2026	0.416	0.402	0.014	0.217	0.214	0.003
2027	0.418	0.400	0.018	0.218	0.215	0.004
2028	0.421	0.398	0.023	0.220	0.215	0.005
2029	0.423	0.396	0.028	0.221	0.215	0.006
2030	0.426	0.393	0.032	0.222	0.216	0.006
2031	0.428	0.391	0.037	0.224	0.216	0.007
2032	0.431	0.389	0.042	0.225	0.216	0.008
2033	0.433	0.386	0.047	0.226	0.217	0.009
			Total Savings (million gallons)			**18.6**

Estimated savings from conservation efforts for the period 2023-2033 reach 47,000 gallons for MDD (one day) and 18.6 million gallons over the next ten years.

4.1.3 Measure Evaluation

The Association's conservation program for 2023-2033 consists of nine measures which are discussed below. The program reflects the continuation and/or enhancement of existing measures. The Association plans for the conservation program to remain flexible; therefore, details may be modified to meet the conservation goal and maintain cost-effectiveness of the program.

1. System Leak Detection and Repair
The Association will continue to utilize and analyze data from SCADA, source meters, service meters, and maintain regular system leak detection and repair efforts. Evaluation will consist of reviewing the DSL percentage and volume each year to gauge progress toward the DSL requirement of 10 percent or less on a rolling three-year average (i.e., lower DSL than the goal identified above).

2. Conservation Pricing
The Association will continue to support their existing five-tier pricing structure. Conservation pricing will continue to be implemented for all years of the conservation program. The evaluation will consist of reviewing the impact of

pricing during peak summer months. In particular, when such data is available, peak day, week and month water usage can be compared to prior years to detect changes that can be associated with new pricing strategies. In the next annual rate review, consideration will be given to increasing the incremental pricing between the higher tiers.

3. Public Outreach

The Association currently distributes its annual Consumer Confidence Reports (CCRs) by April each year and outdoor water use calendars each spring. CCRs will continue to include information about the Association's conservation programs.

4. Joint Programs/Collaboration

The Association will continue to work collaboratively with the City of Everett on water conservation. Collaboration will take place in all years of the conservation program. Collaboration efforts will be evaluated each year for involvement and cost-effectiveness.

5. Bills Showing Consumption History

The Association is currently providing members with an expanded consumption history of the previous billing period and the same period the previous year on each water bill.

6. Conservation Kits

The Association has distributed water conservation kits in the past as they have received them from the City of Everett. Typically, the Association receives 50 to 60 conservation kits at a time, depending on the City's distribution schedule. A few kits are requested each year from members. The Association Manager then hands out the kits to homeowners while meeting with them. The Association will continue to provide conservation information through the Association's annual CCR. In addition, information on water saving devices will be posted on the Association's website.

The Association will continue providing conservation kits to interested single family residential and multi-family residential water members. Kits will be available to water members for all years of the conservation program. To evaluate effectiveness and estimate savings the Association will record the number of kits provided multiplied by the per unit savings estimated per kit.

7. Irrigation Watering Schedule

The Association will continue to coordinate with the City of Everett to provide outdoor water use calendars to reduce the impact of MDD during the peak summer months. This measure will be implemented for all years of the conservation program. Evaluation will consist of annually reviewing MDD and MDD/ADD figures to validate effectiveness of the voluntary program.

8. Regional Conservation Program
Snohomish County adopted the North Snohomish Coordinated Water System Plan which was written in 1991 and updated in 2010. However, this report does not address conservation measures. Regional water conservation measures outlined in the City of Everett's *Comprehensive Water Plan* include specific goals and objectives. Annually or upon request, Three Lakes receives a limited amount of conservation kits as part of the City of Everett's regional plan.

9. Review of MDD versus ADD
Further conservation efforts will be implemented including public education programs geared toward the reduction in the high demand days. Since the Association classifies members in two different use classes as well as four different meter sizes, it will be able to monitor water use by each class and meter size. This will help to identify member classes and meter sizes which the Association will need to further target in the promotion of water conservation. Annual and seasonal usage will be analyzed to determine the effectiveness of the program.

4.1.4 Measure Implementation

All WUE measures described in Section 4.1.3 above are planned for implementation by the Association, as described above.

4.1.5 Member Education

Member education with respect to water use efficiency is accomplished through multiple existing and proposed WUE measures (see Sections 4.1.1 and 4.1.3) conservation pricing, public outreach, conservation kits, and outdoor water use scheduling.

4.1.6 Projected Water Savings

Estimated total system savings are reported in Section 4.1.2.

4.1.7 Effectiveness Evaluation

For evaluation of the goals listed in 4.1.2, two water use metrics will be monitored. DSL is calculated bimonthly following each billing cycle and tracked annually for the systems management consideration and for its annual WUE reporting. Actual bimonthly and annual DSL will be compared to the goal of 15 percent, and the rolling three-year average will continue to be compared to the DOH requirement of 10 percent. Daily demand data will be tracked and evaluated annually to determine the system MDD, relative to the ADD, to calculate the ratio of MDD/ADD. This value will be compared to the goal of annual reductions from 2.10 to 1.90.

4.1.8 Program Evaluation

The performance of the water conservation program will be evaluated annually as the WUE annual report is prepared each spring. Evaluation procedures will vary for each program component based on its conservation tactic (i.e., hardware versus behavioral), but reviewed to assess its effectiveness in achieving the program's conservation goal. The amount of water saved and savings in terms of water facilities will also be considered in the review process. If program measures are not meeting the established conservation goal, appropriate modifications will be made to uphold and attempt to achieve the program's goals.

The WUE rule requires municipal water suppliers to submit a WUE performance report to the DOH by July 1st of each year for the previous year [WAC 246-290-840(1)(a)]. The information submitted to DOH must be made available to the public. The Association plans to distribute the performance report to the public in conjunction with its annual Consumer Confidence Report (CCR). The Association's most recent annual reports are included in Appendix I.

4.1.9 Distribution System Leakage

Under the WUE rules, all municipal water suppliers must maintain their DSL at or below 10 percent of their production, based on a rolling three-year average. Leakage must be reported as a percentage and as a volume. If municipal water suppliers are not meeting the DSL requirement, they must develop and implement a Water Loss Control Action Plan (WLCAP). That action plan would outline steps and timelines needed to reduce system leakage.

The Association has taken measures to minimize leaks on both the supply-side (Association) and demand-side (member), as listed below and previously described in Section 4.1.1, Item 3.

- monitoring
- leak adjustment policy
- meter testing/replacement
- non-revenue water tracking
- water main repair and replacement program

See Section 2.2.4 for additional discussion of DSL.

4.1.10 Water Rate Structure

The Association intends to continue to support their existing five-tier pricing structure. Conservation pricing will be implemented for all years of the conservation program. The evaluation will consist of reviewing the impact of pricing during peak summer months. The Association completed a Rate Study in

2012. The study evaluated water use patterns, fixed and variable costs and forecast revenue and expenses, for operating and capital needs. The study considered three alternative rate structures. The final recommended and adopted rate structure reduced the bi-monthly volume of water included in the base rate from 2,000 cubic feet to 600. An increasing block charge was established for five additional increments of 600 cubic feet of bi-monthly usage. The base and block charges have been increased several times since, with the latest increase effective July 1, 2023, for the new fiscal year (July 1 thru June 30). The rates are evaluated annually each fall/winter, for consideration of adjustment the following summer. Future rate reviews may consider increasing costs for each existing tier.

4.1.11 Reclaimed Water Opportunities

There is currently no potential for existing uses of reclaimed water as the local area is served by individual onsite sewage disposal systems. The Association does not currently have any sewer facilities; however, if facilities are constructed in the future, reclaimed water alternatives will be reviewed. See Section 4.2.5 for a more complete discussion of water reuse.

4.1.12 Water Supply Characteristics

As previously discussed, the Association secures all its water supply from the City of Everett, via two transmissions main connections. Everett anticipates the City can meet the future demand of the Association, as discussed in Chapter 2.

4.2 EXISTING SOURCE OF SUPPLY ANALYSIS

The Department of Ecology requires water systems to demonstrate serious consideration of other options prior to issuing new or expanded water rights. The purpose of the supply analysis is to evaluate opportunities to obtain or optimize the use of existing sources already developed and evaluate other innovative methods to meet water needs.

4.2.1 Enhanced Conservation Measures

As discussed in Section 4.1, the Association has implemented nine water use efficiency measures with the goal of reducing MDD and ADD system-wide and works diligently to detect and repair leaks and focus water main replacement projects where leaks are more prevalent.

4.2.2 Water Right Changes

The Association purchases the water it distributes from the City of Everett and has no water rights to any local aquifers or surface waters.

The City of Everett holds the water rights for the Association's source of supply. According to the City's 2020 *Comprehensive Water Plan* the City has more than adequate water rights for its members through 2040 and beyond.

4.2.3 Interties

The Association does not have any emergency interties in place at this time and the possibility of a future intertie is low due to the proximity of adjacent purveyors and their hydraulic grade lines. However, a future additional intertie with Everett may be warranted depending on localized development and need for water supply and distribution facilities within the Association's service area.

4.2.4 Artificial Recharge

Artificial recharge is generally in the form of injection or infiltration of available surface water, typically from winter runoff or other available water. This water is then reintroduced into an aquifer and its subsequent withdrawal. This potential supply method is not an option considered to be cost-efficient in the Association's service area.

4.2.5 Use of Reclaimed Water, Reuse and other Non-Potable Sources

Because there are no sewage treatment facilities in or immediately near the Association's service area, detailed planning efforts regarding reclaimed water use have not been completed. At this time, the costs of a reclaimed water distribution system would likely far exceed the estimated benefit from the use of reclaimed water.

4.2.6 Treatment

Presently the City of Everett is responsible for all required treatment of its water supply. The type and level of treatment will need to be determined at such times as additional sources are identified.

4.3 WATER RIGHT EVALUATION

The Association's source of water is derived from water rights issued to the City of Everett for the Sultan River Watershed. Everett has confirmed its ability to meet the Association's demand for at least the next twenty years per a letter received from the City in May 2023.

A review of this plan indicates the City has adequate water rights to meet the needs of the Association.

4.4 WATER SYSTEM RELIABILITY ANALYSIS

A water system reliability analysis is necessary and prudent to understand the issues that threaten the Association's ability to provide an adequate quantity of high quality water to its members at all times.

4.4.1 Summary of System Reliability Efforts

Source Reliability

The Association presently purchases all of its water from City of Everett. The supply projections provided in the City's current *Comprehensive Water Plan* indicate that the City of Everett has adequate supply to meet the Association's forecasted demands, with conservation benefits, for at least the next 20 years. Refer to Chapters 2 and 3 for more information regarding source of supply.

Water Treatment

As with source capacity, the City of Everett also maintains the water quality of the water distributed by the Association. Per the City of Everett's current *Comprehensive Water Plan*, the reliability of the City's water treatment facilities is considered extremely good.

Water Rights Adequacy

The Association has no water rights but has assurance that its supply needs will be met by the City of Everett through the planning period.

Facility Reliability

Elements of Chapter 3 discuss each system component and the related reliability.

4.4.2 Water Shortage Response Planning

The Association prepared a Water Shortage Response Plan in 2016. A copy is included in Appendix J.

4.4.3 Monitoring Water Levels

No monitoring wells are present in the Association's service area.

4.5 INTERTIES

4.5.1 Existing Interties

The Association has two interties with the City of Everett's water system, as described above.

4.5.2 New Intertie Proposals

The Association plans to complete an additional intertie with the City of Everett water supply system. The planned location is generally in the vicinity of Dubuque and Storm Lake Roads. The intertie would supply the proposed BPS #3 as described in Chapter 3, with flow capacity of at least 350 gpm, with ability to increase capacity for demands beyond 20 years to approximately 600 gpm.

4.5.3 Intertie Agreements

There are no intertie agreements held by the Association.

4.6 IDENTIFICATION OF SYSTEM IMPROVEMENTS

The following identifies recommended improvements in the areas of conservation and source management.

4.6.1 Rate Study Annual Update

The Association completed a rate and charges study in 2012. The study evaluated different billing structures. Ultimately a structure that reduced the volume of water included in the base rate for each bimonthly period was selected. The financial model has been reviewed and updated annually, with periodic rate adjustments. The revenue and expense forecast should reviewed annually to determine if rates should be adjusted for the next fiscal year. As noted above, refinements of the water use tiers or cost increase per tier will be evaluated with future rate reviews.

4.6.2 Water Use Efficiency Program

The Association plans to continue to implement its WUE program with emphasis on:

- Leak detection and repair
- Conservation message in periodic notices to members
- Conservation messaging through tiered pricing for increased demand

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CHAPTER 5 – SOURCE PROTECTION

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CHAPTER 5

SOURCE PROTECTION

This chapter is intended to develop a program to protect and improve the source water utilized by the Association. However, as identified in Chapters 1 through 3, the water distributed by the Three Lakes Water Association is purchased from the City of Everett.

The City owns and operates the watersheds, the water treatment facility and the transmission system leading from the watersheds to the Association's connection points. Authority for development and implementation of source protection lies with the City of Everett and other holders of water rights within the watershed areas.

Additional information regarding the City of Everett's facilities and its source water protection program can be found in the City's current *Comprehensive Water System Plan*.

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CHAPTER 6 – OPERATION AND MAINTENANCE PROGRAM

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CHAPTER 6

OPERATION AND MAINTENANCE PROGRAM

The following section summarizes the operation and maintenance procedures which assure satisfactory management of the water system operations in accordance with WAC 246-290. Ideally, operation and maintenance programs should be assembled in stand alone documents that clearly outline the day-to-day functions involved in keeping the water system running smoothly and within guidelines. This section is intended to summarize these stand-alone documents when available and provide directions when they are not.

6.1 ASSOCIATION MANAGEMENT AND PERSONNEL

The Three Lakes Water Association is a private non-profit municipal water purveyor which operates under the direction of a Board of Trustees. At the expiration of the normal term, Trustee positions are filled by vote of the members of the Association. Trustee officer positions (e.g., president, secretary, etc.) and vacancies within the Board are filled through nominations and elections by the Board members. There are eight positions on the Board, and each Trustee is required to be an Association member. One trustee is designated the alternate each year and is not allowed to vote at meetings where there is attendance of all eight trustees. This position cannot be held in consecutive years.

By vote and in accordance with the Association by-laws, the Board makes and establishes policies that govern the operation of the Association. The Board conducts its regular meeting at 6:00 p.m. on the second Tuesday of each month. The Association's business address and general information is presented below:

Association address and Phone Number:	Three Lakes Water Association 360-568-8022
Mailing Address:	Post Office Box 24 Snohomish, Washington 98291
Office Address:	17503 58th St SE Snohomish, Washington 98290
Association Contact Person:	*Donald Kemmis, Manager, WDM 2, CCS*
Certified Operators:	*Kaila Klicker, Assistant Manager, WDM 2, CCS* *Seth Way, Field Technician, Office Assistant, CCS*

Office Administrator	*Brittany Henning, Office Administrator, Field Technician*
Dept. of Health Regional Engineer	*PJ Wilkerson, 253-395-6766*
Dept. of Health Identification Number:	88150 6
Dept. of Health Contact Persons:	Richard Rodriguez, Regional Planner PJ Wilkerson, Regional Engineer Northwest Drinking Water Operations PO Box 47800, MS K17-12 Olympia, WA 98504

The Manager is the certified system operator and is responsible for the performance of the water system. The Manager is supported by a certified operator/assistant manager, a field technician/office assistant and office administrator.

The responsibilities of the Manager include, but are not limited to, the following:

- Inspection of major facilities including the standpipe and pump stations
- Inspection and maintenance of distribution system
- Direction of consultants such as legal, financial and engineering
- Investigation of complaints and reported problems
- Locating water facilities as requested
- Responding to emergency situations
- Coordination of the repair of leaks, line breaks and the installation of new service connections
- Reading of water service meters on a bi-monthly cycle
- Investigating and resolving reported cross-connection problems
- Inspection of projects which may affect the water system in any way
- Maintenance of all parts required for repair
- Inspection and clearing around all fire hydrants
- Locking and unlocking meters
- Flushing of dead-end mains and all fire hydrants
- Working with other utilities for coordinated efforts on construction projects
- Water sampling and testing
- Preparing and mailing water bills
- Making bank deposits and payments
- Preparing checks for payment of bills
- Compiling monthly and annual financial statements
- Managing customer accounts
- Updating system inventory
- Preparing and submitting use-Loss Reports
- Managing the Cross-connection Control Program and Backflow Status Report

- Preparing Certificate of Water Availability Letters
- Preparing tax reports, employee records, newsletters
- Board of Trustees coordination and meeting attendance

Many of the specific responsibilities are delegated to or supported by the Board Secretary or Treasurer, the Assistant Manager and other staff.

6.2 OPERATOR CERTIFICATION

DOH requires the system operator of the Three Lakes Water Association to be certified as a Water Distribution Manager (WDM) 2. The Manager and Assistant Manager are each certified as a WDM 2. Three staff members are certified as Cross-connection Control Specialists. Copies of current certifications are included in Appendix B.

6.3 SYSTEM OPERATION AND CONTROL

The Association recently completed a standalone Operations and Management (O&M) Manual. The O&M Manual addresses the authority and responsibilities of the Association as a public water system, and as a private corporation. The Manual includes an overview of operating and administrative practices and activities, including an overview of preventative maintenance for its system and equipment. The Manual is supported by an Association Policies and Procedures Manual, a Water Quality Monitoring Program, Continuity of Operations Plan and Employee Handbook and an Emergency Response Plan, as well as documents referenced in this WSP and updated appendices. The following is a description of the major system components including basic operation and maintenance procedures.

6.3.1 System Components

The major system components of the Association include the following (see Figure 3.1):

- two supply connections to the City of Everett's Water Supply System
- source meters at supply connection
- storage standpipe
- two pump stations
- distribution system piping ranging in size from 2 inch to 10 inch
- isolation valves
- service meters
- sample stations
- fire hydrants

For additional information regarding these facilities, see Section 3.3.

6.3.2 Routine System Operation and Maintenance

City of Everett Supply Taps

Each supply tap is inspected daily during the week and as needed on weekends to verify security and proper operations of the facility. Confirmation of operation is verified by visual inspection of connection points and checking of electrical controls where applicable.

Storage Standpipe

The storage standpipe is visually inspected daily during the week and as needed on weekends for volume and security. The standpipe is also observed for signs of leakage or corrosion. Standpipe screens and seals are inspected on an annual basis. The current standpipe was completed in 2010 and was internally inspected in 2018 by a diver. The interior coating, structure and appurtenances were found to be in very good condition. A minimal layer of sediment was removed from the bottom of the standpipe.

Distribution Pump Stations

The two pump stations are checked daily during the week and as needed on weekends to verify site conditions, security and the proper operation of all equipment and controls. Major equipment items receive scheduled lubrication or other maintenance as recommended by the equipment manufacturer, and per the operation and maintenance manual for the equipment.

Distribution System

The Association does not maintain a significant inventory of pipe or miscellaneous fittings for repairs. However, they contract with a local contractor for on-call services. The Manager coordinates all emergency pipeline repairs and system work with assistance from the contractor.

Dead-end mains are flushed at least annually, and the system is flushed annually to provide necessary cleaning to avoid potential water quality problems. Additional flushing occurs in response to customer complaints or pipeline repairs that necessitate the flushing of lines.

Isolation Valves

Valves are exercised at least annually and more often for valves that are known to be more difficult to operate. Valve maintenance/replacement is scheduled in response to observed deficiencies (or with other water main improvement projects). Valve covers are inspected for damage and proper setting to grade and are adjusted or replaced as necessary.

Pressure Reducing Valves

The two-system pressure reducing valve (PRV) stations are visually inspected quarterly or in response to customer complaints from the immediate area. Pressure gauge readings are compared to desired set points to determine if adjustments are necessary. The PRVs are less than fifteen years old and were last maintained in July 2018 by contracted professionals.

Service Meters

The Manager coordinates the installation of all service meters. Meters that are not operating or not operating satisfactorily are identified by the meter readings and are replaced as necessary. Meter usage data is analyzed to determine faulty meters. A meter replacement program targets the replacement of each service meter before registering 80,000 cubic feet of volume. Records for each meter including location, meter number and installation date, and installation date of radio read head are kept in a database.

Fire Hydrants

Fire hydrants are inspected annually and painted as required. The target is to maintain and update four hydrants per quarter (replace main valve components), to the extent necessary to maintain all hydrants ready for service. Fire hydrant access is cleared of obstructions as necessary. Any identified hydrant deficiencies are addressed as soon as possible.

6.3.3 Preventative Maintenance Program

Preventative maintenance actions are discussed above.

6.3.4 Equipment and Supplies

The Association does not maintain a significant inventory of repair parts, although more routinely needed items are purchased for ready use. Parts which are needed for repairs or minor improvements are supplied by the local contractors on the Association's roster. The Association does maintain a small inventory of 3/4" x 5/8" service meters as well as meter setters.

6.4 WATER QUALITY MONITORING

Water quality sampling is performed by the Manager and submitted to a local lab which reports the results to DOH. Chlorine residual is monitored seven days a week. Routine water quality samples are taken monthly at two rotating sample locations within the distribution system. In the event a positive bacteriological sample is discovered, the Association takes repeat samples at the predetermined locations as specified in the Association's Coliform Monitoring Plan. This plan is included as Appendix F.

Water sampling for lead, copper and additional inorganic and organic substances is also performed by the Manager as requested by the City of Everett and as required by DOH. All water sampling is conducted per Chapter 246-290-300 WAC and results are forwarded to the City. Results from the City's testing are distributed to the Association's customers through the Annual Water Quality Report.

DOH implemented new requirements starting October 1, 2011, regarding Lead and Copper monitoring. The Lead and Copper Rule Short-Term Revisions (LCR-STR) are now required for all Group A Community and nontransient noncommunity (NTNC) water systems. The new requirements apply to consumer notification, new sources and long-term treatment changes, clarification of compliance and monitoring periods, reduced monitoring, public education, consumer confidence report, lead service lines, and resources for assistance in complying with the rule revisions. The Association adheres to the Lead and Copper Rule in order to achieve DOH compliance by participating in the City of Everett lead and copper regional testing and monitoring program. Samples are collected and provided to the City and the City provides regional data for the Association to share with its members in its annual water quality report.

The Association is responsible for delivering a safe water supply to its members and customers. Monitoring and sampling are required by several state and federal regulations as discussed below. The Association has developed their own water quality monitoring program as a comprehensive resource to manage all monitoring activities and requirements. It is updated as notice is received of new regulations or updates.

The Association will continue to work with the City to comply with the new requirements.

The Association is subject to the Stage 2 Rules. A monitoring plan was prepared in 2006 and it concluded that quarterly sampling for TTHM and HAA5 at two locations in the system was required, beginning in the first quarter following April 1, 2012. Such monitoring began in May 2012. The second quarterly sample was taken in August 2012. Both samples reported very low detection levels. Quarterly sampling at one location was required through February 2022. Based on low detection levels, the Association's required frequency was reduced to annual testing at one location during the month of May. Depending on the detection levels for each annual testing, the Association may be required to return to quarterly sampling if the levels are determined to be too high per DOH.

The following table summarizes the Association's testing requirements including individual tests, testing locations and descriptions of the test.

Table 6.1
State and Federal Water Quality Testing Requirements

Required Testing	***Location***	***Description***
Total Coliform	From monitoring locations as specified in Coliform Monitoring Plan	Coliform testing is required monthly. Two samples shall be taken as designated by the Coliform Monitoring Plan and submitted for testing.
Lead-Copper	From the distribution system at targeted sample tap locations	Testing is performed by the City of Everett. The Association contributes to the testing by providing samples from their system.
Stage 2 Rule	From the distribution system at targeted sample tap locations	Testing is performed by the City of Everett. The Association contributes to the testing by providing samples from their system.
Daily Chlorine Residual	From the distribution system at targeted sample tap locations	Testing is performed by the Association.

In addition to the above sampling the Association is required to take asbestos samples once every nine years. The Association completed the asbestos sample in August 2020. The results indicated detected levels well below the reporting level. The present Manager and his assistant recall the Association has had only one positive coliform sample October 2010 and very few complaints regarding water quality issues. No other routine coliform samples since then have tested positive for coliform bacteria. Everett is responsible for monitoring associated with their use of fluoride addition to the water supply.

The last two DOH sanitary surveys were completed in March 2017 and August 2022.

The 2017 survey recognized the Association's increasing efforts to improve the reliability and sustainability of the system, supported by the Board's increasing emphasis from reactive management to proactive management. Many improvements were noted including addition of a second certified operator and a third in training, accelerated meter replacement program, updated website, cell lease revenue and new office/shop building. The only significant deficiency was a result of the inability for DOH to inspect the reservoir top hatch and vent due to a recall on the reservoir ladder safety harness. That inspection was completed as directed in the survey. There were no significant findings noted. The Association was encouraged to review and update their coliform monitoring plan and that has been completed (see Appendix F). The survey included a recommendation to consider developing a plan for booster chlorination.

The August 2022 survey was complimentary of the operation and management of the system, and included no significant deficiencies, significant findings or observations. The survey report included recommendations to work with the City of Everett to mitigate flooding of the City's meter vaults and for the Association to consider sampling chlorine residual at more sites to start to build a chlorine residual profile of the distribution system. Gathering such data will provide more information to determine if a chlorination booster system is warranted.

6.5 EMERGENCY RESPONSE PROGRAM

The Association has prepared an emergency response plan. The plan was reviewed and updated in February 2019. The plan outlines general information regarding possible emergencies and responses to them. Specifics such as notification procedures, vulnerability analysis and contingency operations are addressed in the following sections.

6.5.1 *Emergency Association Call Up List*

During Office Hours	Contact the Association Manager **Phone: 360-568-8022**
Office Closed	Calls to the Association office are forwarded to the Association's voice mail system. The message instructs the caller to call the Manager and the Manager's cell phone number is in the message. ***<u>After Hours Emergency Contact Numbers</u>*** ***Phone: 360-568-8022 OR 425-903-1601***

6.5.2 Notification Process

The following outlines the steps that should be taken in case of an emergency situation in the water system (e.g., health risk, hazardous situation, natural disaster, security breach, vandalism, terrorism, etc.):

A. The responding person shall notify the Manager immediately. If they are not available, the person shall contact the designated person.

B. In the case of a loss of water service which is projected to last more than 24 hours, customers should be notified.

C. In the case of a positive routine distribution sample for E. *coli*, the Board of Trustees determined in February 2017 that they do not want to wait until repeat tests are available before issuing advice to the Members.

6.5.3 Vulnerability Analysis

Improvements proposed to maintain or improve the reliability of the Association's facilities are presented in Chapters 3 and 8. These improvements are focused on eliminating existing system deficiencies in the facilities, replacing older portions of the system that have or will soon reach the end of their useful life and the provision of fire flows that are appropriate throughout the water service area.

A water system's vulnerability assessment identifies areas of the system which are in danger of damage or failure during various types of emergency or threat scenarios. The assessment also evaluates alternative operating modes and provides additional emergency response procedures.

On June 12, 2002, the federal Public Health Security and Bioterrorism Preparedness and Response Act (PL. 107-188) was enacted. Section 1433(a) of the act requires water systems that serve a population of more than 3,300 people to complete a Vulnerability Assessment (VA). These systems must also certify to the US EPA that the VA has been completed and submit a copy the EPA. In January 2003, the US EPA finalized guidance for preparation of a VA.

The Association is under the threshold for purveyors that are required by EPA to complete a vulnerability assessment as defined above. Similarly, the Association is below the threshold for completion of a risk and resilience assessment and updated emergency response plan under the America's Water Infrastructure Act of 2018 (AWIA, Public Law 115-270).

WAC 246-290-420 addresses the requirements for water system reliability and emergency response. Provision of adequate quantity and quality of water in a reliable manner is the overriding requirement imposed by DOH and is the goal of the Association. Standard operation conditions are addressed in Chapter 3. In the case of abnormal operating conditions, the Manager must consider the specific circumstances and determine how best to maintain water quality and delivery to as many connections as possible.

The Three Lakes system is essentially a single system, with the booster pumps and standpipe directly serving all customers. The western portion of the system is separated by two PRV stations serving the north and south end of a loop. Reliability in service is provided by utilizing two sources of supply connections, two booster pump stations with backup pump equipment, one of which has a standby power generator. The system operates automatically to maintain the standpipe at nearly full, thus assuring adequate pressure to all customers. The standpipe is operated to maintain fire suppression storage and this volume can also provide limited standby storage should both sources be unavailable. The PRV stations are redundant in that service can continue uninterrupted should one of the stations be inoperable.

In the event of a main break or other unexpected impact on the ability to deliver adequate pressure or volume, the Manager must determine the best course of action to restore the system to normal conditions, and to advise affected customers about interruptions to their service. In most cases this involves advance or emergency notice of an interruption of water supply, construction work to restore the system, following by disinfection and flushing before service is restored. The Association uses a combination of personal contact, door-hangar notices, mailed notices and website announcements to keep affected customers informed.

Additional circumstances are described in the Association's emergency response plan.

6.6 SAFETY PROCEDURES

Association employees are exposed to field and office hazards. As an employer, the Association is required to prepare and implement an employee safety program per the requirements of the Washington Industrial Safety and Health Act.

6.7 CROSS-CONNECTION CONTROL PROGRAM

DOH regulations place the primary responsibility for control of cross-connections with the water purveyor. The Association has prepared a cross-connection control program. The program was reviewed and updated in 2018 and 2022 and is managed by the Assistant Manager. A copy is included in Appendix E.

The more common high hazards in the Association's service area include water supply for agriculture and livestock and secondary sources of supply from the area lakes and private wells. The Association has ten "Table 9" hazards. They all have the required backflow prevention assemblies, and all have been tested in the past year.

6.8 CUSTOMER COMPLAINTS RESPONSE PROGRAM

The Association maintains a record of customer complaints by making notations in the Association's phone logbook and documenting the complaint in the minutes of the next Board meeting. In addition, complaints which are personally filed by customers who attend the Board meetings are logged into the minutes of the meeting.

Complaints are responded to by the Manager who determines the appropriate corrective action. Multiple complaints which arise from maintenance activities (such as dirty water complaints which often come after water is run through hydrants) are not individually documented.

6.9 RECORDS AND REPORTS

The Manager is assigned the responsibility of maintaining all records pertaining to water use, billings, receipts and water utility financial records. In addition, they also maintain records regarding the system facilities, utility locate requests, repairs, water quality monitoring and reporting. All programs and manuals are reviewed and updated on an annual basis.

6.10 OPERATIONS AND MAINTENANCE IMPROVEMENTS

Several operations and maintenance improvements are discussed throughout this plan. The following is a summary of the specific plan elements which should be completed along with recommended completion dates.

- We recommend the Association continue at least annual flushing, with adjustments for specific lines or areas based on the results of flushing (more or less frequent)
- The PRVs should continue to be serviced annually (check strainers, inspect for leaks, etc.) and every five years each valve should be rebuilt (disassemble valve, replace main valve diaphragm, etc.). The PRVs were last rebuilt in July 2018.
- The standpipe should be comprehensively visually inspected both externally and internally every seven years. This schedule may be reduced to five years in the future depending on the age and findings in the subsequent inspection. Internal standpipe inspection may be made by draining the standpipe or by a commercial diver. If inspected by a diver, the standpipe must first be isolated from the water system and all connection valves shall be locked out. All equipment, clothing, and personnel entering the standpipe must be cleaned thoroughly, and it must be certified that the equipment and clothing has been used only for potable water inspections. Two certified divers should be on site, and an additional diver should be available outside the standpipe in case of emergency. Before anyone or any equipment is allowed to enter the standpipe, the residual chlorine should be checked to determine that it is adequate. Air should be supplied to the divers from external air-supply equipment. The next inspection should be scheduled for December 2025.

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CHAPTER 7 – DESIGN AND CONSTRUCTION STANDARDS

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CHAPTER 7

DESIGN AND CONSTRUCTION STANDARDS

The objective of this chapter is to describe the design and construction standards of the Three Lakes Water Association. The inclusion of the standards into this document enables the Association to utilize an alternative review and approval process from DOH for distribution system projects. The alternative review process allows the Association to approve construction documents for distribution main and other distribution system related facilities without written approval from DOH. The Association is still responsible for complying with all applicable sections of the regulations, including project report and construction document requirements listed under WAC 246-290-110 and 120.

Eligible distribution related projects include distribution reservoirs/storage tanks, booster pump facilities, transmission mains, distribution mains, pipe linings and tank coatings. The water system standards must be at least as stringent as those discussed in Chapter 246-290 WAC.

7.1 PROJECT REVIEW PROCEDURES

The Association requires all construction activities related to the Association's water system to be coordinated through the Association. All developer extensions shall be reviewed by the Association's engineer through the developer extension process. All projects within the water service area which are proposed by Snohomish County, the City of Everett, Snohomish County PUD and all other jurisdictions shall also be reviewed by Association staff and the engineer when they have a possibility of affecting Association facilities. Procedures relating to the developer extension process can be found in the Association's *Developer Extension Manual.*

7.2 POLICIES AND REQUIREMENTS FOR OUTSIDE PARTIES

Policies for development are set forth in this plan in Chapter 1, Section 1.10, Service Area Policies and Section 1.11, Conditions of Service.

The Association has previously not entered into or allowed latecomer or reimbursement agreements. Such agreements may be appropriate for certain developer extensions, wherein the conditions of service result in one member or developer providing a benefit to another property owner that does not yet have service. The Manual acknowledges the Association may enter into such agreements, but the terms will be developed on a case-by-case basis.

7.3 DESIGN STANDARDS

The Association recently updated its *Developer Extension Manual*, adopted in October 2021, which provides guidance through the necessary steps required to obtain water service from the Three Lakes Water Association by an extension of the existing water system. The manual describes the process, includes checklists and forms, and provides design, construction and detail standards for water system improvements.

The *Developer Extension Manual* was submitted to DOH for review and approval concurrently with the submittal of this Plan.

7.3.1 The water system extension shall be routed as necessary to meet the following criteria:

A. Provide water line to serve all the frontage of all lots or structures in the proposed development.
B. Connect between the water system in the proposed development and the Association's existing water distribution system at the location and in the manner (e.g., "wet tap" on main, connection at existing plugged or capped end, "cut-in" tee and valves) as indicated by the Association.
C. Extend water line to the farthest corner of the property or through the property for potential future connection in accordance with the Association's Comprehensive Water System Plan or as required by the Association.
D. "Loop" the water system within the proposed development and/or with multiple connections to the existing water distribution system in accordance with the Association's Comprehensive Water System Plan or as required by the Association or as required to provide the required flow to the most remote fire hydrant in the proposed water extension.
E. Locate the water system in the public right-of-way to the maximum extent feasible.
F. Locate valves on all three branches of tee connection, at changes in pipe diameter and at intervals of no more than 500 feet along the water main.

7.3.2 Water line size shall be determined as necessary to meet all of the following criteria, subject to approval by the Association:

A. In accordance with size indicated in the Association's Comprehensive Water System Plan.
B. As necessary to allow minimum required fire flow and/or peak hour demand, whichever is greater with maximum velocity of 8 feet per second, minimum pressure of 20 psi during fire flow conditions and 30 psi during maximum day demand conditions, maximum pressure of 80 psi.

C. Minimum mainline pipe diameter shall be 8 inches in diameter depending on the site conditions and the required fire flows by zoning code.

D. Fire hydrant laterals of 6-inch diameter shall be a maximum of 50 feet in length, measured from the distribution main. Fire hydrant laterals of 8-inch diameter shall be a maximum of 150 feet in length, measured from the distribution main.

7.3.3 Water system extensions shall be sized for the minimum fire flows according to current Snohomish County Zoning Designation, or greater as required by the local fire District or Snohomish County Fire Marshal, or as indicated in the Association's Comprehensive Water Plan.

7.3.4 Gate valves shall conform to AWWA C-509 or C515 Resilient Seat and shall be furnished with a concrete valve marker. Valve marker shall be painted and stenciled to Association requirements.

7.3.5 Valve boxes shall be located with valve markers as required.

7.3.6 The minimum cover on water mains shall be three feet unless otherwise approved by the Association, or as required by the Local Road Agency.

7.3.7 Water services shall be Type K copper service line (3/4" or 1" at the discretion of the Manager or as approved on the plans) with brass fittings (see parts list on detail). The service line shall be installed per the standard detail. All saddles and corp stop shall be minimum 1".

7.3.8 Meter boxes shall be Association Standard and shall be furnished and installed by the Developer.

7.3.9 Casings under roadway for far side services may be required by other jurisdiction (material and size/depth per agency).

7.3.10 Fire hydrants shall conform to AWWA C-502 and shall be American Darling or approved equal with a 5¼ inch main valve opening, a 4-½" steamer port with 5" Female Storz adapter and two (2) 2-1/2" Hose Connections (all N.S.T.). Hydrants shall be spaced at distances appropriate for the type of development as approved by the local fire authority or a maximum distance of 500 feet between any new hydrants or from any existing hydrants. They shall be painted with two coats of paint to meet Association requirements and installed with guard posts. Hydrant main sizes shall be 8" diameter on dead end mains. Six-inch laterals to hydrants shall be a maximum of fifty feet in length. When lateral exceeds 50 feet, gate valves shall be installed on the lateral at the mainline tee and within 10 feet of the hydrant.

7.3.11 A two inch blow off assembly as required by the details shall be installed at all dead-end water mains (temporary or permanent). Additional blows offs may be required at low points in the system as required by the Association's Engineer. Air and air vacuum relief valves shall be installed at high points of water transmission and distribution mains.

7.3.12 Water line marker posts shall be installed at changes of direction, at terminations and every 300 feet along water lines on easements.

7.3.13 Galvanized pipe shall not be used underground.

7.3.14 Valves on dedicated fire sprinkler or other fire protection service lines shall be installed with post-indicator assemblies. Maximum height for the post indicator shall be 36 inches above the adjacent grade.

7.3.15 A double detector check valve assembly is required between the potable water system and private fire sprinkler and/or standpipe connections. The use of fire retardants, anti-freeze or other hazardous additives in the fire sprinkler system is prohibited.

7.3.16 Sample stations shall be provided per Association standards.

7.3.17 Water system extensions shall also comply with the latest edition of the DOH Water System Design Manual. If there is a conflict between the requirements of this document and the Design Manual, the stricter requirements shall govern.

7.4 CONSTRUCTION STANDARDS

The Association's construction standards for materials and methods and standard details for water system appurtenances and construction are included in its *Developer Extension Manual*.

7.5 CONSTRUCTION CERTIFICATION AND FOLLOW-UP PROCEDURES

All construction activity related to the Association's water system must be coordinated through the Association. No work on the water system shall be performed without an Association inspector being present. The Association may refuse acceptance of any portion of the work installed without the Inspector having reviewed the work. The Association must be notified a minimum of two full working days in advance of a firm starting date and time to arrange for and schedule the Inspector. Work must proceed in a continuous manner. If there are breaks in construction, there must be two working days' notice before beginning work again. All inspection and testing costs are to be paid by the developer.

The approved construction plans and specifications shall be followed. No deviations will be allowed without written request for change and approval received from the Association. The Association reserves the right to order changes in the event of conditions or circumstances discovered during construction. Such changes could result from the ability or care shown by the contractor, natural and man-made conditions, or any other reason.

Final tie-in to the existing Association system will not be permitted until after acceptance of the entire installation by the Association. All taps to existing Association mains must be performed while the Association Inspector is present. Final acceptance will not be made until all submittals required are completed and after acceptable system installation is complete.

The water system extension shall be hydrostatically pressure tested in accordance with the *Developer Extension Manual*. The contractor shall provide all testing equipment. The final testing shall be performed in the presence of the Association's inspector.

Any changes or additions to the facilities used for water supply must be properly disinfected prior to using them for service, in accordance with WAC 246-290-451(1). The Association will complete a "Construction Completion Report", which is required for public water system projects in accordance with WAC 246-290-040 following completion of construction of Association and developer-initiated projects.

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CHAPTER 8 – IMPROVEMENT PROGRAM

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CHAPTER 8

IMPROVEMENT PROGRAM

The purpose of this chapter is to incorporate the system needs and recommended improvements as previously identified in other chapters into an improvement program. The capital improvement program presented in this chapter has been developed in accordance with the requirements of WAC 246-290-100.

The development of a comprehensive plan and an improvement program provide for orderly expansion and improvement of the Association's water system. The population and water demand forecasts, existing system analyses and design criteria presented in previous chapters were used to formulate the following Capital Improvement Plan. The Association's service area was reviewed with respect to areas of expected future growth for the purpose of determining the need for future water main extensions.

8.1 PRIORITIZING PROJECTS

A three-step process was used to develop the Association's Capital Improvement Plan (CIP). These steps include the identification of potential system improvements, the evaluation of the alternatives and finally the selection of alternatives for the implementation of the Capital Improvement Plan.

8.2 IDENTIFICATION OF SYSTEM IMPROVEMENTS AND ASSESSMENT OF ALTERNATIVES

Each element of the water system was analyzed, and a draft list of potential improvements was developed to address existing or anticipated system deficiencies as documented in Chapter 3. When applicable, alternative improvements were developed for each deficiency. The alternatives were identified in consideration of meeting DOH and Association standards, serving the designated land use of the water service area, improving reliability of the water system, and minimizing capital and operating costs. Most of the deficiencies did not support consideration of alternatives as the solution was readily identified due to regulatory or geographical considerations.

The following sections summarize and describe the improvements which have been recommended.

Source of Supply and Booster Pump Stations

As described in Chapter 3, the Association's supply of water comes from the City of Everett. Review of the City's current Comprehensive Water System Plan indicates that the supply of water available for the Association is adequate through and beyond the planning period. As described in Section 3.4.1, a new intertie to the City of Everett system and a booster pump station (BPS#3) is recommended to provide improved supply capacity and redundancy. Improvements are recommended at both the existing booster pump stations for reliability and anticipated equipment replacement needs.

Water Treatment

Water treatment is provided by the City of Everett and a review of the City's current Comprehensive Water System Plan indicates that the treatment capacity for the water supplied to the Association is adequate through and beyond the planning period. Therefore, no treatment projects are recommended, except for a potential project to monitor for PFAS compounds and develop an action plan should such compounds be detected in the water supply from Everett.

Storage

As described in Section 3.3.3, the Association's 228,000-gallon standpipe was sized per the DOH criteria in effect at the time. The criteria have changed, and the system is considered deficient in storage under the current recommended DOH criteria. However, with two sources of supply from independent City of Everett transmission mains, the Association has concluded that additional storage capacity, which would include a significant amount of additional dead storage, is a relatively low priority for the system. As described in Section 3.3.3, no storage improvements are recommended for the near future, but the CIP includes consideration of additional storage within the 20-year planning period.

Distribution/Transmission System

The hydraulic analysis resulted in no need for improvements to address current or forecast pressure or velocity deficiencies. The improvements recommended for the distribution system focus on replacement of asbestos cement (AC) water main and replacement of long dead-end small diameter water mains. In addition, continuation of the Association's long-range program for replacement of blowoff assemblies and fire hydrants is recommended.

Two water main projects will install approximately 11,100 feet of new 8-inch water main to expand service to unserved portions of the service area. These projects will connect proposed BPS #3 to existing mains on Dubuque and Storm Lake Roads.

The Association will also replace nearly 3,700 feet of existing aging, dead-end, and undersized (i.e., typically less than 4-inch) water mains. Blow off assemblies will be installed on dead-end mains and fire hydrant assemblies will be replaced as necessary.

The remaining recommended water main projects are part of an extensive 6-inch AC main replacement program. Aging 6-inch AC water main is spread throughout the Association and the replacement of all AC main over time will increase the useful life of the system and reduce distribution system leakage. The Association has secured funding to replace nearly 15,000 feet of existing 6-inch AC main. The replacement main will be 8-inch ductile iron, as that size and material is the Association standard. The work under this funded project will be completed in three or four[1] phases. The remaining AC pipe will be scheduled for replacement over the next 20 years. By that time, the oldest pipe in the system will be nearly 80 years old. Some of the AC pipe segments will likely have some remaining life but breaks would be anticipated to be more frequent.

There are no improvements specifically directed at increasing fire flow to areas of the system where existing flows are less than the goal discussed in Chapter 3. However, as various water mains are replaced and upsized to minimum 8" diameter and as dead ends in the system are looped by developer extension and other capital projects, fire flow capacity will increase in those areas.

Other Improvements

The Association is in the process of completing an assessment of lead service lines in the system.

The telemetry and communication systems have been substantially updated in the past five years. Future improvements will focus on increased functionality and replacement of hardware and software to keep pace with advances in technology.

The hardware and software systems used in the office for billing and other administrative work will also be periodically updated to keep pace with advances in technology. The assets of the system are being documented in an asset management program including addition of available data in a geographic information system (GIS) database and mapping.

The Association will continue to assess the vulnerability of its facilities and implement additional security measures where it is determined to be appropriate.

The radio unit, battery and register of member water meters will be replaced on a proactive schedule to keep ahead of battery depletion.

The Association vehicles are scheduled for replacement based on a 15-year life cycle.

An additional building for vehicles and additional shop/storage area is proposed on Association property adjacent to the existing office/shop building.

[1] One segment of the work depends on the outcome of coordination with Snohomish County. The County is preparing to complete a culvert replacement project and the timing and configuration of that project will determine how the Association completes the necessary main replacement in that area.

Presuming approval of this Plan in 2023, the next WSP update will be necessary by 2033.

8.3 SELECTION OF ALTERNATIVES

The selection of projects for supply, storage and transmission/distribution improvements are discussed in Section 3.4 and summarized in Section 8.2 and the accompanying tables and figures. The sequence and scheduling of projects which are scheduled to be completed over the next ten-year planning period was developed by following a general priority outline balanced with the review of the current and projected financial resources of the Association as described in Chapter 9. The considerations in selecting projects include the items listed below:

a) Current deficiencies with the potential of impacting water quality.
b) Current deficiencies limit supply of MDD and PHD to the system.
c) Forecasted deficiencies in source of supply and storage capacities.
d) Current deficiencies in delivering fire flow to areas of the Association's existing service area.
e) Anticipated growth and expansion of existing water service area.

8.4 CAPITAL IMPROVEMENT PLAN AND SCHEDULE

The following tables and figures illustrate the projects which have been selected to address current deficiencies and to accommodate the forecasted growth in the system over the next twenty years.

Table 8.1 presents those projects which are necessary to address current deficiencies, to accommodate growth for the 20-year planning period and to provide extension of service throughout the water service area (except for local extensions).

The cost estimates presented are based on 2023 prices and represent estimated total project costs. For reference, the Engineering News Record Construction Cost Index for Seattle is 15,174 (July 2023)[2]. Project costs are developed from estimated construction cost plus allied costs. Allied costs are estimated as 50% of the estimated construction cost and represent costs for permitting, surveying, engineering design and observation, inspection, administration, legal and other project related costs, including 15% contingency and 7.9% sales tax.

Project Cost Estimates

[2] The Construction Cost Index increased by 25% from December 2019 to July 2023.

Cost estimates involve an engineering judgment based on experience; however, construction costs can vary widely due to many factors which cannot be predicted such as labor availability, competitive conditions, economic conditions, final location of the project, current management, environmental considerations, and other intangibles affecting design and construction costs at the time the work is actually performed. Generally, actual costs still may not be known until construction bids are received and even those may be subject to adjustment because of changed conditions encountered during construction. The Association, in its decision making, must always keep in mind that the costs presented in these tables are preliminary estimates.

Operation and maintenance costs are not reflected in the project cost estimates. However, these costs are important and require consideration during the design phase of a proposed facility or project.

8.5 IMPROVEMENT PROJECT FUNDING

As further detailed in Chapter 9, it has been determined that all capital improvement projects scheduled for the next 10 years will be funded through a combination of developer extensions, general facility charges and State-funded low interest loans. It is not possible to accurately predict the annual revenue from general facility charges or the success of loan applications that may be submitted in a particular year. Therefore, the sequencing and scheduling of projects may need to be modified in consideration of future revenue which may not be realized by the Association.

TABLE 8.1
Capital Projects and Planning Efforts

ID	Capital Improvement	Project Description	Estimated Project Cost (2023 $)	Recommended Year of Completion
I. SUPPLY / TREATMENT				
A	BPS	BPS #3 with standby generator (at same time as H or I). Secure property for station in vicinity of Dubuque Road and Storm Lake Road intersection.	$ 800,000	as needed for development
B	BPS	BPS #2 - replace one motor and soft starter.	$ 17,000	2025
C	BPS	BPS #1 - replace roof.	$ 87,500	2024
D	BPS	BPS #1 - evaluate building for seismic resiliency	$ 7,500	2034
AA	PFAS	PFAS monitoring and action planning.	$ 10,000	2034
		Subtotal for Supply Projects	**$ 922,000**	
II. STORAGE				
E	Storage	Standpipe - recoat exterior.	$ 50,000	2030
F	Storage	Standpipe - recoat interior.	$ 65,000	2035
G	Storage	Additional storage - consider additional storage facility - capacity, location to be determined. (Allowance is based on 37' diameter, 97' to overflow standpipe.)	$ 4,094,000	2040
		Subtotal for Storage Projects	**$ 4,209,000**	
III. TRANSMISSION/DISTRIBUTION				
H	8" Water Main	Construct approximately 4,800 linear feet of 8" main along Dubuque Road from BPS #3 to the intersection of 171st Ave SE (potentially at same time as A).	$ 1,080,000	as needed for development
I	8" Water Main	Construct approximately 6,300 linear feet of 8" main along Storm Lake Road from BPS #3 to the existing system, south of 48th St SE (potentially at same time as A).	$ 1,418,000	as needed for development
J	8" Water Main	Replace approximately 14,000 linear feet of existing AC water main with 8" DI water main from BPS #1 south along 171st Ave SE to Three Lakes Road, and along 58th Ave SE (Wishon Road) from 171st Ave SE to the Standpipe site, in three phases.	$ 3,528,000	2024-2026

ID	Capital Improvement	Project Description	Estimated Project Cost (2023 $)	Recommended Year of Completion
K	8" Water Main	Replace approximately 900 linear feet of existing AC water main with 8" DI water main on 62nd St SE from existing 8" DI main to 181st Ave SE (potentially with Phase 2 or 3 of J).	$ 152,000	2024
L	8" Water Main	Replace approximately 500 linear feet of existing AC water main with 8" DI water main along 163rd Ave SE at the roadway crossing of Panther Creek (project is in response to County project to replace two existing culverts with a bridge or box culvert, potentially with Phase 2 or 3 of J).	$ 129,000	2025
M	AC Water Main Replacement	Replace approximately 59,300 linear feet of existing AC water main pipe with DI mains (multi-phase project).	$ 13,343,000	2030-2043
N	Small Diameter Main Replacement	Replace approximately 1,800 linear feet of existing 2-inch PVC with 4" DI main east of 153rd Ave SE. Replace approximately 1,250 linear feet of existing 2-inch PVC with 4" DI main east and north of Panther Lake Road. Replace approximately 630 linear feet of existing 2-inch PVC with 4" DI main north from 181st Ave SE near Flowing Lake. Replace approximately 540 feet of existing 2" PVC with 4" DI main north of Storm Lake Road, at 184th Dr SE.	$ 712,000	2030-2040
O	Blowoff and Fire Hydrant Replacement	Install blowoff assemblies at end of dead-end mains and replace existing fire hydrant assemblies as necessary (10-year program).	$ 100,000	2024-2033
		Subtotal for Trans./Dist. Projects	**$ 20,462,000**	
IV. OTHER				
P	Lead Service Line Assessment	Complete assessment of potential for or location of lead service lines in system and services.	$ 2,000	2023
Q	Telemetry System Upgrade	Update Association's telemetry system (software and hardware updates).	$ 15,000	2028
R	Office Network Upgrade	Upgrade or replace office network system.	$ 5,000	2027
S	Customer Billing System	Upgrade or replace customer billing system.	$ 20,000	2027

ID	Capital Improvement	Project Description	Estimated Project Cost (2023 $)	Recommended Year of Completion
T	Asset Management Program	Build GIS database and asset management tools, including GPS data collector.	$ 15,000	2023-2025
U	Enhance Security Measures	Enhance security systems at reservoir and booster pump stations.	$ 7,000	2025
V	Meter Register Replacement Program	Replace existing meter register/battery assembly on 10 or 15 year cycle, based on type of installed register.	$ 261,900	2024-2038
W	Vehicles & Equipment	Replace three service trucks (15 year life cycle), trailer, small tractor	$ 135,000	2025-2038
X	Office/Shop Building	Replace roof	$ 25,000	2030
Y	Garage	Expand use of office/standpipe site to include four-bay garage, with site improvements	$ 400,000	2030
Z	Water System Plan Update	Update the 2023 Water System Plan	$ 100,000	2033
		Subtotal for Other Projects	**$ 985,900**	
Capital Projects and Planning Efforts Total			**$ 26,578,900**	

TABLE 8.2
10-Year Capital Projects and Planning Efforts

ID	Capital Improvement	Project Description	Page Where Need Identified*	Funding Source**	Estimated Project Cost (2023 $)	Recommended Year of Completion
B	BPS	BPS #2 - replace one motor and soft starter.	3-24	Rates	$ 17,000	2025
C	BPS	BPS #1 - replace roof.	3-24	Rates	$ 87,500	2024
E	Storage	Standpipe - recoat exterior.	3-22	Rates	$ 50,000	2030
J	8" Water Main	Replace approximately 14,000 linear feet of existing AC water main with 8" DI water main from BPS #1 south along 171st Ave SE to Three Lakes Road, and along 58th Ave SE (Wishon Road) from 171st Ave SE to the Standpipe site, in three phases.	3-22	GFC/Rates	$ 3,528,000	2024-2026
K	8" Water Main	Replace approximately 900 linear feet of existing AC water main with 8" DI water main on 62nd St SE from existing 8" DI main to 181st Ave SE (potentially with Phase 2 or 3 of J).	3-22	GFC/Rates	$ 152,000	2025
L	8" Water Main	Replace approximately 500 linear feet of existing AC water main with 8" DI water main along 163rd Ave SE at the roadway crossing of Panther Creek (project is in response to County project to replace two existing culverts with a bridge or box culvert, potentially with Phase 2 or 3 of J).	3-22	GFC/Rates	$ 129,000	2026
M	AC Water Main Replacement	Replace approximately 59,300 linear feet of existing AC water main pipe with DI mains (multi-phase project).	3-23	GFC/Rates	$ 2,669,000	2030-2033

ID	Capital Improvement	Project Description	Page Where Need Identified*	Funding Source**	Estimated Project Cost (2023 $)	Recommended Year of Completion
N	Small Diameter Main Replacement	Replace approximately 540 feet of existing 2" PVC with 4" DI main north of Storm Lake Road, at 184th Dr SE.	3-23	Rates	$ 91,000	2030-2040
O	Blowoff and Fire Hydrant Replacement	Install blowoff assemblies at end of dead-end mains and replace existing fire hydrant assemblies as necessary (10-year program).	3-23	Rates	$ 100,000	2024-2033
P	Lead Service Line Assessment	Complete assessment of potential for or location of lead service lines in system and services.	3-23	Rates	$ 2,000	2023
Q	Telemetry System Upgrade	Update Association's telemetry system (software and hardware updates).	3-22	GFC	$ 15,000	2028
R	Office Network Upgrade	Upgrade or replace office network system.	3-25	GFC	$ 5,000	2027
S	Customer Billing System	Upgrade or replace customer billing system.	3-25	Rates	$ 20,000	2027
T	Asset Management Program	Build GIS database and asset management tools, including GPS data collector.	3-26	GFC	$ 15,000	2023-2025
U	Enhance Security Measures	Enhance security systems at reservoir and booster pump stations.	3-25	GFC	$ 7,000	2025
V	Meter Register Replacement Program	Replace existing meter register/battery assembly on 10 or 15 year cycle, based on type of installed register.	3-25	Rates	$ 242,100	2024-2033
W	Vehicles & Equipment	Replace two service trucks (15 year life cycle), add trailer	3-26	GFC/Rates	$ 70,000	2025-2033

ID	Capital Improvement	Project Description	Page Where Need Identified*	Funding Source**	Estimated Project Cost (2023 $)	Recommended Year of Completion
X	Office/Shop Building	Replace roof	3-25	Rates	$ 25,000	2030
Y	Garage	Expand use of office/standpipe site to include four-bay garage, with site improvements	3-25	GFC	$ 400,000	2030
Z	Water System Plan Update	Update the 2023 Water System Plan	3-26	Rates	$ 100,000	2033
		10-Year Capital Projects and Planning Efforts Total			**$ 7,724,600**	

Notes:

ENR CC Index, Seattle, July 2023 = 15,174.36

*#-# indicates 2023 WSP page number, "Staff" indicates Association Staff recommendation, all recommendations summarized in Table 3.4, page 3-27

**Funding Sources:

GFC	Funded from Association General Facilities Charges revenue
Rates	System improvements and projects funded by water service charges
DE	Developer Extension - donated

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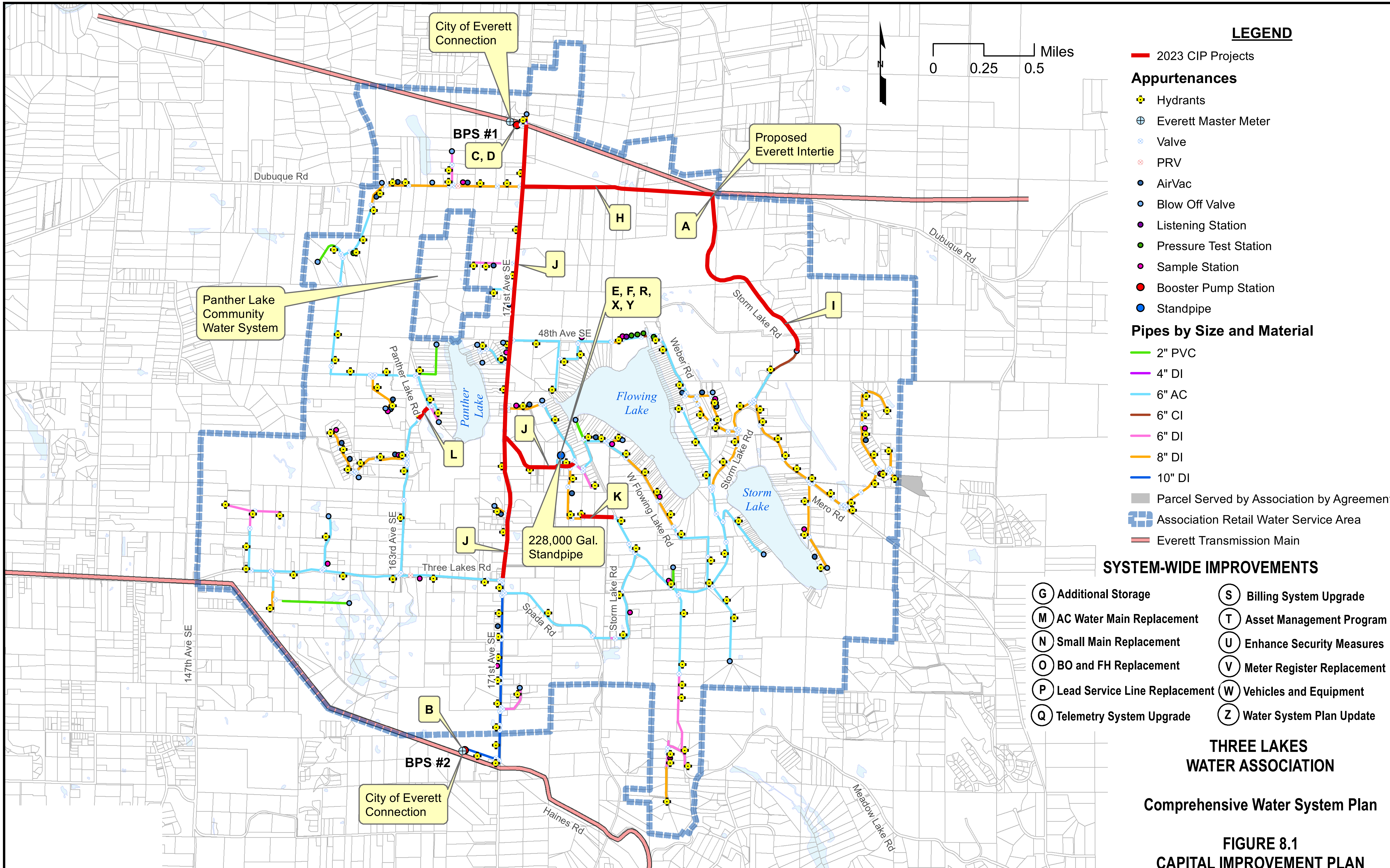

City of Everett Connection
BPS #1
C, D
Dubuque Rd
Proposed Everett Intertie
H
A
J
Panther Lake Community Water System
171st Ave SE
E, F, R, X, Y
I
Storm Lake Rd
48th Ave SE
Weber Rd
Flowing Lake
Panther Lake
Panther Lake Rd
L
J
K
W Flowing Lake Rd
Storm Lake Rd
Storm Lake
Mero Rd
163rd Ave SE
Three Lakes Rd
J
228,000 Gal. Standpipe
Spada Rd
Storm Lake Rd
147th Ave SE
171st Ave SE
B
BPS #2
City of Everett Connection
Haines Rd
Meadow Lake Rd
Dubuque Rd
Miles
0 0.25 0.5
N
LEGEND
2023 CIP Projects
Appurtenances
Hydrants
Everett Master Meter
Valve
PRV
AirVac
Blow Off Valve
Listening Station
Pressure Test Station
Sample Station
Booster Pump Station
Standpipe
Pipes by Size and Material
2" PVC
4" DI
6" AC
6" CI
6" DI
8" DI
10" DI
Parcel Served by Association by Agreement
Association Retail Water Service Area
Everett Transmission Main
SYSTEM-WIDE IMPROVEMENTS
G Additional Storage
M AC Water Main Replacement
N Small Main Replacement
O BO and FH Replacement
P Lead Service Line Replacement
Q Telemetry System Upgrade
S Billing System Upgrade
T Asset Management Program
U Enhance Security Measures
V Meter Register Replacement
W Vehicles and Equipment
Z Water System Plan Update
THREE LAKES WATER ASSOCIATION
Comprehensive Water System Plan
FIGURE 8.1
CAPITAL IMPROVEMENT PLAN

CHAPTER 9 – FINANCIAL PROGRAM

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CHAPTER 9

FINANCIAL PROGRAM

There are several objectives of a water system's financial program. These include the assurance that the capital improvement plan can be funded, the establishment of a balanced operating budget, development of adequate rates and charges for cash flow stability and emergency repairs, consideration of rate affordability and impact of rates on water use efficiency. Statutory authority for financial programs is derived from Chapters 43.20, 70.116 and 70.119A RCW. Regulatory authority includes Chapter 246-290-100 WAC.

9.1 PAST AND FORECAST FINANCIAL STATUS

The historical revenues and expenses of the Association for the previous six-year period are presented in Table 9.1. A detailed breakdown of the historic revenues and expenses for the previous six years is included in Appendix H. A summary of the Association's current and projected annual budget, through 2033, is presented in Table 9.2. A detailed breakdown of the forecast through 2033 is included in Appendix H.

The Association has three types of funds: operations, capital, and debt reserve funds. Cash and investments are held in multiple accounts for each fund type. This is to be certain that funds are fully insured by the FDIC (i.e., under the current limit of $250,000 per account holder per institution). Operations funds (sometimes noted as the "general fund") includes checking and money market accounts. A balance of at least 90 days of operating expenses is maintained in the checking account and funds are transferred in each month from the other operations or capital accounts to cover monthly payments for various operations and capital expenses. The capital funds include checking, savings and money market accounts and certificates of deposit (CDs). These funds are restricted for use for capital improvements to the system. The debt funds are three required accounts to hold required funds for principal and interest payments for three current Drinking Water State Revolving Fund (DWSRF) low-interest loans.

The Association has adopted a policy for minimum fund balances: $150,000 for capital improvements and $50,000 for operations.

TABLE 9.1
HISTORIC REVENUES & EXPENSES
Fiscal Year ending June 30

	2018	2019	2020	2021	2022	2023
REVENUES						
Water Rates*	$ 617,181	$ 633,601	$ 643,101	$ 664,961	$ 726,832	$ 826,796
Fees and Other Service Charges	$ 82,096	$ 49,266	$ 72,312	$ 40,309	$ 57,522	$ 66,932
Other Revenues	$ 10,078	$ 19,536	$ 10,615	$ 6,428	$ 2,646	$ 2,763
TOTAL REVENUES	**$ 709,355**	**$ 702,403**	**$ 726,028**	**$ 711,698**	**$ 787,000**	**$ 896,491**
EXPENSES						
Salaries & Other Benefits	$ 227,619	$ 250,874	$ 268,205	$ 289,245	$ 323,674	$ 360,019
Power & Other Utilities	$ 18,941	$ 20,423	$ 24,304	$ 26,157	$ 24,236	$ 26,267
Monitoring	$ 1,658	$ 1,777	$ 1,325	$ 2,388	$ 1,381	$ 847
Materials, Supplies and Parts	$ 171,191	$ 195,062	$ 181,705	$ 193,901	$ 242,573	$ 252,123
Transportation Expenses	$ 6,045	$ 4,755	$ 4,441	$ 2,968	$ 5,134	$ 5,778
Miscellaneous	$ -	$ -	$ -	$ -	$ -	$ -
Total Operation & Maintenance Expense	$ 425,454	$ 472,891	$ 479,980	$ 514,659	$ 596,998	$ 645,034
Office Supplies & Postage	$ 11,193	$ 11,905	$ 17,651	$ 10,299	$ 11,151	$ 12,366
Insurance - Vehicles, Liability, Worker's Comp	$ 9,797	$ 11,532	$ 11,979	$ 12,681	$ 11,191	$ 18,697
Legal & Accounting	$ -	$ -	$ -	$ -	$ -	$ -
Engineering & Professional Services	$ 30,069	$ 36,906	$ 34,937	$ 25,126	$ 36,785	$ 31,311
Fees	$ 3,325	$ 2,930	$ 3,792	$ 2,794	$ 3,121	$ 3,660
Miscellaneous Expenses (e.g. Training, interest)	$ 18,924	$ 17,844	$ 16,043	$ 18,698	$ 17,582	$ 20,560
Total General & Administrative Expenses	$ 73,308	$ 81,117	$ 84,402	$ 69,598	$ 79,830	$ 86,594
Depreciation Expense	$ 151,073	$ 147,564	$ 132,554	$ 132,142	$ 158,076	$ 160,769
TOTAL EXPENSES	**$ 649,835**	**$ 701,572**	**$ 696,936**	**$ 716,399**	**$ 834,904**	**$ 892,397**
TOTAL EXPENSES NIC DEPRECIATION	**$ 498,762**	**$ 554,008**	**$ 564,382**	**$ 584,257**	**$ 676,828**	**$ 731,628**
Taxes (Property, B & O, Excise)	$ 60,693	$ 65,360	$ 68,081	$ 67,528	$ 71,404	$ 79,318
Annual Debt Payments-Loans/Bonds (Principal only)	$ 88,528	$ 87,537	$ 94,472	$ 86,034	$ 84,823	$ 81,902
Net CIP Expense (Revenue)	$ (77,041)	$ 120,383	$ (92,535)	$ 92,052	$ (49,591)	$ 134,366
Operating Cash Reserve Annual Installment	$ -	$ -	$ -	$ -	$ -	$ -
Emergency Reserve Annual Installment	$ -	$ -	$ -	$ -	$ -	$ -
Replacement Reserve Annual Installment	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL REVENUE REQUIREMENT	**$ 722,015**	**$ 974,852**	**$ 766,954**	**$ 962,013**	**$ 941,540**	**$ 1,187,983**
BUDGET SURPLUS (DEFICIT)*	**$ (12,660)**	**$ (272,449)**	**$ (40,926)**	**$ (250,315)**	**$ (154,540)**	**$ (291,492)**
Total Outstanding Debt-Loans/Bonds	$ 1,092,507	$ 1,004,970	$ 916,380	$ 821,908	$ 727,435	$ 640,263
Operations Fund Balance	$ 260,021	$ 271,702	$ 409,857	$ 417,809	$ 440,564	$ 412,061
Capital Improvement Fund Balance	$ 1,184,607	$ 1,015,756	$ 1,022,433	$ 880,516	$ 861,888	$ 733,796
Total of All Funds	**$ 1,444,628**	**$ 1,287,458**	**$ 1,432,290**	**$ 1,298,325**	**$ 1,302,452**	**$ 1,145,857**

* Not including portion of rates transferred to Capital Improvement Fund

TABLE 9.2
PROJECTED REVENUES & EXPENSES
Fiscal Year ending June 30

	2024	*2025*	*2026*	*2027*	*2028*
REVENUES					
Water Rates*	$ 801,732	$ 911,439	$1,036,148	$1,177,906	$1,339,043
Fees and Other Service Charges	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000
Other Revenues	$ 10,044	$ 10,861	$ 8,129	$ 7,135	$ 7,515
TOTAL REVENUES	**$ 819,776**	**$ 930,300**	**$1,052,276**	**$1,193,041**	**$1,354,558**
EXPENSES					
Salaries & Other Benefits	$ 396,000	$ 415,800	$ 436,590	$ 458,420	$ 481,340
Power & Other Utilities	$ 30,000	$ 30,900	$ 31,827	$ 32,782	$ 33,765
Monitoring	$ 2,000	$ 2,060	$ 2,122	$ 2,185	$ 2,251
Materials, Supplies and Parts	$ 248,879	$ 271,823	$ 280,126	$ 288,694	$ 297,534
Transportation Expenses	$ 6,000	$ 6,180	$ 6,365	$ 6,556	$ 6,753
Miscellaneous - Transfer to Capital	$ -	$ 180,000	$ 180,000	$ 180,000	$ 350,000
Total Operation & Maintenance Expense	$ 682,879	$ 906,763	$ 937,030	$ 968,637	$1,171,643
Office Supplies & Postage	$ 15,200	$ 15,656	$ 16,126	$ 16,609	$ 17,108
Insurance - Vehicles, Liability, Worker's Comp	$ 20,000	$ 20,600	$ 21,218	$ 21,855	$ 22,510
Engineering & Professional Services	$ 34,000	$ 35,020	$ 36,071	$ 37,153	$ 38,267
Fees	$ 7,000	$ 7,210	$ 7,426	$ 7,649	$ 7,879
Miscellaneous Expenses (e.g. Training)	$ 19,477	$ 18,402	$ 17,559	$ 16,727	$ 15,905
Total General & Administrative Expenses	$ 95,677	$ 96,888	$ 98,400	$ 99,992	$ 101,669
Depreciation Expense	$ 163,955	$ 186,060	$ 210,455	$ 238,608	$ 270,912
TOTAL EXPENSES	**$ 942,512**	**$1,189,711**	**$1,245,885**	**$1,307,237**	**$1,544,224**
TOTAL EXPENSES NIC DEPRECIATION	**$ 778,557**	**$1,003,651**	**$1,035,430**	**$1,068,629**	**$1,273,312**
Taxes (Property, B & O, Excise)	$ 80,000	$ 82,400	$ 84,872	$ 87,418	$ 90,041
Annual Debt Payments-Loans/Bonds (P&I, interest only for new debt)	$ 200,566	$ 270,104	$ 353,084	$ 348,770	$ 344,456
Net CIP Expense (Revenue)	$ (149,561)	$ (152,642)	$ (321,762)	$ (349,797)	$ (503,089)
TOTAL REVENUE REQUIREMENT	**$1,073,518**	**$1,389,573**	**$1,362,080**	**$1,393,629**	**$1,475,632**
BUDGET SURPLUS (DEFICIT)*	**$ (253,742)**	**$ (459,273)**	**$ (309,803)**	**$ (200,588)**	**$ (121,073)**
Total Outstanding Debt-Loans/Bonds (P&I)	$1,928,689	$2,887,432	$3,801,669	$3,530,239	$3,258,809
Operations Fund Balance	$ 373,280	$ 217,529	$ 149,503	$ 186,497	$ 177,703
Capital Improvement Fund Balance	$ 682,790	$ 565,328	$ 534,006	$ 535,033	$ 693,665
Total of All Funds	**$1,056,070**	**$ 782,858**	**$ 683,510**	**$ 721,530**	**$ 871,368**

* Not including portion of rates transferred to Capital Improvement Fund

TABLE 9.2 (continued)
PROJECTED REVENUES & EXPENSES
Fiscal Year ending June 30

	2029	*2030*	*2031*	*2032*	*2033*
REVENUES					
Water Rates*	$1,522,207	$1,730,406	$1,967,060	$2,236,055	$2,541,807
Fees and Other Service Charges	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000
Other Revenues	$ 9,014	$ 11,980	$ 9,768	$ 5,925	$ 4,192
TOTAL REVENUES	**$1,539,221**	**$1,750,387**	**$1,984,828**	**$2,249,980**	**$2,553,998**
EXPENSES					
Salaries & Other Benefits	$ 505,407	$ 530,678	$ 557,212	$ 585,072	$ 614,326
Power & Other Utilities	$ 34,778	$ 35,822	$ 36,896	$ 38,003	$ 39,143
Monitoring	$ 2,319	$ 2,388	$ 2,460	$ 2,534	$ 2,610
Materials, Supplies and Parts	$ 306,655	$ 316,068	$ 325,782	$ 335,806	$ 346,150
Transportation Expenses	$ 6,956	$ 7,164	$ 7,379	$ 7,601	$ 7,829
Miscellaneous - Transfer to Capital	$ 450,000	$ 650,000	$ 800,000	$1,150,000	$1,250,000
Total Operation & Maintenance Expense	$1,306,115	$1,542,120	$1,729,729	$2,119,015	$2,260,058
Office Supplies & Postage	$ 17,621	$ 18,150	$ 18,694	$ 19,255	$ 19,833
Insurance - Vehicles, Liability, Worker's Comp	$ 23,185	$ 23,881	$ 24,597	$ 25,335	$ 26,095
Legal & Accounting	$ -	$ -	$ -	$ -	$ -
Engineering & Professional Services	$ 39,415	$ 40,598	$ 41,816	$ 43,070	$ 44,362
Fees	$ 8,115	$ 8,358	$ 8,609	$ 8,867	$ 9,133
Miscellaneous Expenses (e.g. Training)	$ 15,094	$ 15,178	$ 15,273	$ 15,380	$ 15,501
Total General & Administrative Expenses	$ 103,431	$ 106,164	$ 108,989	$ 111,908	$ 114,924
Depreciation Expense	$ 307,844	$ 350,077	$ 396,966	$ 449,996	$ 510,800
TOTAL EXPENSES	**$1,717,390**	**$1,998,362**	**$2,235,683**	**$2,680,919**	**$2,885,782**
TOTAL EXPENSES NIC DEPRECIATION	**$1,409,546**	**$1,648,284**	**$1,838,718**	**$2,230,923**	**$2,374,982**
Taxes (Property, B & O, Excise)	$ 92,742	$ 95,524	$ 98,390	$ 101,342	$ 104,382
Annual Debt Payments-Loans/Bonds (P&I, interest only for new debt)	$ 281,320	$ 277,006	$ 272,692	$ 268,378	$ 264,064
Net CIP Expense (Revenue)	$ (541,058)	$ (49,175)	$ 159,327	$ (177,333)	$ (249,690)
TOTAL REVENUE REQUIREMENT	**$1,550,395**	**$2,321,718**	**$2,766,093**	**$2,873,306**	**$3,004,538**
BUDGET SURPLUS (DEFICIT)*	**$ (11,174)**	**$ (571,331)**	**$ (781,265)**	**$ (623,326)**	**$ (450,539)**
Total Outstanding Debt-Loans/Bonds (P&I)	$2,987,379	$2,774,771	$2,562,163	$2,349,554	$2,136,946
Operations Fund Balance	$ 214,635	$ 221,213	$ 268,934	$ 186,649	$ 261,283
Capital Improvement Fund Balance	$ 953,403	$ 725,572	$ 293,552	$ 202,507	$ 188,133
Total of All Funds	**$1,168,039**	**$ 946,785**	**$ 562,486**	**$ 389,156**	**$ 449,416**

* Not including portion of rates transferred to Capital Improvement Fund

The Association will typically utilize its capital fund to complete new improvements. Revenues to support capital improvements are collected from new connections and a portion of monthly service charges, as necessary, and as appropriate to fund repair and replacement work in the system. Debt funding is used for more significant capital improvements and/or to maintain adequate capital fund balances in case of emergency needs. The Association will apply for low-interest loans or utilize other available funding resources. The loans would likely be through the DWSRF program or other state or federal loan program established to serve privately owned potable water systems, or a commercial loan.

The Association currently has three DWSRF loans, one of which will be paid off in 2023 (BPS #2) and one that matures in 2028 (Replacement Standpipe). The most recent loan was for the Mero Road/195th Water Main Replacement project, completed in 2015. Two additional DWSRF loans have recently been secured. Preconstruction (2022) and Construction (2023) loans have been initiated for the 171st Ave Water Main Replacement Project. As of September 2023, no funds had been drawn for these new loans, except for the Preconstruction loan fee.

9.2 REVENUE SOURCES AND EXPENSE FORECAST

Rates and charges must be maintained at an adequate level to ensure sufficient funds are available to properly maintain and operate the water system. Funds must also be available for construction of the projects outlined in the water system plan through a combination of cash contributions and debt financing.

The projects, which are presented in Table 8.1, are proposed as the Association's Capital Improvement Plan (CIP). Table 8.2 identifies the potential funding sources for each of the projects in the 10-year CIP.

Revenue will come primarily from membership share fees and connection charges (general facility charges or GFCs) for new members, and from water service charges for all members. The GFC will be evaluated following completion of this Plan and adjusted at the discretion of the Association Board. For purposes of this forecast, that increase is anticipated to be three percent. The Association has leased space on their property for a wireless communication facility and this lease also provides monthly revenue for the Association. The forecast presented in Table 9.2 conservatively assumes an increase in new members at one-half the growth rate forecast in Chapter 2 (i.e., 0.3 percent instead of 0.6 percent). Some or all of the cost of some new main extensions will be borne by property owners using the developer extension process. However, this is anticipated to be applicable to only two of the projects listed in Table 8.2.

Expenses are forecast to increase at varying rates. The cost of water and related charges from the City of Everett are known for the years 2023 and 2024 but assumed rates of increase are forecast thereafter. The costs of services and materials are anticipated to increase at the general long-term rate of inflation of three percent. Labor and benefits costs are forecast to increase at eight percent through 2024 and then five percent annually thereafter, for the current level of staffing. Water consumption is forecast to remain at about 200 gpd/ERU as discussed in Chapter 2, and water loss is conservatively forecast to remain at about 20 percent.

Based on the growth and cost estimates and the current year operating budget, a long-range budget forecast has been developed. Water rate adjustments and use of debt funding are considered in an iterative analysis to develop a forecast that meets the financial policies for minimum funds and provides adequate funding for the improvements recommended in this Plan. With a low growth rate forecast for the rural area served by the Association, there is little pressure to expand system capacity. However, with an aging system, the cost of repair and replacement becomes a significant issue and prompts the need for increased rates to fund the system replacement and upgrade projects recommended in this Plan.

9.3 FINANCIAL VIABILITY ANALYSIS

The Association performed a financial viability analysis based on DOH's former Financial Viability Test (FVT) requirements for Group A community water systems under 1,000 connections. The FVT consisted of four related financial tests. The analysis covers the ten-year planning period presented in the Comprehensive Water System Plan. The first three tests examine the adequacy of the utility's operating budget, operating cash reserve, and emergency reserve. The fourth test, the household income index analysis, allows the utility and the DOH to evaluate the water rate impact on system users. All four tests are discussed in detail below.

<u>Test No. 1 - Develop an Operating Budget</u>

The first study is to establish and examine the utility' operating budget to demonstrate sufficient revenue to meet all its incurred expenses. The Association developed an annual operating budget prior to completion of the 2013 WSP. A draft and final annual budget are adopted annually. The budget forecast for this planning process is for a ten-year period. Updates to the budget forecast should be completed annually, including impacts from projects and activities identified in the utility's WSP. Additional review and update is warranted following significant variations from the financial plan.

Table 9.2 demonstrates that the Association does not have operating revenue to cover expenses when depreciation is included. By removing depreciation from the equation (as a non-cash expense), and with the benefit of recommended rate and connection charge increases, and loan proceeds, the Association has sufficient revenue for the forecast period, anticipating ongoing annual review and adjustment of rates. The forecast increases in revenue and charges presented in Table 9.2 and Appendix H are for general planning purposes only. An annual review and update of the financial forecast is recommended before considering adjusted rates and charges. The detailed breakdown of the budget forecast is included in Appendix H.

Study No. 2 - Create and Fund an Operating Cash Reserve

The second study topic examines if the utility can develop and fund an operating cash reserve. The operating cash reserve is in the operations fund and must be maintained to meet cash flow needs and provide contingency funds for unforeseen operating expenses. Many utilities attempt to keep at least one-eighth of their annual operating and maintenance (O&M) and general and administrative (G&A) expenses in an operating cash reserve to prevent potential cash flow problems. The one-eighth criterion was established by DOH as a former requirement for the VFT.

Table 9.1 and Appendix H, Historic Revenues and Expenses, shows annual operating expenses ranging from $521,220 to $676,828 (not including depreciation). The minimum cash balance required per the Financial Viability Manual for this same historical expense range is as much as $84,604. The minimum forecast for the year 2024 is about $107,000. The minimum cash balance required is less than the projected running operations fund cash balance. This one-eight threshold is applied throughout the forecast period.

Study No. 3 - Create and Fund an Emergency Reserve

The third study is to analyze the utility's ability to cover the costs of an emergency or failure of its most vulnerable system component. This can be accomplished either by 1) developing and funding an emergency reserve, or 2) obtaining an alternative financing arrangement. Generally, a source of supply, the largest pumping equipment, or key transmission lines represent the most expensive and difficult facility to replace and are used to estimate the minimum emergency reserve amount.

The Association has adopted a policy to maintain an operating minimum reserve amount in the capital fund of $150,000. Costs to repair the pump stations, a water main break or typical problems in the event of a disaster, are assumed to statistically be less than $150,000. Considering the capital improvement plan presented in Chapter 8, the use of debt funding and rate increases, along with conservatively estimated revenue from new connections, is adjusted to forecast the forecast running capital fund balance remains above the minimum reserve amount.

Study No. 4 - Conduct Median Household Income Index Analysis

The fourth study measures the rate impact of increased operating and facility expenses on its system users. This analysis has three parts:

1) Compute 1.5 percent of the respective county's average annual median household income (MHHI). The MHHI is a value computed by the U.S. Census Bureau.
2) Determine the current and projected average annual residential water bill for the forecast period.
3) Compare the existing and projected average annual residential bill to 1.5 percent annual MHHI for the forecast period.

This analysis provides an indication of a member's ability to pay the existing and projected rates. When rates exceed 1.5 percent of the MHHI in any year of the budget, it suggests the utility's rates may not be affordable.

The U.S. Census Bureau reports the MHHI for Snohomish County for year 2021 was $100,042. Assuming an increase of two percent for 2022, the 2022 MHHI is conservatively estimated to be about $102,043. Rates are forecast to increase at the rate as discussed in Section 9.4, and MHHI is forecast to increase at the rate of two percent annually. The results are summarized in Table 9.3. The rate's forecast through fiscal year 2028 are anticipated to be below the 1.5% threshold; however, rates are forecast to exceed the threshold at that time and reach 2.35% by year 2033. The feasibility and acceptance of this will need to be reviewed by the Association with each annual rate review, balanced with consideration of additional debt.

Table 9.3
Median Income and Water Bill

Year Ending	Median Household Income (MHHI)	1.5% of MHHI	Current and Projected Water Bill (customer with average usage)
2021	$100,042	$1,501	$870
2022	$102,043	$1,531	$900
2023	$104,084	$1,561	$1,014
2024	$106,165	$1,592	$1,051
2025	$108,289	$1,624	$1,176
2026	$110,454	$1,657	$1,317
2027	$112,664	$1,690	$1,476
2028	$114,917	$1,724	$1,656
2029	$117,215	$1,758	$1,859
2030	$119,559	$1,793	$2,089
2031	$121,951	$1,829	$2,349
2032	$124,390	$1,866	$2,643
2033	$126,877	$1,903	$2,976

Note: Average water bill is historical information for 2021 and 2022, and forecast thereafter. MHHI is actual for 2021 and forecast thereafter.

9.4 ASSESSMENT OF RATES

The bi-monthly water rates are currently as follows:

Schedule 1	1 ERU	5/8” Meter	$151.00	Includes 0-600 CF
Schedule 7	1.5 ERU	1” Meter	$226.50	Includes 0-900 CF
Schedule 8	2 ERU	1-1/2” Meter	$302.00	Includes 0-1,200 CF
Schedule 9	3.5 ERU	2” Meter	$528.50	Includes 0-2,100 CF
Schedule 5	0 ERU	No Meter	$24.21	Member with no meter – 0 CF

Additional bi-monthly usage volume is currently charged as follows:

Schedule 1	5/8”	1 ERU
$2.70 per 100 CF	(from 601 CF – 1,200 CF within billing cycle)	
$2.95 per 100 CF	(from 1,201 CF – 1,800 CF within billing cycle)	
$3.20 per 100 CF	(from 1,801 CF – 2,400 CF within billing cycle)	
$3.45 per 100 CF	(from 2,401 CF – 3,000 CF within billing cycle)	
$3.80 per 100 CF	(from 3,001 CF to infinity within billing cycle)	

The charge per 100 CF is the same for five blocks of usage over the amount included in the base rate for Schedules 7, 8 and 9, with the volume thresholds per block multiplied by ERU count of the Schedule 1 thresholds.

Table 9.2 and Appendix H illustrates the revenue forecast with normal operating revenues and expenses for the period 2023 through 2033, assuming no unusual events and no additional loans in the 10-year forecast period. Annual rate increases are based on two components of the rate. The portion of the rate that is calculated for Schedule 5 is based on the cost of forecast increases in the cost of construction. The forecast assumes annual inflation of 3% of this portion of the charge. The main portion of the water service charge for water users is set to cover the cost of water, utilities, services, personnel, administration and operations, as well as supplement funding for future replacement projects. The forecast assumes an annual increase of 13.3% to provide adequate funding for the ongoing operations and improvements to the system. The net increase for the two components for a member that uses the average amount of water each billing cycle is an increase ranging from nearly 12% to about 12.6% by 2033. An increase of this magnitude will increase the cost of water service for a member that uses the average amount of water in the system approximately $10 more per month in 2024/2025, increasing to about $27 more per month by 2032/2033. It is likely that additional debt will be necessary in about 10 years to continue the long-range program of water main replacement.

The water service and general facilities charges are typically evaluated annually each fall, with consideration of adoption of increased rates at the start of the following fiscal year, based on the latest update of the Association's financial statements and other new information.

CHAPTER 10 – MISCELLANEOUS DOCUMENTS

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CHAPTER 10

MISCELLANEOUS DOCUMENTS

10.1 WATER SYSTEM PLAN CONSISTENCY STATEMENT

To ensure consistency of water system planning documents with adopted local comprehensive plan, Snohomish County was provided a draft copy of the land use and population portions of this plan with a request for approval of the DOH consistency checklist. The County deferred action until reviewing the entire plan. Following review of the September 2023 version of this plan, the County provided a signed Local Government Consistency Review Checklist. This form is included in Appendix A.

10.2 AGREEMENT WITH CITY OF EVERETT

The general commitment for continued provision of water to the Association by the City of Everett is detailed in a letter from the City dated May 10, 2023. A copy of this letter is included in Appendix A.

10.3 OTHER DOCUMENTS

Documents as referenced throughout the plan are included in the appendices which follow this chapter.

10.4 REFERENCES

The following references were used in the update of this plan.

- Washington State Department of Health - Group A Public Water Systems Chapter 246-290 WAC
- Washington State Department of Health - *Water System Design Manual*, June 2020
- Washington State Department of Health - *Water Use Efficiency Guidebook*, revised January 2017
- Three Lakes Water Association - *Comprehensive Water System Plan*, revised January 2013
- Three Lakes Water Association – *Comprehensive Water System Plan Limited Update Extension*, March 2019
- North Snohomish County Coordinated Water System Plan, December 2010
- City of Everett Public Works - *Comprehensive Water Plan*, 2020
- Snohomish County PUD – *Water System Plan*, December 2022
- Roosevelt Water Association – *Limited Water System Plan Update*, February 2021

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APPENDIX A – PLAN REVIEW AND APPROVALS

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THREE LAKES WATER ASSOCIATION – BOARD MEETING MINUTES

June 13th, 2023

The Three Lakes Water Association Board of Trustees held their June 13th, 2023 Board Meeting at 6:00 p.m. in a virtual setting utilizing phone and webinar technologies. The Association website and Facebook page requested members who wished to address the board to inform the board president by email so he could report any comments, questions, or concerns to the board. The board president's email is president@3lwa.org.

Call to Order
The meeting was called to order at 6:05 p.m. by President Jay Klicker. A quorum was satisfied by other Board trustees in attendance: Treasurer Donald Kemmis, Trustee Marek Jedrzejewicz, Trustee Yvonne Craig, Trustee Raymond Cox. Secretary Terra Nicolle logged in at 6:32. Vice President Tyler Eshleman and Trustee Heidi Mann were unexcused.

Members, Guests & Employees- Engineer Rodney Langer of David Evans and Associates, Inc. (DEA), Assistant Manager Kaila Klicker, staff member Seth Way and staff member Brittany Henning acting as recording secretary, Members Shirley and Richard West were present.

DEA Engineers' Report- Engineer Rodney Langer presented a summary of his status report, which was e-mailed and provided to the Board on June 12th, 2023. Highlights of the monthly DEA report are summarized as follows:

> **Water System Plan Update-** Engineer Rodney Langer provided the attendees of this month's board meeting with a presentation of the 2023 Water System Plan. Rodney thoroughly explained each section of the WSP in detail during the public hearing, which can be found on the Association's website. This plan must be submitted to the Department of Health for review and approval, as well as for the City of Everett and neighboring water purveyors as an informational guide to our practices. The public hearing portion of the meeting is concluded. Shirley and Richard West leave the meeting at 6:56pm.
>
> **171st Water Main Replacement Project-** Rodney continues to integrate field data findings provided by staff from last month's potholing activity, narrowing down an alignment of pipe through phase 1 running from BPS#1 to 48thSt SE. This allows the Association to further avoid environmentally sensitive areas along 171st Ave SE, as well as obtain the best approach to schedule this work. Environmental permitting is still awaiting approval from the County and a contract will be drafted to finish the design.

Manager & Cross Connection Report

Assistant Manager Kaila Klicker presented a summary of the manager report, which was e-mailed and provided to the Board on June 13th, 2023. Highlights of the monthly manager report is as summarized as follows: The idle pump time has decreased over the past month to 2 hours 25 minutes. Two system communication failures occurred, requiring Manager Kemmis and Assistant Manager Klicker to respond. Trustee Jedrzejewicz continues to assist in the replacement of the firewall equipment at BPS#1. Rivertown Homes West DE submitted an initial project deposit on May 12th; Rodney will collaborate with this developer to plan out next steps for this project. Manager Kemmis completed the two-year warranty inspection for the Flowing Lake Park entrance revision on May 30th. Per EPA requirement, staff continues to find, record, and submit data on lead and copper lines for inventory due September 2024. Currently, there are 196 connections with unconfirmed material types on the Association's side, and 372 connections with unknown service material types on the member's side. A questionnaire will be enclosed within the June billing asking for any information related to members' private service line material. On May 17th, Staff attended a meeting with Fire Chief Don Waller and crew to observe and discuss truck filling processes at fire station #42. It was concluded that there is minimal risk for a related backflow incident and the fire department has agreed to record and communicate water usage for fill operations going forward. This aids the Association in the documentation of all non-revenue water use per DOH. Fiscal year 2023/2024's budget has been drafted and revised to meet the Association's projected numbers. The draft budget was provided to the Board for review and comments. Staff have been working on annual hydrant flushing and maintenance, so far completing operation of 37% out of 143 hydrants on the system. Three signer cards are still awaiting completion at Pacific Premier.

Approval of May 9th Board Meeting Minutes
Motion made by Manager Kemmis to approve May's Board Meeting Minutes, seconded by Trustee Ray Cox. The motion passes.

Officers Reports

Treasurer Report and Pay Bills- Staff Way presented a summary of the treasurer report. The financial report was prepared and distributed to the Board summarizing the financial position through June 13th, 2023 (attached). Total funds on hand are $1,179,976.14. One transfer of $75,000 was made to cover payroll and bills. Reports are provided for the past month's expenses, prepaid invoices, and payroll summary. Checks were presented to be signed once authorized by the board.

<u>Current Financial Info</u>
General Funds- $446,108.37
Capital- $584,698.87
Reserve- $ 148,898.90
Total Expenses- $67,208.49

Motion made by Treasurer Donald Kemmis to approve payment of the bills as presented, seconded by Trustee Terra Nicolle. The motion passes.

President- Signed a few share certificates, reviewed the draft budget.

Vice President- No report, absent.

Secretary- Signed a few share certificates.

Treasurer- Spoke to individual about cell lease.

<u>Old Business</u>

No old business to report.

<u>New Business</u>

Cell Lease- Landmark Dividends has reached out to Manager Kemmis in hopes of acquiring and managing the Verizon lease. This will be researched and discussed with the board to identify the pros and cons of doing so. The board has agreed to share the lease details with this entity, allowing consideration of available options.

Call to Adjourn Meeting
Motion made by Manager Don Kemmis to adjourn the meeting, seconded by Trustee Terra Nicolle. The motion passes. The meeting was adjourned at 7:56 p.m.

EVERETT
WASHINGTON

May 10th, 2023

Rodney Langer, PE
Project Manager
David Evans and Associates
14432 SE Eastgate Way, Suite 400
Bellevue Washington 98007

RE: Confirmation of Water Supply – Three Lakes Water Association

Dear Mr. Langer:

We appreciate the opportunity to review Draft Chapters 1 & 2 of the Three Lakes Waster Association's WSP update. As presented in Table 2.8, the anticipated water demands throughout the Three Lakes system in the year 2033 is 0.225 mgd and 0.431 mgd for average day and maximum day, respectively, and 0.239 mgd and 0.458 mgd for year 2043, respectively. The City of Everett in its 2020 Comprehensive Water Plan included an estimated 0.29 mgd and 0.52 mgd for average day and maximum day, respectively in its water demand projections for year 2040. This equates to less than ½ % of Everett's current Water Filtration Plant capacity, and we don't anticipate having any issues with continuing to supply Three Lakes Water Association through the Year 2043 and beyond.

If you have any questions, please contact me at (425) 257-7210.

Sincerely,

Souheil Nasr, P.E.
Utilities Engineering Manager

Cc.: Don Kemmis, Three Lakes Water Association

Public Works

3200 Cedar Street
Everett, WA 98201

425.257.8800
425.257.8882 fax

everettpw@everettwa.gov
everettwa.gov/pw

DAVID EVANS AND ASSOCIATES INC.

April 5, 2023

Mr. Souheil Nasr, PE
Utilities Engineering Manager, City of Everett, Public Works
3200 Cedar Street
Everett, WA 98201

[via email only: SNasr@everettwa.gov]

SUBJECT: Request for Review and Confirmation of Service – Three Lakes Water Association

Dear Mr. Nasr,

We are writing on behalf of Three Lakes Water Association. We are currently working on updating the Association's 2013 Comprehensive Water System Plan and are requesting the City's review of the current draft of Chapters 1 and 2, attached.

As referenced in Section 1.5 of the attached materials, we understand the City has based its 2020 water system plan update on future (2040) demands from Three Lakes as 0.29 mgd and 0.52 mgd for average day and maximum day, respectively. As discussed in the attached draft Chapter 2 and presented in Table 2.8, we anticipate water demands throughout the Three Lakes system in the year 2033 to be 0.225 mgd and 0.413 mgd for average day and maximum day, respectively, and 0.23 mgd and 0.45 mgd for year 2040, respectively (year 2040 values available in the calculations supporting the values in Table 2.8).

Please review these future demands against your water system and water rights capacity and confirm your ability and intention to continue to serve the Association for at least the planning period presented in this update, and beyond as anticipated in your water system plan. We would like to receive your review and supply confirmation by April 28, 2023, if possible.

Chapters 1 and 2 are essentially complete except for the highlighted sections, flagged for review or update prior to plan completion.

Please contact Don Kemmis, Manager of the Three Lakes Water Association at 360-568-8022 or me at 425-586-9751 if you have any questions. Thank you.

Sincerely,

DAVID EVANS AND ASSOCIATES, INC.

Rodney Langer

Rodney Langer, PE
Project Manager

Copies: Don Kemmis, Three Lakes Water Association
Attachments/Enclosures: Draft Chapters 1 and 2, Water System Plan
Project Number: TLWA0000-2006
File Path: P:\T\TLWA00002006\0600INFO\Submittals\LTR - Everett Review Request.docx

Rodney Langer

From:	Strandberg, Terri <terri.strandberg@co.snohomish.wa.us>
Sent:	Wednesday, May 10, 2023 5:00 PM
To:	Rodney Langer
Cc:	Don Kemmis; kklicker@3lwa.org
Subject:	RE: Three Lakes Water Association - Draft portion of Water System Plan

Hello Rodney –
Thank you for sending this portion of Three Lakes draft water system plan for county review and comments.

We have reviewed the land use maps, the service area policies, the franchise agreement and the future water demand forecast. Everything looks good, although our Principal Demographer did have the following comment on population tables in chapter 2:

I have reviewed the population projections contained in draft Chapter 2 (Planning Data and Water Demand Forecasting) of the Three Lakes Water Association's updated draft water system plan, and have determined that they are using population projections that are consistent with the County's adopted growth targets that are contained in the Countywide Planning Policies.

In reviewing their materials, however, I've noted a discrepancy between the population series shown in Table 2.1 Historical Population on page 2-2 and that shown in Table 2.6 Population Projection on page 2-10 which I believe can be resolved by adding a footnote to Table 2.6 indicating that it refers only to population projected to be served by the Association (i.e., connected to their water system) if I'm not mistaken.

Please send an electronic final draft of the plan when completed for the county's files. We would like to review the final draft before signing the consistency statement.

Terri Strandberg, Principal Planner
Snohomish County Planning and Development Services

From: Rodney Langer <Rodney.Langer@deainc.com>
Sent: Wednesday, April 5, 2023 12:37 PM
To: Strandberg, Terri <terri.strandberg@co.snohomish.wa.us>
Cc: Don Kemmis <dkemmis@3lwa.org>; kklicker@3lwa.org
Subject: RE: Three Lakes Water Association - Draft portion of Water System Plan

Terri…one correction to note in Chapter 2: In Section 2.2.2 we report growth of residential 230 units over the planning period to 1089 units – those figures are for beyond the planning period…the correct values for year 2043 are 117 and 985.

Thanks.

Rodney Langer, PE
David Evans and Associates, Inc.
d: 425.586.9751 c: 206.930.3616

From: Rodney Langer
Sent: Wednesday, April 5, 2023 12:07 PM
To: Strandberg, Terri <terri.strandberg@co.snohomish.wa.us>
Cc: Don Kemmis <dkemmis@3lwa.org>; kklicker@3lwa.org
Subject: Three Lakes Water Association - Draft portion of Water System Plan

Hello Terri

As we discussed last year, we are working on an update of the Association's water system plan. We have completed the final draft for chapters 1 and 2, attached. There are several highlighted elements flagged for update as the plan progresses to completion.

We are asking for the County's review of these materials in anticipation of a request for completion of a local government consistency checklist with the County's planning documents.

We have prepared the checklist and attach it in case the County would be ready to complete it once the draft chapters are reviewed. I understand that you may defer formal action on the checklist until you have received a full copy of the plan for review.

Please let me know if you have any questions. We hope to hear back from you by May 5 or sooner as feasible.

Thanks!

Rodney Langer, PE | Water/Wastewater Practice Leader, Water and Environment
David Evans and Associates, Inc.
14432 SE Eastgate Way, Suite 400 | Bellevue, WA, 98007 | www.deainc.com
d: 425.586.9751 | c: 206.930.3616 | Cisco: 22751 | rodney.langer@deainc.com

Rodney Langer

From:	Burke, Lori <Lori.Burke@snoco.org>
Sent:	Monday, April 10, 2023 3:41 PM
To:	Rodney Langer; McCrary, Mike
Cc:	Don Kemmis; kklicker@3lwa.org
Subject:	RE: Fire Flow Criteria for Water System Planning

The information provided years ago by Ron Tangen is still accurate and within Snohomish County Code 30.53A. However, I would add a note that this fire flow would be adequate for a structure up to 3,600 square feet only.

Required fire flow is calculated utilizing Appendix B of the International Fire Code. The required fire flow is calculated based upon the type of construction and the total square footage of the proposed structure. For calculation purposes, the square footage should include all square footages on every floor level within the exterior walls and under all horizontal projections of the roof. Snohomish County Code allows a 25% reduction in required fire flow for structures constructed in the rural properties.

If you have any further questions, please feel free to contact me.

Lori T. Burke | *Assistant Fire Marshal*
Snohomish County Planning and Development Services
3000 Rockefeller Avenue M/S 604 | Everett, WA 98201
425-262-2279 - O | 425-512-4299 - C | lori.burke@snoco.org

From: Rodney Langer <Rodney.Langer@deainc.com>
Sent: Wednesday, April 5, 2023 1:55 PM
To: McCrary, Mike <M.McCrary@co.snohomish.wa.us>; Burke, Lori <Lori.Burke@snoco.org>
Cc: Don Kemmis <dkemmis@3lwa.org>; kklicker@3lwa.org
Subject: Fire Flow Criteria for Water System Planning

I am writing on behalf of Three Lakes Water Association as we work on an update of the Association's 2013 Water System Plan. In support of that plan, we prepared a letter summarizing various criteria for fire flow planning for a public water system in a rural area. And we received a response from your department confirming the basis of our fire flow planning as 750 gpm for 1 hour (see letter and email response summary attached).

I have reviewed the references cited in the letter from 2011 and find that the only substantive change is to note that County Code now adopts the 2018 IFC, including Appendices B and C. Reference in the letter to IFC 508.1 should be replaced with 507.1 as amended by SCC 30.53A.514.

Please confirm that the basis for fire flow planning as used for the prior plan, as indicated above, is still appropriate.

Please let me know if you need additional information. Thank you.

Rodney Langer, PE | Water/Wastewater Practice Leader, Water and Environment
David Evans and Associates, Inc.

14432 SE Eastgate Way, Suite 400 | Bellevue, WA, 98007 | www.deainc.com
d: 425.586.9751 | c: 206.930.3616 | Cisco: 22751 | rodney.langer@deainc.com

ENERGY | LAND DEVELOPMENT | MARINE SERVICES | SURVEYING AND GEOMATICS | TRANSPORTATION | WATER AND ENVIRONMENT

August 4, 2011

Snohomish County Fire Marshal's Office
Attn: Michael McCrary, Fire Marshal
3000 Rockefeller Avenue, M/S 604
Everett, WA 98201

Subject: Three Lakes Water Association, Inc.
Fire Protection Review for Comprehensive Water System Plan

Dear Marshal McCrary:

On behalf of Three Lakes Water Association, Inc. (Association), we have reviewed requirements pertaining to fire suppression and fire hydrants.

There are several regulations regarding provision of fire suppression services which are or may be relevant to the Association. We understand the respective codes as described below and plan to use the recommended fire flow as a goal for planning future facilities within the Association service area:

WAC 246-293-640 – Fire Flow Requirements
Per Table 1 in the subject regulation, fire flow is not required for rural development, subject to local regulations.

WAC 246-293-650 – Fire Hydrant Requirements
General requirements for hydrants are presented.

North Snohomish County Coordinated Water System Plan (CWSP), December, 2010
The CWSP was prepared by the Snohomish County Water Utility Coordinating Committee as required by RCW 70.116 and Chapter 246-293 WAC. Section IV of the CWSP includes minimum design standards. The standards are applicable to extensions of the system and are encouraged for existing portions of the system. There is no fire flow requirement in Low Density Rural Residential, Rural Residential 10 or Rural Residential 5 land use designations (as applicable for the Association). Rural Cluster Subdivisions with lot size less than one acre requires a minimum of 750 gpm for 120 minutes, with maximum hydrant spacing of 600 feet.

Snohomish County Code Chapter 30.53A
This chapter identifies the minimum requirements for fire hydrants and their location in unincorporated Snohomish County. Hydrant location is subject to the approval of the County fire marshal and the water purveyor.

SMC 30.53A.010 adopts by reference the International Fire Code (IFC), 2006 Edition, with specific amendments and exclusions. Section 508.1 of the IFC is replaced in its entirety by the County. Subsection (3)(b) indicates "All land...shall be served by a water supply designed to meet the required fire flow for fire protection as set out in Appendix B of the IFC, except that fire flow requirements for rural areas outside of an Urban Growth Area shall be reduced by 25 percent." This amendment continues with exemptions for areas of lots larger than one acre.

SMC 30.53A.516 requires fire hydrants serving single family dwellings to be spaced no more than 600 feet apart with no lot or parcel in excess of 300 feet from a fire hydrant.

IFC Appendix B requires 1,000 gpm fire flow for one and two-family dwellings with fire-flow calculation area not exceeding 3,600 square feet. Increased flow rates are required for larger and non-residential structures. Such higher flow rates would likely be needed in very isolated locations in the Association's service area. Fire flow duration is not specified for one- and two-family dwellings. The minimum duration for larger structures is two hours.

Reductions are available for sprinklered structures. However, such reductions should not be relied up for system planning due to their discretionary use at each property.

Most of the Association's water service area is within Snohomish Fire Protection District No. 4, however there are some remote areas that are not presently served by the distribution system that are within the Lake Stevens Fire or Snohomish County Fire Protection District No. 16 areas.

Following a review of these various regulations, in the context of the predominance of single-family rural development in the Association service area, we plan to use the rate of 750 gpm for 120 minutes fire flow at any location along proposed distribution system extensions. Hydrant placement shall be 600 foot maximum spacing. This criterion will be used as the goal for the extent of the existing distribution system.

Please review our recommended approach and if no objectives, please respond with your approval. We are available to meet if you feel it would be beneficial to discuss the fire flow requirements in person.

Sincerely,
CHS Engineers, LLC

Rodney Langer

Rodney Langer, P.E.
Project Manager

C: Don Kemmis, Manager, Three Lakes Water Association, Inc.
Chief Lingenfelter, Lake Stevens Fire
Chief Mark Collins, Snohomish Fire Protection District No. 4
Fire Chief, Snohomish County Fire Protection District No. 16

Email received from Snohomish County Fire Marshal's Office on 1/30/2012:

What you are designing is adequate for rural Snohomish County. The adopted IFC is now the 2009 edition. The 750 gpm is correct for rural Snohomish County the flow duration however has been reduced to 1 hour in the 2009 IFC. The spacing of fire hydrants is correct.

Ron Tangen
Senior Fire Inspector - Plan Review
(425) 388-3311 ext. 2264
rtangen@snoco.org

The Fire Marshal's Office provides safe livable environments through inspection, investigation and education.

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APPENDIX B – WFI AND OPERATOR CERTIFICATES

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Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 05/08/2023
Printed: 8/23/2023
WFI Printed For: On-Demand
Submission Reason: Pop/Connect Update

RETURN TO: Central Services - WFI, PO Box 47822, Olympia, WA, 98504-7822 or email wfi@doh.wa.gov

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
88150 6	THREE LAKES WATER ASSOCIATION	SNOHOMISH	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

DONALD R. KEMMIS [MANAGER]
PO BOX 24
SNOHOMISH, WA 98291

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

7. OWNER NAME & MAILING ADDRESS

THREE LAKES WATER ASSOCIATION MANAGER
DONALD R. KEMMIS
PO BOX 24
SNOHOMISH, WA 98291

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 17503 58TH ST SE
CITY SNOHOMISH STATE WA ZIP 98290

9. 24 HOUR PRIMARY CONTACT INFORMATION

Primary Contact Daytime Phone:	(360) 568-8022
Primary Contact Mobile/Cell Phone:	(425) 903-1601
Primary Contact Evening Phone:	(425) 418-4835
Fax:	E-mail: Dxxxxxs@3lwa.org

10. OWNER CONTACT INFORMATION

Owner Daytime Phone:	(360) 568-8022
Owner Mobile/Cell Phone:	
Owner Evening Phone:	(xxx)-xxx-xxxx
Fax:	E-mail: Dxxxxxs@3lwa.org

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☒ Not applicable (Skip to #12)
- ☐ Owned and Managed
- ☐ Managed Only
- ☐ Owned Only

SMA NAME: ____________ SMA Number:

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

- ☐ Agricultural
- ☒ Commercial / Business
- ☐ Day Care
- ☐ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☒ Recreational / RV Park
- ☒ Residential
- ☐ School
- ☐ Temporary Farm Worker
- ☒ Other (church, fire station, etc.): ____________

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☒ Association
- ☐ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☐ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

228,000

15 Source Number	16 SOURCE NAME: LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456. IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	17 INTERTIE: INTERTIE SYSTEM ID NUMBER	18 SOURCE CATEGORY: WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	19 USE: PERMANENT	SEASONAL	EMERGENCY	20 SOURCE METERED	21 TREATMENT: NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	22 DEPTH: DEPTH TO FIRST OPEN INTERVAL IN FEET	23 CAPACITY (GALLONS PER MINUTE)	24 SOURCE LOCATION: 1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	EVERETT (Pipeline #3)	24050 L											X			Y	X							309			00N	00E
S02	EVERETT (Pipeline #5)	24050 L											X			Y	X							315			00N	00E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
88150 6	THREE LAKES WATER ASSOCIATION	SNOHOMISH	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)		865	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or more per year)	865		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	7	7	
28. TOTAL SERVICE CONNECTIONS		872	

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 2180

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students, daycare children and/or employees are present each month that are NOT already included in the residential population?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	2	2	2	2	2	2	2	2	2	2	2	2

34. NITRATE SCHEDULE	QUARTERLY	ANNUALLY	ONCE EVERY 3 YEARS
(One Sample per source by time period)			

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other ____________

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: ____________ DATE: ____________

PRINT NAME: ____________ TITLE: ____________

WATERWORKS OPERATOR CERTIFICATION
VALIDATION CARD
FOR CERTIFICATE OF COMPETENCY

CERTIFICATE NUMBER	VALID FOR YEAR
13714	**2023**

BE IT KNOWN THAT THE WASHINGTON STATE DEPARTMENT OF HEALTH HAS RECOGNIZED:

Kaila Klicker

AS A CERTIFIED WATERWORKS OPERATOR

CLASSIFICATION:

CCS, WDM 2

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATERWORKS OPERATOR CERTIFICATION
VALIDATION CARD
FOR CERTIFICATE OF COMPETENCY

CERTIFICATE NUMBER	VALID FOR YEAR
12774	**2023**

BE IT KNOWN THAT THE WASHINGTON STATE DEPARTMENT OF HEALTH HAS RECOGNIZED:

Donald Kemmis

AS A CERTIFIED WATERWORKS OPERATOR

CLASSIFICATION:

CCS, WDM 2

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATERWORKS OPERATOR CERTIFICATION
VALIDATION CARD
FOR CERTIFICATE OF COMPETENCY

CERTIFICATE NUMBER	VALID FOR YEAR
15719	**2023**

BE IT KNOWN THAT THE WASHINGTON STATE DEPARTMENT OF HEALTH HAS RECOGNIZED:

Seth Way

AS A CERTIFIED WATERWORKS OPERATOR

CLASSIFICATION:

CCS

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APPENDIX C – BYLAWS AND AGREEMENTS

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A R T I C L E S O F I N C O R P O R A T I O N
O F
T H R E E L A K E S W A T E R
A S S O C I A T I O N, I N C.

We, the undersigned, all of whom are residents of Snohomish County, State of Washington, do hereby voluntarily associate ourselves together for the purpose of forming a non-profit corporation, without capital stock, under the provisions of Chapter 24.04, Title 24, R.C.W.

ARTICLE I

The name of this corporation shall be Three Lakes Water Association, Inc.

ARTICLE II

The nature of the business of the corporation and the objects and purposes for which, or for any of which, this corporation is formed are:

a. To associate its members together for their mutual benefit and to that end to construct, maintain and operate a private water system for the supplying of water for domestic, livestock, garden, industrial and commercial purposes as more fully explained in Section 2 of Article VI, and for the sale of any surplus water remaining after the needs of its members have been satisfied, and to engage in any activity related thereto, including but not limited to the acquisition of water by appropriation, drilling, pumping and/or purchase, and the purchase, laying, installation, operation, maintenance and repair of wells, pumping equipment, water mains, pipe lines, valves, meters, and all other equipment necessary to the construction, maintenance and operation of a water system.

b. To borrow from any source, money, goods, or services without limitation as to amount of corporate indebtedness or liability; and to pledge or mortgage any of its property as security therefor, in any manner permitted by law.

c. To acquire, and to hold, own, and exercise all rights of ownership in and to sell, transfer, or pledge shares of capital stock or bonds, or become a member or a stockholder of any corporation or association engaged in any related activities.

d. To buy, lease, hold, and exercise all privileges of ownership in and to all real or personal property as may be necessary or convenient for the conduct and operation of the business of the corporation or incidental thereto.

d. To establish reserves and to invest the funds thereof in stocks, bonds, and other property as the board of trustees may deem satisfactory.

f. To levy assessments in such manner and in such amount as may be provided in the by-laws of this corporation.

e. *To have and exercise all powers, privileges and rights conferred on corporations by the laws of the State of Washington and all powers and rights incidental in carrying out the purposes for which this corporation is formed, except such as are inconsistent with the express provisions of the act under which this corporation is incorporated.*

h. *The foregoing shall be construed both as objects and powers, and the enumeration thereof shall not be held to limit or restrict in any manner the general powers conferred on this corporation by the laws of the State of Washington, all of which are hereby expressly claimed.*

ARTICLE III

The place where the principal business of the corporation is to be transacted is 17503 58th St SE, Snohomish, in the County of Snohomish, State of Washington, but the corporation may maintain offices and places of business at such other places within the State of Washington as the board of trustees may determine.

ARTICLE IV

The period of existence of this corporation shall be perpetual.

ARTICLE V

The private property of the members shall not be subject to payment of corporation debts. This provision is not intended to forbid any or all members from contracting to pay obligations of the corporation or from executing lien instruments, which would mortgage their private property to secure such obligations of the corporation.

ARTICLE VI

Section 1. *This corporation shall not have capital stock, but its capital shall be represented by membership certificates.*

Section 2. *Under the terms and conditions prescribed by its By-Laws, this corporation shall admit as members only such persons as are bona fide landowners of a property having a reasonable accessibility to the source of, and who are in need of having water supplied for domestic, livestock, garden, industrial, and commercial purposes from the water system constructed, maintained and operated by the corporation, and located within the Retail Service Area of the Association as such is declared in its most recent Water System Plan. The corporation shall not be required to admit members if the capacity of its water system is exhausted by the needs of its existing members unless a proposed new member is purchasing a property presently served by the corporation and when the seller is retaining their membership because of other property or properties they may own that are presently served by the corporation. In addition, owners of property outside the Association's retail service area (but that may otherwise be served by the Association's water system) may become a member and* *have their property served by the Corporation, upon mutual agreement between the Association and the adjacent water purveyor to provide such service.*

Section 3. The membership fee in this corporation shall be fixed and determined by its By- Laws. The voting power and property rights and interest of each member whose fees are fully paid and who is in good standing shall be equal and each member shall be entitled to one vote only. Voting by proxy is allowed. Proxy guidelines shall be defined in the By-Laws of the corporation. New members, upon their admission in this corporation, shall be entitled to one vote and to share in the property of the corporation equally with the old members. When a member has paid their membership fee in full they shall receive a certificate of membership. Assessments against members and a determination of their liabilities shall be fixed by the By-Laws of the corporation.

Section 4. This corporation is organized on a non-profit basis for the mutual benefit of its members and consequently will not have profits from which to pay dividends on its capital. After all expenses of the corporation have been paid and reasonable reserves, as determined by the board of trustees, set aside, the net earnings of the corporation shall be accumulated in a surplus fund for the purpose of replacing, enlarging, extending and repairing the system and property of the corporation, and for such other purposes as the board of trustees may determine to be for the best interests of the corporation. The said surplus fund or any portion thereof may from time to time, at the discretion of the board of trustees, be distributed to the members as provided in the By-Laws, on the basis of the assessments and charges made and levied against and paid by such members during the year.

ARTICLE VII

The number of trustees shall be at least seven and one alternate trustee, who shall act on behalf of an absent trustee. All trustees shall be members of the corporation. The names and addresses of those who are to serve as the first trustees until the trustees are elected by the members, which election must not be less than two months and not more than six months from the date of incorporation are:

Name	*Address*
Roy Wishon	*Route 4, Snohomish, Washington*
Norman T. Aarstad	*Route 4, Snohomish, Washington*
Don Holt	*Route 4, Snohomish, Washington*
Don Moser	*Route 4, Snohomish, Washington*
Carl Hoffman	*Route 4, Snohomish, Washington*
Robert Laz	*Route 2, Snohomish, Washington*
William Alexander	*Route 2, Snohomish, Washington*

The principal place of business and address of this corporation will be 17419 Wishon Road Snohomish, Washington[1].

[1] *Editor's note – the Articles of Incorporation were revised in July 2014 and the place of business was updated in Article III, but not in Article VII. The correct address is as stated in Article III.*

At the first annual meeting of the members, two trustees shall be elected for a term of one year; two for a term of two years; and three for a term of three years. At each annual meeting thereafter, the members shall elect for a term of three years the number of trustees who terms of office have expired.

Revised & Amended
July 15, 2014

BY-LAWS
OF
THREE LAKES WATER ASSOCIATION, INC.

ARTICLE I
General Purposes

The Purposes for which this corporation is formed, and the powers which it may exercise are set forth in the articles of incorporation of the corporation.

ARTICLE II
Name and Location

Section 1. The name of this corporation is the Three Lakes Water Association, Inc.

Section 2. The principal office of this corporation shall be located at 17503 58^{th} ST SE, County of Snohomish, State of Washington, but the corporation may maintain offices and places within or without the state as the board of trustees may determine.

ARTICLE III
Seal

Section 1. The seal of the corporation shall have inscribed there on, the name of the corporation, the year of its organization and the words, "Non-Stock Corporation, Washington."

Section 2. The Secretary of the corporation shall have custody of the seal.

Section 3. The seal may be used by causing it or a facsimile thereof to be impressed or affixed or reproduced or otherwise.

ARTICLE IV
Fiscal Year

The fiscal year of the corporation shall begin the first day of July in each year.

ARTICLE V
Membership

Section 1. The holders of membership certificates of this corporation are its members. Any bona fide landowner of a property having reasonable accessibility to the source of, and who are in need of having water supplied for domestic, livestock, garden, industrial, and commercial purposes from the water system constructed, maintained and operated by the corporation, and located within the Retail Service Area of the Association as such is declared in its most recent Water System Plan, will be admitted to membership upon subscribing for and otherwise acquiring a membership certificate; provided that no person otherwise eligible shall be admitted to the corporation if the capacity of the corporation's water system is exhausted by the needs of its existing members, unless a proposed new member is purchasing a property presently served by the corporation and when the seller is retaining their membership because of other property or properties they may own that is presently served by the corporation. In addition, owners of property outside the Association's retail service area (but that may otherwise be served by the Association's water system) may become a member and have their property served by the Corporation, upon mutual agreement between the Association and the adjacent water purveyor to provide such service. Charter members shall be those who hold membership certificates of record in the corporation on the date of completion of construction of the initial or primary system, as determined by the board of trustees. New memberships, issued to other than charter members, will require the payment of a fee including service installation charges as determined by the board of trustees.

Section 2. There shall be three classes of memberships: Users, Charter part-time users, and Non-users with unoccupied property. Each member of this corporation, regardless of class of membership shall be entitled to one, but no more than one, vote at meetings of the members. Any member may own more than one membership certificate, in one or more classes of membership, in this corporation, but such multiple ownership does not give said member any greater interest in the corporation than a member owning but one membership certificate.

Section 3. Each membership, as represented by a valid membership certificate and the service connection therefore, is to be located at a specific spot, or station, along the water distribution main line. Should the property on which a membership is located be sold or otherwise transferred from a member to any other person or party, the right of membership shall automatically pass to the new owner of the property, and, providing that the transferring member is free from indebtedness to the corporation and that the new owner executes the then current form of water users, or membership agreement, the membership shall be transferred on the books of the corporation to the new owner.

ARTICLE VI
Membership Certificates

Section 1. This corporation shall not have capital stock, but its capital shall be represented by membership certificates.

Section 2. The membership certificates shall be issued to each holder of a fully paid membership and shall be numbered consecutively, in accordance with the order of issue. Each membership certificate shall bear on its face the following statements:

a. This membership certificate, No. ____________ , is issued and accepted in accordance with and subject to the conditions and restrictions stipulated in the articles of incorporation and by-laws and amendments to the same of the Three Lakes Water Association, Inc.

b. Transfers of membership certificates shall be made only upon the books of the corporation, upon the surrender of the certificates covering the same by the holders thereof or by their legal representatives-only to persons eligible to become members as determined on the basis of Article V of the by-laws and only when the member transferring is free from indebtedness to the corporation.

c. Each member of this corporation, regardless of class of membership or the number of memberships owned by said member, is entitled to one, but no more than one, vote at the meetings of the members. Every member upon becoming a member of this corporation agrees to sign such agreement for the purchase of water from the corporation as may from time to time be provided and required by the corporation.

ARTICLE VII
Meetings of Members

Section 1. The annual meeting of the members of this corporation shall be held in the County of Snohomish, State of Washington, at 7:00 P.M. on a non-holiday weekday in the month of October of each year.

Section 2. Special meetings of the members may be called at any time by the action of the board of trustees and such meetings must be called whenever a petition requesting such meeting is signed by at least ten percent of the members and presented to the secretary or to the board of trustees. The purpose of every special meeting shall be stated in the notice thereof, and no business shall be transacted thereat except such as is specified in the notice.

Section 3. Notice of meetings of members of the corporation must be given by a notice mailed to each member of record, directed to the address shown upon the books of the corporation, at least ten days and no more than 30 days prior to the meeting. Such notice shall state the nature, time, place and purpose of the meeting, but no failure or irregularity of notice of any annual meeting, regularly held, shall affect any proceedings taken thereat.

Section 4. The members present at any meeting of the members shall constitute a quorum at any meeting of the corporation for the transaction of business. The voting powers of the members of this corporation shall be equal: each member shall have one vote only. At any meeting of the members, a member entitled to vote by proxy and be represented in all regards as if they were present in person, provided that each, but only one proxy is held by one other member of the corporation and is executed not more than 30 days prior to the meeting at which it is used on the form provided by, and available from the Secretary of the corporation. All executed proxies must be submitted to the corporation secretary for validation at least one hour prior to the meeting at which they are to be used.

Section 5. Trustees of this corporation shall be nominated and elected at the annual meeting of the members, unless otherwise appointed per Article VIII.

1. Section 6. The order of business at the regular meetings and so far as possible or applicable at all other meetings shall be as outlined below. All meetings shall be conducted in accordance with Robert's Rules of Order.

1. Call to order and proof of quorum.
2. Proof of notice of meeting.
3. Reading and action on any unapproved minutes.
4. Reports of officers and committees.
5. Election of trustees.
6. Unfinished business.
7. New business.
8. Adjournment.

ARTICLE VIII
Trustees and Officers

Section 1. The board of trustees of this corporation shall consist of seven members and one alternate trustee who shall act on behalf of absent trustees, all of whom shall be members of the corporation. The designation of the alternate trustee shall be determined by the board annually as described below. At each annual meeting, the members shall elect for a term of three years the number of trustees whose terms have expired. As of the October 2013 annual meeting the trustee positions[1] were sequenced as follows, based on election records for the 2011, 2012 and 2013 annual meetings:

Position	Term (annual meeting to annual meeting)
1	2011-2014
2	2011-2014
3	2012-2015
4	2012-2015
5	2012-2015
6	2012-2015
7	2013-2016
8	2013-2016

The prior version of these by-laws has been interpreted such that the alternate trustee designation has a one-year term. The trustee in position 3 (2012-2015) is presently designated

[1]The designation of "position" is introduced in 2014 for reference to trustee terms established by recent elections, in chronological order.

as the alternate trustee (i.e. for the office year from 2013-2014). For purposes of clarity and confirming a set sequence of only two or three trustee positions open each year (by reason of completion of a full term), the term of position 3 is herein established to terminate as of the 2014 annual meeting. Thus the term of positions 1, 2 and 3 will terminate in 2014; the term of positions 4, 5 and 6 will terminate in 2015; and, the term of positions 7 and 8 will terminate in 2016. There shall be no fixed relationship between a specific numbered trustee position and the office of alternate trustee.

Section 2. The board of trustees shall meet within ten days after the annual election of trustees and elect from among themselves by ballot and majority vote the officers of the board: president, vice president, secretary, treasurer and an alternate, each of whom shall hold office until the next annual meeting and until the election and qualification of their successor in such office unless sooner removed from the board or the office by death, resignation or for cause, or completion of their term as a trustee. A trustee may not be elected to the alternate office for consecutive years. The board shall elect replacement officers from among themselves in the same manner if an office is vacated by death, resignation or for cause. If the office is vacant due to an open trustee position, such officer election shall take place once all open trustee positions are filled by appointment or election as described below.

Section 3. If any trustee position becomes vacant prior to the end of the term by reason of death, resignation, or by removal from the position by the trustees or members as described below, the remaining trustees shall elect from the members of the corporation, by ballot and a majority vote, a new trustee who shall fill the vacated position until the next annual meeting of the members of the corporation, at which time the members shall elect a trustee for the unexpired term, provided that in the call of such an annual meeting a notice of such election shall be given. Cause for removal from the position of trustee, or from an office while not affecting one's position as a trustee, may include unexcused nonattendance at three consecutive scheduled board of trustees meetings or three of the last six scheduled meetings of the board of trustees or any other reason the board of trustees deems appropriate. The trustee against whom such charges have been presented shall be informed, in writing by certified mail, of such charges at least 21 days prior to any meeting to be held regarding removal from a board office or trustee position and shall have the opportunity at that meeting to be heard by in person or be represented by counsel and to present witnesses. The board of trustees shall have the same opportunity. The notice shall indicate if the proposed action is to remove the trustee from the board office or from the position as a trustee. If the removal of a trustee is approved, such action shall also vacate any board office held by the trustee.

Section 4. A majority (being four or more trustees) of the board of trustees shall constitute a quorum at a meeting of the board.

Section 5. Compensation of officers may be fixed at any meeting of the corporation. Trustees shall receive no compensation for their services as such.

Section 6. Trustees may be removed from their trustee position in the following manner: any member or trustee (acting as a member) may present charges against a trustee by filing them in writing with the secretary of the corporation. If presented by a member or trustee (acting as a member), the charges must be accompanied by a petition signed by ten percent of the members of the corporation. Such removal shall be voted on at the next annual or special meeting of the members and shall be effective if approved by a vote of a majority of the members. The trustee against whom such charges have been presented shall be informed, in writing delivered by certified mail, of such charges at least 21 days prior to the meeting and shall have the opportunity at such meeting to be heard in person or by counsel and to present witnesses; and the person or persons presenting such charges against him shall have the same opportunity. If the removal of a trustee is approved, such action shall also vacate any board office held by the removed trustee.

ARTICLE IX
Duties of Trustees

Section 1. The board of trustees, subject to restriction of law, the articles of incorporation, or these by-laws, shall exercise all powers of the corporation and without prejudice to or limitation upon their general powers, it is hereby expressly provided that the board of trustees shall have, and are hereby given, full power and authority (to be exercised by motion or resolution approved or adopted by a majority vote of the trustees) in respect to the matters of the Association and as hereinafter set forth:

a. To pass the qualifications of members in accordance with Article V and to cause to be issued appropriate certificates of membership.

b. To select and appoint all officers, agents, or employees of the corporation or remove such agents or employees of the corporation for just cause, prescribe such duties and designate such powers as may not be inconsistent with these by-laws, fix their compensation and pay for faithful services.

c. To borrow from any source, money, goods or services and to make issue notes and other negotiable and transferable instruments, mortgages, deeds of trust, and trust agreements, and to do every act and thing necessary to effectuate the same.

d. To prescribe, adopt and amend, from time to time, such equitable uniform rules and regulations as, in their discretion, may be deemed essential or convenient for the conduct of the business and affairs of the corporation and the guidance and control of its officers and employees, and to prescribe adequate for the breach thereof.

e. To engage the services of a Certified Public Accountant (CPA) at least annually to audit, review or compile the financial statements of the Association, as those terms are defined by the CPA profession. The level of service shall be at the discretion of the board of trustees. The report prepared by the CPA shall be submitted to the members of the corporation at their annual meeting.

f. To fix the charges to be paid by each member for services rendered by the corporation to the member, the time of payment, and the manner of collection.

g. To require all officers, agents and employees charged with responsibility for the custody of any funds of the corporation to give adequate bonds, the cost thereof to be paid by the corporation, and it shall be mandatory upon the trustees to so require.

h. To select one or more banks to act as depositories of the funds of the corporation and to determine the manner of receiving, depositing, and disbursing the funds of the corporation and the form of checks and the person or persons by whom the same shall be signed, with the power to change such banks and the person or persons signing such checks and the form thereof at will. At a minimum, all expenditures or transfer of funds out of the control of the Association shall be approved by the board and executed by two or more trustees.

i. To levy assessments against the membership certificates of the corporation and to enforce the collection of such assessments in accordance with Article XI, Section 5.

ARTICLE X
<u>Duties of Officers</u>

Section 1. Duties of President: The president shall preside over all meeting of the corporation and the board of trustees, call special meeting of the board of trustees, perform all duties as may be prescribed by the board of trustees, and sign all membership certificates and such other papers of the corporation as he/she may be authorized or directed to sign by the board of trustees, provided the board of trustees may authorize any trustee or employee manager to sign any or all checks, contracts and other instruments in writing on behalf of the corporation. Prior to the next fiscal year, the president shall present a preliminary budget for the next fiscal year to the board of trustees for review. The president, as elected following the member's annual meeting and election of new officers, shall present a final budget for the current fiscal year to the board of trustees, no later than the December meeting, for their approval.

Section 2. Duties of the Vice-President: In the temporary absence of the president, the vice-president shall perform the duties of the president.

Section 3. Duties of the Secretary: The following duties shall be accomplished by the secretary, or be accomplished under the secretary's direction; however, where signatures are called for under these duties, only the secretary may sign on behalf of the Association. The secretary shall keep or direct a complete record of all meetings of the corporation and of the board of trustees and shall have general charge and supervision of the books and records of the corporation. He/She shall sign all membership certificates with the president and such other papers pertaining to the corporation as the secretary may be authorized or directed to do so by the board of trustees. He/She shall serve all notices required by law and by these by-laws and shall make a full report of all matters and these by-laws and shall make a full report of all matters and business pertaining to this office to the members at the annual meeting. He/She shall keep the corporate seal and membership certificates records of the corporation, complete and countersign all certificates issued and affix said corporate seal to all papers requiring seal. The secretary shall keep a proper membership certificate record, showing the name of each member of the corporation and date of issuance, surrender, cancellation or forfeiture. He/She shall make all reports required by law and shall perform such other duties as may be required of them by the corporation or the board of trustees. Upon the election of their successor, the secretary shall turn over to the new secretary all books and other property belonging to the corporation that he/she may have in their possession. He/She shall also perform such duties with respect to the finances of the corporation as may be prescribed by the board of trustees.

Section 4. Duties of the Treasurer: The following duties shall be accomplished by the treasurer or be accomplished under the treasurer's direction; however, where signatures are called for under these duties, only the treasurer may sign on behalf of the Association. He/She shall keep the books of the corporation and make all collections of dues and water charges. He/She shall receive and disburse the funds of the corporation as hereinafter provided. He/She shall keep all money of the corporation deposited in the name of the corporation. At frequent intervals he/she shall make reports to the board of trustees. He/She may be required to give acceptable bond, in such sum as the board may determine, premium to be paid by the corporation, for the faithful performance of their duties.

Section 5. Duties of the Alternate: The alternate trustee may fully participate in the function and activity of the board of trustees, except that when all seven other trustees are present for any meeting, the alternate trustee may not make a motion or vote on any matter presented to the board for decision or action at such meeting.

ARTICLE XI
Benefits and Duties of Members

Section 1. The corporation will install, maintain, and operate a main distribution pipe line or lines from the source of the water supply and service lines from the main distribution pipe line or lines to the property line of each membership of the corporation, at which points, designated as delivery points, meters to be purchased, installed, owned, and maintained by the corporation shall be placed. The cost of the service line from the main distribution pipe line or lines of the corporation to the property line of each charter membership shall be paid by the corporation, if installed with construction of the main distribution pipe. The corporation will also purchase and install a shut-off valve in each service line from its main distribution line or lines, such shut-off valve to be owned and maintained by the corporation and to be installed on some portion of the service line owned by the corporation. The corporation shall have the sole and exclusive right to use such shut-off valve to turn it off and on. The cost of all service lines installed after installation of the main distribution pipe line past a membership property shall be paid by the member desiring such installation. Service line connections shall be 3/4" inch diameter unless member requests and pays for the extra cost of larger service. Members shall be fully responsible for any damages or other consequences, whether to public or private property, or to the Association water system as a result of the member's operation of the Association's shut-off valve.

Section 2. Each member shall be entitled to purchase from the corporation pursuant to such agreements as may from time to time be provided and required by the corporation, such water for domestic, livestock, garden, industrial, and commercial purposes as a member may desire, subject, however, to the provisions of these by-laws and such rules and regulations as may be prescribed by the board of trustees.

Section 3. No new service line or change in an existing service line may be made which will interfere with an existing line or the delivery of water therein. Each service line shall connect with the corporation's water system at the nearest available place to the place desired use by the member if the corporation's water system shall be of sufficient capacity to permit the delivery of water through a service line at that place without interfering with the delivery of water through a prior service line. If the corporation's water system shall be inadequate to permit the delivery of water through a service line installed at such place without interfering with the delivery of water through a prior service line, then such service line shall be installed at such place as may be designated by the corporation. Each membership will be required to provide and maintain the necessary and desired plumbing connections from the individual service meter (corporation delivery point) to point of water use. Members shall install and maintain a private pressure reducing valve on their private service line to limit pressure to 80 pounds per square inch (psi) or lower as desired or otherwise required by local code.

Section 4. In the event the total water supply shall be insufficient to meet all of the needs of the members, or in the event there is a shortage of water, the corporation may prorate the water available among the various memberships on such basis as is deemed equitable by the board of trustees, and may also prescribe a schedule of hours covering the use of water and require adherence thereto, provided that if at any time the total water supply shall be insufficient to meet all of the needs of the members for domestic, livestock, garden, industrial, and commercial purposes, the corporation must first satisfy all the needs of the members for domestic purposes before supplying any water for livestock purposes, and must satisfy all the needs of the members for both domestic and livestock purposes before supplying water for garden, industrial, or commercial purposes.

Section 5. The board of trustees shall, prior to the beginning of each fiscal year, or at other times as the board deems necessary, determine the assessments for debt repayment, and shall establish a monthly rate to be charged each user member thereafter for a specified quantity of water, such monthly rate to be payable irrespective of whether any water is used by a member during any month if service facilities are installed for such member, and the amount of additional charges, if any, for additional water which may be supplied the members; shall fix the dates for the payment of such charges, and shall notify each member of the amount of such charges and the dates for the payment thereof. A member to be entitled to the delivery of water shall pay such charges at the office of the corporation at or prior to the dates fixed by the board of trustees. The failure to pay water charges duly imposed shall result in the automatic imposition of penalties to be established as policy by the board of trustees, including but not limited to shut-off of water supply and revocation of membership.

Section 6. The board of trustees shall be authorized to adopt, and update from time to time in their discretion, a water user's policy which shall embody the principles set forth in the foregoing sections of this article, other policy adopted by the board and applicable local, state and federal regulations applicable to customers of potable water systems.

ARTICLE XII
Distribution of Surplus Funds

Section 1. It is not anticipated that there will be any net income. If there should be any, then at the end of the fiscal year, after paying the expenses of the corporation for operational and otherwise, and after setting aside reserves for depreciation an all buildings, equipment, and office fixtures, and such other reserves as the board of trustees may deem proper, and after providing for payments on interest and principal of obligations and amortized debts of the corporation, and after providing for the purchase of proper supplies and equipment, the net earnings shall be accumulated in a surplus fund for the purpose of replacing, enlarging, extending and repairing the system and property of the corporation, and for such other purposes as the board of trustees may determine to be for the best interests of the corporation. The said surplus fund or any portion thereof may, from time to time, at the discretion of the board of trustees, be distributed to the members as provided in the by-laws, on the basis of the assessments and charges made and levied against and paid by such members during the year.

Section 2. Any part or the whole of such apportionment may be credited at the discretion of the board of trustees, to the indebtedness of the members should any exist, and in such case the members shall be notified in writing of the amount so applied. (Revised & amended, 1970)

ARTICLE XIII
Amendments

Section 1. These-by-laws may be repealed or amended by a vote of a majority of the members present at any annual meeting of the corporation, or at any special meeting of the corporation called for the purpose, except that the members shall not have the power to change the purpose of the corporation so as to decrease its right and powers under the laws of the state, or to waive any requirement of bond or other provision for the safety and security of the property and funds of the corporation or its members, or to deprive any members of rights and privileges than existing, or so to amend the by-laws as to effect a fundamental change in the policies of the corporation. Notice of any amendment to be made at any meeting of the members must be given at least ten days before such meeting and must set forth the amendments to be considered. At a meeting where changes to these by-laws are to be considered by vote, the board of trustees may consider if any non-substantive changes to the proposed revisions are to be made prior to the vote. Any vote regarding by-laws changes shall be only for approval or rejection of the changes as presented.

AMENDMENT I

Prior to any sale of the Association's Corporation, 60% of the members must vote to validate it. There must also be a 60% majority vote of those 60% to validate the ballet. (06-14-10)

AMENDMENT II

(Repealed July 15 2014)

AMENDMENT III

Members shall comply with the Association's Cross Connection Control Program. The failure to do so will result in the automatic imposition of the following penalties: (1) Non compliance will result in the water being shut off from the customer's property. (2) In the event it becomes necessary for the Association to pull meter and cancel members share due to non compliance, a registered letter will be sent to that effect. The share will be reinstated when compliance is met and any past due charges, including costs for pulling meter and reinstalling meter is paid.

AMENDMENT IV

Committees: The board of trustees may establish standing and ad hoc committees as needed to assist with Association business. These committees shall be composed of Association members with the exception of technical assistance. Committee minutes and a list of those people's names on committees shall be maintained by the secretary of the Association. (06-14-10)

SNOHOMISH COUNTY
PUD
PUBLIC UTILITY DISTRICT NO. 1
Energizing Life in Our Communities

October 19, 2021

RE: Property Tax Account No. 280706-001-009-00
5927 205th Ave SE, Snohomish WA

To Whom It May Concern:

The proposed parcel appears to be within the Snohomish County PUD's service area. The District has no water mains near this area.

The District agrees to deny service to the above-described property.

If you have any other question, please contact me at 425-397-3015.

Sincerely,

Lois Stone
Water Liaison
Snohomish County PUD Water Utility

WATER SERVICE AREA CHANGE AGREEMENT
between
SNOHOMISH COUNTY PUBLIC UTILITY DISTRICT NO. 1
and
THREE LAKES WATER ASSOCIATION, INC.

An Agreement between the Snohomish County Public Utility District No. 1 (PUD), a public utility district, and Three Lakes Water Association, Inc, (Association), a private water system incorporated in the State of Washington:

WHEREAS, the Association and the PUD each provide retail water service to portions of unincorporated Snohomish County, per their respective water system plans; and

WHEREAS, the Association and the PUD each signed an "Agreement for Establishing Water Utility Service Area Boundaries," which are on file with Snohomish County Planning and Development Services (PDS), an example of which can be found in Appendix D of the 2010 update to the North Snohomish County Coordinated Water System Plan (CWSP); and

WHEREAS, the respective water service areas of the PUD and Association are indicated in Figure I-1 of the CWSP (June 2010 edition); and

WHEREAS, gaps and overlaps exist between the respective water service areas of the PUD and Association along the westerly and northwesterly boundary of the Association water service area; and

WHEREAS, the Association and the PUD each maintain existing water mains in the immediate vicinity of the gaps and overlaps and provide service to selected properties; and

WHEREAS, Section III 2.D. of the CWSP allows service area boundaries to be revised at any time with the signing and executing of revised service area agreements by authorized representatives of each affected purveyor; and

WHEREAS, this agreement is proposed as an amendment to the service area agreements on file with PDS;

NOW, THEREFORE, the PUD and the Association hereby agree to adjust their respective water service areas to eliminate gaps and overlaps such that there exists a single common boundary line between the two service areas from Three Lakes Road northerly and easterly to the Everett water transmission main alignment north of Dubuque Road, depicted as the Proposed Boundary on Exhibit A attached hereto and included herein by reference. The PUD and the Association further agree to include this revised area in their next respective water system plan updates.

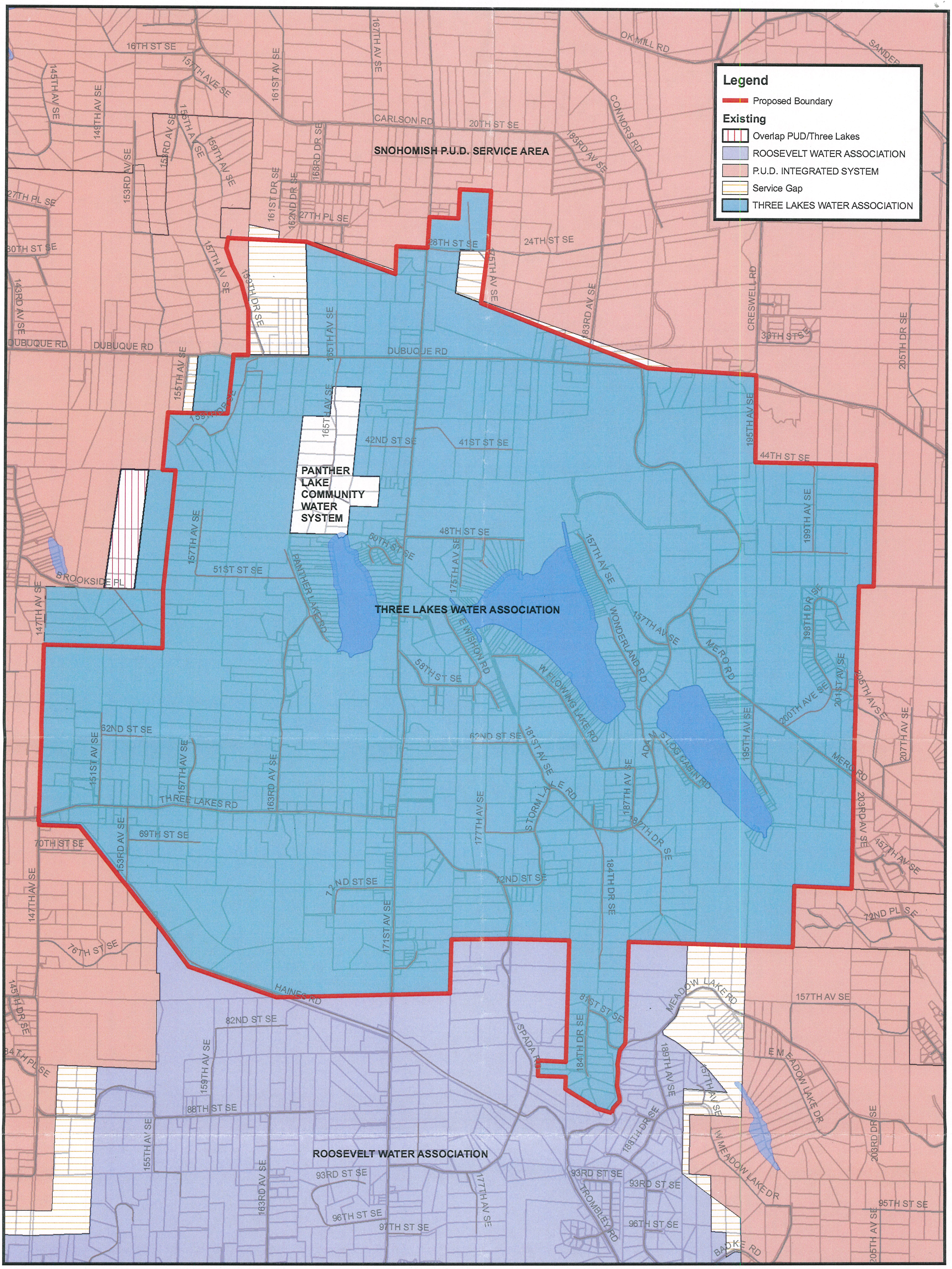
EFFECTIVE this 20th day of Sept, 2010.

APPROVED:

(sign)

Donald R Kemmis (print)
Trustee
Three Lakes Water Association, Inc.

Kim D. Moore
Assistant General Manager
Snohomish County PUD No. 1



Snohomish County PUD
Water Resources

SNOHOMISH COUNTY PUD PUBLIC UTILITY DISTRICT NO. 1

Exhibit A

Note: This map is provided as a courtesy only.
The Snohomish County PUD in no way guarantees the accuracy or completeness of the digital data portrayed on this map.
Furthermore, the Snohomish County PUD assumes no liability for any errors or omissions in the digital data.

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WATER SERVICE AREA CHANGE AGREEMENT
between
(1) ROOSEVELT WATER ASSOCIATION,
(2) SNOHOMISH COUNTY PUBLIC UTILITY DISTRICT NO. 1,
(3) THREE LAKES WATER ASSOCIATION, INC., and
(4) MEADOW LAKE WATER ASSOCIATION

An Agreement between Roosevelt Water Association (Roosevelt); Snohomish County Public Utility District No. 1 (PUD), a public utility district; Three Lakes Water Association, Inc. (Three Lakes), a private water system incorporated in the State of Washington; and Meadow Lake Water Association (Meadow Lake) (individually a "Party" and collectively the "Parties"):

WHEREAS, the above Parties each provide retail water service to portions of unincorporated Snohomish County, per their respective water system plans; and

WHEREAS, Roosevelt, Three Lakes, and PUD each previously signed an "Agreement for Establishing Water Utility Service Area Boundaries," on file with Snohomish County Planning and Development Services (PDS), an example of which can be found in Appendix D of the 2010 update to the North Snohomish County Coordinated Water System Plan (CWSP); and

WHEREAS, the current respective water service areas of the Parties to this Agreement are indicated in Figure I-1 of the CWSP (December 2010 edition); and

WHEREAS, gaps and overlaps exist between the respective water service areas along Roosevelt's northwesterly and northeasterly service area boundaries; and

WHEREAS, the Parties maintain existing water mains in the immediate vicinity of the gaps and overlaps and provide service to selected properties; and

WHEREAS, Section III 2.D. of the CWSP allows service area boundaries to be revised at any time with the execution of revised service area agreements by authorized representatives of each affected purveyor; and

WHEREAS, this Agreement serves as an amendment to the agreements on file with PDS;

NOW, THEREFORE, the Parties hereby agree to adjust their respective water service areas to match the Proposed Boundaries on the Exhibit attached hereto and included herein by reference.

PROVIDED THAT, if a development occurs within the Three Lakes service area north of the service area gap that is being assigned to Roosevelt (labeled as "Unserviced Roosevelt PUD" in the Exhibit), and such development includes (even if in phases) that portion of said service area gap north of Meadow Lake Road, then Roosevelt will relinquish that portion of said service area gap north of Meadow Lake Road of its service area to Three Lakes. Such relinquishment shall be confirmed in a water service area change agreement, approval for which shall not be unreasonably withheld by either Three Lakes or Roosevelt.

FURTHERMORE, the Parties agree to include this revised area in their next respective water system plan updates.

THIS AGREEMENT SHALL BE EFFECTIVE with respect to each Party when that Party's authorized representative executes the agreement. The original signature pages shall be delivered to the attention of Gary Idleburg at PDS, which maintains the file of water service area agreements under the CWSP. Copies of the signature pages shall be delivered to each Party to this Agreement. This Agreement may be executed in counterparts.

The water utility listed below executed this Agreement on this ______ day of ______________, 2011.

Water Utility: ROOSEVELT WATER ASSOCIATION

APPROVED:

________________________________ (sign)

________________________________ (print)

________________________________ (title)

The water utility listed below executed this Agreement on this ______ day of ______________, 2011.

Water Utility: SNOHOMISH COUNTY PUD NO. 1

APPROVED:

________________________________ (sign)

________________________________ (print)

________________________________ (title)

The water utility listed below executed this Agreement on this ______ day of ______________, 2011.

Water Utility: THREE LAKES WATER ASSOCIATION

APPROVED:

Kirk L. Schlemlein (sign)

KIRK L. SCHLEMLEIN (print)

PRESIDENT (title)

The water utility listed below executed this Agreement on this 9TH day of AUGUST, 2011.

Water Utility: MEADOW LAKE WATER ASSOCIATION

APPROVED:

________________________________ (sign)

________________________________ (print)

________________________________ (title)

The water utility listed below executed this Agreement on this 8 day of AUGUST, 2011.

Water Utility: ROOSEVELT WATER ASSOCIATION

APPROVED:

Glen E. Allen (sign)

GLEN E. Allen (print)

President. (title)

The water utility listed below executed this Agreement on this ______ day of ______________, 2011.

Water Utility: SNOHOMISH COUNTY PUD NO. 1

APPROVED:

______________________________ (sign)

______________________________ (print)

______________________________ (title)

The water utility listed below executed this Agreement on this ______ day of ______________, 2011.

Water Utility: THREE LAKES WATER ASSOCIATION

APPROVED:

______________________________ (sign)

______________________________ (print)

______________________________ (title)

The water utility listed below executed this Agreement on this ______ day of ______________, 2011.

Water Utility: MEADOW LAKE WATER ASSOCIATION

APPROVED:

______________________________ (sign)

______________________________ (print)

______________________________ (title)

The water utility listed below executed this Agreement on this ______ day of ______________, 2011.

Water Utility: ROOSEVELT WATER ASSOCIATION

APPROVED:

________________________________ (sign)

________________________________ (print)

________________________________ (title)

The water utility listed below executed this Agreement on this ______ day of ______________, 2011.

Water Utility: SNOHOMISH COUNTY PUD NO. 1

APPROVED:

________________________________ (sign)

KIM D. MOORE (print)

AGM-WATER (title)

The water utility listed below executed this Agreement on this 11 day of August, 2011.

Water Utility: THREE LAKES WATER ASSOCIATION

APPROVED:

________________________________ (sign)

________________________________ (print)

________________________________ (title)

The water utility listed below executed this Agreement on this ______ day of ______________, 2011.

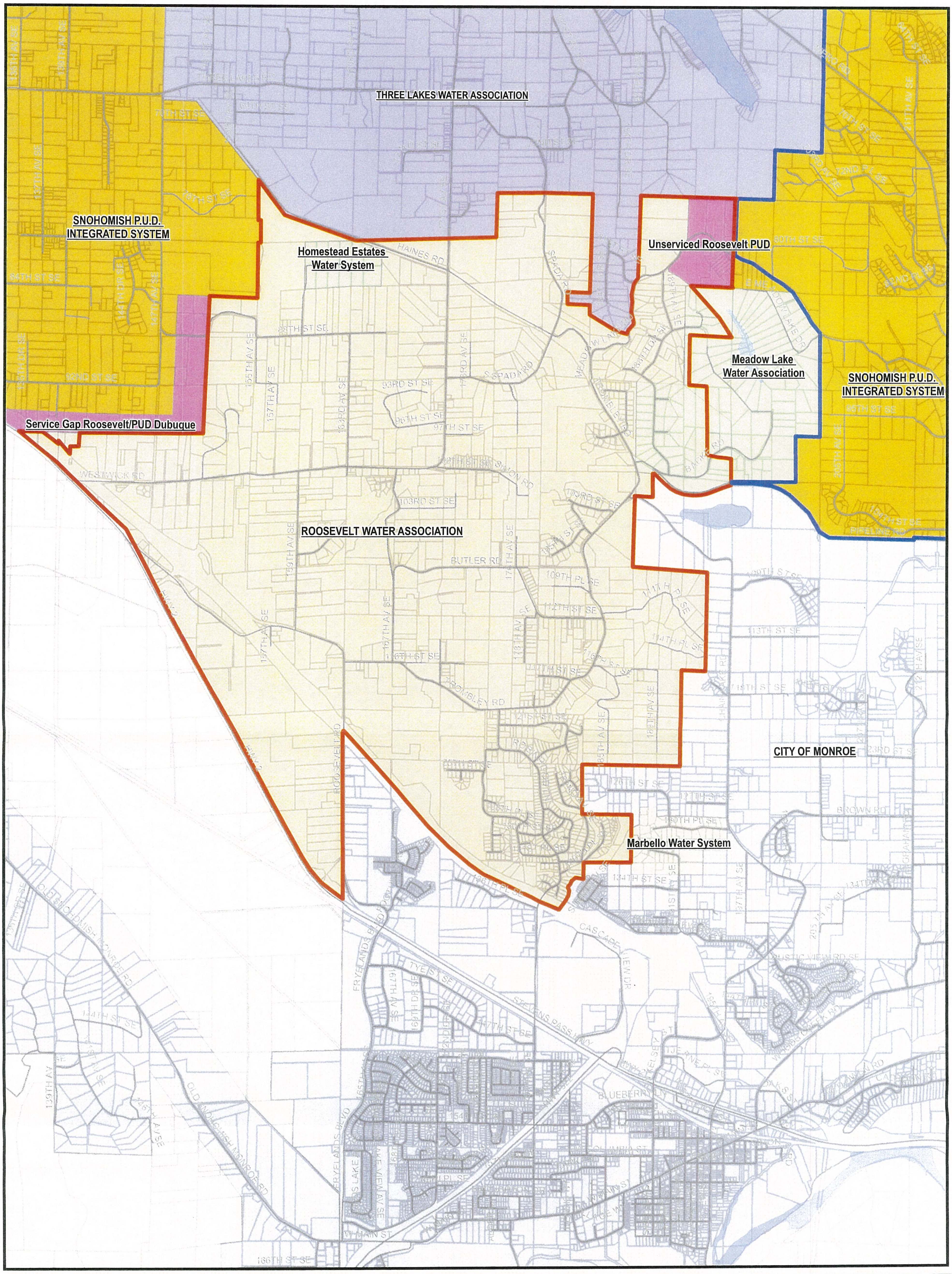
Water Utility: MEADOW LAKE WATER ASSOCIATION

APPROVED:

________________________________ (sign)

________________________________ (print)

________________________________ (title)



Snohomish County PUD
Water Resources

SNOHOMISH COUNTY PUD PUBLIC UTILITY DISTRICT NO. 1

Exhibit

Proposed Boundaries for Roosevelt

0 1,250 2,500 5,000 Feet

Location Map

Note: This map is provided as a courtesy only.
The Snohomish County PUD in no way guarantees the accuracy or completeness of the digital data portrayed on this map.
Furthermore, the Snohomish County PUD assumes no liability for any errors or omissions in the digital data.

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APPENDIX D – FIRE FLOW STANDARDS

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APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix B provides a tool for the use of jurisdictions in establishing a policy for determining fire-flow requirements in accordance with Section 507.3. The determination of required fire flow is not an exact science, but having some level of information provides a consistent way of choosing the appropriate fire flow for buildings throughout a jurisdiction. The primary tool used in this appendix is a table that presents fire flow based on construction type and building area based on the correlation of the Insurance Services Office (ISO) method and the construction types used in the* International Building Code®.

SECTION B101 GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

SECTION B102 DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m^2), used to determine the required fire flow.

SECTION B103 MODIFICATIONS

B103.1 Decreases. The *fire code official* is authorized to reduce the *fire-flow* requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full *fire-flow* requirements is impractical.

B103.2 Increases. The *fire code official* is authorized to increase the *fire-flow* requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall be not more than twice that required for the building under consideration.

B103.3 Areas without water supply systems. For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the *fire code official* is authorized to utilize NFPA 1142 or the *International Wildland-Urban Interface Code.*

SECTION B104 FIRE-FLOW CALCULATION AREA

B104.1 General. The *fire-flow calculation area* shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building, except as modified in Section B104.3.

B104.2 Area separation. Portions of buildings that are separated by *fire walls* without openings, constructed in accordance with the *International Building Code,* are allowed to be considered as separate *fire-flow calculation areas.*

B104.3 Type IA and Type IB construction. The *fire-flow calculation area* of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

> **Exception:** *Fire-flow calculation area* for open parking garages shall be determined by the area of the largest floor.

SECTION B105 FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum *fire-flow* and flow duration requirements for one- and two-family *dwellings*, Group R-3 and R-4 buildings and *townhouses* shall be as specified in Tables B105.1(1) and B105.1(2).

B105.2 Buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum *fire-flow* and flow duration for buildings other than one- and two-family *dwellings*, Group R-3 and R-4 buildings and *townhouses* shall be as specified in Tables B105.2 and B105.1(2).

B105.3 Water supply for buildings equipped with an automatic sprinkler system. For buildings equipped with an *approved automatic sprinkler system*, the water supply shall be capable of providing the greater of:

1. The *automatic sprinkler system* demand, including hose stream allowance.
2. The required *fire flow*.

TABLE B105.1(1)
REQUIRED FIRE FLOW FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0–3,600	No automatic sprinkler system	1,000	1
3,601 and greater	No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
0–3,600	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	500	$^1/_2$
3,601 and greater	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	$^1/_2$ value in Table B105.1(2)	1

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m.

TABLE B105.1(2)
REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *International Building Code*.

b. Measured at 20 psi residual pressure.

TABLE B105.2
REQUIRED FIRE FLOW FOR BUILDINGS OTHER THAN ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2)
Section 903.3.1.1 of the *International Fire Code*	25% of the value in Table B105.1(2)[a]	Duration in Table B105.1(2) at the reduced flow rate
Section 903.3.1.2 of the *International Fire Code*	25% of the value in Table B105.1(2)[b]	Duration in Table B105.1(2) at the reduced flow rate

For SI: 1 gallon per minute = 3.785 L/m.

a. The reduced fire flow shall be not less than 1,000 gallons per minute.

b. The reduced fire flow shall be not less than 1,500 gallons per minute.

SECTION B106 REFERENCED STANDARDS

ICC	IBC—18	International Building Code	B104.2
ICC	IWUIC—18	International Wildland-Urban Interface Code	B103.3
ICC	IRC—18	International Residential Code	Table B105.1(1)
NFPA	1142—17	Standard on Water Supplies for Suburban and Rural Fire Fighting	B103.3

APPENDIX C

FIRE HYDRANT LOCATIONS AND DISTRIBUTION

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix C focuses on the location and spacing of fire hydrants, which is important to the success of fire-fighting operations. The difficulty with determining the spacing of fire hydrants is that every situation is unique and has unique challenges. Finding one methodology for determining hydrant spacing is difficult. This particular appendix gives one methodology based on the required fire flow that fire departments can work with to set a policy for hydrant distribution around new buildings and facilities in conjunction with Section 507.5.*

SECTION C101
GENERAL

C101.1 Scope. In addition to the requirements of Section 507.5.1, fire hydrants shall be provided in accordance with this appendix for the protection of buildings, or portions of buildings, hereafter constructed or moved into the jurisdiction.

SECTION C102
NUMBER OF FIRE HYDRANTS

C102.1 Minimum number of fire hydrants for a building. The number of fire hydrants available to a building shall be not less than the minimum specified in Table C102.1.

TABLE C102.1
REQUIRED NUMBER AND SPACING OF FIRE HYDRANTS[h]

FIRE-FLOW REQUIREMENT (gpm)	MINIMUM NUMBER OF HYDRANTS	AVERAGE SPACING BETWEEN HYDRANTS[a, b, c, f, g] (feet)	MAXIMUM DISTANCE FROM ANY POINT ON STREET OR ROAD FRONTAGE TO A HYDRANT[d, f, g]
1,750 or less	1	500	250
1,751–2,250	2	450	225
2,251–2,750	3	450	225
2,751–3,250	3	400	225
3,251–4,000	4	350	210
4,001–5,000	5	300	180
5,001–5,500	6	300	180
5,501–6,000	6	250	150
6,001–7,000	7	250	150
7,001 or more	8 or more[e]	200	120

For SI: 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

a. Reduce by 100 feet for dead-end streets or roads.

b. Where streets are provided with median dividers that cannot be crossed by fire fighters pulling hose lines, or where arterial streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, hydrant spacing shall average 500 feet on each side of the street and be arranged on an alternating basis.

c. Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.

d. Reduce by 50 feet for dead-end streets or roads.

e. One hydrant for each 1,000 gallons per minute or fraction thereof.

f. A 50-percent spacing increase shall be permitted where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 of the *International Fire Code*.

g. A 25-percent spacing increase shall be permitted where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2 or 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*.

h. The fire code official is authorized to modify the location, number and distribution of fire hydrants based on site-specific constraints and hazards.

SECTION C103
FIRE HYDRANT SPACING

C103.1 Hydrant spacing. Fire apparatus access roads and public streets providing required access to buildings in accordance with Section 503 shall be provided with one or more fire hydrants, as determined by Section C102.1. Where more than one fire hydrant is required, the distance between required fire hydrants shall be in accordance with Sections C103.2 and C103.3.

C103.2 Average spacing. The average spacing between fire hydrants shall be in accordance with Table C102.1.

> **Exception:** The average spacing shall be permitted to be increased by 10 percent where existing fire hydrants provide all or a portion of the required number of fire hydrants.

C103.3 Maximum spacing. The maximum spacing between fire hydrants shall be in accordance with Table C102.1.

SECTION C104
CONSIDERATION OF EXISTING FIRE HYDRANTS

C104.1 Existing fire hydrants. Existing fire hydrants on public streets are allowed to be considered as available to meet the requirements of Sections C102 and C103. Existing fire hydrants on adjacent properties are allowed to be considered as available to meet the requirements of Sections C102 and C103 provided that a fire apparatus access road extends between properties and that an easement is established to prevent obstruction of such roads.

SECTION C105
REFERENCED STANDARD

ICC	IBC—18	International Residential Code	Table C102.1

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APPENDIX E – CROSS-CONNECTION CONTROL PROGRAM

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Three Lakes Water Association

Cross-Connection Control Program

Adopted November 2018
Updated March 2022

Three Lakes Water Association
Post Office Box 24
Snohomish, Washington 98290
360-568-8022

Prepared by:

Three Lakes Water Association

Kaila Klicker, Assistant Manager, WDM2, CCS

Three Lakes Water Association
Cross-Connection Control Program

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Three Lakes Water Association
Cross-Connection Control Program

Regulations

A regulation, known as the legal instrument, for Three Lakes Water Association relates to the establishment of a water system Cross-Connection Control Program.

Whereas, it is the responsibility of the water purveyor to provide water to the downstream side of the member's service meter that meets Washington State Water Quality Standards;

Whereas, it is the responsibility of the water purveyor to prevent the contamination of the purveyor's water system from the source of supply to the member's downstream side of the service meter;

Whereas, Washington Administrative Code 246-290-490 mandates a written legal instrument that establishes and implements a Cross-Connection Control Program satisfactory to the Washington State Department of Health;

Whereas, cross-connections within the member's owned plumbing system pose a potential source for the contamination of the Association's water supply;

Therefore, Three Lakes Water Association, the purveyor, establishes the following Cross-Connection Control Regulations, to protect the purveyor owned water system from the risk of contamination. For public health and safety, the established cross-connection control regulations shall apply equally to all new and existing members.

Regulations

1. Title

    a. This chapter shall be known as the Three Lakes Water Association Cross-Connection Control Regulations.

2. Termination of Service

a. If a member fails to discontinue the use of all cross-connections, except in accordance with the Association's Water Users Policy and the Cross-Connection Control Regulations, it shall be sufficient cause for the immediate discontinuance of the member's water service to the premises.

3. No Creation of Special Duty

   a. It is the purpose of this Cross-Connection Control Regulation to provide for the health, welfare and safety of the members and not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by the terms of this article.

   b. It is the specific intent of the Cross-Connection Control Regulations to place the obligation of complying with its requirements upon the permit applicant and any person owning, operating or controlling any premises, building or structure within the scope of this Regulation; that no provision nor term used in this Regulation is intended to impose any duty upon the Association or any of its officers, agents or employees from whom the implementation or enforcement of this Regulation shall be discretionary and not mandatory.

   c. Nothing contained within this Regulation is intended to be, nor shall be, construed to create or form the basis for any liability on the part of the Association or its officers, agents and employees for any injury or damage resulting from the failure of any premises or building to comply with the provisions of this Regulation or be reason or a consequence of any inspector, notice, order, certificate, permission or approval authorized or issued or done in connection with the implementation or enforcement of this Regulation or by reason of any action of the Association, related in any manner to the enforcement of this Regulation by its officers, agents or employees.

4. Severability

   a. The provisions of this Regulation are declared to be separate and severable. The invalidity of any clause, sentence, paragraph, subdivision, section or portion of this Regulation or the invalidity of the application thereof to any person or circumstances shall not affect the validity of the remainder of this Regulation, or the validity of its application to other persons or circumstances.

5. Repealer

    a. All provisions of Three Lakes Water Association, which are inconsistent with this program, are hereby repealed.

6. Review and Update

    a. Three Lakes Water Association shall on an annual basis, review and if necessary, update the Cross-Connection Control Program to meet current local, state and federal regulations.

Approved by the Three Lakes Water Association Board of Trustees

Date: ___________________________

By: ______________________________
Bob Bartell, President

Three Lakes Water Association
Cross-Connection Control Program

Operating Procedures

1. Purpose

    a. To protect the purveyor's potable water system and the member's potable water system as required per WAC 246-290-490 from contamination through cross-connection control, by surveying and assessing plumbing for cross-connection and if necessary, requiring the installation of approved backflow prevention assemblies when an actual or potential cross-connection exists and cannot be eliminated.

2. Responsibility

    a. Three Lakes Water Association, system identification number 881506, shall be responsible for cross-connection control beginning at the water supply source, including the water distribution system, to the point of delivery to the member's potable water system, which begins on the downstream connection of the member's water meter.

    b. The Association shall coordinate with the authority having jurisdiction in all matters concerning cross-connection control. The purveyor shall document and describe the coordination, including the responsibilities within the property lines of the member's premises.

3. Requirements

    a. Three Lakes Water Association shall ensure that cross-connections between the purveyor's potable water supply and the member's potable water system are eliminated or controlled by the means of plumbing retrofit, education, air gap or the installation of an approved backflow prevention assembly with testing by a certified Washington State Department of Health Backflow Assembly Tester commensurate with the degree of hazard. All expenses shall be borne by the member/user.

b. The CCS shall have the authority to order the member, person in control of the member's system or the agent of the member to remove any existing or potential cross-connection or backflow connection that presents an unreasonable risk of contamination to the purveyor's potable water system. The CCS shall classify the degree of hazard posed.

c. The Association may discontinue water service to any member's structure(s) or parcel(s) when the CCS provides written notice of a violation and it is not corrected within a reasonable period of time provided, especially if the hazard constitutes an unreasonable risk to the purveyors' potable water system. The Association has the option after the member's discontinuance of water service to install the proper approved backflow prevention assembly and bill the member for all costs involved or to revoke the share.

d. When the CCS denies or discontinues water service to a member's premises due to a cross-connection hazard, the CCS shall notify the authority having jurisdiction and the Association prior to taking such action, except in the event of an emergency.

4. Minimum Elements of a Cross-Connection Control Program (CCCP)

    a. It is the intent of Three Lakes Water Association to implement and perform the minimum elements of a CCCP for proper procedures acceptable to DOH. The required elements of WAC 246-290-490 are detailed below, including a description of each as it applies to the Association.

Element 1: The purveyor will adopt a local ordinance, resolution, code, by-law or other written legal instruments that:

a. Established the purveyor's legal authority to implement a Cross-Connection Control Program;

Three Lakes Water Association has adopted a regulation on November 13, 2018, creating a cross-connection control legal instrument.

b. Describes the operating policies and technical provisions of the purveyor's cross-connection control program; and

Three Lakes Water Association's operating procedures, policies and agreements shall provide the basis for performing the program.

c. *Describes the corrective actions used to ensure that members comply with the purveyor's cross-connection control requirements.*

If a member fails to discontinue the use of all cross-connections, except in accordance with this ordinance, it shall be sufficient cause for the immediate discontinuance of the member's water service to the premises.

Element 2: The purveyor shall develop and implement procedures and schedules for evaluating new and existing service connections to assess the degree of hazard posed by the member's premises to the purveyor's distribution system and notifying the member within a reasonable time of the hazard evaluation results. At a minimum, the program shall meet the following:

a. *For new connections made on or after the effective date of these regulations, procedures shall ensure that an initial evaluation is conducted before service is provided;*

Members shall furnish information on water use practices within their premises. Based on the provided information, further investigations may be necessary and the member's premises shall be open at all reasonable times for the purpose of determining whether there is an actual or potential cross-connection to the Association's potable water system. Members shall comply with the Association's policies and agreements for compliance to eliminate cross-connections and that the approval for water service shall not be granted until CCC requirements and inspections have been met. This includes the proper installation of an approved backflow assembly prevention assembly, the testing of the assembly is completed by a certified Washington State Department of Health Backflow Assembly Tester and a passing test report is provided to the CCS. Authorized employees of the Association with proper identification shall have access during reasonable hours and with reasonable notification to all premises to which potable water is supplied.

b. *For existing connections made prior to the effective date of these regulations, procedures shall ensure that an initial evaluation is conducted in accordance with a schedule acceptable to the department; and*

The member’s premises shall be open at all reasonable hours to the Association’s CCS or their representative for the purpose of conducting surveys. Existing connections shall comply with the Association’s policies and agreements for compliance to eliminate cross-connections. Upon the CCS learning of an actual or potential cross-connection, a letter shall be sent to the member requesting a scheduled appointment to conduct a site survey. After the site survey, a letter will be sent to the member indicating the required type of protection, timeframe for the installation of the backflow prevention assembly and testing of the assembly completed by a certified Washington State Department of Health Backflow Assembly Tester with a passing test report is provided to the CCS for final approval. Authorized employees of the Association with proper identification shall have access during reasonable hours and with reasonable notification to all premises to which potable water is supplied.

The initial site survey for all existing and new member’s facilities shall be conducted within twenty months if it is a Class A, low hazard, and within sixty days if it is a Class C, high hazard or when the CCC checklist is returned to the Association. The initial site survey for new construction shall be conducted at the time of the application of water service or when the CCC checklist is returned to the Association.

c. For all service connections, once an initial evaluation has been conducted, procedures shall ensure that periodic reevaluations are conducted in accordance with a schedule acceptable to the department and whenever there is a change in the use of the premises.

The Association may at least annually, conduct periodic inspections.

A re-inspection survey for all existing and new member’s air gaps shall be conducted annually. A re-inspection survey for all existing and new member’s other backflow prevention assemblies whether for residential or commercial premises or in-premises purposes, shall be conducted when a backflow prevention assembly is moved, replaced, repaired, modified or at the discretion of the CCS.

Element 3: The purveyor shall develop and implement procedures and schedules for ensuring that:

a. Cross-connections are eliminated whenever possible;

Cross-connections shall be eliminated in accordance with Three Lakes Water Association's CCC written legal instrument.

b. *When cross-connections cannot be eliminated, they are controlled by the installation of approved backflow preventers commensurate with the degree of hazard; and*

   When cross-connections cannot be eliminated, they shall be controlled by the installation of an approved backflow prevention assembly or device commensurate with the degree of hazard in accordance with the Association's CCC written legal instrument.

c. *Approved backflow preventer are installed in accordance with the requirements of subsection (6) of this section.*

   Approved backflow prevention assemblies shall be installed pursuant to WAC 246-290-490 (6).

   After reviewing the cross-connection control checklist and completing a site survey, reference shall be made to the member to tables eight and nine of WAC 246-290-490 for the appropriate methods of backflow protection.

   The Association may require backflow protection for single family residential users based on a site survey, a cross-connection incident or after reviewing the cross-connection control checklist for the parcel where backflow prevention assemblies are required. An assessment shall be made of the degree of hazard posed by the member to the public potable water system. Based on this assessment, if the degree of hazard is such that the purveyor believes premises isolation is necessary, an approved backflow prevention assembly commensurate with the degree of hazard shall be installed at or near the service connection or alternative location acceptable to the purveyor in order to isolate the member's potable water system from the purveyor's water distribution system.

   For all existing fire protection systems, a site survey shall be conducted for backflow protection. If it is discovered in the site survey that no chemicals are used and the purveyor's potable water is used, a Double Check Valve

Assembly (DCVA) shall be required and a timeframe shall be specified by the Association for installation, inspection and testing.

For all existing fire protection systems which pose an immediate health hazard due to the use of chemicals or auxiliary water supply, a Reduced Pressure Backflow Assembly (RPBA) shall be required and a timeframe of ninety days shall be specified by the Association for installation, inspection and testing. Where an immediate hazard exists on a required fire protection system, the Association may take abatement action. The CCS shall immediately contact the Association, the authority having jurisdiction, the Snohomish Health District and DOH. The Association may install the appropriate backflow prevention assembly at the right of way line in order to protect the public potable water system and all costs of abating the immediate health hazard and for compliance shall be borne by the member.

Element 4: The purveyor shall ensure that personnel, including at least one person certified as a CCS, may develop and implement the Cross-Connection Control Program.

a. Three Lakes Water Association shall employ at all times or contract at least one person certified as a CCS to develop and implement the Cross-Connection Control Program.

b. The current CCS for Three Lakes Water Association is Don Kemmis, certification number 12774, Kaila Klicker, certification number 13714 and Renee Clarke, certification number 14544.

c. Presently, the CCS is administering the Cross-Connection Control Program, which includes:

    a. Implementing the CCC Program, which is reviewed annually.

    b. Reviewing all hazard evaluations.

    c. Conducting site surveys.

    d. Reviewing and recording backflow assembly tester's reports.

    e. Reviewing and recording BAT's certifications and test kit calibrations.

f. Preforming water quality control as directed by the Association's Manager.

g. Preparing the annual summary report (ASR) for DOH.

h. Preparing and mailing annual backflow prevention assembly testing letters.

i. Keeping up to date with new cross-connection material and education.

j. Administering a database.

Element 5: The purveyor shall develop and implement procedures to ensure that approved backflow prevention assemblies or devices are inspected and/or tested (as applicable) in accordance with subsection (7) of this section.

a. The CCS shall review and prepare the annual backflow prevention assembly testing letters for all members that require annual testing.

b. All backflow prevention devices (non-testable) shall be inspected at installation, after a backflow incident, after repair, reinstallation or relocation.

Element 6: The purveyor shall develop and implement a backflow prevention assembly testing quality control assurance program, including but not limited to, documentation of BAT certifications and test kit calibrations, BPA test reports and the timeframes for submitting completed BPA test reports.

a. Three Lakes Water Association shall maintain a list of BATs, which includes a current copy of their validation card and a current copy of their kit calibration certificate.

b. All approved and accepted backflow prevention assemblies, including inspecting air gaps, shall be tested annually, after a backflow incident, after an assembly is repaired, replaced or relocated. All tests shall be done by a

DOH certified BAT. The results of the tests shall be reported to the CCS within thirty days. The member shall pay for all testing and repairs. The Association shall provide a list of BATs within the annual backflow prevention assembly testing letter. The member agrees to install all backflow prevention assemblies required by the CCS and to maintain those assemblies in good working order. The assemblies shall be of a type, size and make approved by the CCS and DOH. The assemblies shall be installed based on the standards established by the Association. See installation requirements and instructions for further details.

c. The member agrees to obtain prior approval from the Association for all changes in water use and alterations or additions to the plumbing system, and shall comply with any additional requirements imposed by the CCS.

d. The Association shall send annual letters to members requiring their assemblies to be tested and to submit their test results to the Association within thirty working days from the time they receive their letter.

e. The Association shall send a second letter if no test results are received within thirty day timeframe. The letter will inform them to submit their test results within fifteen days or water service may be terminated.

f. The Association shall send a final and certified letter specifying a date for the discontinuance of public potable water service to the premises. The CCS shall notify the Association and the authority having jurisdiction regarding the discontinuance.

g. All backflow prevention assembly test reports shall be reviewed for accuracy and filed appropriately.

h. All BATs who are testing member's BPAs shall submit a copy of their test kit calibration and verification results to the CCS at least annually or upon the request.

i. Testing procedures shall conform to WAC 246-290-490 (7d) that have been adopted by USC and the CCS shall understand and be familiar with the backflow prevention assembly testing procedures as outlined in the Cross-Connection Control Manual Accepted Procedure and Practice 7th edition.

j. Any BAT requesting to be listed on the Association's contact list shall submit a current copy of their validation, a current copy of their kit calibration certificate, proof of liability insurance, business name and phone number to the Association.

k. BATs may use the Association's backflow prevention assembly test report form or an acceptable form recognized by the Cross-Connection Control Manual Accepted Procedure and Practice 7th edition or Cross-Connection Control for Small Water Systems Guidance Document.

Element 7: The purveyor shall develop and implement procedures, when appropriate, for responding to backflow incidents.

a. In the event of any backflow incident where they purveyor's water system has been or may be contaminated, the CCS, DOH, AHL and SHD shall be notified immediately, but no later than the end of the following business day. Failure of the member to notify the Association of a backflow incident shall subject the member/user to the provisions of regulation 110. All costs incurred enforcing this provision shall be borne by member/user that caused the backflow to occur when a backflow incident is known by the purveyor to have contaminated the public potable water system or occurred within the premises of a member served by the purveyor.

b. The purveyor shall document details of any backflow incidents on a form acceptable to DOH.

c. The purveyor shall include all backflow incident reports in the annual Cross-Connection Control Program Summary Report.

d. Three Lakes Water Association shall submit a monthly coliform report and all other water quality complaints such as dirty water, foul smelling water and main line interruptions, to the CCS for review and documentation.

e. Three Lakes Water Association shall make provisions for isolating the source of contamination, cleaning, flushing and a corrective action to prevent future occurrences of a backflow incident.

Element 8: The purveyor shall include information on cross-connection control in the purveyor’s existing program for educating consumers about potable water system operations. This program may include periodic bill inserts, public service announcements, pamphlet distribution, notification to new members and Consumer Confidence Reports.

a. The Association shall each year define the purpose of a CCC Program in the Consumer Confidence Reports (CCR) and have handouts available explaining the intent and responsibility of the CCCP with a contact name and phone number available for members.

b. With every new share or share transfer, a cross-connection control checklist shall be provided to the member to fill out and return to the Association. The checklist requests that the member checks any of the health hazards they may have or may be installing on their property.

Element 9: The purveyor shall develop and maintain cross-connection control records including, but not limited to, the following:

a. A master list of service connections and/or member’s premises where the purveyor relies upon an approved backflow prevention assembly to protect the public potable water system from contamination, the assessed hazard level and the required backflow prevention assembly installed.

b. Inventory information on any approved air gaps installed in lieu of approved backflow prevention assemblies, including the exact device location, assessed degree of hazard, installation date, history of inspections and the person performing the inspections.

c. Inventory information on any approved backflow prevention assemblies, including the exact assembly location, assembly description (type, manufacturer, model, size and serial number), assessed degree of hazard, installation date, history of inspections, tests and repairs, test results and the person performing the tests.

d. Inventory information on any approved AVBs used for irrigation system applications, including the exact device location, description (manufacturer, model and size), installation date, history of inspections and the person performing the inspections.

e. Cross-Connection Program Summary Reports and backflow incident reports as required under WAC 246-290-490, subsection (8).

f. Records and reports shall be kept as required under WAC 246-290-490, subsection (8(ii(iii))). The minimum listed correspondence shall be kept in a common database on file.

    a. Cross-connection control legal instrument title.

    b. Cross-Connection Control Program

    c. Master list of service connections and/or member's premises where the purveyor relies upon an approved backflow prevention assembly to protect the public potable water system from contamination, the assessed hazard level and the required backflow prevention assembly installed.

    d. BAT's test/maintenance report.

    e. All correspondence with members regarding cross-connection control

    f. Annual Cross-Connection Program Summary Reports

    g. BAT's names, validations, kit calibrations and dates certified.

    h. All public education correspondence.

    i. All correspondence with State and Local Health Authorities.

    j. All correspondence with the authority having jurisdiction.

    k. Drawings and diagrams of backflow prevention assembly installations.

g. Currently all the information for the CCC Program is stored on a self-generated database.

Element 10: Purveyors who distribute and/or have facilities that receive reclaimed water within their water service area shall meet any additional cross-connection control requirements imposed by the department under a permit issued in accordance with chapter 90.46 RCW.

a. At this time, the Association does not receive or distribute reclaimed water. In the event that reclaimed water use if proposed within the Association's water service area, all cross-connection control requirements mandated by the permitting authority in accordance with chapter 90.46 RCW shall be implemented into part of the CCC Program and complied.

Three Lakes Water Association
Cross-Connection Control Program

Program Requirements and Recommendations

1. Prohibition of Return of Water Use

    a. Any known used water such as make up water and cooling water shall have a backflow prevention assembly commensurate with the degree of hazard at each point of connection per WAC 246-290-490 (2(1)).

2. Unapproved Auxiliary Supplies

    a. A premises with an unapproved auxiliary water supply interconnected with the public potable water supply shall be considered a high health hazard and shall require premises isolation by air gap or a RPBA. The minimum protection required by the Association of an unapproved auxiliary water supply which is not connected with the public potable water supply is premises isolation by a DCVA.

3. Tanker Trucks

    a. All trucks and equipment that are constructed with holding tanks for water (hydro seeders, sweepers, dust control, etc.), and have requested to fill their holding tanks with the Association's public potable water supply shall be required to have an approved RPBA under the direction of the CCS.

4. Temporary Water Connections

    a. The Association shall inspect and monitor all temporary water connection for those used for water main construction or any other system construction uses. The inspection will be for proper disinfection, sampling and backflow prevention. The Association shall require a minimum of a DCVA for all temporary water connections. The assembly shall be inspected, tested and monitored during temporary water connection construction projects.

5. Failure to Comply

a. The member agrees to comply with the Association's CCCP. Failure to do so, shall result the automatic imposition of the following penalties:

    a. Non-compliance shall result in discontinuance of water service to the member's property.

    b. In the event it becomes necessary for the Association to pull the member's meter and cancel their share due to non-compliance, a certified letter shall be mailed to the member. The share shall be reinstated only when compliance is met and any past due charges, costs for pulling the meter and costs for reinstalling the meter are paid.

b. The CCS shall give appropriate notice to the purveyor and to the LAA prior to discontinuance or denying water service, except in the event of an emergency.

6. Education

    a. The CCS shall keep abreast of all new instruction and material regarding cross-connection control by attending classes, workshops, seminars and retaining the certificate necessary for the position.

7. Summary

    a. The CCS shall incorporate good engineering, public health practices and other policies to ensure a sound CCCP for Three Lakes Water Association.

    b. Three Lakes Water Association shall, on an annual basis, review, and if necessary, update the CCCP to comply with local, state and federal regulations.

Three Lakes Water Association
P.O. Box 24, Snohomish, WA 98291-0024
(360) 568-8022 www.3lwa.org

Cross-Connection Control

RE: **Cross-Connection Control Checklist**

Dear Member,

The Three Lakes Water Association has implemented a Cross-Connection Control Program (CCCP), as required by the Washington State Department of Health (DOH). The purpose of the program is to protect the public water system from an actual or a potential health hazard via cross-connection, which could enter the public water system from your potable water system.

As part of our efforts to keep your drinking water safe, we are conducting a Cross-Connection Control (CCC) hazard survey. The purpose of the survey is to help us determine if any of our members have special plumbing or activities on their premises that could increase the risk of contamination to our water system. In this event, you may be required to have a backflow protection installed on your service line or to eliminate the hazard in order to prevent contamination of the public water system.

Please complete the attached <u>Cross-Connection Control Checklist Form</u> by checking the applicable boxes and return the completed and signed survey to the address shown on the letterhead.

A copy is enclosed for your records. Additional information or questions related to this letter may be obtained by contacting me at (360) 568-8022. We will review your checklist and determine whether we need to contact you for further information or for an on-site survey. Thank you for your cooperation.

Respectfully,

Kaila Klicker

Kaila Klicker
Assistant Manager and Cross-Connection Control Specialist
Three Lakes Water Association
(425) 903-1655

Cross-Connection Control Checklist

Please complete and return to:
Three Lakes Water Association
P.O. Box 24, Snohomish, WA 98291
360-568-8022 www.3lwa.org customerservice@3lwa.org

Name: ______________________ Phone: ______________ Acct #: __________

Parcel #: ______________ Site Address: ____________________

Please mark yes for any of the following you have or will be installing:

1. Automatic sprinkler or irrigation system: Yes ☐ No ☐
2. Potable or irrigation water reservoir/storage container: Yes ☐ No ☐
3. Swimming pool: Yes ☐ No ☐
4. Hot tub: Yes ☐ No ☐
5. Livestock watering troughs: Yes ☐ No ☐
6. Residential fire sprinkler or supression system: Yes ☐ No ☐
7. Drafting from a lake or from any other source for the purpose of lawn irrigation or any other use: Yes ☐ No ☐
8. Solar heating: Yes ☐ No ☐
9. Photo developing: Yes ☐ No ☐
10. Water treatment system (such as a water softener): Yes ☐ No ☐
11. Grey water system (such as reclaiming wash water): Yes ☐ No ☐
12. Water supply to a dock or boat moorage: Yes ☐ No ☐
13. Greenhouse: Yes ☐ No ☐
14. Private well/c: Yes ☐ No ☐
15. Septic pump: Yes ☐ No ☐
16. Boiler: Yes ☐ No ☐
17. Medical equipment connected to water supply: Yes ☐ No ☐
18. Post-mix soda dispenser: Yes ☐ No ☐
19. Decorative ponds: Yes ☐ No ☐
20. Dialysis: Yes ☐ No ☐
21. Hydronic Systems (radiant heat in floors and or walls): Yes ☐ No ☐
22. Booster or potable water pressure pump: Yes ☐ No ☐
23. Any other device that will be connected to the potable water supply: Yes ☐ No ☐

***If yes to the above, please provide an explanation on the back of this page.**

---

*If yes for any of the above questions, the following items will be enforced without exception if deemed as a potential hazard by the Association. All existing members will be phased in over a period of time on an individual basis. This checklist must be completed and returned by all members.

1. Irrigation systems require a minimum protection of a double check valve assembly; the other items may require a higher level of backflow protection. Contact the Association for specific requirements.
2. The backflow assembly must be installed by the property/homeowner or by a licensed plumber per the Association standards.
3. The backflow assembly must meet all AWWA and State standards. It must also appear on the most recent Washington Department of Health list of approved assemblies. Contact the Association or Washington Department of Health at 1-800-525-2536 for a list of approved assemblies.
4. Assemblies shall be tested by a State certified Backflow Assembly Tester (BAT) immediately after installation, relocation or repair. An annual test shall be performed therafter. All results shall be reported to the Association within thirty (30) days of the completed test.
5. The Association can provide a list of certified Backflow Assembly Testers (BATs).
6. The cost of installation, relocation, annual inspections and repairs is the responsibility of the property/homeowner. Please call the Association for inspection after installing a backflow assembly.
7. The homeowner understands that after the installation of a water meter, the Association may conduct an on-site inspection of the property and/or building for potential cross-connections. If a cross-connection is discovered, the Association will require the installation of a State-approved backflow assembly.
8. If any of the above cross-connection control hazards become present in the future, the homeowner shall notify the Association for a potential reassessment in order to stay in compliance with the Association's Cross-Connection Control Program as well as the Bylaws.

Homeowner Signature: ______________________ Date: ______________

***If new construction or no site address is available, please provide a parcel/tax ID number.**

Three Lakes Water Association

P.O. Box 24, Snohomish, WA 98291-0024
(360) 568-8022 www.3lwa.org

Cross-Connection Control

RE: **Cross-Connection Control Checklist Confirmation**

Dear Member,

Thank you for returning a completed Cross-Connection Control checklist. It was determined that a site survey was not necessary based on what you marked on the checklist. If any of the listed cross-connection control hazards become present in the future, you must notify the Association for a potential reassessment in order to stay in compliance with the Association's Bylaws as well as the Cross-Connection Control Program (CCCP), as required by the Washington State Department of Health (DOH). The purpose of the program is to protect the public water system from an actual or a potential health hazard via cross-connection, which could enter the public water system from your private potable water system. For the most part, the first individuals affected by a cross-connection hazard are those within your household, so our goal is to inform you about this matter to help you protect your own private potable water system.

Additional information or questions related to this letter may be obtained by contacting me at (360) 568-8022. Thank you for your cooperation.

Respectfully,

Kaila Klicker

Kaila Klicker
Assistant Manager and Cross-Connection Control Specialist
Three Lakes Water Association
(425) 903-1655

Three Lakes Water Association
P.O. Box 24, Snohomish, WA 98291-0024
(360) 568-8022 www.3lwa.org

Cross-Connection Control

Name Date:
Address
City, State, Zip Code

Account #

Re: **Site Survey Request at Address**

Dear Name,

Three Lakes Water Association has implemented a Cross-Connection Control Program (CCCP), as required by the Washington State Department of Health (DOH) for the Association's potable water system. The purpose of the program is to protect the public potable water system from an actual or potential health hazard by cross-connection contamination, which could enter the public potable water system from your potable water system.

As part of the CCCP, the Association must assess the degree of hazard posed by each of our member's potable water systems on the public potable water system. Depending on the results of the assessment, you may be required to install a backflow prevention assembly on your service line or to eliminate the potential hazard. A site cross-connection survey may need to be conducted in order for us to assess the hazard for you premises.

Please contact me at (360) 568-8022 within the next **fifteen (15)** working days after receiving this letter to schedule an appointment. The site survey appointment is to determine the appropriate protection required based on your response to the cross-connection control checklist mailed to you. It was marked on the checklist that there is or will be a **potential hazard** on your premises.

The site survey will give us an opportunity to update our records, ensure that the appropriate protection is installed and discuss the requirements necessary to maintain compliance with DOH regulations. As part of this survey, you will receive information about cross-connection control and how it affects the public potable water system.

Additional information or questions related to this letter may be obtained by contacting me at (360) 568-8022. Thank you in advance for your prompt attention to this matter.

Sincerely,

Kaila Klicker
Assistant Manager and Cross-Connection Control Specialist
Three Lakes Water Association
(425) 903-1655

Three Lakes Water Association
P.O. Box 24, Snohomish, WA 98291-0024
(360) 568-8022 www.3lwa.org

Cross-Connection Control

Name Date:
Address
City, State, Zip Code

Account #

Re: **Site Survey Request at Address**

Dear Name,

Three Lakes Water Association has implemented a Cross-Connection Control Program (CCCP), as required by the Washington State Department of Health (DOH) for the Association's potable water system. The purpose of the program is to protect the public potable water system from an actual or potential health hazard by cross-connection contamination, which could enter the public potable water system from your potable water system.

As part of the CCCP, the Association must assess the degree of hazard posed by each of our member's potable water systems on the public potable water system. Depending on the results of the assessment, you may be required to install a backflow prevention assembly on your service line or to eliminate the potential hazard. A site cross-connection survey may need to be conducted in order for us to assess the hazard for you premises.

Please contact me at (360) 568-8022 within the next **fifteen (15)** working days after receiving this letter to schedule an appointment. The site survey appointment is to determine if protection is required as the Association has not received a response to the two cross-connection control checklists mailed to you.

The site survey will give us an opportunity to update our records, ensure that the appropriate protection is installed and discuss the requirements necessary to maintain compliance with DOH regulations. As part of this survey, you will receive information about cross-connection control and how it affects the public potable water system.

Additional information or questions related to this letter may be obtained by contacting me at (360) 568-8022. Thank you in advance for your prompt attention to this matter.

Sincerely,

Kaila Klicker
Assistant Manager and Cross-Connection Control Specialist
Three Lakes Water Association
(425) 903-1655

Three Lakes Water Association
P.O. Box 24, Snohomish, WA 98291-0024
(360) 568-8022 www.3lwa.org

Cross-Connection Control

Name Date:
Address
City, State, Zip Code

Account #

Re: **Site Survey Assessment at Address**

Dear Name,

Three Lakes Water Association has implemented a Cross-Connection Control Program (CCCP), as required by the Washington State Department of Health (DOH) for the Association's potable water system. The purpose of the program is to protect the public potable water system from an actual or potential health hazard by cross-connection contamination, which could enter the public potable water system from your potable water system.

During the site survey performed on Month, Day, Year at Address, the items listed below were assessed as requirements for compliance.

1. The installation of a **type of backflow assembly** for your **potential hazard**.
2. Initial testing performed by a Backflow Assembly Tester certified by Washington State Department of Health and the test report submitted to the Association.
3. Annual testing performed by a Backflow Assembly Tester certified by Washington State Department of Health and the test report submitted to the Association.

The requirements listed above shall need to be completed within **thirty (30)** working days after receiving this letter. After the installation of the required backflow prevention assembly has been completed, please notify me for inspection. Failure to comply with any of the above requirements may cause the Association to initiate action to obtain compliance, including the discontinuance of your potable water supply serving your premises.

Additional information or questions related to this letter may be obtained by contacting me at (360) 568-8022. Thank you in advance for your prompt attention to this matter.

Sincerely,

Kaila Klicker
Assistant Manager and Cross-Connection Control Specialist
Three Lakes Water Association
(425) 903-1655

Enclosures: Backflow Assembly Testers List, Test Report Form

Three Lakes Water Association

P.O. Box 24, Snohomish, WA 98291-0024
(360) 568-8022 www.3lwa.org

Cross-Connection Control

Date

Name
Address
City, State, Zip Code

Account #

Re: **Annual backflow prevention assembly testing <u>Month, Year</u>**

Dear Name,

The Washington State Department of Health (DOH) regulations (WAC 246-290-490) require water purveyors to administer a Cross-Connection Control Program (CCCP) to protect the public water system from pollution and or contamination. As part of this program, you have a **Type of Backflow Assembly** for your **Potential Hazard** installed at **Address** that is due for annual testing, as required by DOH. This test is scheduled for the month of **Month, Year.**

Please have the testing performed by a DOH certified Backflow Assembly Tester (BAT). You may use the same tester as last year as long as he/she is current with DOH. Supporting material enclosed.

If the assembly(s) installed in your water system fails its test, please make the necessary repairs. Upon completion of a satisfactory test, have the tester fill out the enclosed report form, with your signature and return to me within **five (5)** working days of the acceptable test. **<u>Failure to comply with this required annual backflow testing could result in the termination of water service to your premises and/or additional fees if the Association is required to send certified letters in order to obtain compliance.</u>**

Additional information or questions related to this letter may be obtained by contacting me at (360) 568-8022

Thank you in advance for your prompt attention to this matter.

Sincerely,

Kaila Klicker
Assistant Manager and Cross-Connection Control Specialist
Three Lakes Water Association
(425) 903-1655

Enclosures: Backflow Assembly Testers List, Test Report Form

Three Lakes Water Association

P.O. Box 24, Snohomish, WA 98291-0024

(360) 568-8022 www.3lwa.org

Cross-Connection Control

SECOND NOTICE

Date

Name
Address
City, State, Zip Code

Account #

Re: **Annual backflow prevention assembly testing Month, Year**

Dear Name,

According to the Washington Administrative Code (WAC 246-290-490), each year you are required to have your backflow prevention assembly(s) tested by a Washington State Department of Health (DOH) certified backflow assembly tester (BAT). The intent is to ensure that the protection assembly in your water system is functioning properly in order to protect the public water system from pollution or contaminates.

On **Month, Day, Year**, the annual test letter was sent to you with the supporting material, requiring you to have your **Type of Backflow Assembly** for your **Potential Hazard** installed at **Address** tested by **Month, Day, Year**. As of this date, I have not received the test results.

It is your responsibility as the property owner to ensure this required testing is completed. Please have the backflow prevention assembly(s) tested and return the completed tester's report to me within **fifteen (15) days** of this letter. If this test has been performed, please forward a copy of the test results to me so that the record is complete and can be closed. **Failure to comply with this required annual backflow testing could result in the termination of water service to your premises and/or additional fees if the Association is required to send certified letters in order to obtain compliance.**

Additional information or questions related to this letter may be obtained by contacting me at (360) 568-8022.

Sincerely,

Kaila Klicker
Assistant Manager and Cross-Connection Control Specialist
Three Lakes Water Association
(425) 903-1655

Three Lakes Water Association
P.O. Box 24, Snohomish, WA 98291-0024
(360) 568-8022 www.3lwa.org

Cross-Connection Control

FINAL NOTICE

Date

Name
Address
City, State, Zip Code

Account #

Re: **Notice and Order of Water Service Termination**

This letter was also sent certified. Certified Letter #

Dear Name,

On Month, Day, Year and on Month, Day, Year (copy of the first and second letter enclosed) you were notified to have your backflow assembly tested and return the completed test results to Three Lakes Water Association. You were also notified that failure to comply with this required annual backflow testing could result in the termination of water service to your premises. **As of this date I have not received this annual test report as required to be in compliance with WAC 246-290-490.**

Your failure to comply with this "Notice and Order" or any regulation to the Association's Cross-Connection Control Program shall cause your water service to be terminated (per Amendment III of the Three Lakes Water Association Bylaws dated July 15, 2014). You are required to provide a satisfactory test report signed by an approved backflow tester on or before Month, Day, Year or water service to Address will be shut/locked off on Month, Day, Year.

All costs to enforce this action shall be borne by the member. If you have any questions, regarding this letter please contact me at (425) 903-1601.

Sincerely,

Don Kemmis
General Manager and Cross-Connection Control Specialist
Three Lakes Water Association
(425) 903-1601

File: Address

Three Lakes Water Association

P.O. Box 24, Snohomish, WA 98291-0024
(360) 568-8022   www.3lwa.org

Cross-Connection Control

Date

Name
Address
City, State, Zip Code

Account #

Re: **Site Assessment at Address**

This letter was also sent certified. Certified Letter #

Dear Name,

Three Lakes Water Association has implemented a Cross-Connection Control Program (CCCP), as required by the Washington State Department of Health (DOH) for the Association's potable water system. The purpose of the program is to protect the public potable water system from an actual or potential health hazard by cross-connection contamination, which could enter the public potable water system from your potable water system.

Based on the failure to submit a completed and signed cross-connection control checklist as mailed by the Association and the denial of a site survey, which was requested by the Association in writing and mailed to the member on Month, Day, Year, the items listed below are assessed as requirements of the member for compliance.

1. The installation of a **Reduced Pressure Backflow Assembly** as approved by Washington State DOH shall be installed at the immediate downstream point of the existing meter serving the above address in order to establish premises isolation from your private water system to the public water system from cross connection(s) that may exist on the subject property.
2. An inspection of this new backflow assembly including the piping configuration between the meter and the RPBA shall be performed by a Three Lakes Water Association Cross-connection Control Specialist for approval.
3. Initial testing shall be performed by a Backflow Assembly Tester certified by Washington State Department of Health and a satisfactory backflow test report must be submitted to the Association within thirty working days of this notification.
4. Once the installation has been completed, subsequent annual testing shall be performed by a Backflow Assembly Tester certified by Washington State Department of Health and a sstisfactory backflow test report shall be submitted to the Association in order to remain in compliance with the Cross-Connection Control Program.

Requirements 1-3 as listed above shall be completed within **thirty (30)** working days of the date of this notification. The installation of the above backflow assembly shall meet the Association's specifications as provided. Once the installation of the required backflow prevention assembly has been completed, please notify me for inspection.

Your failure to comply with this “Notice and Order” or any regulation to the Association’s Cross-Connection Control Program may cause the Association to initiate action to obtain compliance, including the discontinuance of your potable water supply serving your premises, per Amendment III of the Three Lakes Water Association Bylaws dated July 15, 2014, as well as WAC 246-290-490.

Additional information or questions related to this letter may be obtained by contacting me at (360) 568-8022. Thank you in advance for your prompt attention to this matter.

Sincerely,

Kaila Klicker
Assistant Manager and Cross-Connection Control Specialist
Three Lakes Water Association
Enclosures: Backflow Assembly Testers List, Test Report Form, RPBA Installation Specifications

CC File: Address, Board President

Backflow Prevention Assembly Test Report

Three Lakes Water Association

P.O. Box 24, Snohomish, WA 98291-0024

(360) 568-8022 www.3lwa.org

Account Number: ______________

Name of Premise: __________________________________ **Commercial** ☐ **Residential** ☐

Service Address: ______________________ **City:** ________________ **Zip Code:** ____________

Contact Person: ____________________ **Phone**: ________________ **Fax**: ________________

Location of Assembly: ____

Downstream Process: ______________________ **DCVA** ☐ **RPBA** ☐ **PVBA** ☐ **Other:** __________

New Install ☐ **Existing** ☐ **Replacement** ☐ **Old Serial #** __________ **Proper Installation:** **Yes** ☐ **No** ☐

Make of Assembly: ______________**Model:** ______________**Serial Number:** ________________**Size:** __________

Initial Test	DCVA/RPBA Check Valve Number 1	DCVA/RPBA Check Valve Number 2	RPBA	PVBA/SVBA AIR INLET
Passed ☐ **Failed** ☐	Leaked ☐ ____________ PSID	Leaked ☐ ____________ **PSID**	Opened at ______ PSID #1 Check _______ PSID Air Gap Ok? _________	Opened at _______PSID Did Not Open ☐
New Parts and Repairs	Clean / Replace / Part ☐ ☐ ______ ☐ ☐ ______ ☐ ☐ ______ ☐ ☐ ______	Clean / Replace / Part ☐ ☐ ______ ☐ ☐ ______ ☐ ☐ ______ ☐ ☐ ______	Clean / Replace / Part ☐ ☐ ______ ☐ ☐ ______ ☐ ☐ ______ ☐ ☐ ______	Check Valve Held at _________PSID Leaked ☐ Cleaned ☐ Repaired ☐
Test After Repairs **Passed** ☐ **Failed** ☐	Leaked ☐ ____________ **PSID**	Leaked ☐ ____________ **PSID**	Opened at ______ PSID #1 Check _______PSID	Air Inlet __________ PSID Check Valve _______ PSID

Required minimum air gap separation provided: Yes ☐ No ☐ **Detector Meter Reading:** ________________

Remarks: ____

____ **Line Pressure:** ______**PSI** **Confined Space?** _______

Tester's Signature: ______________________ **Certification Number:** ______________**Date:** ____________

Tester's Name (Printed):__________________________ **Tester's Phone Number:** ________________

Repaired By: ____ **Date:** ________________

Final Test By:__________________________**Certification Number:** ____________ **Date:** ___________

Calibration Date: _________**Gauge Number:** _________ **Model Number:** _________ **Service Restored:** Yes ☐ No ☐

I certify that this report is accurate and I have used WAC 246-290-490 approved test methods and test equipment.

Cross-Connection Control Program

BACKFLOW INCIDENT REPORT FORM

Note: *Use this form to comply with WAC 246-290-490(8)(g).*

Part 1: Public Water System (PWS) Information

PWS ID:	PWS Name:	County:

Part 2: Backflow Incident Information

A. Incident Identification

Incident date:	Time of incident:	Incident ID (DOH use):

B. Information on Premises where Backflow Originated

Name of premises:	
Premises physical address:	
City: ,WA	Zip:
Premises type: non-residential ☐ residential ☐	
Premises category/description (Table 9 category*, if applicable):	
Most recent hazard evaluation prior to incident (mm/dd/yyyy): None ☐	
PWS's assessed hazard level:	*Premises isolation* required by PWS? Yes ☐ No ☐
Type of backflow preventer required by PWS:	PWS relies on *in-premises protection*? Yes ☐ No ☐
Other hazard evaluation information:	

*See WAC 246-290-490(4)(b)(i).

C. Method of Discovery of Backflow

How the backflow was discovered (check all that apply):	Direct observation ………………. ☐ Meter running backwards ……….. ☐ Water use decrease ……………… ☐ Disinfectant residual monitoring ... ☐ Water quality monitoring ……….. ☐	Water quality complaint ……………..... ☐ Illness/injury complaint ……………...... ☐ Result of Investigation ………………... ☐ Other (Describe): ☐
Incident reported to the public water system by:	PWS Personnel ☐ Premises Owner/Occupant ☐ Other PWS Customer ☐ Backflow Assembly Tester ☐ Other (Specify):	

D. Contaminant Information

Contaminant type (check all that apply):	Microbiological ☐ Chemical ☐ Physical ☐
Describe contaminant (for example, the organism name, chemical, etc.). Please attach lab analysis or MSDS, if available.	

E. Extent and Effects of Contamination

Estimated extent of contamination:	Contained within premises ☐ Entered PWS distribution system ☐
Estimated number of connections affected:	Residential Non-residential
Estimated population affected or at risk:	Residential Non-residential
Number water quality complaints:	Describe water quality complaints:
Number illnesses reported:	Describe illnesses/irritation (specific illnesses, if known):
Number physical injuries(e.g. burns) or irritation(e.g. rashes) cases reported:	

<u>Part 3: Cross-Connection Control Information at Backflow Site</u>

A. Source of Contaminant

Source of contaminant or fixture type (check all that apply):	Air conditioner/heat exchanger …..… ☐ Auxiliary water supply ……………... ☐ Beverage machine ……………..…… ☐ Boiler, hot water system ……..…..… ☐ Chemical injector/aspirator ………... ☐ Fire protection system ……………..….. ☐ Irrigation system (PWS supplied) ….. ☐	Industrial/commercial process water/fluid………………………. ☐ Medical/dental fixture ……….…… ☐ Reclaimed water system………..….. ☐ Swimming pools, spa ….……..……. ☐ Wastewater (sewage) system …..….. ☐ Other (specify): ……….……. ☐ ……………………………..

B. Distribution System Pressure Conditions in the Vicinity of the Backflow Incident

Type of backflow:	Backsiphonage ☐ Backpressure ☐	**Typical distribution system pressure in vicinity of incident** (if range, enter lower end of range)**:** psi
Main/pressure status at time of incident (check all that apply):	Normal ……………………………... ☐ Main break ………………….............. ☐ Fire fighting ……………………….. ☐ Other high usage …………………… ☐ Power outage ……………………….. ☐	Source/plant outage ………………… ☐ Scheduled water shutoff by PWS …... ☐ Unscheduled/emergency shutoff …… ☐ Unknown ...………………….......... ☐ Other (specify) ☐

Describe causes and circumstances leading to backflow:

C. Backflow Preventer Information/Installation/Approval Status at Site of Backflow

Complete the tables in C and D for the ***premises isolation*** preventer for either of the following situations:

- If a premises isolation backflow preventer is installed ***and*** the contaminant entered the PWS distribution system.
- If the premises isolation assembly is the only backflow preventer at the site.

In all other cases, complete tables in C and D for the ***in-premises*** backflow preventer installed at the fixture. If more than one backflow preventer was involved in the backflow incident, copy tables C and D and complete them for the additional preventer(s).

If no backflow preventer was installed at the time the incident occurred, check this box ☐ and go directly to Part 4. Don't fill out the tables below (in C and D).

Backflow preventer information:	Type installed: Installed for: Make: Model: Size: Serial number: Date installed:	
Installation status (check all that apply):	Properly installed/plumbed ☐ Improperly protected bypass present ☐ Improperly installed/plumbed ☐ If so, explain:	
Commensurate with assessed degree of hazard?	Yes ☐ No ☐	If not, explain:
DOH/USC-approved at time of backflow incident?	Yes ☐ No ☐	If not, approved when installed? Yes ☐ No ☐

D. Backflow Preventer Inspection/Testing Information at Site of Backflow

Most recent inspection/test information *prior* to backflow incident. Attach test report(s), if available.	No test report on record ……………………………………………… ☐ Date tested/inspected: Passed test/inspection *without* repairs ………………… ☐ Failed initial test/inspection, passed *after* repair ……… ☐ Failed test/inspection, no repairs made ……………….. ☐	
Inspection/test information *after* backflow incident [per WAC 246-290-490(7)(b)]. Attach test report.	Not tested/inspected ……………………………………………. ☐ Date tested/inspected: Passed test/inspection *without* repairs ………………… ☐ Failed initial test/inspection, passed *after* repair……… ☐ Failed test/inspection, no repairs made………………... ☐	
Preventer failure information , if applicable (check all that apply):	Fouled check ……………… ☐ Debris …………………… ☐ Weather-related damage …... ☐	Damaged seat …. ☐ Other: ☐
If preventer failed inspection/test, did failure allow backflow?	Yes ☐ No ☐ If yes, explain:	

Part 4: Corrective Action/Notifications

Action *taken* by PWS to restore water quality (check all that apply):	None ……………………… ☐ Flushed/cleaned mains …… ☐ Flushed/cleaned plumbing… ☐ Disinfected mains ………… ☐ Disinfected plumbing ……... ☐	Other treatment (describe): ☐ Replaced mains ………… ☐ Replaced plumbing …….. ☐ Other: ☐
Action *ordered* by PWS to correct cross-connection (check all that apply):	None ……………………… ☐ Eliminate cross-connection... ☐ Remove by-pass …………... ☐ Install **new** preventer … ☐ For *premises isolation* ☐ For *fixture protection* ☐	Change **existing** preventer ☐ Repair/replumb ………. ☐ Reinstall correctly …..... ☐ Replace with same type ☐ Upgrade type ……..…… ☐ Other: ☐
Action ordered accomplished?	Yes ☐ Date: No ☐ If no, explain:	
Agency notifications per WAC 246-290-490(8)(f) (check all that apply):	DOH ☐ Local Health Agency ☐ Local Adm. Authority ☐ Issued by end of next business day:	
Notifications of consumers in area of incident (check all that apply):	Population at risk ☐ Public notification (PN per DOH regs.) ☐ Boil Water Advisory ☐ Other (describe):	
Other enforcement/corrective actions (describe):		

Part 5: Cost of Backflow Incident (optional)

Item	PWS Personnel Hours Expended	Cost to PWS ($)	Cost to Premises Owner ($)
Investigation			
Restoration of water quality			
Correction of cross-connection situation			
Litigation and/or settlement			
Other not included in above			

Part 6: Further Information/Documentation

Additional information about this incident such as pictures, sketches, newspaper/journal articles, water quality analyses, epidemiological reports, etc. would be helpful. Information may be in electronic form or hard copy.

Part 7: Form Completion Information

Note: *Form should be completed by a person currently certified as a Cross-Connection Control Specialist.*

I certify that the information provided in this Backflow Incident Report is complete and accurate to the best of my knowledge.			
CCC Program Mgr. Name (print):			Title:
Signature:		CCS Cert. Number:	Date:
Phone:	E-mail:		
I have reviewed this report and certify that the information is complete and accurate to the best of my knowledge.			
PWS Mgr./Representative Name (Print):			Title:
Signature:		Op. Cert. Number:	Date:

Please send completed backflow incident form:

By mail to:

Washington State Department of Health
Office of Drinking Water – CCC Program Manager
P O Box 47822
Olympia, WA 98504-7822

By email to: cccprogram@doh.wa.gov

Please send questions, comments, or suggestions about this form to us at the address above or e-mail them to cccprogram@doh.wa.gov

For people with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TDD/TTY call 711).

Three Lakes Water Association

P.O. Box 24, Snohomish, Wa 98291
(360) 568-8022 www.3lwa.org

Hydrant Use Permit

Date Issued:	______________	Permit Number:	______________
Company Name:	______________	Billing Address:	______________
			______________
Contact Person:	______________	Hydrant Location:	______________
Phone Number:	______________	Reason for Use:	______________
State(Business)I.D.#	______________		______________
Vehicle Licence Plate:	______________	Vehicle Make/Model:	______________
Permit Cost:	$65.00	Valid for (date):	______________

*There is a minimum deposit for estimated water used based on $42.50 for first 500 gallons and an additional $1.50 per 100 gallons over minimum.

Requirements:

1. The applicant must provide a Washington State Department of Health (DOH) approved Reduced Pressure Backflow Assembly (RPBA) with a current backflow test report or an approved air gap.
2. The applicant must supply their own regulations-type hydrant wrench and should be aware of the proper operation of the hydrant.
3. The hydrant must be manned at all times when in use.
4. The hydrant must be free for the use of the Fire Department whenever required.
5. The applicant agrees to pay for any damage to the system involving the hydrant in use, including theft.
6. The Cross-Connection Control Specialist (CCS) must inspect the backflow assembly and review the current test report.

Notes:

$65.00	Permit
______	1st 500 gal
______	1.50 per 100 gal
______	Total

$500.00 Fine if caught without a valid permit

Signature of Permit Holder: ______________________________ Date: __________

Signature of CCS: ______________________________ Date: __________

***Copy to: Don Kemmis, General Manager, CCS**

2022 Backflow Assembly Tester (BAT) Contact List

Tester	*Certification Number*	*Company*	*City*	*Phone Number*
Jordan Ottow	B5124	Panther Backflow	Snohomish	(425) 231-6360
Cody Gobbato	B6482	ABC Water Specialty	Lake Stevens	(425) 355-9826
Thomas Gamman	B4594	Batmaster	Lake Stevens	(425) 397-0275
Jeffery Hansen	B6450	AWA Backflow	Lake Stevens	(206) 369-5660

* You may also use the same tester from last year provided the tester is currently certified by the Department of Health

In Premises, Fixture, Equipment & Point-of-Use Protection

The information in Table 5-4 may differ from backflow prevention requirements for individual plumbing fixtures found in plumbing codes. For public health protection within a customer's premises, the plumbing code having jurisdiction should be followed including permit, inspection and approval requirements.

Table 5-4 is provided to illustrate only *some* of the health hazards found in plumbing systems. This table is intended to assist water purveyors in assessing the degree of hazard a customer's plumbing system places upon the purveyor's water distribution system. Deficiencies in backflow prevention within the customer's premises should be compensated for through the selection of an appropriate assembly for premises isolation. The purveyor should notify the customer periodically of thermal expansion concerns and of the fact that they may not be protected internally from cross connection hazards when premises isolation is installed. Table 5-4 can also be found in its entirety as Appendix L of this manual.

TABLE 5-4
RECOMMENDED PROTECTION AT FIXTURES & EQUIPMENT

DESCRIPTION OF FIXTURE OR EQUIPMENT, OR USE OF WATER	ASSESSED HEALTH HAZARD	MINIMUM PROTECTION AT FIXTURE*
Air compressor	low	DCVA
Air conditioning systems	high	RPBA
Air washers (remove particulates to control air pollution)	high	RPBA
Aquarium make-up water	high	AG,RPBA
Aspirators, medical/lab	high	RPBA
Aspirator, weedicide, herbicide, pesticide	high	RPBA
Aspirator, vault drain	high	RPBA
Autoclave	high	RPBA
Autopsy tables, embalming equipment	high	RPBA

Continued...

TABLE 5-4 (continued)
RECOMMENDED PROTECTION AT FIXTURES & EQUIPMENT

DESCRIPTION OF FIXTURE OR EQUIPMENT, OR USE OF WATER	ASSESSED HEALTH HAZARD	MINIMUM PROTECTION AT FIXTURE
Baptismal fountain	high	RPBA,AG,AVB
Bathtub, below rim filler	high	RPBA
Bedpan washer	high	RPBA
Beverage dispenser, post-mix using CO_2	high	RPBA**
Bidets	low/high	AVB
Boiler feed lines	high	RPBA
Booster pumps	low/high	DCVA, RPBA
Bottle washing equipment	high	RPBA,PVB,SVB
Box hydrant (hose connection installed flush with the ground)	low/high	PVB,SVB,DCVA
Brine tank	low	AG,DCVA
Can washing equipment	high	RPBA, PVB, SVB
Chemical feed tank for industrial process	high	AG, RPBA
Chemical feeder for commercial cleaners	high	AG, RPBA
Chlorinators	high	RPBA
Commercial coffee urns	low	AG, AVB
Computer cooling lines	high	RPBA
Condensate tanks	high	RPBA
Commercial cooking kettles	low	AG, AVB
Cooling towers	high	AG, RPBA
Decorative ponds	high	AG, RPBA
Degreasing equipment	high	RPBA
Dental equipment, cuspidors	high	RPBA
Dialysis equipment	high	RPBA
Dishwashers	low	AVB
Dishwashers, commercial	high	AVB, RPBA, AG
Dishwashers, high-temp	high	AG, AVB
Drinking fountains	low	AG
Dye vats and tanks	high	AG, RPBA
Espresso machines	high	AG, RPBA
Etching tanks	high	AG, RPBA

Continued...

TABLE 5-4 (continued)
RECOMMENDED PROTECTION AT FIXTURES & EQUIPMENT

DESCRIPTION OF FIXTURE OR EQUIPMENT, OR USE OF WATER	ASSESSED HEALTH HAZARD	MINIMUM PROTECTION AT FIXTURE
Fermenting tanks	high	AG, RPBA
Fertilizer injection	high	RPBA
Film processing equipment	high	RPBA
Fire department connection	low/high	DCVA, RPBA
Fire sprinkler system without chemical addition	low	DCVA, DCDA
Fire sprinkler system with chemical addition	high	RPBA, RPDA
Floor drains	high	AG
Fluoride tanks (water treatment plants)	high	RPBA
Flushing floor drains	high	AVB
Frost-free yard hydrant (stop-and-drain valve)	low/high	DCVA, RPBA
Fume hoods (lab)	high	AVB
Garbage can washers	high	RPBA
Heat exchangers other than listed double wall types with leak path	high	RPBA
Heat pumps	high	RPBA
Hot water heating boilers, commercial	high	RPBA
Hydrotherapy baths	high	RPBA
Ice makers	high	AG, RPBA
Industrial fluid or piping systems	high	RPBA
Inter-connected (looped) services	low	DCVA
Irrigation system with chemical addition	high	RPBA
Irrigation system without chemical addition	low	PVB, SVB, DCVA
Janitor sinks	low	AVB, HBVB
Kitchen equipment	low	AVB
Laboratory equipment	high	AVB, LFVB
Laundry machines, commercial	high	RPBA
Livestock drinking tanks	high	AG, AVB
Make-up tanks	high	AG, RPBA
Mobile carpet cleaners (if connected to water supply)	high	RPBA
Mobile home park	low/high	DCVA, RPBA

Continued...

TABLE 5-4 (continued)
RECOMMENDED PROTECTION AT FIXTURES & EQUIPMENT

DESCRIPTION OF FIXTURE OR EQUIPMENT, OR USE OF WATER	ASSESSED HEALTH HAZARD	MINIMUM PROTECTION AT FIXTURE
Pesticide applicator trucks	high	AG, RPBA
Photo developing sinks, tanks	high	RPBA
Pressure washers without chemical injection	low	DCVA
Private fire hydrants	low	DCVA
Pump prime lines	high	RPBA
Radiant floor heating, hydronic heaters	high	AG, RPBA
Radiator flushing equipment	high	AG, RPBA
Recreational vehicle dump station	high	AG
Sewer connected equipment	high	AG
Sewer flushing	high	AG
Spas	high	AG, RPBA
Steam generating equipment	high	RPBA
Sterilizers	high	RPBA
Stills	high	RPBA
Sumps	high	AG
Swimming pools	high	AG, RPBA
Trap primers	high	AG
Used, reclaimed or gray water systems	high	RPBA
Water softener/water treatment	high	RPBA
X-ray equipment	high	RPBA

*Some fixtures or equipment may indicate the need for recommended mandatory premises isolation as shown in Tables 5-1 and 5-3. In jurisdictions that recommend mandatory premises isolation, the minimum fixture protection may also be required to meet plumbing code and to provide protection to the water users within the premises. The minimum fixture protection for an assessed high health hazard under plumbing code may allow an AG, RPBA, PVB, SVB or AVB, depending on the hydraulic conditions and installation requirements.

**Some jurisdictions allow a vented dual check device within the beverage dispenser or installed in-line on the water connection with non-metallic potable piping between the device and dispenser.

Three Lakes Water Association
Cross-Connection Control Program

References

1. WAC 246-290-490, Washington State Department of Health

2. Pacific Northwest Section-American Water Works Association Details, Seventh Edition, 2012

3. Cross-Connection Control for Small Water Systems, 2004

APPENDIX F – COLIFORM MONITORING PLAN

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COLIFORM

MONITORING PLAN

Three Lakes
Water Association

February, 2017

CHS
ENGINEERS

INTRODUCTION

All Group A public water systems must collect samples for coliform bacteria analysis from their distribution system and source of supply (if applicable) per WAC 246-290-300, per the authority of the federal Total Coliform Rule. Three Lakes Water Association is a Group A public water system, and as such, is subject to these requirements. The Association purchases surface water from the City of Everett through two metered interties. Therefore, the Association is not subject to the Groundwater Rule or any well-specific regulations at this time.

The purpose of this Coliform Monitoring Plan (CMP) is to guide the Association in its efforts to evaluate the microbial water quality of their water system and provide water to its members and the public that is free of disease-causing organisms. It begins with some general information about coliform, sampling procedures and notification regulations. It goes on to present the Association's specific Coliform Monitoring Plan and *E. coli* Response Plan.

This plan was prepared in conformance with Department of Health (DOH) *Publication #331-036 Preparing a Coliform Monitoring Plan for Large or Multiple-Source Systems, April 2013*, as updated in April 2016*.* This plan updates the previous Association Coliform Monitoring Plan, most recently published in 2011. The Plan includes .the Revised Total Coliform Rule (2016), which replaced the Total Coliform Rule on April 1, 2016.

DOH regulates the above-mentioned laws and requirements. Additional information about coliform sampling, rules and regulations can be found on their website at: http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/Contaminants/Coliform/ColiformInformationPacket.

ANALYZING COLIFORM SAMPLES

Water samples will be analyzed for coliform bacteria either being present or absent (see sample or typical lab notice at end of this plan). Coliform bacteria found in drinking water may indicate possible presence of harmful bacteria. Many coliform bacteria may not cause diseases but they tend to accompany disease-causing organism in drinking water.

Coliform presence in water distribution systems tend to cluster and are not evenly dispersed cluster can break up and migrate to different parts of a system thus two samples taken minutes apart can have different results. Samples taken may indicate presence of coliform bacteria while others may indicate absence of any bacteria. For this reason, samples must be collected at various times and locations throughout the water distribution system.

Water samples *must* be tested for fecal coliform or *E. coli* anytime a sample is coliform positive. Water systems should be in close contact with their local health department and lab to be certain all positive coliform samples are tested for the above. Failure to do so is considered a monitoring violation and all samples taken at that time will be treated as a positive fecal coliform. All monitoring, follow up and public notification for exceeding a maximum contaminant level (MCL) will be required.

Three Lakes Water Association and its consulting engineer have prepared this Coliform Monitoring Plan including a Site Sampling Map. It describes when and where samples will be taken.

SCHEDULING SAMPLE COLLECTION

The minimum number of routine samples depends on the population served per the system's current Water Facilities Inventory (WFI) on file with DOH. However, the actual distribution system may require more samples in order to insure that the samples are representative of system water quality.

SAMPLE COLLECTION AND HANDLING

Water department personnel should receive training and be knowledgeable on water sample collection. Samples must be refrigerated immediately after collection and remain so until delivered to the lab. If kept overnight it's important that the samples not be frozen. For best results, samples should be received by the lab on the same day they are taken but no later than 30 hours after being taken. Generally samples should be taken fairly early in the morning and delivered to the lab within three to four hours as normal routine. Failure to collect and have routine samples analyzed will lead to a monitoring violation.

Sample sites shall be rotated such that collection occurs from each designated sample site at least once every quarter. The minimum number of required routine monthly samples is based on the latest population and service connection data. Sample requirements are listed in the Association's latest DOH Water Quality Monitoring Schedule (WQMS), which is reviewed / updated on an annual basis. A summary of the coliform and chemical monitoring requirements is presented in the following tables.

Coliform Monitoring Requirements

	January	February	March	April
Coliform Monitoring Population	1,963	1,963	1,963	1,963
# of Routine Samples Required	2	2	2	2
	May	**June**	**July**	**August**
Coliform Monitoring Population	1,963	1,963	1,963	1,963
# of Routine Samples Required	2	2	2	2
	September	**October**	**November**	**December**
Coliform Monitoring Population	1,963	1,963	1,963	1,963
# of Routine Samples Required	2	2	2	2

Chemical Monitoring Requirements

Test	# of Samples	Compliance Period	Frequency	Last Sample Date	Next Sample Date
Lead & Copper	1	Jan. 2018 - Dec. 2018	Every 3 years	8-26-15	2018
Asbestos	1	Jan. 2017 - Dec. 2017	Every 6 years	10-20-11	2020
TTHM	1	Jan. 2017 - Dec. 2017	Quarterly	2-13-17	Spring 2017
HAA5	1	Jan. 2017 - Dec. 2017	Quarterly	2-13-17	Spring 2017

REPEAT AND FOLLOW-UP WATER SAMPLES

Repeat and follow-up samples are responses with coliform bacteria presence in a water sample. For each sample with a positive result a set of three repeat samples must be taken. Those samples must be taken and delivered to the lab within 24 hours of being notified by the lab of an unsatisfactory sample.

SAMPLES REQUIRING REPEAT SAMPLING

A drinking water sample is unsatisfactory whenever coliform bacteria are present. If a routine sample is positive for total coliform, a set of three repeat samples must be taken.

Special purpose samples such as for new construction or water main pipe repairs do not count towards determining compliance. These types of samples must be clearly marked “Special Purpose Samples” on the forms provided with the sample bottles.

These repeat and follow up samples will be taken as follows and these samples will be called site sample groups.

1. At the routine sample site with coliform presence.
2. One sample within five service connections in either direction of the routine sample site.
3. One sample within five service connections in the opposite direction of the routine and repeat sample site.

The system operator may determine it is appropriate at times to collect and analyze water samples from additional points in the system, or additional samples at routine or other sampling sites. Samples collected from the additional sites or in addition to routine, repeat or follow-up samples shall be marked as "investigative." They don't count as compliance samples.

The sample collector should evaluate the representative status of each sample site every time, before a sample is collected. This includes authorization for the sample collector to choose NOT to sample from a scheduled site if the evaluation reveals current or recent out-of-ordinary events or situations at the sample site. Out-of-ordinary events or situations include construction at the facility where the sample site is located, modification to the plumbing at the sample site, or an activity at the sample site that may have compromised the sanitary integrity of the sample fixture. The sample collector should have the knowledge and authority to choose a different site when circumstances make the scheduled site unsuitable to give a sample that represents the distribution water quality.

MONTH AFTER FOLLOW—UP SAMPLES

The month after a sample with coliform presence is detected, water systems must collect a minimum of three follow up samples. Three Lakes Water Association has a normal schedule that requires only two samples each month. Therefore, in a situation where a coliform presence was detected, the following month, the Association must sample at the point where coliform presence was detected as well as the normal two sample points for the current month. As the Association requires a minimum of two samples per month, the Association will meet this requirement so long as it collects the required number of monthly routine samples.

MAXIMUM CONTAMINANT LEVEL

NON—ACUTE MCL

The presence of total coliform bacteria in a water sample generally indicates contamination from the environment (such as soils and plants). It is possible disease-causing organisms could be present as well. Under the new Revised Total Coliform Rule (2016), the presence of total coliform bacteria *is no longer considered a non-acute violation.* Any number of positive total coliform bacteria samples will not result in a violation (with public notification) so long as an acute MCL (*E.coli*) violation does not occur (see "Acute MCL" below)

Instead, Treatment Technique Trigger Assessments are now required. An assessment must be completed and delivered to DOH within 30 days after a treatment trigger occurs. A Level 1 Assessment is required when:

- Two or more total coliform-present samples are taken in one month
- Water System fails to collect three repeat samples for every total coliform-present routine sample

A more complex Level 2 Assessment is required if there are additional sample issues. Level 2 Assessment triggers, requirements, and comparisons are provided under the Level Assessments paragraph

ACUTE MCL

The acute MCL is the standard for the presence of *E. coli* and fecal coliform bacteria in drinking water. *E. coli* and fecal coliform are indicators for recent contamination by sewage or animal waste. The Revised Total Coliform Rule (RTCR) calls the acute Maximum Contaminant Level (MCL) an "E.coli MCL"

A single sample with a coliform presence, an *E. coli* presence, or a fecal coliform presence does not result in an acute MCL violation. *The acute MCL violation is determined based on the results of both the routine sample and the related set of repeat samples collected as follow-up to the unsatisfactory routine sample.*

An acute MCL violation can occur four ways:

a. A total coliform-present repeat sample follows an *E.coli*-present routine sample.
b. An *E.coli*-present repeat sample follows a total coliform-present routine sample.
c. The lab fails to test a total coliform-present repeat sample for *E.coli.*
d. A system fails to take three repeat samples following an *E. Coli*-present routine sample.

If the above conditions are met, a Level 2 Assessment must be completed along with public notification of an acute MCL violation.

LEVEL ASSESSMENTS

A treatment technique trigger is a situation that requires a water system to take action. The RTCR requires water systems to conduct an assessment to "find and fix" any sanitary defects whenever a treatment technique trigger occurs. There are two assessment levels based on the severity and frequency of the problem. Both evaluate the entire system from the sample collection to the source of supply.

A Level 1 or Level 2 Assessment must be completed within 30 days of a treatment trigger. Systems are not to wait for DOH notification to begin an assessment.

LEVEL 1 ASSESSMENT TRIGGERS

- Two or more total coliform-present samples are taken in one month
- The public water system fails to collect three repeat samples for every total coliform-present routine sample

LEVEL 2 ASSESSMENT TRIGGERS

- An *E.coli* MCL violation
- A second Level 1 treatment trigger within a rolling 12-month period

Level 2 Assessments must be conducted by someone with state-certified qualifications (such as a professional engineer, WDM, or DOH staff).

Additional details are presented in the table below.

Level Assessment Templates are provided at the end of this Monitoring Plan.

Level 1 vs. Level 2 Assessments

Level 1	Level 2
Confirmed TC contamination. OR Failure to collect all required repeat samples.	An *E. coli* MCL violation. OR Triggered by a second Level 1 Assessment in 12 months.
Performed by water system—basic inspection.	Performed by PE, WDM2, DOH, or LHJ staff (special—*E.coli* triggered assessment)—comprehensive inspection.
	More in-depth than Level 1 Assessment.
State provides template/guide for conducting assessment.	State provides template/guide for conducting assessment.
Submit assessment to state within 30 days of trigger.	Submit assessment to state within 30 days of trigger.
Look for sanitary defects or concerns with operations and maintenance.	Look for sanitary defects or issues in operations and maintenance.
Take corrective action!	**Take corrective action!**

DOH and PUBLIC NOTIFICATION

ACUTE MCL: (tier 1 violation)

Three Lakes Water Association shall notify DOH NW Drinking Water Operations as soon as being told of positive Fecal Coliform or *E. coli* sample. When an acute MCL is detected the Association must provide public notice as soon as possible but within 24 hours to the customers served. The Association shall use one or more of the following methods to deliver notice to the customers.

1. Radio
2. Television
3. Hand or direct delivery
4. Post notice in conspicuous location(s)

A copy of the public notice and certification that all public notice requirements have been met shall be sent to DOH NW Drinking Water Operations within 10 days from the day notice was issued.

Public notification is also required within 30 days when a:

- Water system fails to conduct a required Level 1 or Level 2 Assessment within 30 days of learning about the treatment technique trigger.
- Water system fails to correct a sanitary defect identified in a Level 1 or Level 2 Assessment within 30 days of learning about the treatment technique trigger.

Water System Name: Three Lakes Water Association	County: Snohomish	Water System ID #: 881506
Operator in Responsible Charge (ORC): Don Kemmis	ORC Phone: (425) 903-1601	Water System Mailing Address: Three Lakes Water Association P.O. Box 24 Snohomish, WA 98291 (360) 568-8022 3lwa.org
ORC Address, City, State: P.O Box 1693, Snohomish, WA 98291		
Assessor Name:		
Assessor Address, City, State, Zip:		
Date(s) Assessment Completed:		

Your water system exceeded a treatment technique trigger for the Revised Total Coliform Rule. Assess the water system's condition and operation using this *Level 1 Assessment Template* as a guide.

Part A: Respond to each item below. Identify corrective actions taken to address the issue(s) found.
Part B: Summarize your findings and include an action plan with timetable for corrective actions not yet taken.

For parts A and B, include additional information (photos or other documentation) as needed to depict assessment findings and corrective actions that have been completed. All assessment elements listed in this template must be addressed in your assessment. Systems with multiple facilities such as wells or storage tanks may need to provide additional pages.

Within 30 days of learning of the treatment technique trigger, submit completed assessment documentation to your regional office and keep a copy in your water system files.

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
1. Site and Sampling Protocol 1a. Do you have a written coliform monitoring plan & sampling procedure that ensures samples are representative of the distribution system?	☒ Yes ☐ No	☐ Yes ☐ No	
1b. Have there been any changes in sampling conditions or procedures that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
1c. Inspect the sampling sites: - Are the sampling locations free of potential sources of contamination? - Are the sampling taps in good condition? Other: (describe) ______________________________________	☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
2. Distribution 2a. Do you have procedures in place to ensure proper maintenance of the distribution system, including: - Appropriate pipe replacement and repair procedures - Replacement and repair of other distribution system components - Regular flushing program - Routine vault inspections - Fully implemented cross connection control program - Maintain positive pressure in all parts of the distribution system	☒ Yes ☐ No ☒ Yes ☐ No ☒ Yes ☐ No ☐ N/A ☒ Yes ☐ No ☐ N/A ☒ Yes ☐ No ☒ Yes ☐ No	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
2b. Has there been any recently reported low pressure (<20 PSI) or complete loss of pressure in the distribution system?	☐ Yes ☐ No	☐ Yes ☐ No	
2c. Have there been any changes in distribution conditions or operations that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	
2d. Inspect the distribution system: - Are there any visible line breaks or leaks? - Are there any observed unprotected cross connections? - Is there any evidence of vandalism or other security breaches? - Other: (describe) ______________________________________	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
3. Storage Facilities 3a. Does your water system have a water storage tank? *If no, skip to Section 4.*	☒ Yes ☐ No		
3b. Do you have procedures in place for periodic inspection and maintenance of the exterior and interior of each storage facility?	☒ Yes ☐ No	☐ Yes ☐ No	
3c. Have there been any changes in storage conditions or operations that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
3d. Inspect the storage facilities: - Does the tank have any cracks or other openings? - Is the reservoir roof free of any unprotected openings? - Is the access hatch constructed and sealed to keep contaminants out? - If there is an air vent on the storage tank, is it constructed to prevent the entry of contaminants? - Is the overflow line constructed to prevent contaminants from entering the tank? - If the overflow line discharges into a storm drain, to surface water, or directly into a sanitary sewer, is it protected by a proper air gap? - Is there any evidence of vandalism or other security breaches? Other: (describe) ____	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
4. Source--Groundwater 4a. Does your water system have a well or spring? If no, skip to Section 6.	☐ Yes ☒ No		
4b. Do you comply with Sanitary Control Area requirements (WAC 246-290-135(2)?	☐ Yes ☐ No	☐ Yes ☐ No	
4c. Have there been any changes in source conditions or operations that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	
4d. Inspect the source facilities: - Is the sanitary control area free of all potential sources of contamination? - Is the wellhead or spring box above grade with no potential for flooding? - Is the pressure tank water logged? - Is the well cap sealed and watertight, and the well casing free of unprotected openings? - (For springs) Is the spring box (structure, hatch, and overflow) free of any unprotected openings? Other: (describe) ____	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
5. Treatment--Groundwater 5a. Is any source continuously treated with a disinfectant? If no, skip to Section 6.	☐ Yes ☒ No		
5b. Do you have procedures in place for proper operation and maintenance of disinfection treatment facilities?	☐ Yes ☐ No	☐ Yes ☐ No	
5c. Have there been any changes in treatment equipment or process that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
5d. Inspect the treatment facilities: - Is the treatment system operating properly? - Is there any evidence of vandalism or other security breaches? Other: (describe) ____	☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
6. Source—Surface Water Supply (watershed) 6a. Does your water system have a surface water supply? If no, skip to Section 8.	☒ Yes ☐ No		Maintained by City of Everett
6b. Do you comply with Watershed Control Program requirements (WAC 246-290-135(4)?	☒ Yes ☐ No	☐ Yes ☐ No	Maintained by City of Everett
6c. Have there been any changes within the watershed or in raw water conditions that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	
6d. Inspect the surface water intake/headworks: - Is there evidence of problems at the intake? - Is there evidence of vandalism or other security breaches at the intake? Other: (describe) ____	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
7. Treatment—Surface Water 7a. Do you have procedures in place for proper operation and maintenance of surface water treatment facilities?	☒ Yes ☐ No	☐ Yes ☐ No	Maintained by City of Everett
7b. Have there been any changes in treatment equipment or process that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	
7c. Inspect the treatment facilities: - Is the treatment system operating properly? - Is there any evidence of vandalism or other security breaches? - Other: (describe) ____	☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	

Part A: Assessment	Corrective action needed?	Corrective action(s) taken & date taken
8. Other assessment activities (describe): The Association's entire distribution system from its pumps and storage facilities, to its distribution main shall be analyzed for any potential entrance of contamination.		

Part B. Assessment Summary and Action Plan with Timetable for corrective actions not yet taken

☐ ASSESSOR: CHECK HERE if you did not identify any issues that may have directly or indirectly caused or contributed to entry of coliform bacteria into the system.

Corrective Actions Completed: ASSESSOR: Summarize the issues found and the corrective actions that have been completed and date completed

Describe issue found	Describe corrective action taken and date completed

Corrective Actions Not Completed: ASSESSOR: Describe the issues for which corrective actions have not yet been completed. **Provide an action plan with timetable for completion.**

Describe issue found	Describe planned corrective action and timetable for completion.

Print Name of Assessor: ______________________ Signature of Assessor: ______________________ Date: ______________

OFFICE OF DRINKING WATER USE ONLY

Regional Office Reviewer: ______________________ Date of Review: ______________________

Assessment sufficient? ☐ Yes ☐ No Likely cause determined? ☐ Yes ☐ No Sanitary defect(s) identified? ☐ Yes ☐ No

Corrective actions completed? ☐ Yes ☐ No Corrective action plan included? ☐ Yes ☐ No Corrective action plan approved? ☐ Yes ☐ No

Comments:

RTCR Level 2 Assessment Guidance Template

331-570, March 2016

Send your assessment to:

Eastern Region	16201 East Indiana Avenue, Suite 1500 Spokane Valley, WA 99216	Phone: 509.329.2100 Fax: 509.329.2104 Email: mark.steward@doh.wa.gov
Northwest Region	20425 72nd Ave. South, Suite 310 Kent, WA 98032-2358	Phone: 253.395.6750 Fax: 253.395.6760 Email: dw.nwro@doh.wa.gov
Southwest Region	PO Box 47823 Olympia, WA 98504-7823	Phone: 360-236-3030 Fax: 360-664-8058 Email: swro.coli@doh.wa.gov

Water System Name: **Three Lakes Water Association**	County: **Snohomish**	Water System ID #: 881506
Operator in Responsible Charge (ORC): Don Kemmis	ORC Phone: **(425) 903-1601**	Water System Mailing Address: Three Lakes Water Association P.O. Box 24 Snohomish, WA 98291 (360) 568-8022 3lwa.org
ORC Address, City, State: P.O. Box 1693, Snohomish, WA 98291		
Assessor Name:	Assessor is: ☐ WDM-2, 3, or 4 ☐ Engineer ☐ LHJ	
Assessor Address, City, State, Zip:		
Date(s) Assessment Completed:		

Your water system exceeded a treatment technique trigger for the Revised Total Coliform Rule. Assess the water system's condition and operation using this *Level 2 Assessment Template* as a guide.

Part A: Respond to each item below. Identify corrective actions taken to address the issue(s) found.
Part B: Summarize your findings and include an action plan with timetable for corrective actions not yet taken.

For parts A and B, include additional information (photos or other documentation) as needed to depict assessment findings and corrective actions that have been completed. All assessment elements listed in this template must be addressed in your assessment. Systems with multiple facilities such as wells or storage tanks may need to provide additional pages.

Within 30 days of learning of the treatment technique trigger, submit completed assessment documentation to your regional office and keep a copy in your water system files.

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
1. Site and Sampling Protocol 1a. Do you have a written coliform monitoring plan & sampling procedure that ensures samples are representative of the distribution system?	☒ Yes ☐ No	☐ Yes ☐ No	
1b. Do you have a program in place that ensures that all sample collectors are trained before being allowed to collect compliance samples?	☒ Yes ☐ No	☐ Yes ☐ No	
1c. Do you regularly monitor the condition of each routine and repeat sample site to ensure that no site will contaminate the sample?	☒ Yes ☐ No	☐ Yes ☐ No	
1d. Was the sample collected by a trained, qualified person?	☒ Yes ☐ No	☐ Yes ☐ No	

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
1e. Did the sampler follow your monitoring plan and sampling procedure?	☒ Yes ☐ No	☐ Yes ☐ No	
1f. Was the sample collected representative of the water in the distribution system?	☒ Yes ☐ No	☐ Yes ☐ No	
1g. Have there been any changes in sampling conditions or procedures that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	
1h. Inspect the sampling sites: - Are the sampling locations free of potential sources of contamination? - Are the sampling taps in good condition? Other: (describe) ____	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
2. Distribution 2a. Do you have procedures in place to ensure proper maintenance of the distribution system, including: - Appropriate pipe replacement and repair procedures - Replacement and repair of other distribution system components - Regular flushing program - Routine vault inspections - Fully implemented cross connection control program - Maintain positive pressure in all parts of the distribution system	☒ Yes ☐ No ☒ Yes ☐ No ☒ Yes ☐ No ☐ N/A ☒ Yes ☐ No ☐ N/A ☒ Yes ☐ No ☒ Yes ☐ No	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
2b. Following work done on the water system and following any pressure loss event, do you collect investigative coliform samples?	☐ Yes ☐ No	☐ Yes ☐ No	
2b. Has there been any recently reported low pressure (<20 PSI) or complete loss of pressure in the distribution system?	☐ Yes ☐ No	☐ Yes ☐ No	
2c. Have there been any recent repairs or new construction in the distribution system?	☐ Yes ☐ No	☐ Yes ☐ No	
2d. Are there any known pipe leaks that have not yet been repaired?	☐ Yes ☐ No	☐ Yes ☐ No	
2e. Has there been any recent use of fire hydrants such as hydrant maintenance or utility/FD flushing?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No	
2f. If there are there any air-vacuum relief valve vaults in the distribution system, are any flooded?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No	
2g. Has there been any recent report of a cross connection incident?	☐ Yes ☐ No	☐ Yes ☐ No	
2h. Have there been any off-normal events, such as discolored water, odd taste, or smell?	☐ Yes ☐ No	☐ Yes ☐ No	
2i. Have there been any other changes in distribution conditions or operations that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
2j. Inspect the distribution system: - Are there any visible line breaks or leaks? - Are there any observed unprotected cross connections? - Is there any evidence of vandalism or other security breaches? Other: (describe) ____	 ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	 ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
3. Storage Facilities 3a. Does your water system have a water storage tank? If no, skip to Section 4.	☒ Yes ☐ No		
3b. Do you have procedures in place for periodic inspection and cleaning of the interior of each storage facility including vent, roof hatch, and overflow?	☒ Yes ☐ No	☐ Yes ☐ No	
3c. Has there been any recent work done on a storage facility?	☐ Yes ☐ No	☐ Yes ☐ No	
3d. Are all storage facilities secured from unauthorized entry and vandalism?	☒ Yes ☐ No	☐ Yes ☐ No	
3e. Have there been any other changes in storage conditions or operations that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	
3f. Inspect the storage facilities: - Does the tank have any cracks or other openings? - Is the reservoir roof free of any unprotected openings? - Is the access hatch constructed and sealed to keep contaminants out? - If there is an air vent on the storage tank, is it constructed to prevent the entry of contaminants? - Is the overflow line constructed to prevent contaminants from entering the tank? - If the overflow line discharges into a storm drain, to surface water, or directly into a sanitary sewer, is it protected by a proper air gap? - Is there any evidence of vandalism or other security breaches? Other: (describe) ____	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
4. Source--Groundwater 4a. Does your water system have a well or spring? If no, skip to Section 6.	☐ Yes ☒ No		
4b. Do you comply with Sanitary Control Area requirements (WAC 246-290-135(2)?	☐ Yes ☐ No	☐ Yes ☐ No	
4c. Are all sources protected from fecal contamination by appropriate placement and construction?	☐ Yes ☐ No	☐ Yes ☐ No	
4d. Have any unapproved sources recently been used?	☐ Yes ☐ No	☐ Yes ☐ No	
4e. Have there been any recent land use changes observed within a source sanitary control area, such as construction, farming, or dumping in the last month?	☐ Yes ☐ No	☐ Yes ☐ No	

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
4f. Has there been any standing water, heavy precipitation, or flooding around a source in the last month?	☐ Yes ☐ No	☐ Yes ☐ No	
4g. Has there been any recent work done on a well or spring box?	☐ Yes ☐ No	☐ Yes ☐ No	
4h. Has there been any recent failure of a source pump?	☐ Yes ☐ No	☐ Yes ☐ No	
4i. Has there been any recent maintenance performed on a source pump or other source component?	☐ Yes ☐ No	☐ Yes ☐ No	
4j. Are the source facilities secured from unauthorized entry and vandalism?	☐ Yes ☐ No	☐ Yes ☐ No	
4k. Have there been any other changes in source conditions or operations that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	
4l. Inspect the source facilities:			
- Is the sanitary control area free of all potential sources of contamination?	☐ Yes ☐ No	☐ Yes ☐ No	
- Is the wellhead or spring box above grade with no potential for flooding?	☐ Yes ☐ No	☐ Yes ☐ No	
- Is the pressure tank water logged?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No	
- Is the well cap sealed and watertight, and the well casing free of unprotected openings?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No	
- (For springs) Is the spring box (structure, hatch, and overflow) free of any unprotected openings?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No	
- Is there any evidence of vandalism or other security breaches?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No	
Other: (describe) ____	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No	
5. Treatment--Groundwater 5a. Is any source continuously treated with a disinfectant? If no, skip to Section 6.	☐ Yes ☐ No		
5b. Do you have procedures in place for proper operation and maintenance of disinfection treatment facilities?	☐ Yes ☐ No	☐ Yes ☐ No	
5c. If a disinfection residual should be continuously maintained throughout the distribution system, was the measured free chlorine residual at the time of coliform sample collection below 0.2 mg/L?	☐ Yes ☐ No	☐ Yes ☐ No	
5d. Have there been any recent interruptions in any treatment process?	☐ Yes ☐ No	☐ Yes ☐ No	
5e. Has there been any recent maintenance performed on any treatment component?	☐ Yes ☐ No	☐ Yes ☐ No	
5f. Have there been any other changes in treatment equipment or process that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
5g. Inspect the treatment facilities: - Is the treatment system operating properly? - Is there any evidence of vandalism or other security breaches? Other: (describe) ______________________________	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
6. Source—Surface Water Supply (watershed) 6a. Does your water system have a surface water supply? If no, skip to Section 8.	x☒ Yes ☐ No		Maintained by the City of Everett
6b. Do you comply with Watershed Control Program requirements (WAC 246-290-135(4)?	x☒ Yes ☐ No	☐ Yes ☐ No	Maintained by the City of Everett
6c. Has there been any recent spikes in raw water turbidity?	☐ Yes ☐ No	☐ Yes ☐ No	
6d. Have there been any land use changes within the watershed, such as logging, construction, or different farming practices in the past month?	☐ Yes ☐ No	☐ Yes ☐ No	
6e. Have there been any other changes within the watershed or in raw water conditions that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	
6f. Inspect the surface water intake/headworks: - Is there evidence of problems at the intake? - Is there evidence of vandalism or other security breaches at the intake? Other: (describe) ______________________________	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
7. Treatment—Surface Water 7a. Do you have procedures in place for proper operation and maintenance of surface water treatment facilities?	☐ Yes ☐ No	☐ Yes ☐ No	
7b. Have there been any recent interruptions in any part of the filtration or disinfection treatment process?	☐ Yes ☐ No	☐ Yes ☐ No	
7c. Are filtration and disinfection treatment facilities properly operated and maintained?	☐ Yes ☐ No	☐ Yes ☐ No	
7d. Has there been any maintenance performed on any treatment component in the past month?	☐ Yes ☐ No	☐ Yes ☐ No	
7e. Have there been any problems with a treatment process in the past month, such as high finished water turbidity, disinfection inactivation ratio <1, or changes in coagulation practices or filtration rate?	☐ Yes ☐ No	☐ Yes ☐ No	
7f. Have there been any other changes in treatment equipment or process that may have contributed to the treatment technique trigger? Describe:	☐ Yes ☐ No	☐ Yes ☐ No	

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
7g. Inspect the treatment facilities: - Is the treatment system operating properly? - Is there any evidence of vandalism or other security breaches? Other: (describe) ____	 ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A	 ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
8. Other assessment activities (describe): The Association's entire distribution system from its pumps and storage facilities, to its distribution main shall be analyzed for any potential entrance of contamination.			

Part B. Assessment Summary and Action Plan with Timetable for corrective actions not yet taken

☐ ASSESSOR: CHECK HERE if you did not identify any issues that may have directly or indirectly caused or contributed to entry of coliform bacteria into the system.

Corrective Actions Completed: ASSESSOR: Summarize the issues found and the corrective actions that have been completed and date completed

Describe issue found	Describe corrective action taken and date completed

Corrective Actions Not Completed: ASSESSOR: Describe the issues for which corrective actions have not yet been completed. **Provide an action plan with timetable for completion.**

Describe issue found	Describe planned corrective action and timetable for completion.

Print Name of Assessor: ______________________ Signature of Assessor: ______________________ Date: ______________

OFFICE OF DRINKING WATER USE ONLY

Regional Office Reviewer: ______________________ Date of Review: ______________________

Assessment sufficient? ☐ Yes ☐ No   Likely cause determined? ☐ Yes ☐ No   Sanitary defect(s) identified? ☐ Yes ☐ No

Corrective actions completed? ☐ Yes ☐ No   Corrective action plan included? ☐ Yes ☐ No   Corrective action plan approved? ☐ Yes ☐ No

Comments:

System Information

Plan Date: February 2017

Water System Name **Three Lakes Water Association**	**County** **Snohomish County**	**System I.D. Number** **881506**
Name of Plan Preparer **Rodney Langer** **Don Kemmis**	**Position** **Project Manager** **Water Distribution Manager**	**Daytime Phone #** **(425) 637-3693** **(425) 903-1601**
Sources: DOH Source Number, Source Name, Well Depth, Pumping Capacity	City of Everett 24050 L **Sources & Points of Connection:** S01 Everett Pipeline #3 - 3106 171st Ave SE, 309 gallons per minute S02 Everett Pipeline #5 - 8216 171st Ave SE, 315 gallons per minute	
Storage: List and Describe	1. 17503 58th St SE -- 228,000 gallon capacity	
Treatment: Source Number & Process	N/A	
Pressure Zones: Number and name	Zone #1 Primary zone Zone #2 Secondary/lower zone	
Population by Pressure Zone	Zone #1: 614 Connections Zone #2: 171 Connections **Total: 785 Connections**	
Number of Routine Samples Required Monthly by Regulation: 2	**Number of Sample Sites Needed to Represent the Distribution System: 6**	
***Request DOH Approval of Triggered Source Monitoring Plan?**	**Yes** ☐ **No** ☒	

*If approval is requested a fee will be charged for the review.

A. Laboratory Information

Laboratory Name **Everett Lab**	**Office Phone #** **(425) 257-8230**
Address **4027 4th St SE, Everett, WA 98205**	**After Hours #** **(425) 257-8200**
Hours of Operation	

7:30am-4pm
Contact Name **Larry Henderson-Lab Director**

Emergency Laboratory Name **Edge Analytical - Burlington**	**Office Phone #** **800-755-9295**
Address **1620 S Walnut St, Burlington, WA**	**After Hours #** **(360) 770-0154**
Hours of Operation **8am-5pm**	

B. Wholesaling of Groundwater

	Yes	No
We are a consecutive system and purchase groundwater from another water system.	☐	☒
If yes, Water System Name: Contact Name: Telephone Numbers:		
We sell groundwater to other public water systems.	☐	☒
If yes, Water System Name: ______________________ Contact Name: ______________________ Telephone Numbers: ______________________		

C. Routine, Repeat, and Triggered Source Sample Locations*

The Association's existing sampling stations are in generally good condition. The Association has recently adopted the use of a sampling standpipe for use for future sample sites, and for replacement of existing stations over time.

The Association maintains 20 sampling station sites but has designated the following 6 sites for routine sampling.

Location/Address for **<u>Routine</u> Sample Sites**	Location/Address for **<u>Repeat</u> Sample Sites**
X-1. 5523 198th Dr SE, Snohomish, WA 98290	**X-1A.** 5523 198th Dr SE, Snohomish, WA 98290
	X-1B. 5609 198th Dr SE, Snohomish, WA 98290

	X-1C. 5520 198th Dr SE, Snohomish, WA 98290
X-2. 17900 48th St SE, Snohomish, WA 98290	**X-2A.** 17900 48th St SE, Snohomish, WA 98290
	X-2B. 17818 48th St SE, Snohomish, WA 98290
	X-2C. 4906 Weber Rd, Snohomish, WA 98290
X-3. 8411 184th Dr SE, Snohomish, WA 98290	**X-3A.** 8411 184th Dr SE, Snohomish, WA 98290
	X-3B. 8321 184th Dr SE, Snohomish, WA 98290
	X-3C. 8518 184th Dr SE, Snohomish, WA 98290
X-4. 4215 159th Dr SE, Snohomish, WA 98290	**X-4A.** 4215 159th Dr SE, Snohomish, WA 98290
	X-4B. 3716 159th Dr SE, Snohomish, WA 98290
	X-4C. 4229 159th Dr SE, Snohomish, WA 98290
X-5. 15715 Three Lakes Rd, Snohomish, WA 98290	**X-5A.** 15715 Three Lakes Rd, Snohomish, WA 98290
	X-5B. 15823 Three Lakes Rd, Snohomish, WA 98290
	X-5C. 6410 157th Ave SE, Snohomish, WA 98290
X-6. 6007 West Flowing Lake Rd, Snohomish, WA 98290	**X-6A.** 6007 West Flowing Lake Rd, Snohomish, WA 98290
	X-6B. 6025 West Flowing Lake Rd, Snohomish, WA 98290
	X-6C. 5927 West Flowing Lake Rd, Snohomish, WA 98290

Important Notes for Sample Collector:

1. Two bacteriological sample results and a residual report are required to be submitted to DOH each month.

2. Avoid taking routine coliform samples during weeks that contain major holidays and vacations unless you know trained staff and lab capacity are available to respond to unsatisfactory sample results.

3. Take routine coliform samples to the lab early in the week (Monday or Tuesday) whenever possible such that another set of tests (Tuesday or Wednesday) and results can be received and action can be taken within the same week during normal lab hours if there are unsatisfactory sample results.

4. Take the following items when collecting samples:
    a. Total of three 100mL sample bottles (two for required samples and one for backup)
    b. The sample tap and additional fittings for safe hose bib sampling if required
    c. The Hach test kit (a free residual is needed in the report)

5. If the sample site is no longer a good sample site, substitute with an acceptable site in the same area. If the condition change cannot be resolved, choose a permanent new sample site notify the manager and update this CMP.

6. To take the routine coliform samples, follow the steps below:
    a. Spray sample tap and area with light bleach mixture and wash hands
    b. Attach the sampling tap at the sample location
    c. Turn on the tap and let run for at least five minutes. Before collecting the sample, reduce the tap down to a thin stream, then let the water run one minute.
    d. Complete the residual test
    e. Record the free residual on the form under routine distribution sample
    f. Let the water flow with a slight flow for at least one minute
    g. Fill the sample bottle to the fill line/shoulder
    h. Place cap on the sample bottle.
    i. Be careful not to touch the inside of the cap or bottle or set the cap down.
    j. Be extra careful if it's raining - a rain drop in the sample may cause an unsatisfactory test.

7. The Total Coliform Rule requires the collection of repeat samples within 24 hours when a routine distribution system sample is unsatisfactory. In the event of an unsatisfactory routine distribution system sample, take a total of three repeat samples as noted in the table above.

8. File lab results and residual reports in an easily accessible location.

D. Reduced Triggered Source Monitoring Justification

Not applicable.

E. Routine Sample Rotation Schedule

Follows WQMS, may change on an annual basis (See WQMS)

Month	Monthly Samples Required	Sample Sites Designated	
January	2	X-1	X-2
February	2	X-3	X-4
March	2	X-5	X-6
April	2	X-1	X-2
May	2	X-3	X-4
June	2	X-5	X-6
July	2	X-1	X-2
August	2	X-3	X-4
September	2	X-5	X-6
October	2	X-1	X-2
November	2	X-3	X-4
December	2	X-5	X-6

For maximum coverage of different branches of the distribution system, a decision to rotate the required routine sample(s) among different sample sites may be made. It is recommended that routine sampling sites be tested about four times per year or more often.

F. Three Routine Sample Locations – Month after an Unsatisfactory Sample

In the month following an unsatisfactory sample, at least three routine samples are required.

G. *E. coli*-present assessment and response plans

The following tables present the District's response checklist and response plan.

H. System Map

Figure CMP-A depicts the water system including sampling sites and pressure zones. Figure CMP-B schematically depicts the system hydraulic profile.

Show repeat sample locations on map (required).

Distribution System *E. coli* Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	☒	☐	☐	☐
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	☒	☐	☐	☐
We can easily access and review documentation on water main breaks, construction & repair activities, low pressure and outage incidents.	☒	☐	☐	☐
Our Cross-Connection Control Program is up-to-date.	☒	☐	☐	☐
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	☒	☐	☐	☐
We routinely inspect all treatment facilities for proper operation.	☒	☐	☐	☐
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	☒	☐	☐	☐
We can activate an emergency intertie with an adjacent water system in an emergency.	☒	☐	☐	☐
We have a map of our service area boundaries.	☒	☐	☐	☐
We have consumers who may not have access to bottled or boiled water.	☐	☒	☐	☐
There is a sufficient supply of bottled water immediately available to our customers who are unable to boil their water.	☒	☐	☐	☐
We have identified the contact person at each day care, school, medical facility, food service, and other customers who may have difficulty responding to a Health Advisory.	☐	☒	☐	☐
We have messages prepared and translated into different languages to ensure our consumers will understand them.	☐	☒	☐	☐
We have the capacity to print and distribute the required number of notices in a short time period.	☒	☐	☐	☐
Policy Direction	**Yes**	**No**	**N/A**	**To Do List**
We have discussed the issue of *E. coli*-present sample results with our policy makers.	☒	☐	☐	☐
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	☐	☒	☐	☐
(Cont.)				

Distribution System *E. coli* Response Checklist				
Potential Public Notice Delivery Methods	**Yes**	**No**	**N/A**	**To Do List**
It is feasible to deliver a notice going door-to-door.	☒	☐	☐	☐
We have a list of all of our customers' addresses.	☒	☐	☐	☐
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	☒	☐	☐	☐
We have a list of customer email addresses.	☐	☒	☐	☐
We encourage our customers to remain in contact with us using social media.	☒	☐	☐	☐
We have an active website we can quickly update to include important messages.	☒	☐	☐	☐
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	☐	☒	☐	☐
We need a news release to supplement our public notification process.	☒	☐	☐	☐

Distribution System *E. coli* Response Plan

If we receive notification of an unsatisfactory sample result in our distribution system we will immediately:

1. Call DOH at 253-395-6750.
2. Call City of Everett Water Department within 24 hours of being notified of the total coliform-positive sample.
3. Analyze the total coliform positive sample for fecal coliform or *E. coli.* Collect repeat samples per Part D. Collect additional investigative samples as necessary.
4. Inspect water system facilities, including treatment station for proper operation.
5. Interview staff to determine whether anything unusual was happening in the water system service area, especially since the previous month's samples.
6. Review new construction activities, water main breaks and pressure outages that may have occurred during the previous month.
7. Review Cross-Connection Control Program status.
8. Discuss with DOH whether to issue a Health Advisory based on the findings of steps 3-6. If necessary, issue Health Advisory (HA).
9. Wait for repeat sample results.
10. Flush affected portions of the distribution system.
11. Prepare draft HA (if not already issued) and other public notification materials.
12. Respond appropriately to repeat results:
    - If repeats are all satisfactory, lift HA if one was issued.
    - If any repeat is unsatisfactory, issue HA if not already issued. Host DOH for an inspection and respond accordingly to inspection findings.

Washington State Department of Health
Environmental Public Health
Office of Drinking Water

Water Quality Monitoring Schedule

System: THREE LAKES WATER ASSOCIATION **PWS ID: 88150 6** **Region: NORTHWEST**
Contact: Donald R Kemmis **Group: A - Comm** **County: SNOHOMISH**

NOTE: To receive credit for compliance samples, you must fill out laboratory and sample paperwork completely, send your samples to a laboratory accredited by Washington State to conduct the analyses, AND ensure the results are submitted to DOH Office of Drinking Water. There is often a lag time between when you collect your sample, when we credit your system with meeting the monitoring requirement, and when we generate the new monitoring requirement.

Coliform Monitoring Requirements

	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023	Jan 2024	Feb 2024	Mar 2024	Apr 2024	May 2024	Jun 2024	Jul 2024
Coliform Monitoring Population	2180	2180	2180	2180	2180	2180	2180	2180	2180	2180	2180	2180
Number of Routine Samples Required	2	2	2	2	2	2	2	2	2	2	2	2

- Collect samples from representative points throughout the distribution system.
- Collect required repeat samples following an unsatisfactory sample. In addition, collect a sample from each operating groundwater source.
- For systems that chlorinate, record chlorine residual (measured when the coliform sample is collected) on the coliform lab slip.

Chemical Monitoring Requirements

Distribution Monitoring

Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*	
Lead and Copper	0	Jan 1999 - Jan 9999	Consecutive System			
Asbestos	1	Jan 2020 - Dec 2028	standard - 9 year	10/12/2020		
Total Trihalomethane (THM)	1	Jan 2023 - Dec 2023	reduced - 1 year	05/16/2022	***Nov 2023***	
Halo-Acetic Acids (HAA5)	1	Jan 2023 - Dec 2023	reduced - 1 year	05/16/2022	***Nov 2023***	

Water Quality Monitoring Schedule

Notes on Distribution System Chemical Monitoring

For *Lead and Copper*:

- Collect samples from the COLD WATER side of a KITCHEN or BATHROOM faucet that is used daily.
- Before sampling, make sure the water has sat unused in the pipes for at least 6 hours, but no more than 12 hours (e.g. overnight).
- If you are sampling from a faucet that has hot water, make sure cold water is the last water to run through the faucet before it sits overnight.
- If your sampling frequency is annual or every 3 years, collect samples between June 1 and September 30.

For *Asbestos:* Collect the sample from one of your routine coliform sampling sites in an area of your distribution system that has asbestos concrete pipe.

For *Disinfection Byproducts (HAA5 and THM):* Collect the samples at the locations identified in your Disinfection Byproducts (DBP) monitoring plan.

Water Quality Monitoring Schedule

Other Information

Other Reporting Schedules	Due Date
Submit Consumer Confidence Report (CCR) to customers and ODW (Community systems only):	07/01/2023
Submit CCR certification form to ODW (Community systems only):	10/01/2023
Submit Water Use Efficiency report online to ODW and to customers (Community and other municipal water systems only):	07/01/2023
Send notices of lead and copper sample results to the customers sampled:	30 days after you receive the laboratory results
Submit Certification of customer notification of lead and copper results to ODW:	90 days after you notify customers

Special Notes

None

Northwest Regional Water Quality Monitoring Contacts

For questions regarding chemical monitoring:	Steve Hulsman: (253) 395-6777 or Steve.Hulsman@doh.wa.gov
For questions regarding DBPs:	Steve Hulsman: (253) 395-6777 or Steve.Hulsman@doh.wa.gov
For questions regarding coliform bacteria and microbial issues:	Ingrid Salmon: (253) 395-6754 or ingrid.salmon@doh.wa.gov

Additional Notes

The information on this monitoring schedule is valid as of the date in the upper left corner on the first page. However, the information may change with subsequent updates in our water quality monitoring database as we receive new data or revise monitoring schedules. There is often a lag time between when you collect your sample and when we credit your system with meeting the monitoring requirement.

We have not designed this monitoring schedule to display all compliance requirements. The purpose of this schedule is to assist water systems with planning for most water quality monitoring, and to allow systems to compare their records with DOH ODW records. Please be aware that this monitoring schedule does not include constituents that require a special monitoring frequency, such as monitoring affiliated with treatment.

Any inaccuracies on this schedule will not relieve the water system owner and operator of the requirement to comply with applicable regulations.

If you have any questions about your monitoring requirements, please contact the regional office staff listed above.

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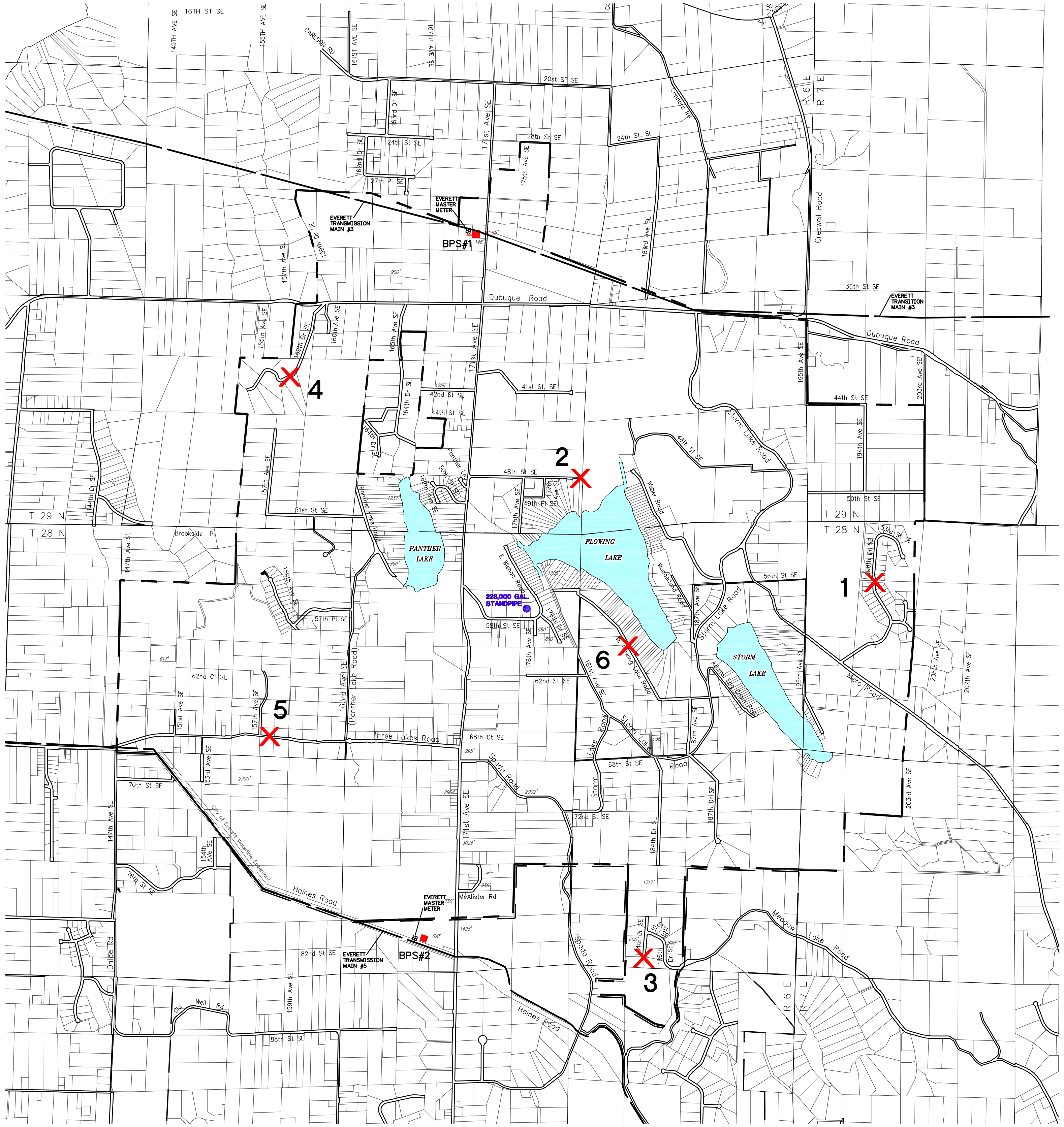

LEGEND

- ASSOCIATION BOUNDARY
- CITY OF EVERETT TRANSMISSION MAIN
- COLIFORM MONITORING SAMPLE SITE
- BPS — BOOSTER PUMP STATION
- STANDPIPE
- PRV

NOTE:

TWO REPEAT SAMPLE SITES ARE AVAILABLE IN THE IMMEDIATE VICINITY OF EACH OF THE SIX INDICATED SITES, AT ADDRESSES AS LISTED IN THE COLIFORM MONITORING PLAN.

THREE LAKES WATER ASSOCIATION EXISTING WATER SYSTEM

COLIFORM MONITORING PLAN

MARCH 2017

CHS ENGINEERS

APPENDIX G – HYDRAULIC MODEL DATA

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FlexTable: Junction Table
Active Scenario: 2023 MDD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
476	J-15	542.00	Zone - 1	(N/A)	(N/A)	(N/A)
477	J-16	534.00	Zone - 1	(N/A)	(N/A)	(N/A)
478	J-17	480.00	Zone - 1	(N/A)	(N/A)	(N/A)
479	J-18	470.00	Zone - 1	(N/A)	(N/A)	(N/A)
480	J-19	462.00	Zone - 1	(N/A)	(N/A)	(N/A)
481	J-20	415.00	Zone - 1	(N/A)	(N/A)	(N/A)
368	J-5	670.00	Zone - 1	41.9	2.13	766.75
170	J450	670.00	Zone - 1	41.9	2.13	766.77
6964	J-55	670.00	<None>	41.9	0.00	766.76
6966	J-57	670.00	<None>	41.9	0.00	766.76
128	J30	545.00	Zone - 2	44.0	2.56	646.72
532	J-41	660.00	Zone - 1	46.2	0.00	766.87
504	J-29	536.00	Zone - 2	47.4	6.45	645.50
502	J-28	533.00	Zone - 2	48.7	0.00	645.51
506	J-30	532.50	Zone - 2	48.9	6.45	645.50
529	J-40	650.00	Zone - 1	50.5	0.00	766.78
500	J-27	528.00	Zone - 2	50.8	6.45	645.51
188	J630	520.00	Zone - 2	54.4	2.82	645.66
189	J640	520.00	Zone - 2	54.4	2.82	645.67
518	J-35	633.00	Zone - 1	56.9	0.00	764.60
525	J-38	632.00	Zone - 1	57.4	9.68	764.60
149	J240	630.00	Zone - 1	58.2	3.20	764.60
187	J620	515.00	Zone - 2	56.5	0.00	645.60
362	J-2	515.00	Zone - 2	56.5	2.82	645.67
182	J570	515.00	Zone - 2	56.5	2.13	645.56
169	J440	635.00	Zone - 1	57.0	2.13	766.76
179	J540	630.00	Zone - 1	59.1	2.15	766.50
520	J-36	625.00	Zone - 1	60.4	9.68	764.60
167	J420	625.00	Zone - 1	61.3	2.13	766.71
129	J40	500.00	Zone - 2	63.5	2.56	646.72
522	J-37	609.00	Zone - 1	67.3	9.68	764.60
202	J770	490.00	Zone - 2	67.0	2.82	644.76
142	J170	610.00	Zone - 1	67.0	2.56	764.79
177	J520	610.00	Zone - 1	67.7	2.15	766.51
221	J970	610.00	Zone - 1	67.8	0.00	766.71
171	J460	610.00	Zone - 1	67.8	2.13	766.76
133	J80	605.00	Zone - 1	68.9	2.56	764.21
200	J750	485.00	Zone - 2	69.4	2.13	645.38
166	J410	605.00	Zone - 1	69.9	3.20	766.51
146	J210	600.00	Zone - 1	71.3	2.56	764.69
132	J70	600.00	Zone - 1	70.9	2.56	763.95
134	J90	600.00	Zone - 1	71.0	0.00	764.21
181	J560	610.00	Zone - 1	72.6	2.13	777.82
195	J700	480.00	Zone - 2	71.6	2.13	645.44
216	J920	600.00	Zone - 1	72.1	0.00	766.58
498	J-26	477.00	Zone - 2	72.9	0.00	645.52
364	J-3	475.00	Zone - 2	73.8	2.82	645.55

FlexTable: Junction Table

Active Scenario: 2023 MDD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
147	J220	590.00	Zone - 1	75.6	2.56	764.66
143	J180	590.00	Zone - 1	75.6	2.56	764.75
184	J590	470.00	Zone - 2	76.0	2.82	645.55
197	J720	470.00	Zone - 2	75.9	2.13	645.39
168	J430	590.00	Zone - 1	76.5	2.13	766.71
493	J-23	467.00	Zone - 2	77.2	0.00	645.53
199	J740	465.00	Zone - 2	78.0	2.13	645.38
185	J600	465.00	Zone - 2	78.1	2.82	645.60
556	J-47	583.00	Zone - 1	78.4	0.00	764.10
145	J200	580.00	Zone - 1	79.9	2.56	764.71
131	J60	580.00	Zone - 1	79.6	2.56	763.95
141	J160	590.00	Zone - 1	81.2	2.13	777.72
178	J530	580.00	Zone - 1	80.7	2.15	766.50
372	J-7	580.00	Zone - 1	80.7	3.20	766.53
150	J250	575.00	Zone - 1	82.1	3.20	764.74
183	J580	460.00	Zone - 2	80.3	2.82	645.55
6941	J-50	575.65	Zone - 1	81.8	0.00	764.66
215	J910	580.00	Zone - 1	80.7	2.13	766.58
6945	J-52	459.29	Zone - 2	80.5	0.00	645.39
160	J350	575.00	Zone - 1	82.3	3.20	765.21
562	J-49	578.50	Zone - 1	81.2	0.00	766.19
214	J900	460.00	Zone - 2	80.7	2.56	646.60
135	J100	575.00	Zone - 1	82.2	2.56	764.93
158	J330	570.00	Zone - 1	84.2	2.56	764.55
464	J-11	570.00	Zone - 1	84.2	0.00	764.56
157	320	570.00	Zone - 1	84.2	2.56	764.56
196	J710	455.00	Zone - 2	82.4	2.82	645.44
370	J-6	575.00	Zone - 1	82.9	0.00	766.58
6948	J-53	451.78	Zone - 2	83.8	0.00	645.39
163	J380	570.00	Zone - 1	84.9	3.20	766.32
137	J120	570.00	Zone - 1	84.4	0.00	765.12
175	J500	570.00	Zone - 1	85.0	3.20	766.51
151	J260	565.00	Zone - 1	86.4	3.20	764.74
222	J980	570.00	Zone - 1	85.1	2.13	766.71
559	J-48	565.00	Zone - 1	86.6	0.00	765.05
162	J370	565.00	Zone - 1	87.1	3.20	766.33
209	J840	560.00	Zone - 1	88.5	2.56	764.54
394	J-10	565.00	Zone - 1	87.2	0.00	766.59
201	J760	445.00	Zone - 2	86.7	2.82	645.39
148	J230	560.00	Zone - 1	88.5	3.20	764.63
130	J50	560.00	Zone - 1	88.2	2.56	763.81
165	J400	560.00	Zone - 1	89.3	3.20	766.45
552	J-45	558.00	Zone - 1	89.0	0.00	763.68
190	J650	440.00	Zone - 2	89.0	2.82	645.80
191	J660	440.00	Zone - 2	89.2	2.82	646.08
159	J340	555.00	Zone - 1	91.0	3.20	765.22
161	J360	555.00	Zone - 1	91.0	3.20	765.35

FlexTable: Junction Table

Active Scenario: 2023 MDD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
470	J-14	553.11	Zone - 1	91.5	0.00	764.58
136	J110	555.00	Zone - 1	90.9	2.13	765.12
207	J820	550.00	Zone - 1	92.8	2.56	764.55
174	J490	555.00	Zone - 1	91.6	2.82	766.62
515	J-34	550.00	Zone - 1	92.9	0.00	764.61
172	J470	555.00	Zone - 1	91.7	2.82	766.97
154	J290	545.00	Zone - 1	95.0	3.20	764.65
366	J-4	430.00	Zone - 2	93.2	2.13	645.38
194	J690	430.00	Zone - 2	93.7	2.56	646.56
535	J-42	540.97	Zone - 1	96.8	0.00	764.75
156	J310	540.00	Zone - 1	97.2	2.56	764.59
155	J300	540.00	Zone - 1	97.2	2.56	764.59
153	J280	540.00	Zone - 1	97.2	3.20	764.71
198	J730	425.00	Zone - 2	95.3	2.13	645.38
144	J190	540.00	Zone - 1	97.2	2.56	764.74
127	J20	540.00	Zone - 1	96.6	2.56	763.32
176	J510	540.00	Zone - 1	98.0	2.15	766.51
152	J270	535.00	Zone - 1	99.4	3.20	764.75
549	J-44	534.00	Zone - 1	99.2	0.00	763.32
210	J850	530.00	Zone - 1	101.5	2.56	764.54
138	J130	535.00	Zone - 1	99.7	2.13	765.45
164	J390	535.00	Zone - 1	100.1	3.20	766.40
140	J150	535.00	Zone - 1	100.6	2.13	767.53
173	J480	530.00	Zone - 1	102.8	2.82	767.51
204	J790	535.00	Zone - 1	106.2	2.13	780.46
6951	J-54	517.75	Zone - 1	107.2	0.00	765.45
139	J140	510.00	Zone - 1	110.5	2.13	765.40
192	J670	390.00	Zone - 2	110.9	2.56	646.25
212	J880	500.00	Zone - 1	114.5	2.56	764.54
126	J10	500.00	Zone - 1	113.9	2.56	763.32
211	J860	495.00	Zone - 1	116.6	2.56	764.54
180	J550	500.00	Zone - 1	117.9	2.82	772.49
193	J680	375.00	Zone - 2	117.3	2.56	646.02
203	J780	505.00	Zone - 1	119.2	2.13	780.46
205	J800	485.00	Zone - 1	128.1	2.13	781.14
375	J-8	430.00	Zone - 1	152.2	2.13	781.72
206	J810	430.00	Zone - 1	152.2	0.00	781.88
213	J890	405.00	Zone - 1	155.6	2.56	764.54

FlexTable: Pipe Table

Active Scenario: 2023 MDD CIP

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
315	860	309.23	PMP-3	J810	4.10	6.0	Ductile Iron	False
316	870	864.72	R-3	PMP-3	4.10	6.0	Ductile Iron	False
247	160	3,735.98	J150	J160	2.09	6.0	Asbestos Cement	False
288	580	3,263.45	J550	J560	1.51	6.0	Ductile Iron	False
287	570	2,690.07	J480	J550	1.48	6.0	Asbestos Cement	False
377	P-12	326.74	J-8	J810	1.48	10.0	Ductile Iron	False
376	P-11	1,085.66	J800	J-8	1.47	10.0	Ductile Iron	False
312	830	443.46	J780	J800	1.46	10.0	Ductile Iron	False
310	810	2,987.84	J560	J780	1.44	10.0	Ductile Iron	False
347	1210	781.29	J980	J150	0.75	8.0	Ductile Iron	False
563	1200(1)	603.11	J130	J-49	0.75	8.0	Ductile Iron	False
564	1200(2)	527.99	J-49	J980	0.75	8.0	Ductile Iron	False
245	130	359.67	J110	J130	0.72	8.0	Ductile Iron	False
560	110(1)	81.48	J100	J-48	0.71	8.0	Ductile Iron	False
561	110(2)	178.25	J-48	J110	0.71	8.0	Ductile Iron	False
289	590	355.59	J560	J160	0.89	10.0	Ductile Iron	False
280	500	1,364.20	J480	J490	0.82	6.0	Ductile Iron	False
6969	P-57	160.34	J-57	T-1	0.88	6.0	Ductile Iron	False
268	370	1,520.73	J360	J370	0.69	6.0	Asbestos Cement	False
267	360	347.69	J340	J360	0.65	6.0	Asbestos Cement	False
242	100	1,321.26	J80	J100	0.43	8.0	Ductile Iron	False
277	470	2,047.82	J450	J150	0.41	8.0	Ductile Iron	False
557	80(1)	295.82	J60	J-47	0.41	8.0	Ductile Iron	False
558	80(2)	390.59	J-47	J80	0.41	8.0	Ductile Iron	False
537	340(2)	1,042.18	J-42	J340	0.58	6.0	Asbestos Cement	False
238	60	520.40	J50	J60	0.38	8.0	Ductile Iron	False
281	510	887.52	J490	J370	0.62	6.0	Asbestos Cement	False
553	50(1)	1,110.72	J20	J-45	0.36	8.0	Ductile Iron	False
554	50(2)	370.33	J-45	J50	0.36	8.0	Ductile Iron	False
279	490	1,142.41	J470	J480	0.63	6.0	Asbestos Cement	False
534	P-52	878.79	J-41	J470	0.59	6.0	Asbestos Cement	False
6968	P-56	115.11	J-55	J-57	0.49	8.0	Ductile Iron	False
6967	P-55	225.92	J450	J-55	0.49	8.0	Ductile Iron	False
301	720	1,396.52	J690	J670	0.47	6.0	Asbestos Cement	False
299	700	1,204.37	J660	J670	0.41	6.0	Asbestos Cement	False
530	450(1)	48.98	J440	J-40	0.39	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2023 MDD CIP

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
298	690	1,917.41	J650	J660	0.38	6.0	Asbestos Cement	False
333	1060	928.80	J910	J420	0.28	6.0	Ductile Iron	False
343	1170	1,578.31	J160	PRV-3	0.36	6.0	Asbestos Cement	False
344	1180	1,065.48	PRV-3	J570	0.36	6.0	Asbestos Cement	False
274	440	458.31	J440	J420	0.34	6.0	Asbestos Cement	False
297	680	641.20	J640	J650	0.35	6.0	Asbestos Cement	False
538	P-53	582.53	J280	J-42	0.26	8.0	Ductile Iron	False
332	1050	1,355.49	J410	J910	0.25	6.0	Ductile Iron	False
248	170	1,273.25	J100	J170	0.47	6.0	Asbestos Cement	False
341	1150	1,645.01	J20	PRV-2	0.33	8.0	Ductile Iron	False
342	1160	399.53	PRV-2	J30	0.33	8.0	Ductile Iron	False
260	290	977.80	J280	J290	0.24	8.0	Ductile Iron	False
533	P-51	1,633.61	J-40	J-41	0.33	8.0	Ductile Iron	False
249	180	481.48	J170	J180	0.44	6.0	Asbestos Cement	False
517	P-44	217.90	J-34	J290	0.22	8.0	Ductile Iron	False
330	1030	2,047.17	J30	J900	0.30	8.0	Ductile Iron	False
309	800	2,413.23	J760	J770	0.29	2.0	PVC	False
296	670	490.62	J630	J640	0.28	6.0	Asbestos Cement	False
331	1040	688.05	J900	J690	0.28	8.0	Ductile Iron	False
271	400	614.59	J390	J400	0.18	6.0	Asbestos Cement	False
300	710	1,058.65	J670	J680	0.26	2.0	PVC	False
295	660	1,120.60	J600	J630	0.25	6.0	Asbestos Cement	False
251	200	512.94	J180	J200	0.38	6.0	Asbestos Cement	False
302	730	2,028.96	J570	J700	0.24	6.0	Asbestos Cement	False
270	390	1,285.53	J370	J390	0.14	6.0	Asbestos Cement	False
292	630	869.29	J580	J600	0.22	6.0	Asbestos Cement	False
252	210	454.85	J200	J210	0.36	6.0	Asbestos Cement	False
369	P-7	133.76	J450	J-5	0.22	2.0	PVC	False
6953	140(2)	389.47	J-54	J140	0.22	2.0	PVC	False
253	220	827.91	J210	J220	0.33	6.0	Asbestos Cement	False
304	750	1,292.25	J700	J720	0.18	6.0	Asbestos Cement	False
272	410	2,002.83	J400	J410	0.12	8.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2023 MDD CIP

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
395	P-19	1,252.08	J490	J-10	0.17	6.0	Asbestos Cement	False
396	P-20	1,882.30	J-10	J-7	0.17	6.0	Ductile Iron	False
516	P-43	1,239.83	J300	J-34	0.16	8.0	Ductile Iron	False
531	450(2)	110.11	J-40	J450	0.20	6.0	Asbestos Cement	False
6943	230(2)	851.77	J-50	J230	0.30	6.0	Asbestos Cement	False
524	P-48	211.43	J-37	J-34	0.06	8.0	Ductile Iron	False
374	P-10	1,181.08	J-7	J500	0.13	6.0	Ductile Iron	False
471	P-24	1,355.02	J300	J-14	0.13	8.0	Ductile Iron	False
472	P-25	1,789.45	J-14	320	0.13	8.0	Ductile Iron	False
495	P-37	1,640.82	J-23	J580	0.12	6.0	Asbestos Cement	False
499	P-38	1,114.16	J-23	J-26	0.12	8.0	Ductile Iron	False
501	P-39	450.98	J-26	J-27	0.12	8.0	Ductile Iron	False
255	240	1,855.02	J230	J240	0.26	6.0	Asbestos Cement	False
536	340(1)	775.50	J270	J-42	0.11	6.0	Asbestos Cement	False
317	880	1,338.16	320	J820	0.10	8.0	Ductile Iron	False
305	760	670.42	J720	J730	0.10	6.0	Asbestos Cement	False
494	P-36	3,062.02	J570	J-23	0.10	6.0	Asbestos Cement	False
6942	230(1)	309.29	J220	J-50	0.17	8.0	Ductile Iron	False
505	P-41	915.45	J-27	J-29	0.08	8.0	Ductile Iron	False
319	910	2,195.52	J820	J840	0.08	8.0	Ductile Iron	False
284	540	442.27	J500	J520	0.07	6.0	Ductile Iron	False
258	270	597.10	J260	J270	0.07	6.0	Asbestos Cement	False
306	770	953.99	J730	J740	0.07	6.0	Asbestos Cement	False
6946	790(1)	560.25	J720	J-52	0.06	6.0	Asbestos Cement	False
6950	790(2)(2)	295.46	J-53	J760	0.06	6.0	Asbestos Cement	False
320	920	1,046.94	J840	J850	0.05	8.0	Ductile Iron	False
519	P-45	240.88	J240	J-35	0.13	8.0	Ductile Iron	False
507	P-42	299.85	J-29	J-30	0.04	8.0	Ductile Iron	False
523	P-47	763.84	J-36	J-37	0.01	8.0	Ductile Iron	False
527	P-50	416.06	J-38	J-37	0.01	8.0	Ductile Iron	False
257	260	1,069.05	J250	J260	0.04	6.0	Asbestos Cement	False
266	350	1,870.47	J350	J340	0.04	6.0	Asbestos Cement	False
269	380	2,794.51	J370	J380	0.04	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2023 MDD CIP

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
6949	790(2)(1)	233.65	J-52	J-53	0.04	8.0	Ductile Iron	False
291	620	721.05	J580	J590	0.03	6.0	Ductile Iron	False
303	740	1,472.16	J700	J710	0.03	6.0	Asbestos Cement	False
365	P-5	638.70	J580	J-3	0.03	6.0	Ductile Iron	False
345	1190	141.18	J430	J970	0.01	8.0	Ductile Iron	False
348	1220	909.93	J970	J980	0.01	8.0	Ductile Iron	False
550	20(1)	1,127.26	J10	J-44	0.02	8.0	Ductile Iron	False
551	20(2)	454.30	J-44	J20	0.02	8.0	Ductile Iron	False
236	40	1,237.96	J30	J40	0.03	6.0	Asbestos Cement	False
239	70	1,233.32	J60	J70	0.03	6.0	Asbestos Cement	False
250	190	788.53	J180	J190	0.03	6.0	Asbestos Cement	False
262	310	1,091.01	J300	J310	0.03	6.0	Asbestos Cement	False
273	430	1,266.81	J420	J430	0.04	6.0	Asbestos Cement	False
526	P-49	1,084.51	J-35	J-38	0.07	8.0	Ductile Iron	False
283	530	910.93	J500	J510	0.02	6.0	Ductile Iron	False
285	550	324.28	J520	J530	0.02	6.0	Ductile Iron	False
286	560	1,423.00	J520	J540	0.02	6.0	Ductile Iron	False
278	480	982.79	J440	J460	0.02	6.0	Ductile Iron	False
307	780	1,302.56	J740	J750	0.02	6.0	Asbestos Cement	False
311	820	1,060.57	J790	J780	0.02	6.0	Ductile Iron	False
367	P-6	258.23	J740	J-4	0.02	6.0	Ductile Iron	False
6952	140(1)	866.12	J130	J-54	0.02	6.0	Asbestos Cement	False
521	P-46	782.54	J-35	J-36	0.06	8.0	Ductile Iron	False
363	P-4	1,141.91	J640	J-2	0.02	8.0	Ductile Iron	False
321	930	184.62	J850	J860	0.02	8.0	Ductile Iron	False
322	950	1,933.27	J840	J890	0.02	8.0	Ductile Iron	False
323	960	440.71	J850	J880	0.02	8.0	Ductile Iron	False
465	P-21	721.05	320	J-11	0.02	8.0	Ductile Iron	False
466	P-22	1,599.67	J-11	J330	0.02	8.0	Ductile Iron	False
327	15	109.92	PMP-1	J10	0.00	6.0	Asbestos Cement	False
329	1020	705.53	R-3	PMP-2	0.00	6.0	Ductile Iron	False
328	1010	359.73	PMP-2	J810	0.00	6.0	Ductile Iron	False
326	10	89.47	R-1	PMP-1	0.00	6.0	Asbestos Cement	False
6975	P-62	325.59	J-55	T-1	0.00	6.0	Ductile Iron	True
334	1070	458.75	J910	J920	0.00	8.0	Ductile Iron	False
503	P-40	568.86	J-27	J-28	0.00	8.0	Ductile Iron	False
241	90	678.03	J80	J90	0.00	6.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2023 MDD CIP

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
371	P-8	361.67	J910	J-6	0.00	2.0	PVC	False
361	P-3	1,059.28	J600	J620	0.00	2.0	PVC	False
244	120	246.16	J110	J120	0.00	2.0	PVC	False
256	250	219.27	J240	J250	0.00	6.0	Asbestos Cement	False
475	P-26	788.07	R-5	PMP-5	(N/A)	6.0	Ductile Iron	False
482	P-27	463.65	PMP-5	J-20	(N/A)	6.0	Ductile Iron	False
483	P-28	1,351.93	J-20	J-19	(N/A)	8.0	Ductile Iron	False
484	P-29	514.98	J-19	J-18	(N/A)	8.0	Ductile Iron	False
485	P-30	603.37	J-18	J-17	(N/A)	8.0	Ductile Iron	False
486	P-31	1,965.14	J-17	J-16	(N/A)	8.0	Ductile Iron	False
487	P-32	320.88	J-16	J-15	(N/A)	8.0	Ductile Iron	False
488	P-33	435.33	J-15	J310	(N/A)	8.0	Ductile Iron	False

FlexTable: Junction Table

Active Scenario: 2023 MDD CIP

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
476	J-15	542.00	Zone - 1	(N/A)	(N/A)	(N/A)
477	J-16	534.00	Zone - 1	(N/A)	(N/A)	(N/A)
478	J-17	480.00	Zone - 1	(N/A)	(N/A)	(N/A)
479	J-18	470.00	Zone - 1	(N/A)	(N/A)	(N/A)
480	J-19	462.00	Zone - 1	(N/A)	(N/A)	(N/A)
481	J-20	415.00	Zone - 1	(N/A)	(N/A)	(N/A)
368	J-5	670.00	Zone - 1	41.9	2.13	766.75
170	J450	670.00	Zone - 1	41.9	2.13	766.77
6964	J-55	670.00	<None>	41.9	0.00	766.77
6966	J-57	670.00	<None>	41.9	0.00	766.76
128	J30	545.00	Zone - 2	44.0	2.56	646.72
532	J-41	660.00	Zone - 1	46.2	0.00	766.88
504	J-29	536.00	Zone - 2	47.4	6.45	645.50
502	J-28	533.00	Zone - 2	48.7	0.00	645.51
506	J-30	532.50	Zone - 2	48.9	6.45	645.50
529	J-40	650.00	Zone - 1	50.5	0.00	766.78
500	J-27	528.00	Zone - 2	50.8	6.45	645.51
188	J630	520.00	Zone - 2	54.4	2.82	645.66
189	J640	520.00	Zone - 2	54.4	2.82	645.67
518	J-35	633.00	Zone - 1	57.3	0.00	765.33
525	J-38	632.00	Zone - 1	57.7	9.68	765.33
149	J240	630.00	Zone - 1	58.6	3.20	765.33
187	J620	515.00	Zone - 2	56.5	0.00	645.60
362	J-2	515.00	Zone - 2	56.5	2.82	645.67
182	J570	515.00	Zone - 2	56.5	2.13	645.56
169	J440	635.00	Zone - 1	57.0	2.13	766.77
179	J540	630.00	Zone - 1	59.1	2.15	766.66
520	J-36	625.00	Zone - 1	60.7	9.68	765.33
167	J420	625.00	Zone - 1	61.3	2.13	766.72
129	J40	500.00	Zone - 2	63.5	2.56	646.72
522	J-37	609.00	Zone - 1	67.6	9.68	765.33
202	J770	490.00	Zone - 2	67.0	2.82	644.76
142	J170	610.00	Zone - 1	67.4	2.56	765.84
177	J520	610.00	Zone - 1	67.8	2.15	766.66
221	J970	610.00	Zone - 1	67.8	0.00	766.72
171	J460	610.00	Zone - 1	67.8	2.13	766.76
133	J80	605.00	Zone - 1	69.6	2.56	765.93
200	J750	485.00	Zone - 2	69.4	2.13	645.38
166	J410	605.00	Zone - 1	69.9	3.20	766.60
146	J210	600.00	Zone - 1	71.7	2.56	765.62
132	J70	600.00	Zone - 1	71.8	2.56	765.86
134	J90	600.00	Zone - 1	71.8	0.00	765.93
181	J560	610.00	Zone - 1	72.5	2.13	777.59
195	J700	480.00	Zone - 2	71.6	2.13	645.44
216	J920	600.00	Zone - 1	72.1	0.00	766.64
498	J-26	477.00	Zone - 2	72.9	0.00	645.52
364	J-3	475.00	Zone - 2	73.8	2.82	645.55

FlexTable: Junction Table

Active Scenario: 2023 MDD CIP

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
147	J220	590.00	Zone - 1	75.9	2.56	765.54
143	J180	590.00	Zone - 1	76.0	2.56	765.75
184	J590	470.00	Zone - 2	76.0	2.82	645.55
197	J720	470.00	Zone - 2	75.9	2.13	645.39
168	J430	590.00	Zone - 1	76.5	2.13	766.72
493	J-23	467.00	Zone - 2	77.2	0.00	645.53
199	J740	465.00	Zone - 2	78.0	2.13	645.38
185	J600	465.00	Zone - 2	78.1	2.82	645.60
556	J-47	583.00	Zone - 1	79.1	0.00	765.90
145	J200	580.00	Zone - 1	80.3	2.56	765.68
131	J60	580.00	Zone - 1	80.4	2.56	765.86
141	J160	590.00	Zone - 1	81.1	2.13	777.49
178	J530	580.00	Zone - 1	80.8	2.15	766.66
372	J-7	580.00	Zone - 1	80.8	3.20	766.69
150	J250	575.00	Zone - 1	82.4	3.20	765.40
183	J580	460.00	Zone - 2	80.3	2.82	645.55
6941	J-50	575.65	Zone - 1	82.2	0.00	765.53
215	J910	580.00	Zone - 1	80.8	2.13	766.64
6945	J-52	459.29	Zone - 2	80.5	0.00	645.39
160	J350	575.00	Zone - 1	82.5	3.20	765.72
562	J-49	578.50	Zone - 1	81.4	0.00	766.54
214	J900	460.00	Zone - 2	80.7	2.56	646.60
135	J100	575.00	Zone - 1	82.7	2.56	766.11
158	J330	570.00	Zone - 1	84.5	2.56	765.27
464	J-11	570.00	Zone - 1	84.5	0.00	765.27
157	320	570.00	Zone - 1	84.5	2.56	765.27
196	J710	455.00	Zone - 2	82.4	2.82	645.44
370	J-6	575.00	Zone - 1	82.9	0.00	766.64
6948	J-53	451.78	Zone - 2	83.8	0.00	645.39
163	J380	570.00	Zone - 1	85.0	3.20	766.51
137	J120	570.00	Zone - 1	84.9	0.00	766.16
175	J500	570.00	Zone - 1	85.1	3.20	766.66
151	J260	565.00	Zone - 1	86.7	3.20	765.40
222	J980	570.00	Zone - 1	85.1	2.13	766.72
559	J-48	565.00	Zone - 1	87.0	0.00	766.14
162	J370	565.00	Zone - 1	87.2	3.20	766.52
209	J840	560.00	Zone - 1	88.8	2.56	765.26
394	J-10	565.00	Zone - 1	87.3	0.00	766.74
201	J760	445.00	Zone - 2	86.7	2.82	645.39
148	J230	560.00	Zone - 1	88.9	3.20	765.46
130	J50	560.00	Zone - 1	89.0	2.56	765.82
165	J400	560.00	Zone - 1	89.4	3.20	766.57
552	J-45	558.00	Zone - 1	89.9	0.00	765.78
190	J650	440.00	Zone - 2	89.0	2.82	645.80
191	J660	440.00	Zone - 2	89.2	2.82	646.08
159	J340	555.00	Zone - 1	91.2	3.20	765.73
161	J360	555.00	Zone - 1	91.2	3.20	765.82

FlexTable: Junction Table

Active Scenario: 2023 MDD CIP

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
470	J-14	553.11	Zone - 1	91.8	0.00	765.30
136	J110	555.00	Zone - 1	91.4	2.13	766.16
207	J820	550.00	Zone - 1	93.1	2.56	765.26
174	J490	555.00	Zone - 1	91.6	2.82	766.78
515	J-34	550.00	Zone - 1	93.2	0.00	765.33
172	J470	555.00	Zone - 1	91.7	2.82	766.99
154	J290	545.00	Zone - 1	95.3	3.20	765.35
366	J-4	430.00	Zone - 2	93.2	2.13	645.38
194	J690	430.00	Zone - 2	93.7	2.56	646.56
535	J-42	540.97	Zone - 1	97.1	0.00	765.41
156	J310	540.00	Zone - 1	97.5	2.56	765.31
155	J300	540.00	Zone - 1	97.5	2.56	765.31
153	J280	540.00	Zone - 1	97.5	3.20	765.39
198	J730	425.00	Zone - 2	95.3	2.13	645.38
144	J190	540.00	Zone - 1	97.7	2.56	765.75
127	J20	540.00	Zone - 1	97.6	2.56	765.68
176	J510	540.00	Zone - 1	98.1	2.15	766.66
152	J270	535.00	Zone - 1	99.7	3.20	765.41
549	J-44	534.00	Zone - 1	100.2	0.00	765.68
210	J850	530.00	Zone - 1	101.8	2.56	765.26
138	J130	535.00	Zone - 1	100.1	2.13	766.28
164	J390	535.00	Zone - 1	100.2	3.20	766.55
140	J150	535.00	Zone - 1	100.4	2.13	766.97
173	J480	530.00	Zone - 1	102.8	2.82	767.58
204	J790	535.00	Zone - 1	106.1	2.13	780.25
6951	J-54	517.75	Zone - 1	107.5	0.00	766.28
139	J140	510.00	Zone - 1	110.9	2.13	766.23
192	J670	390.00	Zone - 2	110.9	2.56	646.25
212	J880	500.00	Zone - 1	114.8	2.56	765.26
126	J10	500.00	Zone - 1	114.9	2.56	765.68
211	J860	495.00	Zone - 1	116.9	2.56	765.26
180	J550	500.00	Zone - 1	117.9	2.82	772.41
193	J680	375.00	Zone - 2	117.3	2.56	646.02
203	J780	505.00	Zone - 1	119.1	2.13	780.25
205	J800	485.00	Zone - 1	128.0	2.13	780.94
375	J-8	430.00	Zone - 1	152.1	2.13	781.51
206	J810	430.00	Zone - 1	152.2	0.00	781.68
213	J890	405.00	Zone - 1	155.9	2.56	765.26

FlexTable: Pipe Table

Active Scenario: 2023 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
315	860	309.23	PMP-3	J810	4.09	6.0	Ductile Iron	False
316	870	864.72	R-3	PMP-3	4.09	6.0	Ductile Iron	False
247	160	3,735.98	J150	J160	2.05	6.0	Asbestos Cement	False
288	580	3,263.45	J550	J560	1.53	6.0	Ductile Iron	False
287	570	2,690.07	J480	J550	1.50	6.0	Asbestos Cement	False
377	P-12	326.74	J-8	J810	1.47	10.0	Ductile Iron	False
376	P-11	1,085.66	J800	J-8	1.46	10.0	Ductile Iron	False
312	830	443.46	J780	J800	1.45	10.0	Ductile Iron	False
310	810	2,987.84	J560	J780	1.44	10.0	Ductile Iron	False
347	1210	781.29	J980	J150	1.27	6.0	Asbestos Cement	False
563	1200(1)	603.11	J130	J-49	1.20	6.0	Asbestos Cement	False
564	1200(2)	527.99	J-49	J980	1.20	6.0	Asbestos Cement	False
245	130	359.67	J110	J130	1.15	6.0	Asbestos Cement	False
560	110(1)	81.48	J100	J-48	1.12	6.0	Asbestos Cement	False
561	110(2)	178.25	J-48	J110	1.12	6.0	Asbestos Cement	False
289	590	355.59	J560	J160	0.88	10.0	Ductile Iron	False
280	500	1,364.20	J480	J490	0.87	6.0	Ductile Iron	False
6969	P-57	160.34	J-57	T-1	0.87	6.0	Ductile Iron	False
268	370	1,520.73	J360	J370	0.82	6.0	Asbestos Cement	False
267	360	347.69	J340	J360	0.79	6.0	Asbestos Cement	False
242	100	1,321.26	J80	J100	0.76	6.0	Asbestos Cement	False
277	470	2,047.82	J450	J150	0.76	6.0	Asbestos Cement	False
557	80(1)	295.82	J60	J-47	0.73	6.0	Asbestos Cement	False
558	80(2)	390.59	J-47	J80	0.73	6.0	Asbestos Cement	False
537	340(2)	1,042.18	J-42	J340	0.71	6.0	Asbestos Cement	False
238	60	520.40	J50	J60	0.67	6.0	Asbestos Cement	False
281	510	887.52	J490	J370	0.67	6.0	Asbestos Cement	False
553	50(1)	1,110.72	J20	J-45	0.64	6.0	Asbestos Cement	False
554	50(2)	370.33	J-45	J50	0.64	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2023 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
279	490	1,142.41	J470	J480	0.60	6.0	Asbestos Cement	False
534	P-52	878.79	J-41	J470	0.57	6.0	Asbestos Cement	False
6968	P-56	115.11	J-55	J-57	0.49	8.0	Ductile Iron	False
6967	P-55	225.92	J450	J-55	0.49	8.0	Ductile Iron	False
301	720	1,396.52	J690	J670	0.47	6.0	Asbestos Cement	False
299	700	1,204.37	J660	J670	0.41	6.0	Asbestos Cement	False
530	450(1)	48.98	J440	J-40	0.41	6.0	Asbestos Cement	False
298	690	1,917.41	J650	J660	0.38	6.0	Asbestos Cement	False
333	1060	928.80	J910	J420	0.36	6.0	Ductile Iron	False
343	1170	1,578.31	J160	PRV-3	0.36	6.0	Asbestos Cement	False
344	1180	1,065.48	PRV-3	J570	0.36	6.0	Asbestos Cement	False
274	440	458.31	J440	J420	0.36	6.0	Asbestos Cement	False
297	680	641.20	J640	J650	0.35	6.0	Asbestos Cement	False
538	P-53	582.53	J280	J-42	0.34	8.0	Ductile Iron	False
332	1050	1,355.49	J410	J910	0.34	6.0	Ductile Iron	False
248	170	1,273.25	J100	J170	0.33	6.0	Asbestos Cement	False
341	1150	1,645.01	J20	PRV-2	0.33	8.0	Ductile Iron	False
342	1160	399.53	PRV-2	J30	0.33	8.0	Ductile Iron	False
260	290	977.80	J280	J290	0.32	8.0	Ductile Iron	False
533	P-51	1,633.61	J-40	J-41	0.32	8.0	Ductile Iron	False
249	180	481.48	J170	J180	0.30	6.0	Asbestos Cement	False
517	P-44	217.90	J-34	J290	0.30	8.0	Ductile Iron	False
330	1030	2,047.17	J30	J900	0.30	8.0	Ductile Iron	False
309	800	2,413.23	J760	J770	0.29	2.0	PVC	False
296	670	490.62	J630	J640	0.28	6.0	Asbestos Cement	False
331	1040	688.05	J900	J690	0.28	8.0	Ductile Iron	False
271	400	614.59	J390	J400	0.27	6.0	Asbestos Cement	False
300	710	1,058.65	J670	J680	0.26	2.0	PVC	False
295	660	1,120.60	J600	J630	0.25	6.0	Asbestos Cement	False
251	200	512.94	J180	J200	0.25	6.0	Asbestos Cement	False
302	730	2,028.96	J570	J700	0.24	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2023 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
270	390	1,285.53	J370	J390	0.23	6.0	Asbestos Cement	False
292	630	869.29	J580	J600	0.22	6.0	Asbestos Cement	False
252	210	454.85	J200	J210	0.22	6.0	Asbestos Cement	False
369	P-7	133.76	J450	J-5	0.22	2.0	PVC	False
6953	140(2)	389.47	J-54	J140	0.22	2.0	PVC	False
253	220	827.91	J210	J220	0.19	6.0	Asbestos Cement	False
304	750	1,292.25	J700	J720	0.18	6.0	Asbestos Cement	False
272	410	2,002.83	J400	J410	0.17	8.0	Ductile Iron	False
395	P-19	1,252.08	J490	J-10	0.17	6.0	Asbestos Cement	False
396	P-20	1,882.30	J-10	J-7	0.17	6.0	Ductile Iron	False
516	P-43	1,239.83	J300	J-34	0.16	8.0	Ductile Iron	False
531	450(2)	110.11	J-40	J450	0.16	6.0	Asbestos Cement	False
6943	230(2)	851.77	J-50	J230	0.16	6.0	Asbestos Cement	False
524	P-48	211.43	J-37	J-34	0.14	8.0	Ductile Iron	False
374	P-10	1,181.08	J-7	J500	0.13	6.0	Ductile Iron	False
471	P-24	1,355.02	J300	J-14	0.13	8.0	Ductile Iron	False
472	P-25	1,789.45	J-14	320	0.13	8.0	Ductile Iron	False
495	P-37	1,640.82	J-23	J580	0.12	6.0	Asbestos Cement	False
499	P-38	1,114.16	J-23	J-26	0.12	8.0	Ductile Iron	False
501	P-39	450.98	J-26	J-27	0.12	8.0	Ductile Iron	False
255	240	1,855.02	J230	J240	0.12	6.0	Asbestos Cement	False
536	340(1)	775.50	J270	J-42	0.11	6.0	Asbestos Cement	False
317	880	1,338.16	320	J820	0.10	8.0	Ductile Iron	False
305	760	670.42	J720	J730	0.10	6.0	Asbestos Cement	False
494	P-36	3,062.02	J570	J-23	0.10	6.0	Asbestos Cement	False
6942	230(1)	309.29	J220	J-50	0.09	8.0	Ductile Iron	False
505	P-41	915.45	J-27	J-29	0.08	8.0	Ductile Iron	False
319	910	2,195.52	J820	J840	0.08	8.0	Ductile Iron	False
284	540	442.27	J500	J520	0.07	6.0	Ductile Iron	False
258	270	597.10	J260	J270	0.07	6.0	Asbestos Cement	False
306	770	953.99	J730	J740	0.07	6.0	Asbestos Cement	False
6946	790(1)	560.25	J720	J-52	0.06	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2023 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
6950	790(2)(2)	295.46	J-53	J760	0.06	6.0	Asbestos Cement	False
320	920	1,046.94	J840	J850	0.05	8.0	Ductile Iron	False
519	P-45	240.88	J240	J-35	0.05	8.0	Ductile Iron	False
507	P-42	299.85	J-29	J-30	0.04	8.0	Ductile Iron	False
523	P-47	763.84	J-36	J-37	0.04	8.0	Ductile Iron	False
527	P-50	416.06	J-38	J-37	0.04	8.0	Ductile Iron	False
257	260	1,069.05	J250	J260	0.04	6.0	Asbestos Cement	False
266	350	1,870.47	J350	J340	0.04	6.0	Asbestos Cement	False
269	380	2,794.51	J370	J380	0.04	6.0	Asbestos Cement	False
6949	790(2)(1)	233.65	J-52	J-53	0.04	8.0	Ductile Iron	False
291	620	721.05	J580	J590	0.03	6.0	Ductile Iron	False
303	740	1,472.16	J700	J710	0.03	6.0	Asbestos Cement	False
365	P-5	638.70	J580	J-3	0.03	6.0	Ductile Iron	False
345	1190	141.18	J430	J970	0.03	8.0	Ductile Iron	False
348	1220	909.93	J970	J980	0.03	8.0	Ductile Iron	False
550	20(1)	1,127.26	J10	J-44	0.03	6.0	Asbestos Cement	False
551	20(2)	454.30	J-44	J20	0.03	6.0	Asbestos Cement	False
236	40	1,237.96	J30	J40	0.03	6.0	Asbestos Cement	False
239	70	1,233.32	J60	J70	0.03	6.0	Asbestos Cement	False
250	190	788.53	J180	J190	0.03	6.0	Asbestos Cement	False
262	310	1,091.01	J300	J310	0.03	6.0	Asbestos Cement	False
273	430	1,266.81	J420	J430	0.03	6.0	Asbestos Cement	False
526	P-49	1,084.51	J-35	J-38	0.02	8.0	Ductile Iron	False
283	530	910.93	J500	J510	0.02	6.0	Ductile Iron	False
285	550	324.28	J520	J530	0.02	6.0	Ductile Iron	False
286	560	1,423.00	J520	J540	0.02	6.0	Ductile Iron	False
278	480	982.79	J440	J460	0.02	6.0	Ductile Iron	False
307	780	1,302.56	J740	J750	0.02	6.0	Asbestos Cement	False
311	820	1,060.57	J790	J780	0.02	6.0	Ductile Iron	False
367	P-6	258.23	J740	J-4	0.02	6.0	Ductile Iron	False
6952	140(1)	866.12	J130	J-54	0.02	6.0	Asbestos Cement	False
521	P-46	782.54	J-35	J-36	0.02	8.0	Ductile Iron	False
363	P-4	1,141.91	J640	J-2	0.02	8.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2023 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
321	930	184.62	J850	J860	0.02	8.0	Ductile Iron	False
322	950	1,933.27	J840	J890	0.02	8.0	Ductile Iron	False
323	960	440.71	J850	J880	0.02	8.0	Ductile Iron	False
465	P-21	721.05	320	J-11	0.02	8.0	Ductile Iron	False
466	P-22	1,599.67	J-11	J330	0.02	8.0	Ductile Iron	False
327	15	109.92	PMP-1	J10	0.00	6.0	Asbestos Cement	False
329	1020	705.53	R-3	PMP-2	0.00	6.0	Ductile Iron	False
328	1010	359.73	PMP-2	J810	0.00	6.0	Ductile Iron	False
326	10	89.47	R-1	PMP-1	0.00	6.0	Asbestos Cement	False
6975	P-62	325.59	J-55	T-1	0.00	6.0	Ductile Iron	True
334	1070	458.75	J910	J920	0.00	8.0	Ductile Iron	False
503	P-40	568.86	J-27	J-28	0.00	8.0	Ductile Iron	False
241	90	678.03	J80	J90	0.00	6.0	Ductile Iron	False
371	P-8	361.67	J910	J-6	0.00	2.0	PVC	False
361	P-3	1,059.28	J600	J620	0.00	2.0	PVC	False
244	120	246.16	J110	J120	0.00	2.0	PVC	False
256	250	219.27	J240	J250	0.00	6.0	Asbestos Cement	False
475	P-26	788.07	R-5	PMP-5	(N/A)	6.0	Ductile Iron	False
482	P-27	463.65	PMP-5	J-20	(N/A)	6.0	Ductile Iron	False
483	P-28	1,351.93	J-20	J-19	(N/A)	8.0	Ductile Iron	False
484	P-29	514.98	J-19	J-18	(N/A)	8.0	Ductile Iron	False
485	P-30	603.37	J-18	J-17	(N/A)	8.0	Ductile Iron	False
486	P-31	1,965.14	J-17	J-16	(N/A)	8.0	Ductile Iron	False
487	P-32	320.88	J-16	J-15	(N/A)	8.0	Ductile Iron	False
488	P-33	435.33	J-15	J310	(N/A)	8.0	Ductile Iron	False

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-10	Zone - 1	False	750.00	724.06	48.2	20.0	20.0
J-27	Zone - 2	False	750.00	621.89	23.5	20.0	20.0
J720	Zone - 2	False	750.00	606.44	26.5	20.0	20.0
J-52	Zone - 2	False	750.00	606.44	26.4	20.0	20.0
J760	Zone - 2	False	750.00	606.44	29.0	20.0	20.0
J740	Zone - 2	False	750.00	494.66	28.7	20.0	20.0
J520	Zone - 1	False	750.00	435.73	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	606.43	29.0	20.0	20.0
J-23	Zone - 2	False	750.00	699.15	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	683.13	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	494.65	41.5	20.0	20.0
J-7	Zone - 1	False	750.00	528.87	41.6	20.0	20.0
J530	Zone - 1	False	750.00	435.72	40.9	20.0	20.0
J500	Zone - 1	False	750.00	442.47	46.0	20.0	20.0
J700	Zone - 2	False	750.00	748.29	22.2	20.0	20.0
J510	Zone - 1	False	750.00	442.46	57.9	20.0	20.0
J-28	Zone - 2	False	750.00	621.73	20.8	20.0	20.0
J240	Zone - 1	True	750.00	754.40	21.1	20.0	20.0
J-36	Zone - 1	True	750.00	754.15	22.8	20.0	20.0
J-30	Zone - 2	False	750.00	586.22	20.5	20.0	20.0
J-37	Zone - 1	True	750.00	756.40	30.1	20.0	20.0
J730	Zone - 2	False	750.00	554.57	46.0	20.1	20.1
J-38	Zone - 1	True	750.00	752.95	20.0	20.1	20.1
J260	Zone - 1	True	750.00	758.54	24.4	20.1	20.1
J600	Zone - 2	True	750.00	760.00	39.6	20.4	20.4
J-35	Zone - 1	True	750.00	751.97	20.0	20.6	20.6
J640	Zone - 2	False	750.00	710.94	20.0	20.8	20.8
J300	Zone - 1	True	750.00	760.00	54.9	20.8	20.8
J820	Zone - 1	True	750.00	760.00	32.1	20.8	20.8
J860	Zone - 1	True	750.00	760.00	46.2	20.8	20.8
J-14	Zone - 1	True	750.00	760.00	44.2	20.8	20.8
J880	Zone - 1	True	750.00	760.00	42.6	20.8	20.8
J310	Zone - 1	True	750.00	760.00	39.7	20.8	20.8
J850	Zone - 1	True	750.00	760.00	32.3	20.8	20.8
J-34	Zone - 1	True	750.00	760.00	55.6	20.8	20.8
320	Zone - 1	True	750.00	760.00	27.9	20.8	20.8
J890	Zone - 1	True	750.00	760.00	82.8	20.8	20.8
J-11	Zone - 1	True	750.00	760.00	25.6	20.8	20.8
J840	Zone - 1	True	750.00	760.00	20.8	20.8	20.8
J630	Zone - 2	False	750.00	710.00	20.0	21.0	21.0
J-3	Zone - 2	True	750.00	760.00	24.2	21.5	21.5
J580	Zone - 2	True	750.00	760.00	43.1	21.5	21.5
J590	Zone - 2	True	750.00	760.00	29.6	21.5	21.5
J-29	Zone - 2	False	750.00	586.59	20.0	21.5	21.5
J650	Zone - 2	True	750.00	760.00	51.8	21.5	21.5

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J290	Zone - 1	True	750.00	760.00	58.1	21.6	21.6
J-2	Zone - 2	False	750.00	683.42	20.0	22.3	22.3
J330	Zone - 1	False	750.00	739.21	20.0	22.5	22.5
J280	Zone - 1	True	750.00	760.00	60.8	22.8	22.8
J270	Zone - 1	True	750.00	760.00	56.4	23.6	23.6
J-42	Zone - 1	True	750.00	760.00	60.8	23.6	23.6
J230	Zone - 1	True	750.00	760.00	52.3	27.9	27.9
J340	Zone - 1	True	750.00	760.00	59.2	30.0	30.0
J710	Zone - 2	False	750.00	684.69	20.0	30.3	30.3
J360	Zone - 1	True	750.00	760.00	60.6	31.6	31.6
J-50	Zone - 1	True	750.00	760.00	47.8	31.6	31.6
J220	Zone - 1	True	750.00	760.00	41.9	31.9	31.9
J660	Zone - 2	True	750.00	760.00	58.7	32.0	32.0
J250	Zone - 1	False	750.00	642.63	20.0	32.1	32.1
J350	Zone - 1	False	750.00	716.33	20.0	32.7	32.7
J210	Zone - 1	True	750.00	760.00	40.8	35.4	35.4
J540	Zone - 1	False	750.00	388.10	20.0	36.0	36.0
J200	Zone - 1	True	750.00	760.00	51.8	37.5	37.5
J800	Zone - 1	True	750.00	760.00	86.0	37.9	37.9
J790	Zone - 1	True	750.00	760.00	52.0	37.9	37.9
J-8	Zone - 1	True	750.00	760.00	108.7	37.9	37.9
J780	Zone - 1	True	750.00	760.00	78.5	37.9	37.9
J810	Zone - 1	True	750.00	760.00	108.5	37.9	37.9
J160	Zone - 1	True	750.00	760.00	46.7	38.1	38.1
J670	Zone - 2	True	750.00	760.00	86.9	38.1	38.1
J570	Zone - 2	True	750.00	760.00	45.5	38.1	38.1
J180	Zone - 1	True	750.00	760.00	50.7	40.0	40.0
J190	Zone - 1	True	750.00	760.00	50.7	40.0	40.0
J750	Zone - 2	False	750.00	424.30	20.0	40.5	40.5
J470	Zone - 1	True	750.00	760.00	82.5	40.7	40.7
J490	Zone - 1	True	750.00	760.00	73.6	41.1	41.1
J-40	Zone - 1	True	750.00	760.00	48.0	41.4	41.4
J440	Zone - 1	True	750.00	760.00	53.6	41.4	41.4
J460	Zone - 1	True	750.00	760.00	48.8	41.4	41.4
J-41	Zone - 1	True	750.00	760.00	39.9	41.4	41.4
J420	Zone - 1	True	750.00	760.00	56.0	41.4	41.4
J560	Zone - 1	True	750.00	760.00	37.9	41.4	41.4
J910	Zone - 1	True	750.00	760.00	66.2	41.4	41.4
J920	Zone - 1	True	750.00	760.00	56.6	41.4	41.4
J150	Zone - 1	True	750.00	760.00	93.9	41.4	41.4
J550	Zone - 1	True	750.00	760.00	86.0	41.4	41.4
J480	Zone - 1	True	750.00	760.00	88.9	41.4	41.4
J410	Zone - 1	True	750.00	760.00	52.3	41.4	41.4
J400	Zone - 1	True	750.00	760.00	70.1	41.4	41.4
J390	Zone - 1	True	750.00	760.00	80.2	41.4	41.4

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J430	Zone - 1	True	750.00	760.00	69.2	41.4	41.4
J370	Zone - 1	True	750.00	760.00	69.8	41.4	41.4
J380	Zone - 1	True	750.00	760.00	22.9	41.4	41.4
J970	Zone - 1	True	750.00	760.00	61.1	41.4	41.4
J980	Zone - 1	True	750.00	760.00	79.2	41.4	41.4
J-49	Zone - 1	True	750.00	760.00	73.2	41.4	41.4
J170	Zone - 1	True	750.00	760.00	45.5	41.5	41.5
J130	Zone - 1	True	750.00	760.00	90.6	41.5	41.5
J-54	Zone - 1	True	750.00	760.00	81.7	41.5	41.5
J110	Zone - 1	True	750.00	760.00	81.7	41.5	41.5
J-48	Zone - 1	True	750.00	760.00	77.3	41.5	41.5
J100	Zone - 1	True	750.00	760.00	73.0	41.5	41.5
J80	Zone - 1	True	750.00	760.00	54.1	41.5	41.5
J90	Zone - 1	True	750.00	760.00	43.3	41.5	41.5
J-47	Zone - 1	True	750.00	760.00	62.8	41.5	41.5
J60	Zone - 1	True	750.00	760.00	63.1	41.5	41.5
J70	Zone - 1	True	750.00	760.00	29.6	41.5	41.5
J50	Zone - 1	True	750.00	760.00	70.7	41.5	41.5
J690	Zone - 2	True	750.00	760.00	83.3	43.4	41.5
J900	Zone - 2	True	750.00	760.00	72.4	43.4	41.5
J-45	Zone - 1	True	750.00	760.00	70.6	41.5	41.5
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.5
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.5
J20	Zone - 1	True	750.00	760.00	76.3	41.5	41.5
J-44	Zone - 1	True	750.00	760.00	78.7	41.5	41.5
J10	Zone - 1	True	750.00	760.00	93.0	41.6	41.6
J450	Zone - 1	True	750.00	760.00	41.4	45.8	41.6
J-55	<None>	True	750.00	760.00	41.6	41.6	41.6
J-57	<None>	True	750.00	760.00	41.6	41.6	41.6
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.6	41.9	41.9
J770	Zone - 2	True	0.00	10.00	62.7	44.0	41.9
J140	Zone - 1	True	0.00	10.00	113.6	41.9	41.9
J120	Zone - 1	True	0.00	10.00	88.5	41.9	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J680	Zone - 2	True	0.00	10.00	115.4	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-45	Zone - 1	False	750.00	660.68	27.1	20.0	20.0
J240	Zone - 1	False	750.00	689.29	21.0	20.0	20.0
J-10	Zone - 1	False	750.00	719.05	48.2	20.0	20.0
J-52	Zone - 2	False	750.00	606.44	26.4	20.0	20.0
J720	Zone - 2	False	750.00	606.44	26.5	20.0	20.0
J760	Zone - 2	False	750.00	606.44	29.0	20.0	20.0
J-27	Zone - 2	False	750.00	621.89	23.5	20.0	20.0
J740	Zone - 2	False	750.00	494.66	28.7	20.0	20.0
J260	Zone - 1	False	750.00	725.63	24.3	20.0	20.0
J-53	Zone - 2	False	750.00	606.43	29.0	20.0	20.0
J50	Zone - 1	False	750.00	660.68	31.7	20.0	20.0
J270	Zone - 1	False	750.00	735.51	53.9	20.0	20.0
J520	Zone - 1	False	750.00	432.51	28.7	20.0	20.0
J-23	Zone - 2	False	750.00	699.15	49.9	20.0	20.0
J-42	Zone - 1	False	750.00	735.50	57.9	20.0	20.0
J840	Zone - 1	False	750.00	702.67	24.4	20.0	20.0
J-36	Zone - 1	False	750.00	689.47	22.9	20.0	20.0
J-26	Zone - 2	False	750.00	683.13	45.5	20.0	20.0
J280	Zone - 1	False	750.00	725.05	58.7	20.0	20.0
J-4	Zone - 2	False	750.00	494.65	41.5	20.0	20.0
J290	Zone - 1	False	750.00	711.23	57.0	20.0	20.0
J530	Zone - 1	False	750.00	432.51	40.9	20.0	20.0
J730	Zone - 2	False	750.00	555.09	46.0	20.0	20.0
J-7	Zone - 1	False	750.00	525.00	41.6	20.0	20.0
J310	Zone - 1	False	750.00	702.65	42.0	20.0	20.0
320	Zone - 1	False	750.00	702.65	29.9	20.0	20.0
J860	Zone - 1	False	750.00	702.65	50.1	20.0	20.0
J820	Zone - 1	False	750.00	702.65	34.7	20.0	20.0
J850	Zone - 1	False	750.00	702.65	36.1	20.0	20.0
J880	Zone - 1	False	750.00	702.65	46.7	20.0	20.0
J890	Zone - 1	False	750.00	702.65	87.1	20.0	20.0
J-11	Zone - 1	False	750.00	702.65	27.9	20.0	20.0
J300	Zone - 1	False	750.00	702.65	55.1	20.0	20.0
J-14	Zone - 1	False	750.00	702.65	45.1	20.0	20.0
J-34	Zone - 1	False	750.00	702.65	55.1	20.0	20.0
J500	Zone - 1	False	750.00	439.20	46.0	20.0	20.0
J-37	Zone - 1	False	750.00	691.38	30.2	20.0	20.0
J510	Zone - 1	False	750.00	439.19	57.9	20.0	20.0
J-47	Zone - 1	False	750.00	661.37	27.4	20.0	20.0
J60	Zone - 1	False	750.00	624.60	28.7	20.0	20.0
J-28	Zone - 2	False	750.00	621.73	20.8	20.0	20.0
J-30	Zone - 2	False	750.00	586.22	20.5	20.0	20.0
J330	Zone - 1	False	750.00	702.17	20.4	20.0	20.0
J-38	Zone - 1	False	750.00	688.38	20.1	20.1	20.1
J20	Zone - 1	False	750.00	660.06	20.4	20.1	20.1

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J600	Zone - 2	True	750.00	760.00	39.6	20.4	20.4
J-35	Zone - 1	False	750.00	687.23	20.0	20.6	20.6
J640	Zone - 2	False	750.00	710.94	20.0	20.8	20.8
J630	Zone - 2	False	750.00	710.01	20.0	20.9	20.9
J10	Zone - 1	False	750.00	647.36	20.0	21.0	21.0
J-44	Zone - 1	False	750.00	652.07	20.0	21.2	21.2
J230	Zone - 1	True	750.00	760.00	43.4	21.3	21.3
J590	Zone - 2	True	750.00	760.00	29.6	21.5	21.5
J580	Zone - 2	True	750.00	760.00	43.1	21.5	21.5
J-3	Zone - 2	True	750.00	760.00	24.2	21.5	21.5
J-29	Zone - 2	False	750.00	586.59	20.0	21.5	21.5
J650	Zone - 2	True	750.00	760.00	51.8	21.5	21.5
J80	Zone - 1	False	750.00	664.72	20.0	22.1	22.1
J700	Zone - 2	True	750.00	760.00	24.5	22.3	22.3
J-2	Zone - 2	False	750.00	683.42	20.0	22.3	22.3
J40	Zone - 2	True	750.00	760.00	29.0	23.2	23.2
J-50	Zone - 1	True	750.00	760.00	37.5	24.7	24.7
J220	Zone - 1	True	750.00	760.00	31.4	25.0	25.0
J340	Zone - 1	True	750.00	760.00	55.5	25.1	25.1
J900	Zone - 2	True	750.00	760.00	57.3	26.5	26.5
J90	Zone - 1	False	750.00	610.42	20.1	26.5	26.5
J360	Zone - 1	True	750.00	760.00	57.2	26.9	26.9
J30	Zone - 2	True	750.00	760.00	23.2	40.7	27.0
J690	Zone - 2	True	750.00	760.00	69.5	27.5	27.5
J210	Zone - 1	True	750.00	760.00	28.8	28.1	28.1
J250	Zone - 1	False	750.00	619.03	20.0	29.1	29.1
J350	Zone - 1	False	750.00	694.56	20.0	29.5	29.5
J200	Zone - 1	True	750.00	760.00	38.9	30.0	30.0
J710	Zone - 2	False	750.00	684.69	20.0	30.3	30.3
J660	Zone - 2	True	750.00	760.00	56.6	30.5	30.5
J190	Zone - 1	True	750.00	760.00	36.5	32.0	32.0
J180	Zone - 1	True	750.00	760.00	36.5	32.0	32.0
J170	Zone - 1	True	750.00	760.00	30.1	34.0	34.0
J670	Zone - 2	True	750.00	760.00	81.0	34.3	34.3
J540	Zone - 1	False	750.00	385.21	20.0	35.9	35.9
J70	Zone - 1	False	750.00	517.49	20.1	36.7	36.7
J100	Zone - 1	True	750.00	760.00	53.2	39.5	39.5
J-48	Zone - 1	True	750.00	760.00	58.7	40.1	40.1
J110	Zone - 1	True	750.00	760.00	63.7	40.5	40.5
J750	Zone - 2	False	750.00	424.33	20.0	40.5	40.5
J470	Zone - 1	True	750.00	760.00	82.5	40.5	40.5
J490	Zone - 1	True	750.00	760.00	73.1	40.6	40.6
J370	Zone - 1	True	750.00	760.00	68.5	40.9	40.9
J380	Zone - 1	True	750.00	760.00	21.6	40.9	40.9
J-40	Zone - 1	True	750.00	760.00	47.7	41.4	41.4

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J440	Zone - 1	True	750.00	760.00	53.1	41.4	41.4
J460	Zone - 1	True	750.00	760.00	48.3	41.4	41.4
J420	Zone - 1	True	750.00	760.00	54.8	41.4	41.4
J-41	Zone - 1	True	750.00	760.00	39.7	41.4	41.4
J910	Zone - 1	True	750.00	760.00	64.9	41.4	41.4
J920	Zone - 1	True	750.00	760.00	55.2	41.4	41.4
J410	Zone - 1	True	750.00	760.00	51.0	41.4	41.4
J400	Zone - 1	True	750.00	760.00	68.8	41.4	41.4
J390	Zone - 1	True	750.00	760.00	78.9	41.4	41.4
J430	Zone - 1	True	750.00	760.00	65.8	41.4	41.4
J-54	Zone - 1	True	750.00	760.00	66.7	41.4	41.4
J130	Zone - 1	True	750.00	760.00	75.7	41.4	41.4
J-49	Zone - 1	True	750.00	760.00	64.8	41.4	41.4
J970	Zone - 1	True	750.00	760.00	57.4	41.4	41.4
J980	Zone - 1	True	750.00	760.00	75.3	41.4	41.4
J150	Zone - 1	True	750.00	760.00	93.3	41.4	41.4
J480	Zone - 1	True	750.00	760.00	90.0	41.4	41.4
J550	Zone - 1	True	750.00	760.00	94.9	41.4	41.4
J570	Zone - 2	True	750.00	760.00	49.8	41.7	41.5
J160	Zone - 1	True	750.00	760.00	68.2	41.5	41.5
J560	Zone - 1	True	750.00	760.00	59.7	41.5	41.5
J450	Zone - 1	True	750.00	760.00	41.3	45.7	41.5
J-55	<None>	True	750.00	760.00	41.5	41.6	41.5
J780	Zone - 1	True	750.00	760.00	105.0	41.5	41.5
J790	Zone - 1	True	750.00	760.00	78.4	41.5	41.5
J800	Zone - 1	True	750.00	760.00	113.6	41.5	41.5
J-8	Zone - 1	True	750.00	760.00	137.4	41.5	41.5
J810	Zone - 1	True	750.00	760.00	137.4	41.5	41.5
J-57	<None>	True	750.00	760.00	41.6	41.6	41.6
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J120	Zone - 1	True	0.00	10.00	84.1	41.9	41.9
J140	Zone - 1	True	0.00	10.00	109.9	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.4	41.9	41.9
J680	Zone - 2	True	0.00	10.00	115.4	44.0	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J770	Zone - 2	True	0.00	10.00	62.7	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-45	Zone - 1	False	750.00	660.68	27.1	20.0	20.0
J240	Zone - 1	False	750.00	689.29	21.0	20.0	20.0
J-10	Zone - 1	False	750.00	719.05	48.2	20.0	20.0
J-52	Zone - 2	False	750.00	606.44	26.4	20.0	20.0
J720	Zone - 2	False	750.00	606.44	26.5	20.0	20.0
J760	Zone - 2	False	750.00	606.44	29.0	20.0	20.0
J-27	Zone - 2	False	750.00	621.89	23.5	20.0	20.0
J740	Zone - 2	False	750.00	494.66	28.7	20.0	20.0
J260	Zone - 1	False	750.00	725.63	24.3	20.0	20.0
J-53	Zone - 2	False	750.00	606.43	29.0	20.0	20.0
J50	Zone - 1	False	750.00	660.68	31.7	20.0	20.0
J270	Zone - 1	False	750.00	735.51	53.9	20.0	20.0
J520	Zone - 1	False	750.00	432.51	28.7	20.0	20.0
J-23	Zone - 2	False	750.00	699.15	49.9	20.0	20.0
J-42	Zone - 1	False	750.00	735.50	57.9	20.0	20.0
J840	Zone - 1	False	750.00	702.67	24.4	20.0	20.0
J-36	Zone - 1	False	750.00	689.47	22.9	20.0	20.0
J-26	Zone - 2	False	750.00	683.13	45.5	20.0	20.0
J280	Zone - 1	False	750.00	725.05	58.7	20.0	20.0
J-4	Zone - 2	False	750.00	494.65	41.5	20.0	20.0
J290	Zone - 1	False	750.00	711.23	57.0	20.0	20.0
J530	Zone - 1	False	750.00	432.51	40.9	20.0	20.0
J730	Zone - 2	False	750.00	555.09	46.0	20.0	20.0
J-7	Zone - 1	False	750.00	525.00	41.6	20.0	20.0
J310	Zone - 1	False	750.00	702.65	42.0	20.0	20.0
320	Zone - 1	False	750.00	702.65	29.9	20.0	20.0
J860	Zone - 1	False	750.00	702.65	50.1	20.0	20.0
J820	Zone - 1	False	750.00	702.65	34.7	20.0	20.0
J850	Zone - 1	False	750.00	702.65	36.1	20.0	20.0
J880	Zone - 1	False	750.00	702.65	46.7	20.0	20.0
J890	Zone - 1	False	750.00	702.65	87.1	20.0	20.0
J-11	Zone - 1	False	750.00	702.65	27.9	20.0	20.0
J300	Zone - 1	False	750.00	702.65	55.1	20.0	20.0
J-14	Zone - 1	False	750.00	702.65	45.1	20.0	20.0
J-34	Zone - 1	False	750.00	702.65	55.1	20.0	20.0
J500	Zone - 1	False	750.00	439.20	46.0	20.0	20.0
J-37	Zone - 1	False	750.00	691.38	30.2	20.0	20.0
J510	Zone - 1	False	750.00	439.19	57.9	20.0	20.0
J-47	Zone - 1	False	750.00	661.37	27.4	20.0	20.0
J60	Zone - 1	False	750.00	624.60	28.7	20.0	20.0
J-28	Zone - 2	False	750.00	621.73	20.8	20.0	20.0
J-30	Zone - 2	False	750.00	586.22	20.5	20.0	20.0
J330	Zone - 1	False	750.00	702.17	20.4	20.0	20.0
J-38	Zone - 1	False	750.00	688.38	20.1	20.1	20.1
J20	Zone - 1	False	750.00	660.06	20.4	20.1	20.1

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J600	Zone - 2	True	750.00	760.00	39.6	20.4	20.4
J-35	Zone - 1	False	750.00	687.23	20.0	20.6	20.6
J640	Zone - 2	False	750.00	710.94	20.0	20.8	20.8
J630	Zone - 2	False	750.00	710.01	20.0	20.9	20.9
J10	Zone - 1	False	750.00	647.36	20.0	21.0	21.0
J-44	Zone - 1	False	750.00	652.07	20.0	21.2	21.2
J230	Zone - 1	True	750.00	760.00	43.4	21.3	21.3
J590	Zone - 2	True	750.00	760.00	29.6	21.5	21.5
J580	Zone - 2	True	750.00	760.00	43.1	21.5	21.5
J-3	Zone - 2	True	750.00	760.00	24.2	21.5	21.5
J-29	Zone - 2	False	750.00	586.59	20.0	21.5	21.5
J650	Zone - 2	True	750.00	760.00	51.8	21.5	21.5
J80	Zone - 1	False	750.00	664.72	20.0	22.1	22.1
J700	Zone - 2	True	750.00	760.00	24.5	22.3	22.3
J-2	Zone - 2	False	750.00	683.42	20.0	22.3	22.3
J40	Zone - 2	True	750.00	760.00	29.0	23.2	23.2
J-50	Zone - 1	True	750.00	760.00	37.5	24.7	24.7
J220	Zone - 1	True	750.00	760.00	31.4	25.0	25.0
J340	Zone - 1	True	750.00	760.00	55.5	25.1	25.1
J900	Zone - 2	True	750.00	760.00	57.3	26.5	26.5
J90	Zone - 1	False	750.00	610.42	20.1	26.5	26.5
J360	Zone - 1	True	750.00	760.00	57.2	26.9	26.9
J30	Zone - 2	True	750.00	760.00	23.2	40.7	27.0
J690	Zone - 2	True	750.00	760.00	69.5	27.5	27.5
J210	Zone - 1	True	750.00	760.00	28.8	28.1	28.1
J250	Zone - 1	False	750.00	619.03	20.0	29.1	29.1
J350	Zone - 1	False	750.00	694.56	20.0	29.5	29.5
J200	Zone - 1	True	750.00	760.00	38.9	30.0	30.0
J710	Zone - 2	False	750.00	684.69	20.0	30.3	30.3
J660	Zone - 2	True	750.00	760.00	56.6	30.5	30.5
J190	Zone - 1	True	750.00	760.00	36.5	32.0	32.0
J180	Zone - 1	True	750.00	760.00	36.5	32.0	32.0
J170	Zone - 1	True	750.00	760.00	30.1	34.0	34.0
J670	Zone - 2	True	750.00	760.00	81.0	34.3	34.3
J540	Zone - 1	False	750.00	385.21	20.0	35.9	35.9
J70	Zone - 1	False	750.00	517.49	20.1	36.7	36.7
J100	Zone - 1	True	750.00	760.00	53.2	39.5	39.5
J-48	Zone - 1	True	750.00	760.00	58.7	40.1	40.1
J110	Zone - 1	True	750.00	760.00	63.7	40.5	40.5
J750	Zone - 2	False	750.00	424.33	20.0	40.5	40.5
J470	Zone - 1	True	750.00	760.00	82.5	40.5	40.5
J490	Zone - 1	True	750.00	760.00	73.1	40.6	40.6
J370	Zone - 1	True	750.00	760.00	68.5	40.9	40.9
J380	Zone - 1	True	750.00	760.00	21.6	40.9	40.9
J-40	Zone - 1	True	750.00	760.00	47.7	41.4	41.4

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J440	Zone - 1	True	750.00	760.00	53.1	41.4	41.4
J460	Zone - 1	True	750.00	760.00	48.3	41.4	41.4
J420	Zone - 1	True	750.00	760.00	54.8	41.4	41.4
J-41	Zone - 1	True	750.00	760.00	39.7	41.4	41.4
J910	Zone - 1	True	750.00	760.00	64.9	41.4	41.4
J920	Zone - 1	True	750.00	760.00	55.2	41.4	41.4
J410	Zone - 1	True	750.00	760.00	51.0	41.4	41.4
J400	Zone - 1	True	750.00	760.00	68.8	41.4	41.4
J390	Zone - 1	True	750.00	760.00	78.9	41.4	41.4
J430	Zone - 1	True	750.00	760.00	65.8	41.4	41.4
J-54	Zone - 1	True	750.00	760.00	66.7	41.4	41.4
J130	Zone - 1	True	750.00	760.00	75.7	41.4	41.4
J-49	Zone - 1	True	750.00	760.00	64.8	41.4	41.4
J970	Zone - 1	True	750.00	760.00	57.4	41.4	41.4
J980	Zone - 1	True	750.00	760.00	75.3	41.4	41.4
J150	Zone - 1	True	750.00	760.00	93.3	41.4	41.4
J480	Zone - 1	True	750.00	760.00	90.0	41.4	41.4
J550	Zone - 1	True	750.00	760.00	94.9	41.4	41.4
J570	Zone - 2	True	750.00	760.00	49.8	41.7	41.5
J160	Zone - 1	True	750.00	760.00	68.2	41.5	41.5
J560	Zone - 1	True	750.00	760.00	59.7	41.5	41.5
J450	Zone - 1	True	750.00	760.00	41.3	45.7	41.5
J-55	<None>	True	750.00	760.00	41.5	41.6	41.5
J780	Zone - 1	True	750.00	760.00	105.0	41.5	41.5
J790	Zone - 1	True	750.00	760.00	78.4	41.5	41.5
J800	Zone - 1	True	750.00	760.00	113.6	41.5	41.5
J-8	Zone - 1	True	750.00	760.00	137.4	41.5	41.5
J810	Zone - 1	True	750.00	760.00	137.4	41.5	41.5
J-57	<None>	True	750.00	760.00	41.6	41.6	41.6
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J120	Zone - 1	True	0.00	10.00	84.1	41.9	41.9
J140	Zone - 1	True	0.00	10.00	109.9	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.4	41.9	41.9
J680	Zone - 2	True	0.00	10.00	115.4	44.0	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J770	Zone - 2	True	0.00	10.00	62.7	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J520	Zone - 1	False	750.00	447.33	28.7	20.0	20.0
J720	Zone - 2	False	750.00	606.44	26.5	20.0	20.0
J-52	Zone - 2	False	750.00	606.44	26.4	20.0	20.0
J500	Zone - 1	False	750.00	454.39	46.0	20.0	20.0
J-27	Zone - 2	False	750.00	621.89	23.5	20.0	20.0
J760	Zone - 2	False	750.00	606.44	29.0	20.0	20.0
J-7	Zone - 1	False	750.00	545.13	41.6	20.0	20.0
J740	Zone - 2	False	750.00	494.66	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	606.43	29.0	20.0	20.0
J530	Zone - 1	False	750.00	447.32	40.9	20.0	20.0
J-23	Zone - 2	False	750.00	699.15	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	683.13	45.5	20.0	20.0
J510	Zone - 1	False	750.00	454.39	57.8	20.0	20.0
J-4	Zone - 2	False	750.00	494.65	41.5	20.0	20.0
J730	Zone - 2	False	750.00	555.09	46.0	20.0	20.0
J-28	Zone - 2	False	750.00	621.73	20.8	20.0	20.0
J-30	Zone - 2	False	750.00	586.22	20.5	20.0	20.0
J-10	Zone - 1	True	750.00	752.10	48.2	20.0	20.0
J600	Zone - 2	True	750.00	760.00	39.6	20.4	20.4
J640	Zone - 2	False	750.00	710.94	20.0	20.8	20.8
J630	Zone - 2	False	750.00	710.00	20.0	21.0	21.0
J590	Zone - 2	True	750.00	760.00	29.6	21.5	21.5
J580	Zone - 2	True	750.00	760.00	43.1	21.5	21.5
J-3	Zone - 2	True	750.00	760.00	24.2	21.5	21.5
J-29	Zone - 2	False	750.00	586.59	20.0	21.5	21.5
J650	Zone - 2	True	750.00	760.00	51.8	21.5	21.5
J-38	Zone - 1	True	750.00	760.00	21.8	21.8	21.8
J-36	Zone - 1	True	750.00	760.00	24.6	21.9	21.9
J240	Zone - 1	True	750.00	760.00	22.9	21.9	21.9
J-37	Zone - 1	True	750.00	760.00	32.1	22.1	22.1
J-35	Zone - 1	True	750.00	760.00	21.7	22.2	22.2
J700	Zone - 2	True	750.00	760.00	24.5	22.3	22.3
J260	Zone - 1	True	750.00	760.00	26.6	22.3	22.3
J-2	Zone - 2	False	750.00	683.42	20.0	22.3	22.3
J-14	Zone - 1	True	750.00	760.00	46.6	23.2	23.2
320	Zone - 1	True	750.00	760.00	30.2	23.2	23.2
J850	Zone - 1	True	750.00	760.00	34.7	23.2	23.2
J860	Zone - 1	True	750.00	760.00	48.6	23.2	23.2
J840	Zone - 1	True	750.00	760.00	23.2	23.2	23.2
J-11	Zone - 1	True	750.00	760.00	27.9	23.2	23.2
J890	Zone - 1	True	750.00	760.00	85.2	23.2	23.2
J-34	Zone - 1	True	750.00	760.00	57.9	23.2	23.2
J310	Zone - 1	True	750.00	760.00	42.1	23.2	23.2
J820	Zone - 1	True	750.00	760.00	34.4	23.2	23.2
J880	Zone - 1	True	750.00	760.00	45.0	23.2	23.2

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J300	Zone - 1	True	750.00	760.00	57.2	23.2	23.2
J330	Zone - 1	True	750.00	753.98	20.0	23.7	23.7
J290	Zone - 1	True	750.00	760.00	60.4	24.0	24.0
J280	Zone - 1	True	750.00	760.00	63.2	25.2	25.2
J270	Zone - 1	True	750.00	760.00	58.8	26.0	26.0
J-42	Zone - 1	True	750.00	760.00	63.2	26.0	26.0
J230	Zone - 1	True	750.00	760.00	54.6	30.2	30.2
J710	Zone - 2	False	750.00	684.69	20.0	30.3	30.3
J660	Zone - 2	True	750.00	760.00	58.7	32.0	32.0
J340	Zone - 1	True	750.00	760.00	61.7	32.4	32.4
J250	Zone - 1	False	750.00	654.24	20.0	33.3	33.3
J-50	Zone - 1	True	750.00	760.00	50.0	33.9	33.9
J360	Zone - 1	True	750.00	760.00	63.0	34.0	34.0
J350	Zone - 1	False	750.00	731.09	20.0	34.1	34.1
J220	Zone - 1	True	750.00	760.00	44.1	34.3	34.3
J540	Zone - 1	False	750.00	397.62	20.0	36.3	36.3
J210	Zone - 1	True	750.00	760.00	43.0	37.8	37.8
J670	Zone - 2	True	750.00	760.00	86.9	38.1	38.1
J200	Zone - 1	True	750.00	760.00	54.0	39.9	39.9
J750	Zone - 2	False	750.00	424.33	20.0	40.5	40.5
J570	Zone - 2	True	750.00	760.00	49.8	41.7	41.7
J-40	Zone - 1	True	750.00	760.00	49.2	41.8	41.8
J440	Zone - 1	True	750.00	760.00	54.9	41.8	41.8
J460	Zone - 1	True	750.00	760.00	50.0	41.8	41.8
J-41	Zone - 1	True	750.00	760.00	41.5	41.8	41.8
J420	Zone - 1	True	750.00	760.00	57.4	41.8	41.8
J470	Zone - 1	True	750.00	760.00	84.5	41.8	41.8
J910	Zone - 1	True	750.00	760.00	67.9	41.8	41.8
J920	Zone - 1	True	750.00	760.00	58.3	41.8	41.8
J410	Zone - 1	True	750.00	760.00	54.2	41.8	41.8
J400	Zone - 1	True	750.00	760.00	72.1	41.8	41.8
J430	Zone - 1	True	750.00	760.00	71.6	41.8	41.8
J970	Zone - 1	True	750.00	760.00	63.6	41.8	41.8
J390	Zone - 1	True	750.00	760.00	82.4	41.8	41.8
J980	Zone - 1	True	750.00	760.00	81.8	41.8	41.8
J-49	Zone - 1	True	750.00	760.00	75.6	41.8	41.8
J370	Zone - 1	True	750.00	760.00	72.4	41.8	41.8
J380	Zone - 1	True	750.00	760.00	25.5	41.8	41.8
J150	Zone - 1	True	750.00	760.00	97.1	41.8	41.8
J190	Zone - 1	True	750.00	760.00	52.9	41.8	41.8
J180	Zone - 1	True	750.00	760.00	52.9	41.8	41.8
J490	Zone - 1	True	750.00	760.00	76.5	41.8	41.8
J170	Zone - 1	True	750.00	760.00	47.7	41.8	41.8
J130	Zone - 1	True	750.00	760.00	92.9	41.8	41.8
J-54	Zone - 1	True	750.00	760.00	84.0	41.8	41.8

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J110	Zone - 1	True	750.00	760.00	84.0	41.8	41.8
J-48	Zone - 1	True	750.00	760.00	79.6	41.8	41.8
J100	Zone - 1	True	750.00	760.00	75.3	41.8	41.8
J480	Zone - 1	True	750.00	760.00	92.5	41.8	41.8
J450	Zone - 1	True	750.00	760.00	41.8	46.7	41.8
J80	Zone - 1	True	750.00	760.00	56.2	41.8	41.8
J90	Zone - 1	True	750.00	760.00	45.4	41.8	41.8
J-47	Zone - 1	True	750.00	760.00	64.8	41.8	41.8
J550	Zone - 1	True	750.00	760.00	97.2	41.8	41.8
J60	Zone - 1	True	750.00	760.00	65.1	41.8	41.8
J70	Zone - 1	True	750.00	760.00	31.6	41.8	41.8
J50	Zone - 1	True	750.00	760.00	72.6	41.8	41.8
J-55	<None>	True	750.00	760.00	41.8	41.8	41.8
J-45	Zone - 1	True	750.00	760.00	72.5	41.8	41.8
J20	Zone - 1	True	750.00	760.00	78.0	41.8	41.8
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.8
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.8
J-44	Zone - 1	True	750.00	760.00	80.4	41.8	41.8
J900	Zone - 2	True	750.00	760.00	72.4	43.4	41.8
J690	Zone - 2	True	750.00	760.00	83.3	43.4	41.8
J160	Zone - 1	True	750.00	760.00	70.4	41.8	41.8
J560	Zone - 1	True	750.00	760.00	61.9	41.8	41.8
J10	Zone - 1	True	750.00	760.00	94.6	41.8	41.8
J780	Zone - 1	True	750.00	760.00	107.0	41.8	41.8
J790	Zone - 1	True	750.00	760.00	80.5	41.8	41.8
J800	Zone - 1	True	750.00	760.00	115.6	41.8	41.8
J-8	Zone - 1	True	750.00	760.00	139.4	41.8	41.8
J810	Zone - 1	True	750.00	760.00	139.4	41.8	41.8
J-57	<None>	True	750.00	760.00	41.8	41.9	41.9
J-5	Zone - 1	True	0.00	10.00	41.9	42.1	42.0
J-6	Zone - 1	True	0.00	10.00	83.8	42.1	42.0
J140	Zone - 1	True	0.00	10.00	115.7	42.1	42.0
J120	Zone - 1	True	0.00	10.00	90.6	42.1	42.0
J680	Zone - 2	True	0.00	10.00	115.4	44.0	42.0
J620	Zone - 2	True	0.00	10.00	55.0	44.0	42.0
J770	Zone - 2	True	0.00	10.00	62.7	44.0	42.0

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD +FF CIP

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-10	Zone - 1	False	750.00	726.96	48.2	20.0	20.0
J720	Zone - 2	False	750.00	606.44	26.5	20.0	20.0
J-52	Zone - 2	False	750.00	606.44	26.4	20.0	20.0
J-27	Zone - 2	False	750.00	621.89	23.5	20.0	20.0
J760	Zone - 2	False	750.00	606.44	29.0	20.0	20.0
J740	Zone - 2	False	750.00	494.66	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	606.44	29.0	20.0	20.0
J-23	Zone - 2	False	750.00	699.15	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	683.13	45.5	20.0	20.0
J520	Zone - 1	False	750.00	434.33	28.7	20.0	20.0
J-4	Zone - 2	False	750.00	494.65	41.5	20.0	20.0
J700	Zone - 2	True	750.00	751.34	22.2	20.0	20.0
J-7	Zone - 1	False	750.00	528.13	41.6	20.0	20.0
J530	Zone - 1	False	750.00	434.31	40.9	20.0	20.0
J500	Zone - 1	False	750.00	441.08	46.0	20.0	20.0
J510	Zone - 1	False	750.00	441.06	57.9	20.0	20.0
J-28	Zone - 2	False	750.00	621.73	20.8	20.0	20.0
J-30	Zone - 2	False	750.00	586.23	20.5	20.0	20.0
J730	Zone - 2	False	750.00	554.57	46.0	20.1	20.1
J600	Zone - 2	True	750.00	760.00	39.6	20.4	20.4
J-38	Zone - 1	True	750.00	760.00	20.4	20.5	20.5
J-36	Zone - 1	True	750.00	760.00	23.2	20.5	20.5
J240	Zone - 1	True	750.00	760.00	21.6	20.6	20.6
J-37	Zone - 1	True	750.00	760.00	30.8	20.7	20.7
J260	Zone - 1	True	750.00	760.00	25.1	20.8	20.8
J640	Zone - 2	False	750.00	710.94	20.0	20.8	20.8
J-35	Zone - 1	True	750.00	760.00	20.3	20.9	20.9
J630	Zone - 2	False	750.00	710.00	20.0	21.0	21.0
J-3	Zone - 2	True	750.00	760.00	24.2	21.5	21.5
J580	Zone - 2	True	750.00	760.00	43.1	21.5	21.5
J590	Zone - 2	True	750.00	760.00	29.6	21.5	21.5
J-29	Zone - 2	False	750.00	586.59	20.0	21.5	21.5
J650	Zone - 2	True	750.00	760.00	51.8	21.5	21.5
J880	Zone - 1	True	750.00	760.00	43.6	21.8	21.8
J850	Zone - 1	True	750.00	760.00	33.3	21.8	21.8
J860	Zone - 1	True	750.00	760.00	47.2	21.8	21.8
J890	Zone - 1	True	750.00	760.00	83.8	21.8	21.8
J300	Zone - 1	True	750.00	760.00	55.8	21.8	21.8
J310	Zone - 1	True	750.00	760.00	40.7	21.8	21.8
J-34	Zone - 1	True	750.00	760.00	56.6	21.8	21.8
J840	Zone - 1	True	750.00	760.00	21.8	21.8	21.8
J-11	Zone - 1	True	750.00	760.00	26.5	21.8	21.8
J-14	Zone - 1	True	750.00	760.00	45.2	21.8	21.8
J820	Zone - 1	True	750.00	760.00	33.0	21.8	21.8
320	Zone - 1	True	750.00	760.00	28.8	21.8	21.8

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD +FF CIP

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-2	Zone - 2	False	750.00	683.42	20.0	22.3	22.3
J290	Zone - 1	True	750.00	760.00	59.0	22.6	22.6
J330	Zone - 1	False	750.00	744.70	20.1	23.0	23.0
J280	Zone - 1	True	750.00	760.00	61.7	23.8	23.8
J270	Zone - 1	True	750.00	760.00	57.3	24.6	24.6
J-42	Zone - 1	True	750.00	760.00	61.7	24.6	24.6
J230	Zone - 1	True	750.00	760.00	53.7	29.2	29.2
J710	Zone - 2	False	750.00	684.69	20.0	30.3	30.3
J340	Zone - 1	True	750.00	760.00	60.1	30.9	30.9
J660	Zone - 2	True	750.00	760.00	58.7	32.0	32.0
J360	Zone - 1	True	750.00	760.00	61.4	32.4	32.4
J250	Zone - 1	False	750.00	646.05	20.0	32.5	32.5
J-50	Zone - 1	True	750.00	760.00	49.5	33.0	33.0
J350	Zone - 1	False	750.00	720.77	20.0	33.2	33.2
J220	Zone - 1	True	750.00	760.00	43.6	33.3	33.3
J540	Zone - 1	False	750.00	386.64	20.0	35.9	35.9
J210	Zone - 1	True	750.00	760.00	42.8	37.0	37.0
J670	Zone - 2	True	750.00	760.00	86.9	38.1	38.1
J570	Zone - 2	True	750.00	760.00	46.0	38.6	38.6
J790	Zone - 1	True	750.00	760.00	53.3	39.3	39.3
J780	Zone - 1	True	750.00	760.00	79.9	39.3	39.3
J800	Zone - 1	True	750.00	760.00	87.3	39.3	39.3
J810	Zone - 1	True	750.00	760.00	109.8	39.3	39.3
J-8	Zone - 1	True	750.00	760.00	110.1	39.3	39.3
J200	Zone - 1	True	750.00	760.00	54.2	39.3	39.3
J160	Zone - 1	True	750.00	760.00	48.0	39.4	39.4
J750	Zone - 2	False	750.00	424.34	20.0	40.5	40.5
J470	Zone - 1	True	750.00	760.00	82.6	40.8	40.8
J490	Zone - 1	True	750.00	760.00	74.0	41.5	41.5
J-40	Zone - 1	True	750.00	760.00	48.0	41.5	41.5
J440	Zone - 1	True	750.00	760.00	53.6	41.5	41.5
J460	Zone - 1	True	750.00	760.00	48.8	41.5	41.5
J-41	Zone - 1	True	750.00	760.00	39.9	41.5	41.5
J420	Zone - 1	True	750.00	760.00	56.2	41.5	41.5
J910	Zone - 1	True	750.00	760.00	66.4	41.5	41.5
J920	Zone - 1	True	750.00	760.00	56.8	41.5	41.5
J480	Zone - 1	True	750.00	760.00	89.2	41.5	41.5
J410	Zone - 1	True	750.00	760.00	52.6	41.5	41.5
J550	Zone - 1	True	750.00	760.00	86.8	41.5	41.5
J150	Zone - 1	True	750.00	760.00	97.8	41.5	41.5
J560	Zone - 1	True	750.00	760.00	39.3	41.5	41.5
J400	Zone - 1	True	750.00	760.00	70.4	41.5	41.5
J390	Zone - 1	True	750.00	760.00	80.6	41.5	41.5
J370	Zone - 1	True	750.00	760.00	70.2	41.5	41.5
J380	Zone - 1	True	750.00	760.00	23.3	41.5	41.5

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD +FF CIP

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J430	Zone - 1	True	750.00	760.00	71.7	41.5	41.5
J970	Zone - 1	True	750.00	760.00	63.9	41.5	41.5
J980	Zone - 1	True	750.00	760.00	82.5	41.5	41.5
J-49	Zone - 1	True	750.00	760.00	78.2	41.5	41.5
J180	Zone - 1	True	750.00	760.00	53.5	41.5	41.5
J190	Zone - 1	True	750.00	760.00	53.4	41.5	41.5
J170	Zone - 1	True	750.00	760.00	48.7	41.5	41.5
J130	Zone - 1	True	750.00	760.00	96.4	41.5	41.5
J-54	Zone - 1	True	750.00	760.00	87.4	41.5	41.5
J110	Zone - 1	True	750.00	760.00	87.5	41.5	41.5
J-48	Zone - 1	True	750.00	760.00	83.2	41.5	41.5
J100	Zone - 1	True	750.00	760.00	78.8	41.5	41.5
J80	Zone - 1	True	750.00	760.00	64.4	41.5	41.5
J90	Zone - 1	True	750.00	760.00	53.6	41.5	41.5
J-47	Zone - 1	True	750.00	760.00	73.6	41.5	41.5
J60	Zone - 1	True	750.00	760.00	74.6	41.5	41.5
J70	Zone - 1	True	750.00	760.00	41.1	41.5	41.5
J50	Zone - 1	True	750.00	760.00	82.9	41.5	41.5
J690	Zone - 2	True	750.00	760.00	83.3	43.4	41.5
J900	Zone - 2	True	750.00	760.00	72.4	43.4	41.5
J-45	Zone - 1	True	750.00	760.00	83.4	41.5	41.5
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.5
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.5
J20	Zone - 1	True	750.00	760.00	90.3	41.5	41.5
J-44	Zone - 1	True	750.00	760.00	92.7	41.5	41.5
J10	Zone - 1	True	750.00	760.00	106.9	41.5	41.5
J450	Zone - 1	True	750.00	760.00	41.5	45.8	41.6
J-55	<None>	True	750.00	760.00	41.6	41.7	41.6
J-57	<None>	True	750.00	760.00	41.7	41.7	41.7
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.5	41.9	41.9
J770	Zone - 2	True	0.00	10.00	62.7	44.0	41.9
J140	Zone - 1	True	0.00	10.00	112.3	41.9	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J120	Zone - 1	True	0.00	10.00	86.9	41.9	41.9
J680	Zone - 2	True	0.00	10.00	115.4	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD +FF CIP

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-37	Zone - 1	False	750.00	747.86	30.1	20.0	20.0
J240	Zone - 1	False	750.00	745.68	21.0	20.0	20.0
J-10	Zone - 1	False	750.00	735.54	48.2	20.0	20.0
J-36	Zone - 1	False	750.00	745.53	22.7	20.0	20.0
J-27	Zone - 2	False	750.00	621.89	23.5	20.0	20.0
J-52	Zone - 2	False	750.00	606.44	26.4	20.0	20.0
J720	Zone - 2	False	750.00	606.44	26.5	20.0	20.0
J760	Zone - 2	False	750.00	606.44	29.0	20.0	20.0
J740	Zone - 2	False	750.00	494.66	28.7	20.0	20.0
J520	Zone - 1	False	750.00	438.26	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	606.43	29.0	20.0	20.0
J-23	Zone - 2	False	750.00	699.15	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	683.13	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	494.65	41.5	20.0	20.0
J-7	Zone - 1	False	750.00	533.45	41.6	20.0	20.0
J530	Zone - 1	False	750.00	438.25	40.9	20.0	20.0
J500	Zone - 1	False	750.00	445.13	46.0	20.0	20.0
J730	Zone - 2	False	750.00	555.09	46.0	20.0	20.0
J510	Zone - 1	False	750.00	445.12	57.9	20.0	20.0
J-28	Zone - 2	False	750.00	621.73	20.8	20.0	20.0
J-30	Zone - 2	False	750.00	586.22	20.5	20.0	20.0
J820	Zone - 1	True	750.00	760.00	31.4	20.1	20.1
J860	Zone - 1	True	750.00	760.00	45.5	20.1	20.1
J890	Zone - 1	True	750.00	760.00	82.2	20.1	20.1
J850	Zone - 1	True	750.00	760.00	31.6	20.1	20.1
J880	Zone - 1	True	750.00	760.00	41.9	20.1	20.1
J-11	Zone - 1	True	750.00	760.00	24.9	20.1	20.1
J-34	Zone - 1	True	750.00	760.00	54.9	20.1	20.1
J300	Zone - 1	True	750.00	760.00	54.2	20.1	20.1
J-14	Zone - 1	True	750.00	760.00	43.5	20.1	20.1
J840	Zone - 1	True	750.00	760.00	20.2	20.1	20.1
320	Zone - 1	True	750.00	760.00	27.2	20.1	20.1
J310	Zone - 1	True	750.00	760.00	39.0	20.1	20.1
J260	Zone - 1	True	750.00	755.47	24.4	20.1	20.1
J-38	Zone - 1	False	750.00	744.03	20.0	20.1	20.1
J600	Zone - 2	True	750.00	760.00	39.6	20.4	20.4
J-35	Zone - 1	False	750.00	743.09	20.0	20.6	20.6
J640	Zone - 2	False	750.00	710.94	20.0	20.8	20.8
J290	Zone - 1	True	750.00	760.00	57.4	20.9	20.9
J630	Zone - 2	False	750.00	710.01	20.0	20.9	20.9
J-3	Zone - 2	True	750.00	760.00	24.2	21.5	21.5
J580	Zone - 2	True	750.00	760.00	43.1	21.5	21.5
J590	Zone - 2	True	750.00	760.00	29.6	21.5	21.5
J-29	Zone - 2	False	750.00	586.59	20.0	21.5	21.5
J650	Zone - 2	True	750.00	760.00	51.8	21.5	21.5

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD +FF CIP

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J280	Zone - 1	True	750.00	760.00	60.2	22.1	22.1
J330	Zone - 1	False	750.00	734.81	20.0	22.1	22.1
J700	Zone - 2	True	750.00	760.00	24.5	22.3	22.3
J-2	Zone - 2	False	750.00	683.42	20.0	22.3	22.3
J270	Zone - 1	True	750.00	760.00	55.9	22.9	22.9
J-42	Zone - 1	True	750.00	760.00	60.3	22.9	22.9
J230	Zone - 1	True	750.00	760.00	50.8	27.2	27.2
J340	Zone - 1	True	750.00	760.00	59.2	29.5	29.5
J710	Zone - 2	False	750.00	684.69	20.0	30.3	30.3
J-50	Zone - 1	True	750.00	760.00	46.0	30.9	30.9
J360	Zone - 1	True	750.00	760.00	60.7	31.1	31.1
J220	Zone - 1	True	750.00	760.00	40.1	31.2	31.2
J250	Zone - 1	False	750.00	639.54	20.0	31.6	31.6
J660	Zone - 2	True	750.00	760.00	58.7	32.0	32.0
J350	Zone - 1	False	750.00	715.74	20.0	32.1	32.1
J210	Zone - 1	True	750.00	760.00	38.7	34.7	34.7
J540	Zone - 1	False	750.00	389.82	20.0	36.0	36.0
J200	Zone - 1	True	750.00	760.00	49.6	36.8	36.8
J670	Zone - 2	True	750.00	760.00	86.9	38.1	38.1
J180	Zone - 1	True	750.00	760.00	48.3	39.3	39.3
J190	Zone - 1	True	750.00	760.00	48.3	39.3	39.3
J750	Zone - 2	False	750.00	424.33	20.0	40.5	40.5
J470	Zone - 1	True	750.00	760.00	83.2	41.1	41.1
J-40	Zone - 1	True	750.00	760.00	48.1	41.4	41.4
J440	Zone - 1	True	750.00	760.00	53.7	41.4	41.4
J460	Zone - 1	True	750.00	760.00	48.8	41.4	41.4
J420	Zone - 1	True	750.00	760.00	55.8	41.4	41.4
J910	Zone - 1	True	750.00	760.00	66.2	41.4	41.4
J920	Zone - 1	True	750.00	760.00	56.6	41.4	41.4
J-41	Zone - 1	True	750.00	760.00	40.3	41.4	41.4
J410	Zone - 1	True	750.00	760.00	52.5	41.4	41.4
J170	Zone - 1	True	750.00	760.00	43.0	41.4	41.4
J430	Zone - 1	True	750.00	760.00	69.7	41.4	41.4
J20	Zone - 1	True	750.00	760.00	63.5	41.4	41.4
J10	Zone - 1	True	750.00	760.00	73.1	41.4	41.4
J50	Zone - 1	True	750.00	760.00	63.1	41.4	41.4
J60	Zone - 1	True	750.00	760.00	56.8	41.4	41.4
J70	Zone - 1	True	750.00	760.00	23.3	41.4	41.4
J80	Zone - 1	True	750.00	760.00	49.5	41.4	41.4
J90	Zone - 1	True	750.00	760.00	38.7	41.4	41.4
J100	Zone - 1	True	750.00	760.00	70.5	41.4	41.4
J-44	Zone - 1	True	750.00	760.00	64.4	41.4	41.4
J-45	Zone - 1	True	750.00	760.00	61.8	41.4	41.4
J-47	Zone - 1	True	750.00	760.00	57.5	41.4	41.4
J-48	Zone - 1	True	750.00	760.00	75.3	41.4	41.4

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD +FF CIP

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J110	Zone - 1	True	750.00	760.00	79.8	41.4	41.4
J130	Zone - 1	True	750.00	760.00	89.8	41.4	41.4
J-54	Zone - 1	True	750.00	760.00	80.9	41.4	41.4
J970	Zone - 1	True	750.00	760.00	61.7	41.4	41.4
J-49	Zone - 1	True	750.00	760.00	74.0	41.4	41.4
J980	Zone - 1	True	750.00	760.00	80.0	41.4	41.4
J400	Zone - 1	True	750.00	760.00	70.3	41.4	41.4
J390	Zone - 1	True	750.00	760.00	80.6	41.4	41.4
J150	Zone - 1	True	750.00	760.00	96.8	41.4	41.4
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.4
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.4
J370	Zone - 1	True	750.00	760.00	70.5	41.4	41.4
J380	Zone - 1	True	750.00	760.00	23.6	41.4	41.4
J490	Zone - 1	True	750.00	760.00	74.8	41.4	41.4
J480	Zone - 1	True	750.00	760.00	91.1	41.4	41.4
J900	Zone - 2	True	750.00	760.00	72.4	43.4	41.4
J690	Zone - 2	True	750.00	760.00	83.3	43.4	41.5
J550	Zone - 1	True	750.00	760.00	95.9	41.5	41.5
J570	Zone - 2	True	750.00	760.00	49.8	41.7	41.5
J160	Zone - 1	True	750.00	760.00	70.3	41.5	41.5
J560	Zone - 1	True	750.00	760.00	61.8	41.5	41.5
J450	Zone - 1	True	750.00	760.00	41.4	45.8	41.5
J780	Zone - 1	True	750.00	760.00	107.1	41.5	41.5
J790	Zone - 1	True	750.00	760.00	80.6	41.5	41.5
J-55	<None>	True	750.00	760.00	41.5	41.6	41.5
J800	Zone - 1	True	750.00	760.00	115.8	41.5	41.5
J-8	Zone - 1	True	750.00	760.00	139.6	41.5	41.5
J810	Zone - 1	True	750.00	760.00	139.6	41.5	41.5
J-57	<None>	True	750.00	760.00	41.6	41.6	41.6
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J120	Zone - 1	True	0.00	10.00	84.6	41.9	41.9
J140	Zone - 1	True	0.00	10.00	110.4	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.5	41.9	41.9
J680	Zone - 2	True	0.00	10.00	115.4	44.0	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J770	Zone - 2	True	0.00	10.00	62.7	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD +FF CIP

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-37	Zone - 1	False	750.00	744.55	30.1	20.0	20.0
J240	Zone - 1	False	750.00	742.39	21.0	20.0	20.0
J-10	Zone - 1	False	750.00	731.83	48.2	20.0	20.0
J-36	Zone - 1	False	750.00	742.24	22.8	20.0	20.0
J-27	Zone - 2	False	750.00	621.89	23.5	20.0	20.0
J-52	Zone - 2	False	750.00	606.44	26.4	20.0	20.0
J720	Zone - 2	False	750.00	606.44	26.5	20.0	20.0
J760	Zone - 2	False	750.00	606.44	29.0	20.0	20.0
J740	Zone - 2	False	750.00	494.66	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	606.43	29.0	20.0	20.0
J-23	Zone - 2	False	750.00	699.15	49.9	20.0	20.0
J520	Zone - 1	False	750.00	436.72	28.7	20.0	20.0
J-26	Zone - 2	False	750.00	683.13	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	494.65	41.5	20.0	20.0
J-7	Zone - 1	False	750.00	531.26	41.6	20.0	20.0
J530	Zone - 1	False	750.00	436.71	40.9	20.0	20.0
J730	Zone - 2	False	750.00	555.09	46.0	20.0	20.0
J500	Zone - 1	False	750.00	443.54	46.0	20.0	20.0
J510	Zone - 1	False	750.00	443.53	57.9	20.0	20.0
J-28	Zone - 2	False	750.00	621.73	20.8	20.0	20.0
J-30	Zone - 2	False	750.00	586.23	20.5	20.0	20.0
J-11	Zone - 1	True	750.00	756.81	25.0	20.0	20.0
J-34	Zone - 1	True	750.00	756.81	54.9	20.0	20.0
J-14	Zone - 1	True	750.00	756.81	43.6	20.0	20.0
320	Zone - 1	True	750.00	756.80	27.3	20.0	20.0
J300	Zone - 1	True	750.00	756.80	54.2	20.0	20.0
J890	Zone - 1	True	750.00	756.80	82.4	20.0	20.0
J850	Zone - 1	True	750.00	756.80	31.9	20.0	20.0
J820	Zone - 1	True	750.00	756.80	31.6	20.0	20.0
J880	Zone - 1	True	750.00	756.80	42.2	20.0	20.0
J860	Zone - 1	True	750.00	756.80	45.8	20.0	20.0
J310	Zone - 1	True	750.00	756.80	39.2	20.0	20.0
J840	Zone - 1	True	750.00	756.74	20.4	20.0	20.0
J-38	Zone - 1	False	750.00	741.12	20.0	20.1	20.1
J260	Zone - 1	True	750.00	753.58	24.4	20.1	20.1
J600	Zone - 2	True	750.00	760.00	39.6	20.4	20.4
J-35	Zone - 1	False	750.00	739.82	20.0	20.6	20.6
J290	Zone - 1	True	750.00	760.00	57.2	20.6	20.6
J640	Zone - 2	False	750.00	710.94	20.0	20.8	20.8
J630	Zone - 2	False	750.00	710.01	20.0	20.9	20.9
J590	Zone - 2	True	750.00	760.00	29.6	21.5	21.5
J580	Zone - 2	True	750.00	760.00	43.1	21.5	21.5
J-3	Zone - 2	True	750.00	760.00	24.2	21.5	21.5
J-29	Zone - 2	False	750.00	586.59	20.0	21.5	21.5
J650	Zone - 2	True	750.00	760.00	51.8	21.5	21.5

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD +FF CIP

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J280	Zone - 1	True	750.00	760.00	60.0	21.8	21.8
J330	Zone - 1	False	750.00	732.99	20.0	22.0	22.0
J700	Zone - 2	True	750.00	760.00	24.5	22.3	22.3
J-2	Zone - 2	False	750.00	683.42	20.0	22.3	22.3
J270	Zone - 1	True	750.00	760.00	55.6	22.6	22.6
J-42	Zone - 1	True	750.00	760.00	60.0	22.6	22.6
J230	Zone - 1	True	750.00	760.00	50.6	26.9	26.9
J340	Zone - 1	True	750.00	760.00	58.9	29.2	29.2
J710	Zone - 2	False	750.00	684.69	20.0	30.3	30.3
J-50	Zone - 1	True	750.00	760.00	45.8	30.6	30.6
J360	Zone - 1	True	750.00	760.00	60.3	30.8	30.8
J220	Zone - 1	True	750.00	760.00	39.8	30.9	30.9
J250	Zone - 1	False	750.00	638.08	20.0	31.4	31.4
J350	Zone - 1	False	750.00	713.88	20.0	32.0	32.0
J660	Zone - 2	True	750.00	760.00	58.7	32.0	32.0
J210	Zone - 1	True	750.00	760.00	38.4	34.4	34.4
J540	Zone - 1	False	750.00	388.59	20.0	36.0	36.0
J200	Zone - 1	True	750.00	760.00	49.4	36.6	36.6
J670	Zone - 2	True	750.00	760.00	86.9	38.1	38.1
J180	Zone - 1	True	750.00	760.00	48.1	39.0	39.0
J190	Zone - 1	True	750.00	760.00	48.1	39.0	39.0
J750	Zone - 2	False	750.00	424.33	20.0	40.5	40.5
J470	Zone - 1	True	750.00	760.00	83.0	40.9	40.9
J170	Zone - 1	True	750.00	760.00	42.8	41.3	41.3
J-40	Zone - 1	True	750.00	760.00	48.0	41.4	41.4
J440	Zone - 1	True	750.00	760.00	53.5	41.4	41.4
J460	Zone - 1	True	750.00	760.00	48.7	41.4	41.4
J420	Zone - 1	True	750.00	760.00	55.7	41.4	41.4
J-41	Zone - 1	True	750.00	760.00	40.1	41.4	41.4
J920	Zone - 1	True	750.00	760.00	56.4	41.4	41.4
J910	Zone - 1	True	750.00	760.00	66.0	41.4	41.4
J430	Zone - 1	True	750.00	760.00	69.5	41.4	41.4
J410	Zone - 1	True	750.00	760.00	52.2	41.4	41.4
J970	Zone - 1	True	750.00	760.00	61.5	41.4	41.4
J10	Zone - 1	True	750.00	760.00	72.8	41.4	41.4
J20	Zone - 1	True	750.00	760.00	63.3	41.4	41.4
J60	Zone - 1	True	750.00	760.00	56.6	41.4	41.4
J70	Zone - 1	True	750.00	760.00	23.0	41.4	41.4
J80	Zone - 1	True	750.00	760.00	49.2	41.4	41.4
J100	Zone - 1	True	750.00	760.00	70.3	41.4	41.4
J-45	Zone - 1	True	750.00	760.00	61.5	41.4	41.4
J50	Zone - 1	True	750.00	760.00	62.9	41.4	41.4
J90	Zone - 1	True	750.00	760.00	38.5	41.4	41.4
J-44	Zone - 1	True	750.00	760.00	64.1	41.4	41.4
J-47	Zone - 1	True	750.00	760.00	57.2	41.4	41.4

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2023 MDD +FF CIP

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-48	Zone - 1	True	750.00	760.00	75.0	41.4	41.4
J110	Zone - 1	True	750.00	760.00	79.6	41.4	41.4
J130	Zone - 1	True	750.00	760.00	89.6	41.4	41.4
J-54	Zone - 1	True	750.00	760.00	80.7	41.4	41.4
J-49	Zone - 1	True	750.00	760.00	73.8	41.4	41.4
J980	Zone - 1	True	750.00	760.00	79.8	41.4	41.4
J400	Zone - 1	True	750.00	760.00	70.1	41.4	41.4
J150	Zone - 1	True	750.00	760.00	96.5	41.4	41.4
J390	Zone - 1	True	750.00	760.00	80.4	41.4	41.4
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.4
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.4
J370	Zone - 1	True	750.00	760.00	70.2	41.4	41.4
J380	Zone - 1	True	750.00	760.00	23.3	41.4	41.4
J490	Zone - 1	True	750.00	760.00	74.4	41.4	41.4
J480	Zone - 1	True	750.00	760.00	90.7	41.4	41.4
J900	Zone - 2	True	750.00	760.00	72.4	43.4	41.4
J690	Zone - 2	True	750.00	760.00	83.3	43.4	41.4
J550	Zone - 1	True	750.00	760.00	95.6	41.4	41.4
J570	Zone - 2	True	750.00	760.00	49.8	41.7	41.5
J160	Zone - 1	True	750.00	760.00	69.1	41.5	41.5
J560	Zone - 1	True	750.00	760.00	60.6	41.5	41.5
J450	Zone - 1	True	750.00	760.00	41.3	45.7	41.5
J-55	<None>	True	750.00	760.00	41.5	41.6	41.5
J780	Zone - 1	True	750.00	760.00	105.8	41.5	41.5
J790	Zone - 1	True	750.00	760.00	79.3	41.5	41.5
J800	Zone - 1	True	750.00	760.00	114.4	41.5	41.5
J-8	Zone - 1	True	750.00	760.00	138.2	41.5	41.5
J810	Zone - 1	True	750.00	760.00	138.2	41.5	41.5
J-57	<None>	True	750.00	760.00	41.6	41.6	41.6
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J120	Zone - 1	True	0.00	10.00	84.6	41.9	41.9
J140	Zone - 1	True	0.00	10.00	110.3	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.4	41.9	41.9
J680	Zone - 2	True	0.00	10.00	115.4	44.0	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J770	Zone - 2	True	0.00	10.00	62.7	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J860	Zone - 1	True	750.00	760.00	46.6	21.2	21.2
J-11	Zone - 1	True	750.00	760.00	26.0	21.3	21.3
J310	Zone - 1	True	750.00	760.00	40.1	21.3	21.3
J-28	Zone - 2	False	750.00	619.69	20.7	20.0	20.0
J260	Zone - 1	True	750.00	760.00	24.6	20.3	20.3
J-14	Zone - 1	True	750.00	760.00	44.6	21.3	21.3
J880	Zone - 1	True	750.00	760.00	43.0	21.2	21.2
320	Zone - 1	True	750.00	760.00	28.3	21.3	21.3
J820	Zone - 1	True	750.00	760.00	32.4	21.3	21.3
J300	Zone - 1	True	750.00	760.00	55.3	21.3	21.3
J890	Zone - 1	True	750.00	760.00	83.2	21.2	21.2
J850	Zone - 1	True	750.00	760.00	32.7	21.2	21.2
J-34	Zone - 1	True	750.00	760.00	56.0	21.3	21.3
J240	Zone - 1	True	750.00	760.00	21.1	20.0	20.0
J-10	Zone - 1	False	750.00	723.65	48.2	20.0	20.0
J-27	Zone - 2	False	750.00	619.68	23.5	20.0	20.0
J720	Zone - 2	False	750.00	605.09	26.5	20.0	20.0
J-37	Zone - 1	True	750.00	760.00	30.2	20.2	20.2
J-52	Zone - 2	False	750.00	605.09	26.4	20.0	20.0
J-36	Zone - 1	True	750.00	760.00	22.7	20.0	20.0
J760	Zone - 2	False	750.00	605.09	29.0	20.0	20.0
J740	Zone - 2	False	750.00	493.60	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	605.09	29.0	20.0	20.0
J520	Zone - 1	False	750.00	432.51	28.7	20.0	20.0
J-23	Zone - 2	False	750.00	696.68	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	680.72	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	493.59	41.5	20.0	20.0
J530	Zone - 1	False	750.00	432.50	40.9	20.0	20.0
J-7	Zone - 1	False	750.00	525.87	41.6	20.0	20.0
J730	Zone - 2	False	750.00	553.36	46.0	20.1	20.1
J500	Zone - 1	False	750.00	439.23	46.0	20.0	20.0
J510	Zone - 1	False	750.00	439.21	57.9	20.0	20.0
J290	Zone - 1	True	750.00	760.00	58.5	22.1	22.1
J840	Zone - 1	True	750.00	760.00	21.2	21.3	21.3
J-30	Zone - 2	False	750.00	584.18	20.5	20.0	20.0
J-38	Zone - 1	True	750.00	758.68	20.0	20.1	20.1
J600	Zone - 2	True	750.00	760.00	39.4	20.2	20.2
J-35	Zone - 1	True	750.00	757.73	20.0	20.5	20.5
J640	Zone - 2	False	750.00	708.91	20.0	20.8	20.8
J630	Zone - 2	False	750.00	707.96	20.0	20.9	20.9
J280	Zone - 1	True	750.00	760.00	61.2	23.2	23.2
J590	Zone - 2	True	750.00	760.00	29.4	21.3	21.3
J580	Zone - 2	True	750.00	760.00	42.9	21.3	21.3
J-3	Zone - 2	True	750.00	760.00	24.0	21.3	21.3
J650	Zone - 2	True	750.00	760.00	51.6	21.3	21.3

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-29	Zone - 2	False	750.00	584.52	20.0	21.5	21.5
J330	Zone - 1	False	750.00	741.40	20.0	22.8	22.8
J-42	Zone - 1	True	750.00	760.00	61.2	24.1	24.1
J270	Zone - 1	True	750.00	760.00	56.8	24.1	24.1
J700	Zone - 2	False	750.00	748.79	22.2	20.0	20.0
J-2	Zone - 2	False	750.00	681.62	20.0	22.3	22.3
J230	Zone - 1	True	750.00	760.00	53.3	28.6	28.6
J340	Zone - 1	True	750.00	760.00	59.6	30.4	30.4
J-50	Zone - 1	True	750.00	760.00	49.1	32.5	32.5
J360	Zone - 1	True	750.00	760.00	60.9	31.9	31.9
J710	Zone - 2	False	750.00	683.67	20.0	30.3	30.3
J220	Zone - 1	True	750.00	760.00	43.2	32.9	32.9
J250	Zone - 1	False	750.00	643.28	20.0	32.2	32.2
J350	Zone - 1	False	750.00	717.94	20.0	32.9	32.9
J660	Zone - 2	True	750.00	760.00	58.6	31.8	31.8
J210	Zone - 1	True	750.00	760.00	42.5	36.6	36.6
J540	Zone - 1	False	750.00	385.11	20.0	35.9	35.9
J200	Zone - 1	True	750.00	760.00	53.8	38.8	38.8
J670	Zone - 2	True	750.00	760.00	86.8	38.0	38.0
J190	Zone - 1	True	750.00	760.00	53.1	41.5	41.5
J180	Zone - 1	True	750.00	760.00	53.2	41.5	41.5
J750	Zone - 2	False	750.00	423.50	20.0	40.5	40.5
J470	Zone - 1	True	750.00	760.00	82.4	40.7	40.7
J170	Zone - 1	True	750.00	760.00	48.5	41.5	41.5
J-40	Zone - 1	True	750.00	760.00	48.0	41.5	41.5
J440	Zone - 1	True	750.00	760.00	53.5	41.5	41.5
J460	Zone - 1	True	750.00	760.00	48.7	41.5	41.5
J420	Zone - 1	True	750.00	760.00	56.1	41.5	41.5
J-41	Zone - 1	True	750.00	760.00	39.8	41.5	41.5
J920	Zone - 1	True	750.00	760.00	56.6	41.5	41.5
J910	Zone - 1	True	750.00	760.00	66.3	41.5	41.5
J430	Zone - 1	True	750.00	760.00	71.6	41.5	41.5
J970	Zone - 1	True	750.00	760.00	63.8	41.5	41.5
J410	Zone - 1	True	750.00	760.00	52.4	41.5	41.5
J20	Zone - 1	True	750.00	760.00	90.1	41.5	41.5
J50	Zone - 1	True	750.00	760.00	82.7	41.5	41.5
J90	Zone - 1	True	750.00	760.00	53.4	41.5	41.5
J100	Zone - 1	True	750.00	760.00	78.6	41.5	41.5
J-44	Zone - 1	True	750.00	760.00	92.5	41.5	41.5
J-47	Zone - 1	True	750.00	760.00	73.4	41.5	41.5
J10	Zone - 1	True	750.00	760.00	106.7	41.5	41.5
J60	Zone - 1	True	750.00	760.00	74.4	41.5	41.5
J70	Zone - 1	True	750.00	760.00	40.9	41.5	41.5
J80	Zone - 1	True	750.00	760.00	64.2	41.5	41.5
J-45	Zone - 1	True	750.00	760.00	83.2	41.5	41.5

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-48	Zone - 1	True	750.00	760.00	83.0	41.5	41.5
J110	Zone - 1	True	750.00	760.00	87.4	41.5	41.5
J130	Zone - 1	True	750.00	760.00	96.2	41.5	41.5
J-54	Zone - 1	True	750.00	760.00	87.3	41.5	41.5
J-49	Zone - 1	True	750.00	760.00	78.0	41.5	41.5
J980	Zone - 1	True	750.00	760.00	82.4	41.5	41.5
J400	Zone - 1	True	750.00	760.00	70.2	41.5	41.5
J150	Zone - 1	True	750.00	760.00	97.7	41.5	41.5
J390	Zone - 1	True	750.00	760.00	80.3	41.5	41.5
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.5
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.5
J370	Zone - 1	True	750.00	760.00	69.9	41.5	41.5
J380	Zone - 1	True	750.00	760.00	23.0	41.5	41.5
J490	Zone - 1	True	750.00	760.00	73.7	41.2	41.2
J480	Zone - 1	True	750.00	760.00	89.0	41.5	41.5
J900	Zone - 2	True	750.00	760.00	72.4	43.4	41.5
J690	Zone - 2	True	750.00	760.00	83.3	43.4	41.5
J550	Zone - 1	True	750.00	760.00	86.5	41.5	41.5
J570	Zone - 2	True	750.00	760.00	45.7	38.3	38.3
J160	Zone - 1	True	750.00	760.00	47.6	39.1	39.1
J560	Zone - 1	True	750.00	760.00	38.9	41.5	41.5
J450	Zone - 1	True	750.00	760.00	41.5	45.8	41.6
J-55	<None>	True	750.00	760.00	41.6	41.7	41.6
J780	Zone - 1	True	750.00	760.00	79.5	38.9	38.9
J790	Zone - 1	True	750.00	760.00	52.9	38.9	38.9
J800	Zone - 1	True	750.00	760.00	86.9	38.9	38.9
J-8	Zone - 1	True	750.00	760.00	109.7	38.9	38.9
J810	Zone - 1	True	750.00	760.00	109.4	38.9	38.9
J-57	<None>	True	750.00	760.00	41.7	41.7	41.7
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J120	Zone - 1	True	0.00	10.00	86.9	41.9	41.9
J140	Zone - 1	True	0.00	10.00	112.3	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.5	41.9	41.9
J680	Zone - 2	True	0.00	10.00	115.4	44.0	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J770	Zone - 2	True	0.00	10.00	62.6	44.0	41.9

FlexTable: Junction Table

Active Scenario: 2023 PHD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
476	J-15	542.00	Zone - 1	(N/A)	(N/A)	(N/A)
477	J-16	534.00	Zone - 1	(N/A)	(N/A)	(N/A)
478	J-17	480.00	Zone - 1	(N/A)	(N/A)	(N/A)
479	J-18	470.00	Zone - 1	(N/A)	(N/A)	(N/A)
480	J-19	462.00	Zone - 1	(N/A)	(N/A)	(N/A)
481	J-20	415.00	Zone - 1	(N/A)	(N/A)	(N/A)
368	J-5	670.00	Zone - 1	41.8	4.40	766.60
170	J450	670.00	Zone - 1	41.8	4.40	766.67
6964	J-55	670.00	<None>	41.8	0.00	766.69
6966	J-57	670.00	<None>	41.8	0.00	766.71
128	J30	545.00	Zone - 2	44.0	5.29	646.71
532	J-41	660.00	Zone - 1	46.0	0.00	766.25
504	J-29	536.00	Zone - 2	47.0	13.34	644.54
502	J-28	533.00	Zone - 2	48.3	0.00	644.56
506	J-30	532.50	Zone - 2	48.5	13.34	644.54
529	J-40	650.00	Zone - 1	50.3	0.00	766.26
500	J-27	528.00	Zone - 2	50.4	13.34	644.56
518	J-35	633.00	Zone - 1	53.7	0.00	757.20
188	J630	520.00	Zone - 2	54.0	5.82	644.71
189	J640	520.00	Zone - 2	54.0	5.82	644.73
525	J-38	632.00	Zone - 1	54.2	20.00	757.19
149	J240	630.00	Zone - 1	55.0	6.62	757.20
187	J620	515.00	Zone - 2	56.1	0.00	644.66
362	J-2	515.00	Zone - 2	56.1	5.82	644.73
182	J570	515.00	Zone - 2	56.4	4.40	645.26
169	J440	635.00	Zone - 1	56.7	4.40	766.08
520	J-36	625.00	Zone - 1	57.2	20.00	757.19
179	J540	630.00	Zone - 1	57.7	4.45	763.29
167	J420	625.00	Zone - 1	60.7	4.40	765.39
129	J40	500.00	Zone - 2	63.5	5.29	646.70
522	J-37	609.00	Zone - 1	64.1	20.00	757.19
142	J170	610.00	Zone - 1	64.2	5.29	758.30
133	J80	605.00	Zone - 1	65.8	5.29	757.08
202	J770	490.00	Zone - 2	65.9	5.82	642.22
177	J520	610.00	Zone - 1	66.3	4.45	763.29
221	J970	610.00	Zone - 1	67.1	0.00	764.98
171	J460	610.00	Zone - 1	67.5	4.40	766.07
132	J70	600.00	Zone - 1	67.7	5.29	756.40
134	J90	600.00	Zone - 1	68.0	0.00	757.08
146	J210	600.00	Zone - 1	68.3	5.29	757.77
166	J410	605.00	Zone - 1	68.9	6.62	764.20
200	J750	485.00	Zone - 2	69.0	4.40	644.57
216	J920	600.00	Zone - 1	71.2	0.00	764.62
195	J700	480.00	Zone - 2	71.3	4.40	644.81
181	J560	610.00	Zone - 1	71.9	4.40	776.26
147	J220	590.00	Zone - 1	72.5	5.29	757.59
498	J-26	477.00	Zone - 2	72.5	0.00	644.62

FlexTable: Junction Table

Active Scenario: 2023 PHD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
143	J180	590.00	Zone - 1	72.7	5.29	758.08
364	J-3	475.00	Zone - 2	73.4	5.82	644.63
556	J-47	583.00	Zone - 1	75.2	0.00	756.78
197	J720	470.00	Zone - 2	75.6	4.40	644.62
184	J590	470.00	Zone - 2	75.6	5.82	644.63
168	J430	590.00	Zone - 1	75.7	4.40	765.00
131	J60	580.00	Zone - 1	76.3	5.29	756.41
493	J-23	467.00	Zone - 2	76.9	0.00	644.63
145	J200	580.00	Zone - 1	77.0	5.29	757.90
199	J740	465.00	Zone - 2	77.7	4.40	644.57
185	J600	465.00	Zone - 2	77.7	5.82	644.66
6941	J-50	575.65	Zone - 1	78.7	0.00	757.58
150	J250	575.00	Zone - 1	79.0	6.62	757.62
178	J530	580.00	Zone - 1	79.3	4.45	763.29
372	J-7	580.00	Zone - 1	79.4	6.62	763.41
135	J100	575.00	Zone - 1	79.6	5.29	759.00
160	J350	575.00	Zone - 1	79.7	6.62	759.22
215	J910	580.00	Zone - 1	79.9	4.40	764.62
183	J580	460.00	Zone - 2	79.9	5.82	644.63
562	J-49	578.50	Zone - 1	79.9	0.00	763.21
6945	J-52	459.29	Zone - 2	80.2	0.00	644.62
141	J160	590.00	Zone - 1	80.5	4.40	776.10
214	J900	460.00	Zone - 2	80.7	5.29	646.42
158	J330	570.00	Zone - 1	80.9	5.29	756.99
464	J-11	570.00	Zone - 1	80.9	0.00	757.00
157	320	570.00	Zone - 1	80.9	5.29	757.00
370	J-6	575.00	Zone - 1	82.0	0.00	764.62
137	J120	570.00	Zone - 1	82.0	0.00	759.62
196	J710	455.00	Zone - 2	82.1	5.82	644.80
151	J260	565.00	Zone - 1	83.3	6.62	757.63
6948	J-53	451.78	Zone - 2	83.4	0.00	644.62
163	J380	570.00	Zone - 1	83.5	6.62	762.99
175	J500	570.00	Zone - 1	83.6	6.62	763.30
559	J-48	565.00	Zone - 1	84.1	0.00	759.40
222	J980	570.00	Zone - 1	84.3	4.40	764.96
130	J50	560.00	Zone - 1	84.8	5.29	756.03
209	J840	560.00	Zone - 1	85.2	5.29	756.94
148	J230	560.00	Zone - 1	85.4	6.62	757.43
552	J-45	558.00	Zone - 1	85.5	0.00	755.71
162	J370	565.00	Zone - 1	85.7	6.62	763.01
394	J-10	565.00	Zone - 1	85.9	0.00	763.60
201	J760	445.00	Zone - 2	86.4	5.82	644.61
165	J400	560.00	Zone - 1	88.2	6.62	763.85
470	J-14	553.11	Zone - 1	88.3	0.00	757.09
159	J340	555.00	Zone - 1	88.4	6.62	759.23
136	J110	555.00	Zone - 1	88.5	4.40	759.62
161	J360	555.00	Zone - 1	88.5	6.62	759.66

FlexTable: Junction Table

Active Scenario: 2023 PHD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
190	J650	440.00	Zone - 2	88.7	5.82	644.93
191	J660	440.00	Zone - 2	88.9	5.82	645.39
207	J820	550.00	Zone - 1	89.5	5.29	756.97
515	J-34	550.00	Zone - 1	89.7	0.00	757.22
174	J490	555.00	Zone - 1	90.3	5.82	763.75
172	J470	555.00	Zone - 1	91.4	5.82	766.24
154	J290	545.00	Zone - 1	91.9	6.62	757.33
366	J-4	430.00	Zone - 2	92.8	4.40	644.57
127	J20	540.00	Zone - 1	92.9	5.29	754.83
194	J690	430.00	Zone - 2	93.6	5.29	646.34
535	J-42	540.97	Zone - 1	93.8	0.00	757.67
156	J310	540.00	Zone - 1	93.9	5.29	757.14
155	J300	540.00	Zone - 1	93.9	5.29	757.14
153	J280	540.00	Zone - 1	94.1	6.62	757.52
144	J190	540.00	Zone - 1	94.4	5.29	758.07
198	J730	425.00	Zone - 2	95.0	4.40	644.60
549	J-44	534.00	Zone - 1	95.5	0.00	754.83
152	J270	535.00	Zone - 1	96.3	6.62	757.65
176	J510	540.00	Zone - 1	96.6	4.45	763.30
138	J130	535.00	Zone - 1	97.7	4.40	760.73
210	J850	530.00	Zone - 1	98.2	5.29	756.94
164	J390	535.00	Zone - 1	98.9	6.62	763.52
140	J150	535.00	Zone - 1	100.2	4.40	766.67
173	J480	530.00	Zone - 1	102.2	5.82	766.22
6951	J-54	517.75	Zone - 1	105.1	0.00	760.73
204	J790	535.00	Zone - 1	105.9	4.40	779.71
139	J140	510.00	Zone - 1	108.4	4.40	760.55
126	J10	500.00	Zone - 1	110.2	5.29	754.82
192	J670	390.00	Zone - 2	110.6	5.29	645.72
212	J880	500.00	Zone - 1	111.2	5.29	756.93
211	J860	495.00	Zone - 1	113.3	5.29	756.94
193	J680	375.00	Zone - 2	116.7	5.29	644.84
180	J550	500.00	Zone - 1	117.2	5.82	770.96
203	J780	505.00	Zone - 1	118.9	4.40	779.72
205	J800	485.00	Zone - 1	127.9	4.40	780.63
375	J-8	430.00	Zone - 1	152.0	4.40	781.40
206	J810	430.00	Zone - 1	152.1	0.00	781.62
213	J890	405.00	Zone - 1	152.3	5.29	756.94

FlexTable: Pipe Table

Active Scenario: 2023 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
315	860	309.23	PMP-3	J810	4.32	6.0	Ductile Iron	False
316	870	864.72	R-3	PMP-3	4.32	6.0	Ductile Iron	False
6969	P-57	160.34	J-57	T-1	2.34	6.0	Ductile Iron	False
563	1200(1)	603.11	J130	J-49	2.30	6.0	Asbestos Cement	False
564	1200(2)	527.99	J-49	J980	2.30	6.0	Asbestos Cement	False
245	130	359.67	J110	J130	2.20	6.0	Asbestos Cement	False
560	110(1)	81.48	J100	J-48	2.15	6.0	Asbestos Cement	False
561	110(2)	178.25	J-48	J110	2.15	6.0	Asbestos Cement	False
531	450(2)	110.11	J-40	J450	1.96	6.0	Asbestos Cement	False
347	1210	781.29	J980	J150	1.90	6.0	Asbestos Cement	False
247	160	3,735.98	J150	J160	1.67	6.0	Asbestos Cement	False
530	450(1)	48.98	J440	J-40	1.60	6.0	Asbestos Cement	False
268	370	1,520.73	J360	J370	1.59	6.0	Asbestos Cement	False
377	P-12	326.74	J-8	J810	1.56	10.0	Ductile Iron	False
376	P-11	1,085.66	J800	J-8	1.54	10.0	Ductile Iron	False
267	360	347.69	J340	J360	1.52	6.0	Asbestos Cement	False
312	830	443.46	J780	J800	1.52	10.0	Ductile Iron	False
274	440	458.31	J440	J420	1.50	6.0	Asbestos Cement	False
280	500	1,364.20	J480	J490	1.49	6.0	Ductile Iron	False
310	810	2,987.84	J560	J780	1.48	10.0	Ductile Iron	False
537	340(2)	1,042.18	J-42	J340	1.37	6.0	Asbestos Cement	False
288	580	3,263.45	J550	J560	1.33	6.0	Ductile Iron	False
6967	P-55	225.92	J450	J-55	1.32	8.0	Ductile Iron	False
6968	P-56	115.11	J-55	J-57	1.32	8.0	Ductile Iron	False
242	100	1,321.26	J80	J100	1.29	6.0	Asbestos Cement	False
287	570	2,690.07	J480	J550	1.26	6.0	Asbestos Cement	False
557	80(1)	295.82	J60	J-47	1.23	6.0	Asbestos Cement	False
558	80(2)	390.59	J-47	J80	1.23	6.0	Asbestos Cement	False
238	60	520.40	J50	J60	1.11	6.0	Asbestos Cement	False
281	510	887.52	J490	J370	1.07	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2023 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
553	50(1)	1,110.72	J20	J-45	1.05	6.0	Asbestos Cement	False
554	50(2)	370.33	J-45	J50	1.05	6.0	Asbestos Cement	False
343	1170	1,578.31	J160	PRV-3	1.02	6.0	Asbestos Cement	False
344	1180	1,065.48	PRV-3	J570	1.02	6.0	Asbestos Cement	False
289	590	355.59	J560	J160	0.99	10.0	Ductile Iron	False
333	1060	928.80	J910	J420	0.95	6.0	Ductile Iron	False
332	1050	1,355.49	J410	J910	0.90	6.0	Ductile Iron	False
248	170	1,273.25	J100	J170	0.80	6.0	Asbestos Cement	False
271	400	614.59	J390	J400	0.75	6.0	Asbestos Cement	False
249	180	481.48	J170	J180	0.74	6.0	Asbestos Cement	False
301	720	1,396.52	J690	J670	0.69	6.0	Asbestos Cement	False
270	390	1,285.53	J370	J390	0.67	6.0	Asbestos Cement	False
538	P-53	582.53	J280	J-42	0.64	8.0	Ductile Iron	False
251	200	512.94	J180	J200	0.62	6.0	Asbestos Cement	False
260	290	977.80	J280	J290	0.60	8.0	Ductile Iron	False
309	800	2,413.23	J760	J770	0.59	2.0	PVC	False
299	700	1,204.37	J660	J670	0.57	6.0	Asbestos Cement	False
517	P-44	217.90	J-34	J290	0.56	8.0	Ductile Iron	False
252	210	454.85	J200	J210	0.56	6.0	Asbestos Cement	False
300	710	1,058.65	J670	J680	0.54	2.0	PVC	False
341	1150	1,645.01	J20	PRV-2	0.52	8.0	Ductile Iron	False
342	1160	399.53	PRV-2	J30	0.52	8.0	Ductile Iron	False
298	690	1,917.41	J650	J660	0.51	6.0	Asbestos Cement	False
273	430	1,266.81	J420	J430	0.50	6.0	Asbestos Cement	False
253	220	827.91	J210	J220	0.50	6.0	Asbestos Cement	False
302	730	2,028.96	J570	J700	0.50	6.0	Asbestos Cement	False
494	P-36	3,062.02	J570	J-23	0.48	6.0	Asbestos Cement	False
272	410	2,002.83	J400	J410	0.46	8.0	Ductile Iron	False
330	1030	2,047.17	J30	J900	0.46	8.0	Ductile Iron	False
369	P-7	133.76	J450	J-5	0.45	2.0	PVC	False
6953	140(2)	389.47	J-54	J140	0.45	2.0	PVC	False

FlexTable: Pipe Table

Active Scenario: 2023 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
297	680	641.20	J640	J650	0.44	6.0	Asbestos Cement	False
6943	230(2)	851.77	J-50	J230	0.44	6.0	Asbestos Cement	False
331	1040	688.05	J900	J690	0.42	8.0	Ductile Iron	False
304	750	1,292.25	J700	J720	0.38	6.0	Asbestos Cement	False
255	240	1,855.02	J230	J240	0.36	6.0	Asbestos Cement	False
534	P-52	878.79	J-41	J470	0.36	6.0	Asbestos Cement	False
395	P-19	1,252.08	J490	J-10	0.35	6.0	Asbestos Cement	False
396	P-20	1,882.30	J-10	J-7	0.35	6.0	Ductile Iron	False
516	P-43	1,239.83	J300	J-34	0.34	8.0	Ductile Iron	False
296	670	490.62	J630	J640	0.31	6.0	Asbestos Cement	False
279	490	1,142.41	J470	J480	0.29	6.0	Asbestos Cement	False
277	470	2,047.82	J450	J150	0.28	6.0	Asbestos Cement	False
374	P-10	1,181.08	J-7	J500	0.28	6.0	Ductile Iron	False
471	P-24	1,355.02	J300	J-14	0.27	8.0	Ductile Iron	False
472	P-25	1,789.45	J-14	320	0.27	8.0	Ductile Iron	False
499	P-38	1,114.16	J-23	J-26	0.26	8.0	Ductile Iron	False
501	P-39	450.98	J-26	J-27	0.26	8.0	Ductile Iron	False
345	1190	141.18	J430	J970	0.25	8.0	Ductile Iron	False
348	1220	909.93	J970	J980	0.25	8.0	Ductile Iron	False
6942	230(1)	309.29	J220	J-50	0.25	8.0	Ductile Iron	False
295	660	1,120.60	J600	J630	0.24	6.0	Asbestos Cement	False
536	340(1)	775.50	J270	J-42	0.23	6.0	Asbestos Cement	False
524	P-48	211.43	J-37	J-34	0.22	8.0	Ductile Iron	False
317	880	1,338.16	320	J820	0.20	8.0	Ductile Iron	False
533	P-51	1,633.61	J-40	J-41	0.20	8.0	Ductile Iron	False
305	760	670.42	J720	J730	0.20	6.0	Asbestos Cement	False
292	630	869.29	J580	J600	0.18	6.0	Asbestos Cement	False
505	P-41	915.45	J-27	J-29	0.17	8.0	Ductile Iron	False
319	910	2,195.52	J820	J840	0.17	8.0	Ductile Iron	False
519	P-45	240.88	J240	J-35	0.16	8.0	Ductile Iron	False
284	540	442.27	J500	J520	0.15	6.0	Ductile Iron	False
258	270	597.10	J260	J270	0.15	6.0	Asbestos Cement	False
306	770	953.99	J730	J740	0.15	6.0	Asbestos Cement	False

FlexTable: Pipe Table
Active Scenario: 2023 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
6946	790(1)	560.25	J720	J-52	0.13	6.0	Asbestos Cement	False
6950	790(2)(2)	295.46	J-53	J760	0.13	6.0	Asbestos Cement	False
320	920	1,046.94	J840	J850	0.10	8.0	Ductile Iron	False
526	P-49	1,084.51	J-35	J-38	0.09	8.0	Ductile Iron	False
507	P-42	299.85	J-29	J-30	0.09	8.0	Ductile Iron	False
521	P-46	782.54	J-35	J-36	0.08	8.0	Ductile Iron	False
257	260	1,069.05	J250	J260	0.08	6.0	Asbestos Cement	False
266	350	1,870.47	J350	J340	0.08	6.0	Asbestos Cement	False
269	380	2,794.51	J370	J380	0.08	6.0	Asbestos Cement	False
6949	790(2)(1)	233.65	J-52	J-53	0.07	8.0	Ductile Iron	False
291	620	721.05	J580	J590	0.07	6.0	Ductile Iron	False
303	740	1,472.16	J700	J710	0.07	6.0	Asbestos Cement	False
365	P-5	638.70	J580	J-3	0.07	6.0	Ductile Iron	False
550	20(1)	1,127.26	J10	J-44	0.06	6.0	Asbestos Cement	False
551	20(2)	454.30	J-44	J20	0.06	6.0	Asbestos Cement	False
236	40	1,237.96	J30	J40	0.06	6.0	Asbestos Cement	False
239	70	1,233.32	J60	J70	0.06	6.0	Asbestos Cement	False
250	190	788.53	J180	J190	0.06	6.0	Asbestos Cement	False
262	310	1,091.01	J300	J310	0.06	6.0	Asbestos Cement	False
523	P-47	763.84	J-36	J-37	0.05	8.0	Ductile Iron	False
283	530	910.93	J500	J510	0.05	6.0	Ductile Iron	False
285	550	324.28	J520	J530	0.05	6.0	Ductile Iron	False
286	560	1,423.00	J520	J540	0.05	6.0	Ductile Iron	False
278	480	982.79	J440	J460	0.05	6.0	Ductile Iron	False
307	780	1,302.56	J740	J750	0.05	6.0	Asbestos Cement	False
311	820	1,060.57	J790	J780	0.05	6.0	Ductile Iron	False
367	P-6	258.23	J740	J-4	0.05	6.0	Ductile Iron	False
6952	140(1)	866.12	J130	J-54	0.05	6.0	Asbestos Cement	False
527	P-50	416.06	J-38	J-37	0.04	8.0	Ductile Iron	False
363	P-4	1,141.91	J640	J-2	0.04	8.0	Ductile Iron	False
321	930	184.62	J850	J860	0.03	8.0	Ductile Iron	False
322	950	1,933.27	J840	J890	0.03	8.0	Ductile Iron	False
323	960	440.71	J850	J880	0.03	8.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2023 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
465	P-21	721.05	320	J-11	0.03	8.0	Ductile Iron	False
466	P-22	1,599.67	J-11	J330	0.03	8.0	Ductile Iron	False
495	P-37	1,640.82	J-23	J580	0.02	6.0	Asbestos Cement	False
244	120	246.16	J110	J120	0.00	2.0	PVC	False
329	1020	705.53	R-3	PMP-2	0.00	6.0	Ductile Iron	False
328	1010	359.73	PMP-2	J810	0.00	6.0	Ductile Iron	False
326	10	89.47	R-1	PMP-1	0.00	6.0	Asbestos Cement	False
327	15	109.92	PMP-1	J10	0.00	6.0	Asbestos Cement	False
503	P-40	568.86	J-27	J-28	0.00	8.0	Ductile Iron	False
334	1070	458.75	J910	J920	0.00	8.0	Ductile Iron	False
241	90	678.03	J80	J90	0.00	6.0	Ductile Iron	False
371	P-8	361.67	J910	J-6	0.00	2.0	PVC	False
361	P-3	1,059.28	J600	J620	0.00	2.0	PVC	False
256	250	219.27	J240	J250	0.00	6.0	Asbestos Cement	False
6975	P-62	325.59	J-55	T-1	0.00	6.0	Ductile Iron	True
475	P-26	788.07	R-5	PMP-5	(N/A)	6.0	Ductile Iron	False
482	P-27	463.65	PMP-5	J-20	(N/A)	6.0	Ductile Iron	False
483	P-28	1,351.93	J-20	J-19	(N/A)	8.0	Ductile Iron	False
484	P-29	514.98	J-19	J-18	(N/A)	8.0	Ductile Iron	False
485	P-30	603.37	J-18	J-17	(N/A)	8.0	Ductile Iron	False
486	P-31	1,965.14	J-17	J-16	(N/A)	8.0	Ductile Iron	False
487	P-32	320.88	J-16	J-15	(N/A)	8.0	Ductile Iron	False
488	P-33	435.33	J-15	J310	(N/A)	8.0	Ductile Iron	False

FlexTable: Junction Table

Active Scenario: 2023 PHD CIP

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
476	J-15	542.00	Zone - 1	(N/A)	(N/A)	(N/A)
477	J-16	534.00	Zone - 1	(N/A)	(N/A)	(N/A)
478	J-17	480.00	Zone - 1	(N/A)	(N/A)	(N/A)
479	J-18	470.00	Zone - 1	(N/A)	(N/A)	(N/A)
480	J-19	462.00	Zone - 1	(N/A)	(N/A)	(N/A)
481	J-20	415.00	Zone - 1	(N/A)	(N/A)	(N/A)
368	J-5	670.00	Zone - 1	41.8	4.40	766.64
170	J450	670.00	Zone - 1	41.8	4.40	766.71
6964	J-55	670.00	<None>	41.8	0.00	766.72
6966	J-57	670.00	<None>	41.8	0.00	766.73
128	J30	545.00	Zone - 2	44.0	5.29	646.71
532	J-41	660.00	Zone - 1	45.9	0.00	766.02
504	J-29	536.00	Zone - 2	47.0	13.34	644.54
502	J-28	533.00	Zone - 2	48.3	0.00	644.56
506	J-30	532.50	Zone - 2	48.5	13.34	644.54
529	J-40	650.00	Zone - 1	50.3	0.00	766.36
500	J-27	528.00	Zone - 2	50.4	13.34	644.56
188	J630	520.00	Zone - 2	54.0	5.82	644.71
189	J640	520.00	Zone - 2	54.0	5.82	644.73
518	J-35	633.00	Zone - 1	55.6	0.00	761.45
525	J-38	632.00	Zone - 1	56.0	20.00	761.43
187	J620	515.00	Zone - 2	56.1	0.00	644.66
362	J-2	515.00	Zone - 2	56.1	5.82	644.73
182	J570	515.00	Zone - 2	56.4	4.40	645.26
169	J440	635.00	Zone - 1	56.8	4.40	766.34
149	J240	630.00	Zone - 1	56.9	6.62	761.48
179	J540	630.00	Zone - 1	57.5	4.45	762.90
520	J-36	625.00	Zone - 1	59.0	20.00	761.42
167	J420	625.00	Zone - 1	61.1	4.40	766.28
129	J40	500.00	Zone - 2	63.5	5.29	646.70
202	J770	490.00	Zone - 2	65.9	5.82	642.22
522	J-37	609.00	Zone - 1	65.9	20.00	761.42
177	J520	610.00	Zone - 1	66.2	4.45	762.90
181	J560	610.00	Zone - 1	66.5	4.40	763.60
171	J460	610.00	Zone - 1	67.6	4.40	766.33
142	J170	610.00	Zone - 1	67.9	5.29	766.92
221	J970	610.00	Zone - 1	68.0	0.00	767.08
200	J750	485.00	Zone - 2	69.0	4.40	644.57
166	J410	605.00	Zone - 1	69.1	6.62	764.82
195	J700	480.00	Zone - 2	71.3	4.40	644.81
146	J210	600.00	Zone - 1	71.3	5.29	764.91
216	J920	600.00	Zone - 1	71.5	0.00	765.34
498	J-26	477.00	Zone - 2	72.5	0.00	644.62
133	J80	605.00	Zone - 1	72.7	5.29	773.12
364	J-3	475.00	Zone - 2	73.4	5.82	644.63
134	J90	600.00	Zone - 1	74.9	0.00	773.12
141	J160	590.00	Zone - 1	75.1	4.40	763.60

FlexTable: Junction Table

Active Scenario: 2023 PHD CIP

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
147	J220	590.00	Zone - 1	75.3	5.29	764.03
197	J720	470.00	Zone - 2	75.6	4.40	644.62
184	J590	470.00	Zone - 2	75.6	5.82	644.63
132	J70	600.00	Zone - 1	75.7	5.29	774.92
143	J180	590.00	Zone - 1	76.2	5.29	766.18
168	J430	590.00	Zone - 1	76.6	4.40	767.02
493	J-23	467.00	Zone - 2	76.9	0.00	644.63
199	J740	465.00	Zone - 2	77.7	4.40	644.57
185	J600	465.00	Zone - 2	77.7	5.82	644.66
178	J530	580.00	Zone - 1	79.1	4.45	762.90
372	J-7	580.00	Zone - 1	79.2	6.62	763.02
183	J580	460.00	Zone - 2	79.9	5.82	644.63
6945	J-52	459.29	Zone - 2	80.2	0.00	644.62
215	J910	580.00	Zone - 1	80.2	4.40	765.34
145	J200	580.00	Zone - 1	80.2	5.29	765.48
214	J900	460.00	Zone - 2	80.7	5.29	646.42
150	J250	575.00	Zone - 1	80.7	6.62	761.43
160	J350	575.00	Zone - 1	80.9	6.62	761.91
6941	J-50	575.65	Zone - 1	81.5	0.00	763.95
562	J-49	578.50	Zone - 1	81.9	0.00	767.70
196	J710	455.00	Zone - 2	82.1	5.82	644.80
370	J-6	575.00	Zone - 1	82.3	0.00	765.34
556	J-47	583.00	Zone - 1	82.6	0.00	773.91
158	J330	570.00	Zone - 1	82.7	5.29	761.17
464	J-11	570.00	Zone - 1	82.7	0.00	761.18
157	320	570.00	Zone - 1	82.7	5.29	761.18
6948	J-53	451.78	Zone - 2	83.4	0.00	644.62
175	J500	570.00	Zone - 1	83.5	6.62	762.91
163	J380	570.00	Zone - 1	83.6	6.62	763.27
135	J100	575.00	Zone - 1	84.0	5.29	769.10
131	J60	580.00	Zone - 1	84.3	5.29	774.92
151	J260	565.00	Zone - 1	85.0	6.62	761.43
222	J980	570.00	Zone - 1	85.3	4.40	767.15
394	J-10	565.00	Zone - 1	85.8	0.00	763.21
162	J370	565.00	Zone - 1	85.8	6.62	763.29
137	J120	570.00	Zone - 1	86.0	0.00	768.88
201	J760	445.00	Zone - 2	86.4	5.82	644.61
209	J840	560.00	Zone - 1	87.0	5.29	761.12
148	J230	560.00	Zone - 1	87.9	6.62	763.10
559	J-48	565.00	Zone - 1	88.2	0.00	768.96
165	J400	560.00	Zone - 1	88.4	6.62	764.38
190	J650	440.00	Zone - 2	88.7	5.82	644.93
191	J660	440.00	Zone - 2	88.9	5.82	645.39
159	J340	555.00	Zone - 1	89.5	6.62	761.92
161	J360	555.00	Zone - 1	89.6	6.62	762.07
470	J-14	553.11	Zone - 1	90.1	0.00	761.27
174	J490	555.00	Zone - 1	90.1	5.82	763.36

FlexTable: Junction Table

Active Scenario: 2023 PHD CIP

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
172	J470	555.00	Zone - 1	91.1	5.82	765.64
207	J820	550.00	Zone - 1	91.4	5.29	761.15
515	J-34	550.00	Zone - 1	91.5	0.00	761.40
136	J110	555.00	Zone - 1	92.5	4.40	768.88
366	J-4	430.00	Zone - 2	92.8	4.40	644.57
130	J50	560.00	Zone - 1	93.5	5.29	776.20
194	J690	430.00	Zone - 2	93.6	5.29	646.34
154	J290	545.00	Zone - 1	93.6	6.62	761.42
552	J-45	558.00	Zone - 1	95.0	0.00	777.46
198	J730	425.00	Zone - 2	95.0	4.40	644.60
535	J-42	540.97	Zone - 1	95.4	0.00	761.48
156	J310	540.00	Zone - 1	95.8	5.29	761.32
155	J300	540.00	Zone - 1	95.8	5.29	761.32
153	J280	540.00	Zone - 1	95.8	6.62	761.45
176	J510	540.00	Zone - 1	96.4	4.45	762.91
144	J190	540.00	Zone - 1	97.9	5.29	766.17
152	J270	535.00	Zone - 1	98.0	6.62	761.46
204	J790	535.00	Zone - 1	98.9	4.40	763.59
164	J390	535.00	Zone - 1	99.1	6.62	763.97
210	J850	530.00	Zone - 1	100.0	5.29	761.12
140	J150	535.00	Zone - 1	100.3	4.40	766.80
138	J130	535.00	Zone - 1	101.0	4.40	768.48
173	J480	530.00	Zone - 1	101.2	5.82	764.00
127	J20	540.00	Zone - 1	104.2	5.29	780.90
549	J-44	534.00	Zone - 1	107.5	0.00	782.55
6951	J-54	517.75	Zone - 1	108.5	0.00	768.47
192	J670	390.00	Zone - 2	110.6	5.29	645.72
139	J140	510.00	Zone - 1	111.8	4.40	768.29
203	J780	505.00	Zone - 1	111.9	4.40	763.59
212	J880	500.00	Zone - 1	113.0	5.29	761.11
180	J550	500.00	Zone - 1	114.1	5.82	763.76
211	J860	495.00	Zone - 1	115.1	5.29	761.11
193	J680	375.00	Zone - 2	116.7	5.29	644.84
205	J800	485.00	Zone - 1	120.5	4.40	763.59
126	J10	500.00	Zone - 1	124.7	5.29	788.19
206	J810	430.00	Zone - 1	144.3	0.00	763.59
375	J-8	430.00	Zone - 1	144.3	4.40	763.59
213	J890	405.00	Zone - 1	154.1	5.29	761.12

FlexTable: Pipe Table

Active Scenario: 2023 PHD CIP

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
326	10	89.47	R-1	PMP-1	5.39	6.0	Asbestos Cement	False
327	15	109.92	PMP-1	J10	5.39	6.0	Asbestos Cement	False
550	20(1)	1,127.26	J10	J-44	3.00	8.0	Ductile Iron	False
551	20(2)	454.30	J-44	J20	3.00	8.0	Ductile Iron	False
553	50(1)	1,110.72	J20	J-45	2.44	8.0	Ductile Iron	False
554	50(2)	370.33	J-45	J50	2.44	8.0	Ductile Iron	False
238	60	520.40	J50	J60	2.41	8.0	Ductile Iron	False
557	80(1)	295.82	J60	J-47	2.34	8.0	Ductile Iron	False
558	80(2)	390.59	J-47	J80	2.34	8.0	Ductile Iron	False
242	100	1,321.26	J80	J100	2.31	8.0	Ductile Iron	False
531	450(2)	110.11	J-40	J450	1.63	6.0	Asbestos Cement	False
248	170	1,273.25	J100	J170	1.47	6.0	Asbestos Cement	False
560	110(1)	81.48	J100	J-48	1.45	8.0	Ductile Iron	False
561	110(2)	178.25	J-48	J110	1.45	8.0	Ductile Iron	False
245	130	359.67	J110	J130	1.42	8.0	Ductile Iron	False
249	180	481.48	J170	J180	1.41	6.0	Asbestos Cement	False
563	1200(1)	603.11	J130	J-49	1.36	8.0	Ductile Iron	False
564	1200(2)	527.99	J-49	J980	1.36	8.0	Ductile Iron	False
251	200	512.94	J180	J200	1.29	6.0	Asbestos Cement	False
6969	P-57	160.34	J-57	T-1	1.27	6.0	Ductile Iron	False
252	210	454.85	J200	J210	1.23	6.0	Asbestos Cement	False
253	220	827.91	J210	J220	1.17	6.0	Asbestos Cement	False
534	P-52	878.79	J-41	J470	1.15	6.0	Asbestos Cement	False
6943	230(2)	851.77	J-50	J230	1.11	6.0	Asbestos Cement	False
247	160	3,735.98	J150	J160	1.10	6.0	Asbestos Cement	False
279	490	1,142.41	J470	J480	1.09	6.0	Asbestos Cement	False
333	1060	928.80	J910	J420	1.04	6.0	Ductile Iron	False
255	240	1,855.02	J230	J240	1.03	6.0	Asbestos Cement	False
343	1170	1,578.31	J160	PRV-3	1.02	6.0	Asbestos Cement	False
344	1180	1,065.48	PRV-3	J570	1.02	6.0	Asbestos Cement	False
332	1050	1,355.49	J410	J910	0.99	6.0	Ductile Iron	False
268	370	1,520.73	J360	J370	0.93	6.0	Asbestos Cement	False
347	1210	781.29	J980	J150	0.91	8.0	Ductile Iron	False

FlexTable: Pipe Table
Active Scenario: 2023 PHD CIP

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
267	360	347.69	J340	J360	0.85	6.0	Asbestos Cement	False
271	400	614.59	J390	J400	0.84	6.0	Asbestos Cement	False
270	390	1,285.53	J370	J390	0.77	6.0	Asbestos Cement	False
280	500	1,364.20	J480	J490	0.73	6.0	Ductile Iron	False
6968	P-56	115.11	J-55	J-57	0.71	8.0	Ductile Iron	False
6967	P-55	225.92	J450	J-55	0.71	8.0	Ductile Iron	False
273	430	1,266.81	J420	J430	0.71	6.0	Asbestos Cement	False
537	340(2)	1,042.18	J-42	J340	0.70	6.0	Asbestos Cement	False
301	720	1,396.52	J690	J670	0.69	6.0	Asbestos Cement	False
533	P-51	1,633.61	J-40	J-41	0.65	8.0	Ductile Iron	False
6942	230(1)	309.29	J220	J-50	0.62	8.0	Ductile Iron	False
309	800	2,413.23	J760	J770	0.59	2.0	PVC	False
299	700	1,204.37	J660	J670	0.57	6.0	Asbestos Cement	False
300	710	1,058.65	J670	J680	0.54	2.0	PVC	False
519	P-45	240.88	J240	J-35	0.54	8.0	Ductile Iron	False
341	1150	1,645.01	J20	PRV-2	0.52	8.0	Ductile Iron	False
342	1160	399.53	PRV-2	J30	0.52	8.0	Ductile Iron	False
272	410	2,002.83	J400	J410	0.52	8.0	Ductile Iron	False
298	690	1,917.41	J650	J660	0.51	6.0	Asbestos Cement	False
302	730	2,028.96	J570	J700	0.50	6.0	Asbestos Cement	False
530	450(1)	48.98	J440	J-40	0.48	6.0	Asbestos Cement	False
494	P-36	3,062.02	J570	J-23	0.48	6.0	Asbestos Cement	False
330	1030	2,047.17	J30	J900	0.46	8.0	Ductile Iron	False
369	P-7	133.76	J450	J-5	0.45	2.0	PVC	False
6953	140(2)	389.47	J-54	J140	0.45	2.0	PVC	False
297	680	641.20	J640	J650	0.44	6.0	Asbestos Cement	False
345	1190	141.18	J430	J970	0.43	8.0	Ductile Iron	False
348	1220	909.93	J970	J980	0.43	8.0	Ductile Iron	False
331	1040	688.05	J900	J690	0.42	8.0	Ductile Iron	False
304	750	1,292.25	J700	J720	0.38	6.0	Asbestos Cement	False
274	440	458.31	J440	J420	0.38	6.0	Asbestos Cement	False
395	P-19	1,252.08	J490	J-10	0.35	6.0	Asbestos Cement	False
396	P-20	1,882.30	J-10	J-7	0.35	6.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2023 PHD CIP

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
516	P-43	1,239.83	J300	J-34	0.34	8.0	Ductile Iron	False
281	510	887.52	J490	J370	0.31	6.0	Asbestos Cement	False
296	670	490.62	J630	J640	0.31	6.0	Asbestos Cement	False
287	570	2,690.07	J480	J550	0.29	6.0	Asbestos Cement	False
526	P-49	1,084.51	J-35	J-38	0.29	8.0	Ductile Iron	False
374	P-10	1,181.08	J-7	J500	0.28	6.0	Ductile Iron	False
471	P-24	1,355.02	J300	J-14	0.27	8.0	Ductile Iron	False
472	P-25	1,789.45	J-14	320	0.27	8.0	Ductile Iron	False
538	P-53	582.53	J280	J-42	0.27	8.0	Ductile Iron	False
277	470	2,047.82	J450	J150	0.26	8.0	Ductile Iron	False
499	P-38	1,114.16	J-23	J-26	0.26	8.0	Ductile Iron	False
501	P-39	450.98	J-26	J-27	0.26	8.0	Ductile Iron	False
521	P-46	782.54	J-35	J-36	0.25	8.0	Ductile Iron	False
295	660	1,120.60	J600	J630	0.24	6.0	Asbestos Cement	False
288	580	3,263.45	J550	J560	0.23	6.0	Ductile Iron	False
536	340(1)	775.50	J270	J-42	0.23	6.0	Asbestos Cement	False
260	290	977.80	J280	J290	0.22	8.0	Ductile Iron	False
317	880	1,338.16	320	J820	0.20	8.0	Ductile Iron	False
305	760	670.42	J720	J730	0.20	6.0	Asbestos Cement	False
517	P-44	217.90	J-34	J290	0.18	8.0	Ductile Iron	False
292	630	869.29	J580	J600	0.18	6.0	Asbestos Cement	False
505	P-41	915.45	J-27	J-29	0.17	8.0	Ductile Iron	False
319	910	2,195.52	J820	J840	0.17	8.0	Ductile Iron	False
527	P-50	416.06	J-38	J-37	0.16	8.0	Ductile Iron	False
524	P-48	211.43	J-37	J-34	0.16	8.0	Ductile Iron	False
284	540	442.27	J500	J520	0.15	6.0	Ductile Iron	False
258	270	597.10	J260	J270	0.15	6.0	Asbestos Cement	False
306	770	953.99	J730	J740	0.15	6.0	Asbestos Cement	False
6946	790(1)	560.25	J720	J-52	0.13	6.0	Asbestos Cement	False
6950	790(2)(2)	295.46	J-53	J760	0.13	6.0	Asbestos Cement	False
523	P-47	763.84	J-36	J-37	0.12	8.0	Ductile Iron	False
320	920	1,046.94	J840	J850	0.10	8.0	Ductile Iron	False
507	P-42	299.85	J-29	J-30	0.09	8.0	Ductile Iron	False
266	350	1,870.47	J350	J340	0.08	6.0	Asbestos Cement	False
269	380	2,794.51	J370	J380	0.08	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2023 PHD CIP

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
257	260	1,069.05	J250	J260	0.08	6.0	Asbestos Cement	False
6949	790(2)(1)	233.65	J-52	J-53	0.07	8.0	Ductile Iron	False
310	810	2,987.84	J560	J780	0.07	10.0	Ductile Iron	False
291	620	721.05	J580	J590	0.07	6.0	Ductile Iron	False
303	740	1,472.16	J700	J710	0.07	6.0	Asbestos Cement	False
365	P-5	638.70	J580	J-3	0.07	6.0	Ductile Iron	False
236	40	1,237.96	J30	J40	0.06	6.0	Asbestos Cement	False
239	70	1,233.32	J60	J70	0.06	6.0	Asbestos Cement	False
250	190	788.53	J180	J190	0.06	6.0	Asbestos Cement	False
262	310	1,091.01	J300	J310	0.06	6.0	Asbestos Cement	False
283	530	910.93	J500	J510	0.05	6.0	Ductile Iron	False
285	550	324.28	J520	J530	0.05	6.0	Ductile Iron	False
286	560	1,423.00	J520	J540	0.05	6.0	Ductile Iron	False
278	480	982.79	J440	J460	0.05	6.0	Ductile Iron	False
307	780	1,302.56	J740	J750	0.05	6.0	Asbestos Cement	False
311	820	1,060.57	J790	J780	0.05	6.0	Ductile Iron	False
367	P-6	258.23	J740	J-4	0.05	6.0	Ductile Iron	False
6952	140(1)	866.12	J130	J-54	0.05	6.0	Asbestos Cement	False
363	P-4	1,141.91	J640	J-2	0.04	8.0	Ductile Iron	False
312	830	443.46	J780	J800	0.04	10.0	Ductile Iron	False
321	930	184.62	J850	J860	0.03	8.0	Ductile Iron	False
322	950	1,933.27	J840	J890	0.03	8.0	Ductile Iron	False
323	960	440.71	J850	J880	0.03	8.0	Ductile Iron	False
465	P-21	721.05	320	J-11	0.03	8.0	Ductile Iron	False
466	P-22	1,599.67	J-11	J330	0.03	8.0	Ductile Iron	False
495	P-37	1,640.82	J-23	J580	0.02	6.0	Asbestos Cement	False
376	P-11	1,085.66	J800	J-8	0.02	10.0	Ductile Iron	False
289	590	355.59	J560	J160	0.01	10.0	Ductile Iron	False
244	120	246.16	J110	J120	0.00	2.0	PVC	False
371	P-8	361.67	J910	J-6	0.00	2.0	PVC	False
316	870	864.72	R-3	PMP-3	0.00	6.0	Ductile Iron	False
329	1020	705.53	R-3	PMP-2	0.00	6.0	Ductile Iron	False
315	860	309.23	PMP-3	J810	0.00	6.0	Ductile Iron	False
377	P-12	326.74	J-8	J810	0.00	10.0	Ductile Iron	False
328	1010	359.73	PMP-2	J810	0.00	6.0	Ductile Iron	False
334	1070	458.75	J910	J920	0.00	8.0	Ductile Iron	False
6975	P-62	325.59	J-55	T-1	0.00	6.0	Ductile Iron	True
503	P-40	568.86	J-27	J-28	0.00	8.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2023 PHD CIP

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
241	90	678.03	J80	J90	0.00	6.0	Ductile Iron	False
361	P-3	1,059.28	J600	J620	0.00	2.0	PVC	False
256	250	219.27	J240	J250	0.00	6.0	Asbestos Cement	False
475	P-26	788.07	R-5	PMP-5	(N/A)	6.0	Ductile Iron	False
482	P-27	463.65	PMP-5	J-20	(N/A)	6.0	Ductile Iron	False
483	P-28	1,351.93	J-20	J-19	(N/A)	8.0	Ductile Iron	False
484	P-29	514.98	J-19	J-18	(N/A)	8.0	Ductile Iron	False
485	P-30	603.37	J-18	J-17	(N/A)	8.0	Ductile Iron	False
486	P-31	1,965.14	J-17	J-16	(N/A)	8.0	Ductile Iron	False
487	P-32	320.88	J-16	J-15	(N/A)	8.0	Ductile Iron	False
488	P-33	435.33	J-15	J310	(N/A)	8.0	Ductile Iron	False

FlexTable: Junction Table

Active Scenario: 2033 MDD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
476	J-15	542.00	Zone - 1	(N/A)	(N/A)	(N/A)
477	J-16	534.00	Zone - 1	(N/A)	(N/A)	(N/A)
478	J-17	480.00	Zone - 1	(N/A)	(N/A)	(N/A)
479	J-18	470.00	Zone - 1	(N/A)	(N/A)	(N/A)
480	J-19	462.00	Zone - 1	(N/A)	(N/A)	(N/A)
481	J-20	415.00	Zone - 1	(N/A)	(N/A)	(N/A)
368	J-5	670.00	Zone - 1	41.9	2.26	766.74
6966	J-57	670.00	<None>	41.9	0.00	766.76
6964	J-55	670.00	<None>	41.9	0.00	766.76
170	J450	670.00	Zone - 1	41.9	2.26	766.76
128	J30	545.00	Zone - 2	44.0	2.71	646.72
532	J-41	660.00	Zone - 1	46.2	0.00	766.86
504	J-29	536.00	Zone - 2	47.4	6.84	645.47
502	J-28	533.00	Zone - 2	48.7	0.00	645.48
506	J-30	532.50	Zone - 2	48.9	6.84	645.47
529	J-40	650.00	Zone - 1	50.5	0.00	766.77
500	J-27	528.00	Zone - 2	50.8	6.84	645.48
188	J630	520.00	Zone - 2	54.4	2.99	645.63
189	J640	520.00	Zone - 2	54.4	2.99	645.64
182	J570	515.00	Zone - 2	56.5	2.26	645.55
187	J620	515.00	Zone - 2	56.5	0.00	645.57
362	J-2	515.00	Zone - 2	56.5	2.99	645.64
169	J440	635.00	Zone - 1	57.0	2.26	766.75
518	J-35	633.00	Zone - 1	57.2	0.00	765.11
525	J-38	632.00	Zone - 1	57.6	10.26	765.10
149	J240	630.00	Zone - 1	58.5	3.40	765.11
179	J540	630.00	Zone - 1	59.1	2.28	766.53
520	J-36	625.00	Zone - 1	60.6	10.26	765.10
167	J420	625.00	Zone - 1	61.3	2.26	766.68
129	J40	500.00	Zone - 2	63.5	2.71	646.72
202	J770	490.00	Zone - 2	66.9	2.99	644.66
142	J170	610.00	Zone - 1	67.4	2.71	765.70
522	J-37	609.00	Zone - 1	67.5	10.26	765.10
177	J520	610.00	Zone - 1	67.7	2.28	766.53
221	J970	610.00	Zone - 1	67.8	0.00	766.67
171	J460	610.00	Zone - 1	67.8	2.26	766.75
200	J750	485.00	Zone - 2	69.4	2.26	645.34
133	J80	605.00	Zone - 1	69.6	2.71	765.81
166	J410	605.00	Zone - 1	69.9	3.40	766.52
195	J700	480.00	Zone - 2	71.6	2.26	645.42
146	J210	600.00	Zone - 1	71.6	2.71	765.45
132	J70	600.00	Zone - 1	71.7	2.71	765.73
134	J90	600.00	Zone - 1	71.7	0.00	765.81
216	J920	600.00	Zone - 1	72.1	0.00	766.57
181	J560	610.00	Zone - 1	72.4	2.26	777.35
498	J-26	477.00	Zone - 2	72.9	0.00	645.50
364	J-3	475.00	Zone - 2	73.8	2.99	645.52

FlexTable: Junction Table

Active Scenario: 2033 MDD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
147	J220	590.00	Zone - 1	75.9	2.71	765.35
197	J720	470.00	Zone - 2	75.9	2.26	645.36
184	J590	470.00	Zone - 2	75.9	2.99	645.52
143	J180	590.00	Zone - 1	76.0	2.71	765.60
168	J430	590.00	Zone - 1	76.4	2.26	766.67
493	J-23	467.00	Zone - 2	77.2	0.00	645.50
199	J740	465.00	Zone - 2	78.0	2.26	645.35
185	J600	465.00	Zone - 2	78.1	2.99	645.57
556	J-47	583.00	Zone - 1	79.1	0.00	765.78
145	J200	580.00	Zone - 1	80.3	2.71	765.51
183	J580	460.00	Zone - 2	80.3	2.99	645.52
131	J60	580.00	Zone - 1	80.4	2.71	765.73
6945	J-52	459.29	Zone - 2	80.5	0.00	645.36
178	J530	580.00	Zone - 1	80.7	2.28	766.53
372	J-7	580.00	Zone - 1	80.7	3.40	766.56
215	J910	580.00	Zone - 1	80.7	2.26	766.57
214	J900	460.00	Zone - 2	80.7	2.71	646.59
141	J160	590.00	Zone - 1	81.0	2.26	777.24
562	J-49	578.50	Zone - 1	81.3	0.00	766.47
6941	J-50	575.65	Zone - 1	82.1	0.00	765.34
150	J250	575.00	Zone - 1	82.3	3.40	765.18
196	J710	455.00	Zone - 2	82.4	2.99	645.41
160	J350	575.00	Zone - 1	82.4	3.40	765.53
135	J100	575.00	Zone - 1	82.6	2.71	766.00
370	J-6	575.00	Zone - 1	82.9	0.00	766.57
6948	J-53	451.78	Zone - 2	83.8	0.00	645.36
158	J330	570.00	Zone - 1	84.4	2.71	765.04
464	J-11	570.00	Zone - 1	84.4	0.00	765.04
157	320	570.00	Zone - 1	84.4	2.71	765.04
137	J120	570.00	Zone - 1	84.8	0.00	766.06
163	J380	570.00	Zone - 1	85.0	3.40	766.40
175	J500	570.00	Zone - 1	85.0	3.40	766.53
222	J980	570.00	Zone - 1	85.1	2.26	766.67
151	J260	565.00	Zone - 1	86.6	3.40	765.18
201	J760	445.00	Zone - 2	86.7	2.99	645.36
559	J-48	565.00	Zone - 1	87.0	0.00	766.04
162	J370	565.00	Zone - 1	87.1	3.40	766.40
394	J-10	565.00	Zone - 1	87.2	0.00	766.62
209	J840	560.00	Zone - 1	88.7	2.71	765.02
148	J230	560.00	Zone - 1	88.8	3.40	765.26
130	J50	560.00	Zone - 1	89.0	2.71	765.69
190	J650	440.00	Zone - 2	89.0	2.99	645.77
191	J660	440.00	Zone - 2	89.1	2.99	646.05
165	J400	560.00	Zone - 1	89.3	3.40	766.48
552	J-45	558.00	Zone - 1	89.8	0.00	765.65
159	J340	555.00	Zone - 1	91.1	3.40	765.54
161	J360	555.00	Zone - 1	91.1	3.40	765.64

FlexTable: Junction Table

Active Scenario: 2033 MDD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
136	J110	555.00	Zone - 1	91.3	2.26	766.06
174	J490	555.00	Zone - 1	91.6	2.99	766.66
172	J470	555.00	Zone - 1	91.7	2.99	766.95
470	J-14	553.11	Zone - 1	91.7	0.00	765.07
207	J820	550.00	Zone - 1	93.0	2.71	765.03
515	J-34	550.00	Zone - 1	93.1	0.00	765.11
366	J-4	430.00	Zone - 2	93.2	2.26	645.35
194	J690	430.00	Zone - 2	93.7	2.71	646.55
154	J290	545.00	Zone - 1	95.2	3.40	765.13
198	J730	425.00	Zone - 2	95.3	2.26	645.35
535	J-42	540.97	Zone - 1	97.0	0.00	765.20
156	J310	540.00	Zone - 1	97.4	2.71	765.08
155	J300	540.00	Zone - 1	97.4	2.71	765.08
153	J280	540.00	Zone - 1	97.4	3.40	765.16
127	J20	540.00	Zone - 1	97.6	2.71	765.54
144	J190	540.00	Zone - 1	97.6	2.71	765.59
176	J510	540.00	Zone - 1	98.0	2.28	766.53
152	J270	535.00	Zone - 1	99.6	3.40	765.19
138	J130	535.00	Zone - 1	100.0	2.26	766.19
164	J390	535.00	Zone - 1	100.1	3.40	766.45
549	J-44	534.00	Zone - 1	100.2	0.00	765.54
140	J150	535.00	Zone - 1	100.3	2.26	766.93
210	J850	530.00	Zone - 1	101.7	2.71	765.02
173	J480	530.00	Zone - 1	102.8	2.99	767.49
204	J790	535.00	Zone - 1	106.0	2.26	780.01
6951	J-54	517.75	Zone - 1	107.5	0.00	766.19
139	J140	510.00	Zone - 1	110.8	2.26	766.14
192	J670	390.00	Zone - 2	110.9	2.71	646.23
212	J880	500.00	Zone - 1	114.7	2.71	765.02
126	J10	500.00	Zone - 1	114.9	2.71	765.54
211	J860	495.00	Zone - 1	116.8	2.71	765.02
193	J680	375.00	Zone - 2	117.2	2.71	645.98
180	J550	500.00	Zone - 1	117.8	2.99	772.24
203	J780	505.00	Zone - 1	119.0	2.26	780.01
205	J800	485.00	Zone - 1	127.9	2.26	780.70
375	J-8	430.00	Zone - 1	152.0	2.26	781.29
206	J810	430.00	Zone - 1	152.1	0.00	781.45
213	J890	405.00	Zone - 1	155.8	2.71	765.02

FlexTable: Pipe Table

Active Scenario: 2033 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
315	860	309.23	PMP-3	J810	4.12	6.0	Ductile Iron	False
316	870	864.72	R-3	PMP-3	4.12	6.0	Ductile Iron	False
247	160	3,735.98	J150	J160	2.06	6.0	Asbestos Cement	False
288	580	3,263.45	J550	J560	1.50	6.0	Ductile Iron	False
377	P-12	326.74	J-8	J810	1.48	10.0	Ductile Iron	False
376	P-11	1,085.66	J800	J-8	1.47	10.0	Ductile Iron	False
287	570	2,690.07	J480	J550	1.46	6.0	Asbestos Cement	False
312	830	443.46	J780	J800	1.46	10.0	Ductile Iron	False
310	810	2,987.84	J560	J780	1.44	10.0	Ductile Iron	False
289	590	355.59	J560	J160	0.90	10.0	Ductile Iron	False
280	500	1,364.20	J480	J490	0.83	6.0	Ductile Iron	False
563	1200(1)	603.11	J130	J-49	0.79	8.0	Ductile Iron	False
564	1200(2)	527.99	J-49	J980	0.79	8.0	Ductile Iron	False
347	1210	781.29	J980	J150	0.77	8.0	Ductile Iron	False
245	130	359.67	J110	J130	0.76	8.0	Ductile Iron	False
560	110(1)	81.48	J100	J-48	0.75	8.0	Ductile Iron	False
561	110(2)	178.25	J-48	J110	0.75	8.0	Ductile Iron	False
268	370	1,520.73	J360	J370	0.72	6.0	Asbestos Cement	False
6969	P-57	160.34	J-57	T-1	0.70	6.0	Ductile Iron	False
267	360	347.69	J340	J360	0.68	6.0	Asbestos Cement	False
281	510	887.52	J490	J370	0.62	6.0	Asbestos Cement	False
537	340(2)	1,042.18	J-42	J340	0.61	6.0	Asbestos Cement	False
279	490	1,142.41	J470	J480	0.59	6.0	Asbestos Cement	False
534	P-52	878.79	J-41	J470	0.56	6.0	Asbestos Cement	False
248	170	1,273.25	J100	J170	0.51	6.0	Asbestos Cement	False
301	720	1,396.52	J690	J670	0.48	6.0	Asbestos Cement	False
249	180	481.48	J170	J180	0.48	6.0	Asbestos Cement	False
530	450(1)	48.98	J440	J-40	0.47	6.0	Asbestos Cement	False
242	100	1,321.26	J80	J100	0.44	8.0	Ductile Iron	False
557	80(1)	295.82	J60	J-47	0.43	8.0	Ductile Iron	False
558	80(2)	390.59	J-47	J80	0.43	8.0	Ductile Iron	False
274	440	458.31	J440	J420	0.42	6.0	Asbestos Cement	False
299	700	1,204.37	J660	J670	0.42	6.0	Asbestos Cement	False

FlexTable: Pipe Table
Active Scenario: 2033 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
251	200	512.94	J180	J200	0.41	6.0	Asbestos Cement	False
343	1170	1,578.31	J160	PRV-3	0.40	6.0	Asbestos Cement	False
344	1180	1,065.48	PRV-3	J570	0.40	6.0	Asbestos Cement	False
6968	P-56	115.11	J-55	J-57	0.39	8.0	Ductile Iron	False
6967	P-55	225.92	J450	J-55	0.39	8.0	Ductile Iron	False
238	60	520.40	J50	J60	0.39	8.0	Ductile Iron	False
298	690	1,917.41	J650	J660	0.38	6.0	Asbestos Cement	False
252	210	454.85	J200	J210	0.38	6.0	Asbestos Cement	False
553	50(1)	1,110.72	J20	J-45	0.37	8.0	Ductile Iron	False
554	50(2)	370.33	J-45	J50	0.37	8.0	Ductile Iron	False
277	470	2,047.82	J450	J150	0.37	8.0	Ductile Iron	False
253	220	827.91	J210	J220	0.35	6.0	Asbestos Cement	False
297	680	641.20	J640	J650	0.35	6.0	Asbestos Cement	False
341	1150	1,645.01	J20	PRV-2	0.34	8.0	Ductile Iron	False
342	1160	399.53	PRV-2	J30	0.34	8.0	Ductile Iron	False
6943	230(2)	851.77	J-50	J230	0.32	6.0	Asbestos Cement	False
333	1060	928.80	J910	J420	0.32	6.0	Ductile Iron	False
533	P-51	1,633.61	J-40	J-41	0.32	8.0	Ductile Iron	False
309	800	2,413.23	J760	J770	0.30	2.0	PVC	False
330	1030	2,047.17	J30	J900	0.30	8.0	Ductile Iron	False
332	1050	1,355.49	J410	J910	0.29	6.0	Ductile Iron	False
331	1040	688.05	J900	J690	0.29	8.0	Ductile Iron	False
296	670	490.62	J630	J640	0.28	6.0	Asbestos Cement	False
255	240	1,855.02	J230	J240	0.28	6.0	Asbestos Cement	False
300	710	1,058.65	J670	J680	0.28	2.0	PVC	False
538	P-53	582.53	J280	J-42	0.28	8.0	Ductile Iron	False
302	730	2,028.96	J570	J700	0.26	6.0	Asbestos Cement	False
260	290	977.80	J280	J290	0.25	8.0	Ductile Iron	False
295	660	1,120.60	J600	J630	0.25	6.0	Asbestos Cement	False
517	P-44	217.90	J-34	J290	0.23	8.0	Ductile Iron	False
369	P-7	133.76	J450	J-5	0.23	2.0	PVC	False
6953	140(2)	389.47	J-54	J140	0.23	2.0	PVC	False
271	400	614.59	J390	J400	0.22	6.0	Asbestos Cement	False
292	630	869.29	J580	J600	0.22	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2033 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
304	750	1,292.25	J700	J720	0.20	6.0	Asbestos Cement	False
6942	230(1)	309.29	J220	J-50	0.18	8.0	Ductile Iron	False
395	P-19	1,252.08	J490	J-10	0.18	6.0	Asbestos Cement	False
396	P-20	1,882.30	J-10	J-7	0.18	6.0	Ductile Iron	False
270	390	1,285.53	J370	J390	0.18	6.0	Asbestos Cement	False
516	P-43	1,239.83	J300	J-34	0.17	8.0	Ductile Iron	False
272	410	2,002.83	J400	J410	0.14	8.0	Ductile Iron	False
374	P-10	1,181.08	J-7	J500	0.14	6.0	Ductile Iron	False
471	P-24	1,355.02	J300	J-14	0.14	8.0	Ductile Iron	False
472	P-25	1,789.45	J-14	320	0.14	8.0	Ductile Iron	False
519	P-45	240.88	J240	J-35	0.14	8.0	Ductile Iron	False
499	P-38	1,114.16	J-23	J-26	0.13	8.0	Ductile Iron	False
501	P-39	450.98	J-26	J-27	0.13	8.0	Ductile Iron	False
494	P-36	3,062.02	J570	J-23	0.12	6.0	Asbestos Cement	False
536	340(1)	775.50	J270	J-42	0.12	6.0	Asbestos Cement	False
495	P-37	1,640.82	J-23	J580	0.11	6.0	Asbestos Cement	False
317	880	1,338.16	320	J820	0.10	8.0	Ductile Iron	False
305	760	670.42	J720	J730	0.10	6.0	Asbestos Cement	False
531	450(2)	110.11	J-40	J450	0.09	6.0	Asbestos Cement	False
505	P-41	915.45	J-27	J-29	0.09	8.0	Ductile Iron	False
319	910	2,195.52	J820	J840	0.09	8.0	Ductile Iron	False
284	540	442.27	J500	J520	0.08	6.0	Ductile Iron	False
258	270	597.10	J260	J270	0.08	6.0	Asbestos Cement	False
273	430	1,266.81	J420	J430	0.08	6.0	Asbestos Cement	False
306	770	953.99	J730	J740	0.08	6.0	Asbestos Cement	False
526	P-49	1,084.51	J-35	J-38	0.08	8.0	Ductile Iron	False
6946	790(1)	560.25	J720	J-52	0.07	6.0	Asbestos Cement	False
6950	790(2)(2)	295.46	J-53	J760	0.07	6.0	Asbestos Cement	False
521	P-46	782.54	J-35	J-36	0.06	8.0	Ductile Iron	False
524	P-48	211.43	J-37	J-34	0.06	8.0	Ductile Iron	False
320	920	1,046.94	J840	J850	0.05	8.0	Ductile Iron	False
507	P-42	299.85	J-29	J-30	0.04	8.0	Ductile Iron	False
257	260	1,069.05	J250	J260	0.04	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2033 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
266	350	1,870.47	J350	J340	0.04	6.0	Asbestos Cement	False
269	380	2,794.51	J370	J380	0.04	6.0	Asbestos Cement	False
6949	790(2)(1)	233.65	J-52	J-53	0.04	8.0	Ductile Iron	False
291	620	721.05	J580	J590	0.03	6.0	Ductile Iron	False
303	740	1,472.16	J700	J710	0.03	6.0	Asbestos Cement	False
365	P-5	638.70	J580	J-3	0.03	6.0	Ductile Iron	False
236	40	1,237.96	J30	J40	0.03	6.0	Asbestos Cement	False
239	70	1,233.32	J60	J70	0.03	6.0	Asbestos Cement	False
250	190	788.53	J180	J190	0.03	6.0	Asbestos Cement	False
262	310	1,091.01	J300	J310	0.03	6.0	Asbestos Cement	False
345	1190	141.18	J430	J970	0.03	8.0	Ductile Iron	False
348	1220	909.93	J970	J980	0.03	8.0	Ductile Iron	False
283	530	910.93	J500	J510	0.03	6.0	Ductile Iron	False
285	550	324.28	J520	J530	0.03	6.0	Ductile Iron	False
286	560	1,423.00	J520	J540	0.03	6.0	Ductile Iron	False
278	480	982.79	J440	J460	0.03	6.0	Ductile Iron	False
307	780	1,302.56	J740	J750	0.03	6.0	Asbestos Cement	False
311	820	1,060.57	J790	J780	0.03	6.0	Ductile Iron	False
367	P-6	258.23	J740	J-4	0.03	6.0	Ductile Iron	False
6952	140(1)	866.12	J130	J-54	0.03	6.0	Asbestos Cement	False
363	P-4	1,141.91	J640	J-2	0.02	8.0	Ductile Iron	False
550	20(1)	1,127.26	J10	J-44	0.02	8.0	Ductile Iron	False
551	20(2)	454.30	J-44	J20	0.02	8.0	Ductile Iron	False
321	930	184.62	J850	J860	0.02	8.0	Ductile Iron	False
322	950	1,933.27	J840	J890	0.02	8.0	Ductile Iron	False
323	960	440.71	J850	J880	0.02	8.0	Ductile Iron	False
465	P-21	721.05	320	J-11	0.02	8.0	Ductile Iron	False
466	P-22	1,599.67	J-11	J330	0.02	8.0	Ductile Iron	False
527	P-50	416.06	J-38	J-37	0.01	8.0	Ductile Iron	False
523	P-47	763.84	J-36	J-37	0.00	8.0	Ductile Iron	False
244	120	246.16	J110	J120	0.00	2.0	PVC	False
329	1020	705.53	R-3	PMP-2	0.00	6.0	Ductile Iron	False
327	15	109.92	PMP-1	J10	0.00	6.0	Asbestos Cement	False
6975	P-62	325.59	J-55	T-1	0.00	6.0	Ductile Iron	True
326	10	89.47	R-1	PMP-1	0.00	6.0	Asbestos Cement	False
241	90	678.03	J80	J90	0.00	6.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2033 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
328	1010	359.73	PMP-2	J810	0.00	6.0	Ductile Iron	False
503	P-40	568.86	J-27	J-28	0.00	8.0	Ductile Iron	False
334	1070	458.75	J910	J920	0.00	8.0	Ductile Iron	False
361	P-3	1,059.28	J600	J620	0.00	2.0	PVC	False
371	P-8	361.67	J910	J-6	0.00	2.0	PVC	False
256	250	219.27	J240	J250	0.00	6.0	Asbestos Cement	False
475	P-26	788.07	R-5	PMP-5	(N/A)	6.0	Ductile Iron	False
482	P-27	463.65	PMP-5	J-20	(N/A)	6.0	Ductile Iron	False
483	P-28	1,351.93	J-20	J-19	(N/A)	8.0	Ductile Iron	False
484	P-29	514.98	J-19	J-18	(N/A)	8.0	Ductile Iron	False
485	P-30	603.37	J-18	J-17	(N/A)	8.0	Ductile Iron	False
486	P-31	1,965.14	J-17	J-16	(N/A)	8.0	Ductile Iron	False
487	P-32	320.88	J-16	J-15	(N/A)	8.0	Ductile Iron	False
488	P-33	435.33	J-15	J310	(N/A)	8.0	Ductile Iron	False

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J860	Zone - 1	True	750.00	760.00	46.6	21.2	21.2
J-11	Zone - 1	True	750.00	760.00	26.0	21.3	21.3
J310	Zone - 1	True	750.00	760.00	40.1	21.3	21.3
J-28	Zone - 2	False	750.00	619.69	20.7	20.0	20.0
J260	Zone - 1	True	750.00	760.00	24.6	20.3	20.3
J-14	Zone - 1	True	750.00	760.00	44.6	21.3	21.3
J880	Zone - 1	True	750.00	760.00	43.0	21.2	21.2
320	Zone - 1	True	750.00	760.00	28.3	21.3	21.3
J820	Zone - 1	True	750.00	760.00	32.4	21.3	21.3
J300	Zone - 1	True	750.00	760.00	55.3	21.3	21.3
J890	Zone - 1	True	750.00	760.00	83.2	21.2	21.2
J850	Zone - 1	True	750.00	760.00	32.7	21.2	21.2
J-34	Zone - 1	True	750.00	760.00	56.0	21.3	21.3
J240	Zone - 1	True	750.00	760.00	21.1	20.0	20.0
J-10	Zone - 1	False	750.00	723.65	48.2	20.0	20.0
J-27	Zone - 2	False	750.00	619.68	23.5	20.0	20.0
J720	Zone - 2	False	750.00	605.09	26.5	20.0	20.0
J-37	Zone - 1	True	750.00	760.00	30.2	20.2	20.2
J-52	Zone - 2	False	750.00	605.09	26.4	20.0	20.0
J-36	Zone - 1	True	750.00	760.00	22.7	20.0	20.0
J760	Zone - 2	False	750.00	605.09	29.0	20.0	20.0
J740	Zone - 2	False	750.00	493.60	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	605.09	29.0	20.0	20.0
J520	Zone - 1	False	750.00	432.51	28.7	20.0	20.0
J-23	Zone - 2	False	750.00	696.68	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	680.72	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	493.59	41.5	20.0	20.0
J530	Zone - 1	False	750.00	432.50	40.9	20.0	20.0
J-7	Zone - 1	False	750.00	525.87	41.6	20.0	20.0
J730	Zone - 2	False	750.00	553.36	46.0	20.1	20.1
J500	Zone - 1	False	750.00	439.23	46.0	20.0	20.0
J510	Zone - 1	False	750.00	439.21	57.9	20.0	20.0
J290	Zone - 1	True	750.00	760.00	58.5	22.1	22.1
J840	Zone - 1	True	750.00	760.00	21.2	21.3	21.3
J-30	Zone - 2	False	750.00	584.18	20.5	20.0	20.0
J-38	Zone - 1	True	750.00	758.68	20.0	20.1	20.1
J600	Zone - 2	True	750.00	760.00	39.4	20.2	20.2
J-35	Zone - 1	True	750.00	757.73	20.0	20.5	20.5
J640	Zone - 2	False	750.00	708.91	20.0	20.8	20.8
J630	Zone - 2	False	750.00	707.96	20.0	20.9	20.9
J280	Zone - 1	True	750.00	760.00	61.2	23.2	23.2
J590	Zone - 2	True	750.00	760.00	29.4	21.3	21.3
J580	Zone - 2	True	750.00	760.00	42.9	21.3	21.3
J-3	Zone - 2	True	750.00	760.00	24.0	21.3	21.3
J650	Zone - 2	True	750.00	760.00	51.6	21.3	21.3

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-29	Zone - 2	False	750.00	584.52	20.0	21.5	21.5
J330	Zone - 1	False	750.00	741.40	20.0	22.8	22.8
J-42	Zone - 1	True	750.00	760.00	61.2	24.1	24.1
J270	Zone - 1	True	750.00	760.00	56.8	24.1	24.1
J700	Zone - 2	False	750.00	748.79	22.2	20.0	20.0
J-2	Zone - 2	False	750.00	681.62	20.0	22.3	22.3
J230	Zone - 1	True	750.00	760.00	53.3	28.6	28.6
J340	Zone - 1	True	750.00	760.00	59.6	30.4	30.4
J-50	Zone - 1	True	750.00	760.00	49.1	32.5	32.5
J360	Zone - 1	True	750.00	760.00	60.9	31.9	31.9
J710	Zone - 2	False	750.00	683.67	20.0	30.3	30.3
J220	Zone - 1	True	750.00	760.00	43.2	32.9	32.9
J250	Zone - 1	False	750.00	643.28	20.0	32.2	32.2
J350	Zone - 1	False	750.00	717.94	20.0	32.9	32.9
J660	Zone - 2	True	750.00	760.00	58.6	31.8	31.8
J210	Zone - 1	True	750.00	760.00	42.5	36.6	36.6
J540	Zone - 1	False	750.00	385.11	20.0	35.9	35.9
J200	Zone - 1	True	750.00	760.00	53.8	38.8	38.8
J670	Zone - 2	True	750.00	760.00	86.8	38.0	38.0
J190	Zone - 1	True	750.00	760.00	53.1	41.5	41.5
J180	Zone - 1	True	750.00	760.00	53.2	41.5	41.5
J750	Zone - 2	False	750.00	423.50	20.0	40.5	40.5
J470	Zone - 1	True	750.00	760.00	82.4	40.7	40.7
J170	Zone - 1	True	750.00	760.00	48.5	41.5	41.5
J-40	Zone - 1	True	750.00	760.00	48.0	41.5	41.5
J440	Zone - 1	True	750.00	760.00	53.5	41.5	41.5
J460	Zone - 1	True	750.00	760.00	48.7	41.5	41.5
J420	Zone - 1	True	750.00	760.00	56.1	41.5	41.5
J-41	Zone - 1	True	750.00	760.00	39.8	41.5	41.5
J920	Zone - 1	True	750.00	760.00	56.6	41.5	41.5
J910	Zone - 1	True	750.00	760.00	66.3	41.5	41.5
J430	Zone - 1	True	750.00	760.00	71.6	41.5	41.5
J970	Zone - 1	True	750.00	760.00	63.8	41.5	41.5
J410	Zone - 1	True	750.00	760.00	52.4	41.5	41.5
J20	Zone - 1	True	750.00	760.00	90.1	41.5	41.5
J50	Zone - 1	True	750.00	760.00	82.7	41.5	41.5
J90	Zone - 1	True	750.00	760.00	53.4	41.5	41.5
J100	Zone - 1	True	750.00	760.00	78.6	41.5	41.5
J-44	Zone - 1	True	750.00	760.00	92.5	41.5	41.5
J-47	Zone - 1	True	750.00	760.00	73.4	41.5	41.5
J10	Zone - 1	True	750.00	760.00	106.7	41.5	41.5
J60	Zone - 1	True	750.00	760.00	74.4	41.5	41.5
J70	Zone - 1	True	750.00	760.00	40.9	41.5	41.5
J80	Zone - 1	True	750.00	760.00	64.2	41.5	41.5
J-45	Zone - 1	True	750.00	760.00	83.2	41.5	41.5

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-48	Zone - 1	True	750.00	760.00	83.0	41.5	41.5
J110	Zone - 1	True	750.00	760.00	87.4	41.5	41.5
J130	Zone - 1	True	750.00	760.00	96.2	41.5	41.5
J-54	Zone - 1	True	750.00	760.00	87.3	41.5	41.5
J-49	Zone - 1	True	750.00	760.00	78.0	41.5	41.5
J980	Zone - 1	True	750.00	760.00	82.4	41.5	41.5
J400	Zone - 1	True	750.00	760.00	70.2	41.5	41.5
J150	Zone - 1	True	750.00	760.00	97.7	41.5	41.5
J390	Zone - 1	True	750.00	760.00	80.3	41.5	41.5
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.5
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.5
J370	Zone - 1	True	750.00	760.00	69.9	41.5	41.5
J380	Zone - 1	True	750.00	760.00	23.0	41.5	41.5
J490	Zone - 1	True	750.00	760.00	73.7	41.2	41.2
J480	Zone - 1	True	750.00	760.00	89.0	41.5	41.5
J900	Zone - 2	True	750.00	760.00	72.4	43.4	41.5
J690	Zone - 2	True	750.00	760.00	83.3	43.4	41.5
J550	Zone - 1	True	750.00	760.00	86.5	41.5	41.5
J570	Zone - 2	True	750.00	760.00	45.7	38.3	38.3
J160	Zone - 1	True	750.00	760.00	47.6	39.1	39.1
J560	Zone - 1	True	750.00	760.00	38.9	41.5	41.5
J450	Zone - 1	True	750.00	760.00	41.5	45.8	41.6
J-55	<None>	True	750.00	760.00	41.6	41.7	41.6
J780	Zone - 1	True	750.00	760.00	79.5	38.9	38.9
J790	Zone - 1	True	750.00	760.00	52.9	38.9	38.9
J800	Zone - 1	True	750.00	760.00	86.9	38.9	38.9
J-8	Zone - 1	True	750.00	760.00	109.7	38.9	38.9
J810	Zone - 1	True	750.00	760.00	109.4	38.9	38.9
J-57	<None>	True	750.00	760.00	41.7	41.7	41.7
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J120	Zone - 1	True	0.00	10.00	86.9	41.9	41.9
J140	Zone - 1	True	0.00	10.00	112.3	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.5	41.9	41.9
J680	Zone - 2	True	0.00	10.00	115.4	44.0	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J770	Zone - 2	True	0.00	10.00	62.6	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-34	Zone - 1	True	750.00	754.12	54.9	20.0	20.0
J850	Zone - 1	True	750.00	754.12	32.0	20.0	20.0
J-14	Zone - 1	True	750.00	754.12	43.6	20.0	20.0
J300	Zone - 1	True	750.00	754.12	54.2	20.0	20.0
J860	Zone - 1	True	750.00	754.12	45.9	20.0	20.0
320	Zone - 1	True	750.00	754.12	27.4	20.0	20.0
J-11	Zone - 1	True	750.00	754.12	25.1	20.0	20.0
J890	Zone - 1	True	750.00	754.12	82.5	20.0	20.0
J880	Zone - 1	True	750.00	754.12	42.3	20.0	20.0
J310	Zone - 1	True	750.00	754.12	39.3	20.0	20.0
J820	Zone - 1	True	750.00	754.12	31.6	20.0	20.0
J-10	Zone - 1	False	750.00	732.27	48.2	20.0	20.0
J-28	Zone - 2	False	750.00	619.69	20.7	20.0	20.0
J240	Zone - 1	False	750.00	739.31	21.0	20.0	20.0
J-37	Zone - 1	False	750.00	741.45	30.1	20.0	20.0
J-36	Zone - 1	False	750.00	739.16	22.8	20.0	20.0
J-52	Zone - 2	False	750.00	605.09	26.4	20.0	20.0
J-27	Zone - 2	False	750.00	619.68	23.5	20.0	20.0
J720	Zone - 2	False	750.00	605.09	26.5	20.0	20.0
J760	Zone - 2	False	750.00	605.09	29.0	20.0	20.0
J740	Zone - 2	False	750.00	493.60	28.7	20.0	20.0
J520	Zone - 1	False	750.00	436.46	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	605.09	29.0	20.0	20.0
J-23	Zone - 2	False	750.00	696.68	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	680.72	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	493.59	41.5	20.0	20.0
J530	Zone - 1	False	750.00	436.45	40.9	20.0	20.0
J-7	Zone - 1	False	750.00	531.19	41.6	20.0	20.0
J500	Zone - 1	False	750.00	443.28	46.0	20.0	20.0
J730	Zone - 2	False	750.00	553.87	46.0	20.0	20.0
J510	Zone - 1	False	750.00	443.27	57.9	20.0	20.0
J-30	Zone - 2	False	750.00	584.18	20.5	20.0	20.0
J840	Zone - 1	True	750.00	753.60	20.5	20.0	20.0
J260	Zone - 1	True	750.00	751.86	24.4	20.0	20.0
J-38	Zone - 1	False	750.00	738.07	20.0	20.1	20.1
J600	Zone - 2	True	750.00	760.00	39.4	20.2	20.2
J290	Zone - 1	True	750.00	760.00	56.9	20.3	20.3
J-35	Zone - 1	False	750.00	736.76	20.0	20.5	20.5
J640	Zone - 2	False	750.00	708.91	20.0	20.8	20.8
J630	Zone - 2	False	750.00	707.96	20.0	20.9	20.9
J590	Zone - 2	True	750.00	760.00	29.4	21.3	21.3
J580	Zone - 2	True	750.00	760.00	42.9	21.3	21.3
J-3	Zone - 2	True	750.00	760.00	24.0	21.3	21.3
J650	Zone - 2	True	750.00	760.00	51.6	21.3	21.3
J280	Zone - 1	True	750.00	760.00	59.7	21.5	21.5

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-29	Zone - 2	False	750.00	584.52	20.0	21.5	21.5
J330	Zone - 1	False	750.00	730.91	20.0	21.9	21.9
J700	Zone - 2	True	750.00	760.00	24.3	22.1	22.1
J-2	Zone - 2	False	750.00	681.62	20.0	22.3	22.3
J-42	Zone - 1	True	750.00	760.00	59.8	22.4	22.4
J270	Zone - 1	True	750.00	760.00	55.4	22.4	22.4
J230	Zone - 1	True	750.00	760.00	50.4	26.6	26.6
J340	Zone - 1	True	750.00	760.00	58.7	29.0	29.0
J710	Zone - 2	False	750.00	683.67	20.0	30.3	30.3
J-50	Zone - 1	True	750.00	760.00	45.6	30.4	30.4
J360	Zone - 1	True	750.00	760.00	60.2	30.6	30.6
J220	Zone - 1	True	750.00	760.00	39.6	30.7	30.7
J250	Zone - 1	False	750.00	636.67	20.0	31.3	31.3
J350	Zone - 1	False	750.00	712.81	20.0	31.8	31.8
J660	Zone - 2	True	750.00	760.00	58.6	31.8	31.8
J210	Zone - 1	True	750.00	760.00	38.3	34.2	34.2
J540	Zone - 1	False	750.00	388.33	20.0	36.0	36.0
J200	Zone - 1	True	750.00	760.00	49.3	36.4	36.4
J670	Zone - 2	True	750.00	760.00	86.8	38.0	38.0
J190	Zone - 1	True	750.00	760.00	48.0	38.8	38.8
J180	Zone - 1	True	750.00	760.00	48.0	38.8	38.8
J750	Zone - 2	False	750.00	423.49	20.0	40.5	40.5
J470	Zone - 1	True	750.00	760.00	83.1	41.0	41.0
J170	Zone - 1	True	750.00	760.00	42.7	41.2	41.2
J-40	Zone - 1	True	750.00	760.00	48.1	41.4	41.4
J440	Zone - 1	True	750.00	760.00	53.6	41.4	41.4
J460	Zone - 1	True	750.00	760.00	48.8	41.4	41.4
J420	Zone - 1	True	750.00	760.00	55.8	41.4	41.4
J910	Zone - 1	True	750.00	760.00	66.1	41.4	41.4
J920	Zone - 1	True	750.00	760.00	56.4	41.4	41.4
J-41	Zone - 1	True	750.00	760.00	40.2	41.4	41.4
J410	Zone - 1	True	750.00	760.00	52.3	41.4	41.4
J430	Zone - 1	True	750.00	760.00	69.6	41.4	41.4
J20	Zone - 1	True	750.00	760.00	63.2	41.4	41.4
J50	Zone - 1	True	750.00	760.00	62.8	41.4	41.4
J60	Zone - 1	True	750.00	760.00	56.5	41.4	41.4
J-44	Zone - 1	True	750.00	760.00	64.0	41.4	41.4
J-47	Zone - 1	True	750.00	760.00	57.2	41.4	41.4
J10	Zone - 1	True	750.00	760.00	72.8	41.4	41.4
J70	Zone - 1	True	750.00	760.00	23.0	41.4	41.4
J80	Zone - 1	True	750.00	760.00	49.2	41.4	41.4
J90	Zone - 1	True	750.00	760.00	38.4	41.4	41.4
J100	Zone - 1	True	750.00	760.00	70.3	41.4	41.4
J-45	Zone - 1	True	750.00	760.00	61.5	41.4	41.4
J-48	Zone - 1	True	750.00	760.00	75.0	41.4	41.4

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J110	Zone - 1	True	750.00	760.00	79.6	41.4	41.4
J130	Zone - 1	True	750.00	760.00	89.6	41.4	41.4
J-54	Zone - 1	True	750.00	760.00	80.7	41.4	41.4
J970	Zone - 1	True	750.00	760.00	61.6	41.4	41.4
J-49	Zone - 1	True	750.00	760.00	73.9	41.4	41.4
J980	Zone - 1	True	750.00	760.00	79.9	41.4	41.4
J400	Zone - 1	True	750.00	760.00	70.1	41.4	41.4
J150	Zone - 1	True	750.00	760.00	96.7	41.4	41.4
J390	Zone - 1	True	750.00	760.00	80.4	41.4	41.4
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.4
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.4
J370	Zone - 1	True	750.00	760.00	70.2	41.4	41.4
J380	Zone - 1	True	750.00	760.00	23.3	41.4	41.4
J490	Zone - 1	True	750.00	760.00	74.5	41.4	41.4
J480	Zone - 1	True	750.00	760.00	91.0	41.4	41.4
J900	Zone - 2	True	750.00	760.00	72.4	43.4	41.4
J690	Zone - 2	True	750.00	760.00	83.3	43.4	41.4
J550	Zone - 1	True	750.00	760.00	95.8	41.5	41.5
J570	Zone - 2	True	750.00	760.00	49.8	41.6	41.5
J160	Zone - 1	True	750.00	760.00	70.1	41.5	41.5
J560	Zone - 1	True	750.00	760.00	61.6	41.5	41.5
J450	Zone - 1	True	750.00	760.00	41.4	45.8	41.5
J780	Zone - 1	True	750.00	760.00	107.0	41.5	41.5
J790	Zone - 1	True	750.00	760.00	80.4	41.5	41.5
J-55	<None>	True	750.00	760.00	41.5	41.6	41.5
J800	Zone - 1	True	750.00	760.00	115.6	41.5	41.5
J-8	Zone - 1	True	750.00	760.00	139.4	41.5	41.5
J810	Zone - 1	True	750.00	760.00	139.4	41.5	41.5
J-57	<None>	True	750.00	760.00	41.6	41.6	41.6
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J120	Zone - 1	True	0.00	10.00	84.6	41.9	41.9
J140	Zone - 1	True	0.00	10.00	110.3	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.4	41.9	41.9
J680	Zone - 2	True	0.00	10.00	115.4	44.0	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J770	Zone - 2	True	0.00	10.00	62.6	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J860	Zone - 1	True	750.00	750.67	46.2	20.0	20.0
J-11	Zone - 1	True	750.00	750.67	25.3	20.0	20.0
J310	Zone - 1	True	750.00	750.67	39.4	20.0	20.0
J-28	Zone - 2	False	750.00	619.69	20.7	20.0	20.0
J260	Zone - 1	True	750.00	750.18	24.3	20.0	20.0
J-14	Zone - 1	True	750.00	750.67	43.7	20.0	20.0
J880	Zone - 1	True	750.00	750.67	42.6	20.0	20.0
320	Zone - 1	True	750.00	750.67	27.5	20.0	20.0
J820	Zone - 1	True	750.00	750.67	31.8	20.0	20.0
J300	Zone - 1	True	750.00	750.67	54.2	20.0	20.0
J890	Zone - 1	True	750.00	750.67	82.8	20.0	20.0
J850	Zone - 1	True	750.00	750.67	32.2	20.0	20.0
J-34	Zone - 1	True	750.00	750.67	54.9	20.0	20.0
J240	Zone - 1	False	750.00	735.99	21.0	20.0	20.0
J-10	Zone - 1	False	750.00	728.55	48.2	20.0	20.0
J-27	Zone - 2	False	750.00	619.69	23.5	20.0	20.0
J720	Zone - 2	False	750.00	605.09	26.5	20.0	20.0
J-37	Zone - 1	False	750.00	738.11	30.1	20.0	20.0
J-52	Zone - 2	False	750.00	605.09	26.4	20.0	20.0
J-36	Zone - 1	False	750.00	735.84	22.8	20.0	20.0
J760	Zone - 2	False	750.00	605.09	29.0	20.0	20.0
J740	Zone - 2	False	750.00	493.60	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	605.09	29.0	20.0	20.0
J520	Zone - 1	False	750.00	434.89	28.7	20.0	20.0
J-23	Zone - 2	False	750.00	696.68	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	680.72	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	493.59	41.5	20.0	20.0
J530	Zone - 1	False	750.00	434.88	40.9	20.0	20.0
J-7	Zone - 1	False	750.00	528.97	41.6	20.0	20.0
J730	Zone - 2	False	750.00	553.87	46.0	20.0	20.0
J500	Zone - 1	False	750.00	441.67	46.0	20.0	20.0
J510	Zone - 1	False	750.00	441.66	57.9	20.0	20.0
J290	Zone - 1	True	750.00	760.00	56.6	20.0	20.0
J840	Zone - 1	True	750.00	750.32	20.8	20.0	20.0
J-30	Zone - 2	False	750.00	584.18	20.5	20.0	20.0
J-38	Zone - 1	False	750.00	734.80	20.0	20.1	20.1
J600	Zone - 2	True	750.00	760.00	39.4	20.2	20.2
J-35	Zone - 1	False	750.00	733.46	20.0	20.5	20.5
J640	Zone - 2	False	750.00	708.91	20.0	20.8	20.8
J630	Zone - 2	False	750.00	707.96	20.0	20.9	20.9
J280	Zone - 1	True	750.00	760.00	59.4	21.2	21.2
J590	Zone - 2	True	750.00	760.00	29.4	21.3	21.3
J580	Zone - 2	True	750.00	760.00	42.9	21.3	21.3
J-3	Zone - 2	True	750.00	760.00	24.0	21.3	21.3
J650	Zone - 2	True	750.00	760.00	51.6	21.3	21.3

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-29	Zone - 2	False	750.00	584.52	20.0	21.5	21.5
J330	Zone - 1	False	750.00	729.08	20.0	21.8	21.8
J-42	Zone - 1	True	750.00	760.00	59.5	22.1	22.1
J270	Zone - 1	True	750.00	760.00	55.1	22.1	22.1
J700	Zone - 2	True	750.00	760.00	24.3	22.1	22.1
J-2	Zone - 2	False	750.00	681.62	20.0	22.3	22.3
J230	Zone - 1	True	750.00	760.00	50.1	26.4	26.4
J340	Zone - 1	True	750.00	760.00	58.4	28.7	28.7
J-50	Zone - 1	True	750.00	760.00	45.3	30.1	30.1
J360	Zone - 1	True	750.00	760.00	59.9	30.3	30.3
J710	Zone - 2	False	750.00	683.67	20.0	30.3	30.3
J220	Zone - 1	True	750.00	760.00	39.4	30.4	30.4
J250	Zone - 1	False	750.00	635.18	20.0	31.1	31.1
J350	Zone - 1	False	750.00	710.93	20.0	31.6	31.6
J660	Zone - 2	True	750.00	760.00	58.6	31.8	31.8
J210	Zone - 1	True	750.00	760.00	38.0	33.9	33.9
J540	Zone - 1	False	750.00	387.06	20.0	35.9	35.9
J200	Zone - 1	True	750.00	760.00	49.0	36.1	36.1
J670	Zone - 2	True	750.00	760.00	86.8	38.0	38.0
J190	Zone - 1	True	750.00	760.00	47.7	38.5	38.5
J180	Zone - 1	True	750.00	760.00	47.7	38.5	38.5
J750	Zone - 2	False	750.00	423.49	20.0	40.5	40.5
J470	Zone - 1	True	750.00	760.00	82.9	40.8	40.8
J170	Zone - 1	True	750.00	760.00	42.5	40.9	40.9
J-40	Zone - 1	True	750.00	760.00	47.9	41.3	41.3
J440	Zone - 1	True	750.00	760.00	53.4	41.3	41.3
J460	Zone - 1	True	750.00	760.00	48.6	41.3	41.3
J420	Zone - 1	True	750.00	760.00	55.6	41.3	41.3
J-41	Zone - 1	True	750.00	760.00	40.0	41.3	41.3
J920	Zone - 1	True	750.00	760.00	56.2	41.3	41.3
J910	Zone - 1	True	750.00	760.00	65.8	41.3	41.3
J430	Zone - 1	True	750.00	760.00	69.3	41.3	41.3
J970	Zone - 1	True	750.00	760.00	61.4	41.3	41.3
J410	Zone - 1	True	750.00	760.00	52.0	41.3	41.3
J20	Zone - 1	True	750.00	760.00	62.9	41.3	41.3
J50	Zone - 1	True	750.00	760.00	62.6	41.3	41.3
J90	Zone - 1	True	750.00	760.00	38.2	41.3	41.3
J100	Zone - 1	True	750.00	760.00	70.1	41.3	41.3
J-44	Zone - 1	True	750.00	760.00	63.8	41.3	41.3
J-47	Zone - 1	True	750.00	760.00	56.9	41.3	41.3
J10	Zone - 1	True	750.00	760.00	72.5	41.3	41.3
J60	Zone - 1	True	750.00	760.00	56.3	41.3	41.3
J70	Zone - 1	True	750.00	760.00	22.7	41.3	41.3
J80	Zone - 1	True	750.00	760.00	49.0	41.3	41.3
J-45	Zone - 1	True	750.00	760.00	61.2	41.3	41.3

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-48	Zone - 1	True	750.00	760.00	74.8	41.3	41.3
J110	Zone - 1	True	750.00	760.00	79.4	41.3	41.3
J130	Zone - 1	True	750.00	760.00	89.4	41.3	41.3
J-54	Zone - 1	True	750.00	760.00	80.5	41.3	41.3
J-49	Zone - 1	True	750.00	760.00	73.6	41.3	41.3
J980	Zone - 1	True	750.00	760.00	79.7	41.3	41.3
J400	Zone - 1	True	750.00	760.00	69.9	41.3	41.3
J150	Zone - 1	True	750.00	760.00	96.4	41.3	41.3
J390	Zone - 1	True	750.00	760.00	80.1	41.3	41.3
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.3
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.3
J370	Zone - 1	True	750.00	760.00	69.9	41.4	41.4
J380	Zone - 1	True	750.00	760.00	23.0	41.4	41.4
J490	Zone - 1	True	750.00	760.00	74.2	41.4	41.4
J480	Zone - 1	True	750.00	760.00	90.5	41.4	41.4
J900	Zone - 2	True	750.00	760.00	72.4	43.4	41.4
J690	Zone - 2	True	750.00	760.00	83.3	43.4	41.4
J550	Zone - 1	True	750.00	760.00	95.5	41.4	41.4
J570	Zone - 2	True	750.00	760.00	49.8	41.6	41.4
J160	Zone - 1	True	750.00	760.00	68.9	41.5	41.5
J560	Zone - 1	True	750.00	760.00	60.4	41.5	41.5
J450	Zone - 1	True	750.00	760.00	41.3	45.7	41.5
J-55	<None>	True	750.00	760.00	41.5	41.6	41.5
J780	Zone - 1	True	750.00	760.00	105.6	41.5	41.5
J790	Zone - 1	True	750.00	760.00	79.1	41.5	41.5
J800	Zone - 1	True	750.00	760.00	114.3	41.5	41.5
J-8	Zone - 1	True	750.00	760.00	138.0	41.5	41.5
J810	Zone - 1	True	750.00	760.00	138.0	41.5	41.5
J-57	<None>	True	750.00	760.00	41.6	41.6	41.6
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J120	Zone - 1	True	0.00	10.00	84.5	41.9	41.9
J140	Zone - 1	True	0.00	10.00	110.3	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.4	41.9	41.9
J680	Zone - 2	True	0.00	10.00	115.4	44.0	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J770	Zone - 2	True	0.00	10.00	62.6	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report
Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J860	Zone - 1	True	750.00	760.00	48.2	22.9	22.9
J-11	Zone - 1	True	750.00	760.00	27.6	22.9	22.9
J310	Zone - 1	True	750.00	760.00	41.8	22.9	22.9
J-28	Zone - 2	False	750.00	619.69	20.7	20.0	20.0
J260	Zone - 1	True	750.00	760.00	26.3	22.0	22.0
J-14	Zone - 1	True	750.00	760.00	46.3	22.9	22.9
J880	Zone - 1	True	750.00	760.00	44.6	22.9	22.9
320	Zone - 1	True	750.00	760.00	29.9	22.9	22.9
J820	Zone - 1	True	750.00	760.00	34.1	22.9	22.9
J300	Zone - 1	True	750.00	760.00	56.9	22.9	22.9
J890	Zone - 1	True	750.00	760.00	84.8	22.9	22.9
J850	Zone - 1	True	750.00	760.00	34.3	22.9	22.9
J-34	Zone - 1	True	750.00	760.00	57.7	22.9	22.9
J240	Zone - 1	True	750.00	760.00	22.7	21.7	21.7
J-10	Zone - 1	False	750.00	746.70	48.2	20.0	20.0
J-27	Zone - 2	False	750.00	619.69	23.5	20.0	20.0
J720	Zone - 2	False	750.00	605.09	26.5	20.0	20.0
J-37	Zone - 1	True	750.00	760.00	31.9	21.9	21.9
J-52	Zone - 2	False	750.00	605.09	26.4	20.0	20.0
J-36	Zone - 1	True	750.00	760.00	24.4	21.7	21.7
J760	Zone - 2	False	750.00	605.09	29.0	20.0	20.0
J740	Zone - 2	False	750.00	493.60	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	605.09	29.0	20.0	20.0
J520	Zone - 1	False	750.00	443.02	28.7	20.0	20.0
J-23	Zone - 2	False	750.00	696.68	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	680.72	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	493.59	41.5	20.0	20.0
J530	Zone - 1	False	750.00	443.01	40.9	20.0	20.0
J-7	Zone - 1	False	750.00	539.79	41.6	20.0	20.0
J730	Zone - 2	False	750.00	553.87	46.0	20.0	20.0
J500	Zone - 1	False	750.00	449.98	46.0	20.0	20.0
J510	Zone - 1	False	750.00	449.96	57.8	20.0	20.0
J290	Zone - 1	True	750.00	760.00	60.2	23.7	23.7
J840	Zone - 1	True	750.00	760.00	22.9	22.9	22.9
J-30	Zone - 2	False	750.00	584.18	20.5	20.0	20.0
J-38	Zone - 1	True	750.00	760.00	21.5	21.6	21.6
J600	Zone - 2	True	750.00	760.00	39.4	20.2	20.2
J-35	Zone - 1	True	750.00	760.00	21.4	22.0	22.0
J640	Zone - 2	False	750.00	708.91	20.0	20.8	20.8
J630	Zone - 2	False	750.00	707.96	20.0	20.9	20.9
J280	Zone - 1	True	750.00	760.00	62.9	24.9	24.9
J590	Zone - 2	True	750.00	760.00	29.4	21.3	21.3
J580	Zone - 2	True	750.00	760.00	42.9	21.3	21.3
J-3	Zone - 2	True	750.00	760.00	24.0	21.3	21.3
J650	Zone - 2	True	750.00	760.00	51.6	21.3	21.3

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-29	Zone - 2	False	750.00	584.52	20.0	21.5	21.5
J330	Zone - 1	True	750.00	751.88	20.0	23.6	23.6
J-42	Zone - 1	True	750.00	760.00	62.9	25.7	25.7
J270	Zone - 1	True	750.00	760.00	58.5	25.7	25.7
J700	Zone - 2	True	750.00	760.00	24.3	22.1	22.1
J-2	Zone - 2	False	750.00	681.62	20.0	22.3	22.3
J230	Zone - 1	True	750.00	760.00	54.9	30.3	30.3
J340	Zone - 1	True	750.00	760.00	61.3	32.1	32.1
J-50	Zone - 1	True	750.00	760.00	50.6	34.2	34.2
J360	Zone - 1	True	750.00	760.00	62.7	33.6	33.6
J710	Zone - 2	False	750.00	683.67	20.0	30.3	30.3
J220	Zone - 1	True	750.00	760.00	44.7	34.6	34.6
J250	Zone - 1	False	750.00	651.55	20.0	33.1	33.1
J350	Zone - 1	False	750.00	728.57	20.0	33.8	33.8
J660	Zone - 2	True	750.00	760.00	58.6	31.8	31.8
J210	Zone - 1	True	750.00	760.00	44.0	38.3	38.3
J540	Zone - 1	False	750.00	393.98	20.0	36.2	36.2
J200	Zone - 1	True	750.00	760.00	55.4	40.5	40.5
J670	Zone - 2	True	750.00	760.00	86.8	38.0	38.0
J190	Zone - 1	True	750.00	760.00	54.6	41.8	41.8
J180	Zone - 1	True	750.00	760.00	54.6	41.8	41.8
J750	Zone - 2	False	750.00	423.49	20.0	40.5	40.5
J470	Zone - 1	True	750.00	760.00	84.1	41.8	41.8
J170	Zone - 1	True	750.00	760.00	49.9	41.8	41.8
J-40	Zone - 1	True	750.00	760.00	49.0	41.8	41.8
J440	Zone - 1	True	750.00	760.00	54.6	41.8	41.8
J460	Zone - 1	True	750.00	760.00	49.8	41.8	41.8
J420	Zone - 1	True	750.00	760.00	57.1	41.8	41.8
J-41	Zone - 1	True	750.00	760.00	41.2	41.8	41.8
J920	Zone - 1	True	750.00	760.00	57.9	41.8	41.8
J910	Zone - 1	True	750.00	760.00	67.5	41.8	41.8
J430	Zone - 1	True	750.00	760.00	72.9	41.8	41.8
J970	Zone - 1	True	750.00	760.00	65.2	41.8	41.8
J410	Zone - 1	True	750.00	760.00	53.8	41.8	41.8
J20	Zone - 1	True	750.00	760.00	91.4	41.8	41.8
J50	Zone - 1	True	750.00	760.00	84.1	41.8	41.8
J90	Zone - 1	True	750.00	760.00	54.8	41.8	41.8
J100	Zone - 1	True	750.00	760.00	80.1	41.8	41.8
J-44	Zone - 1	True	750.00	760.00	93.8	41.8	41.8
J-47	Zone - 1	True	750.00	760.00	74.8	41.8	41.8
J10	Zone - 1	True	750.00	760.00	108.0	41.8	41.8
J60	Zone - 1	True	750.00	760.00	75.8	41.8	41.8
J70	Zone - 1	True	750.00	760.00	42.3	41.8	41.8
J80	Zone - 1	True	750.00	760.00	65.6	41.8	41.8
J-45	Zone - 1	True	750.00	760.00	84.6	41.8	41.8

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2033 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-48	Zone - 1	True	750.00	760.00	84.4	41.8	41.8
J110	Zone - 1	True	750.00	760.00	88.8	41.8	41.8
J130	Zone - 1	True	750.00	760.00	97.7	41.8	41.8
J-54	Zone - 1	True	750.00	760.00	88.7	41.8	41.8
J-49	Zone - 1	True	750.00	760.00	79.5	41.8	41.8
J980	Zone - 1	True	750.00	760.00	83.9	41.8	41.8
J400	Zone - 1	True	750.00	760.00	71.6	41.8	41.8
J150	Zone - 1	True	750.00	760.00	99.3	41.8	41.8
J390	Zone - 1	True	750.00	760.00	82.0	41.8	41.8
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.8
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.8
J370	Zone - 1	True	750.00	760.00	71.9	41.8	41.8
J380	Zone - 1	True	750.00	760.00	25.0	41.8	41.8
J490	Zone - 1	True	750.00	760.00	75.9	41.8	41.8
J480	Zone - 1	True	750.00	760.00	92.0	41.8	41.8
J900	Zone - 2	True	750.00	760.00	72.4	43.4	41.8
J690	Zone - 2	True	750.00	760.00	83.3	43.4	41.8
J550	Zone - 1	True	750.00	760.00	96.9	41.8	41.8
J570	Zone - 2	True	750.00	760.00	49.8	41.6	41.6
J160	Zone - 1	True	750.00	760.00	70.3	41.8	41.8
J560	Zone - 1	True	750.00	760.00	61.8	41.8	41.8
J450	Zone - 1	True	750.00	760.00	41.8	46.5	41.8
J-55	<None>	True	750.00	760.00	41.8	41.8	41.8
J780	Zone - 1	True	750.00	760.00	106.9	41.8	41.8
J790	Zone - 1	True	750.00	760.00	80.4	41.8	41.8
J800	Zone - 1	True	750.00	760.00	115.5	41.8	41.8
J-8	Zone - 1	True	750.00	760.00	139.3	41.8	41.8
J810	Zone - 1	True	750.00	760.00	139.3	41.8	41.8
J-57	<None>	True	750.00	760.00	41.8	41.9	41.9
J-5	Zone - 1	True	0.00	10.00	42.0	42.2	42.0
J120	Zone - 1	True	0.00	10.00	88.2	42.2	42.0
J140	Zone - 1	True	0.00	10.00	113.6	42.2	42.0
J-6	Zone - 1	True	0.00	10.00	83.4	42.2	42.0
J680	Zone - 2	True	0.00	10.00	115.4	44.0	42.0
J620	Zone - 2	True	0.00	10.00	55.0	44.0	42.0
J770	Zone - 2	True	0.00	10.00	62.6	44.0	42.0

FlexTable: Junction Table

Active Scenario: 2033 PHD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
476	J-15	542.00	Zone - 1	(N/A)	(N/A)	(N/A)
477	J-16	534.00	Zone - 1	(N/A)	(N/A)	(N/A)
478	J-17	480.00	Zone - 1	(N/A)	(N/A)	(N/A)
479	J-18	470.00	Zone - 1	(N/A)	(N/A)	(N/A)
480	J-19	462.00	Zone - 1	(N/A)	(N/A)	(N/A)
481	J-20	415.00	Zone - 1	(N/A)	(N/A)	(N/A)
368	J-5	670.00	Zone - 1	41.8	4.63	766.51
170	J450	670.00	Zone - 1	41.8	4.63	766.58
6964	J-55	670.00	<None>	41.8	0.00	766.63
6966	J-57	670.00	<None>	41.8	0.00	766.66
128	J30	545.00	Zone - 2	44.0	5.56	646.70
532	J-41	660.00	Zone - 1	45.9	0.00	766.20
504	J-29	536.00	Zone - 2	46.9	14.02	644.41
502	J-28	533.00	Zone - 2	48.2	0.00	644.43
506	J-30	532.50	Zone - 2	48.4	14.02	644.40
529	J-40	650.00	Zone - 1	50.3	0.00	766.23
500	J-27	528.00	Zone - 2	50.4	14.02	644.43
188	J630	520.00	Zone - 2	53.9	6.12	644.59
189	J640	520.00	Zone - 2	53.9	6.12	644.60
518	J-35	633.00	Zone - 1	54.6	0.00	759.12
525	J-38	632.00	Zone - 1	55.0	21.02	759.11
149	J240	630.00	Zone - 1	55.9	6.96	759.14
187	J620	515.00	Zone - 2	56.0	0.00	644.53
362	J-2	515.00	Zone - 2	56.1	6.12	644.60
182	J570	515.00	Zone - 2	56.3	4.63	645.22
169	J440	635.00	Zone - 1	56.7	4.63	766.09
179	J540	630.00	Zone - 1	57.8	4.67	763.49
520	J-36	625.00	Zone - 1	58.0	21.02	759.11
167	J420	625.00	Zone - 1	60.8	4.63	765.60
129	J40	500.00	Zone - 2	63.5	5.56	646.70
522	J-37	609.00	Zone - 1	64.9	21.02	759.11
202	J770	490.00	Zone - 2	65.7	6.12	641.89
142	J170	610.00	Zone - 1	65.7	5.56	761.89
177	J520	610.00	Zone - 1	66.4	4.67	763.49
221	J970	610.00	Zone - 1	67.3	0.00	765.47
171	J460	610.00	Zone - 1	67.5	4.63	766.09
133	J80	605.00	Zone - 1	68.2	5.56	762.71
200	J750	485.00	Zone - 2	69.0	4.63	644.46
166	J410	605.00	Zone - 1	69.0	6.96	764.49
146	J210	600.00	Zone - 1	69.6	5.56	760.76
132	J70	600.00	Zone - 1	70.3	5.56	762.50
134	J90	600.00	Zone - 1	70.4	0.00	762.71
181	J560	610.00	Zone - 1	70.6	4.63	773.25
195	J700	480.00	Zone - 2	71.3	4.63	644.73
216	J920	600.00	Zone - 1	71.3	0.00	764.88
498	J-26	477.00	Zone - 2	72.5	0.00	644.49
364	J-3	475.00	Zone - 2	73.3	6.12	644.50

FlexTable: Junction Table

Active Scenario: 2033 PHD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
147	J220	590.00	Zone - 1	73.7	5.56	760.31
143	J180	590.00	Zone - 1	74.2	5.56	761.45
184	J590	470.00	Zone - 2	75.5	6.12	644.50
197	J720	470.00	Zone - 2	75.5	4.63	644.52
168	J430	590.00	Zone - 1	75.9	4.63	765.47
493	J-23	467.00	Zone - 2	76.8	0.00	644.50
199	J740	465.00	Zone - 2	77.6	4.63	644.46
185	J600	465.00	Zone - 2	77.7	6.12	644.53
556	J-47	583.00	Zone - 1	77.7	0.00	762.62
145	J200	580.00	Zone - 1	78.3	5.56	761.06
131	J60	580.00	Zone - 1	79.0	5.56	762.50
141	J160	590.00	Zone - 1	79.2	4.63	773.11
178	J530	580.00	Zone - 1	79.4	4.67	763.49
372	J-7	580.00	Zone - 1	79.4	6.96	763.62
150	J250	575.00	Zone - 1	79.8	6.96	759.35
183	J580	460.00	Zone - 2	79.8	6.12	644.50
6941	J-50	575.65	Zone - 1	79.9	0.00	760.27
215	J910	580.00	Zone - 1	80.0	4.63	764.88
6945	J-52	459.29	Zone - 2	80.1	0.00	644.51
160	J350	575.00	Zone - 1	80.3	6.96	760.51
562	J-49	578.50	Zone - 1	80.6	0.00	764.80
214	J900	460.00	Zone - 2	80.6	5.56	646.40
135	J100	575.00	Zone - 1	81.4	5.56	763.22
158	J330	570.00	Zone - 1	81.7	5.56	758.87
464	J-11	570.00	Zone - 1	81.7	0.00	758.87
157	320	570.00	Zone - 1	81.7	5.56	758.87
196	J710	455.00	Zone - 2	82.1	6.12	644.72
370	J-6	575.00	Zone - 1	82.2	0.00	764.88
6948	J-53	451.78	Zone - 2	83.4	0.00	644.51
163	J380	570.00	Zone - 1	83.7	6.96	763.42
137	J120	570.00	Zone - 1	83.7	0.00	763.43
175	J500	570.00	Zone - 1	83.7	6.96	763.50
151	J260	565.00	Zone - 1	84.1	6.96	759.35
222	J980	570.00	Zone - 1	84.6	4.63	765.46
559	J-48	565.00	Zone - 1	85.8	0.00	763.35
162	J370	565.00	Zone - 1	85.9	6.96	763.43
209	J840	560.00	Zone - 1	86.0	5.56	758.81
394	J-10	565.00	Zone - 1	86.0	0.00	763.83
201	J760	445.00	Zone - 2	86.3	6.12	644.51
148	J230	560.00	Zone - 1	86.5	6.96	759.86
130	J50	560.00	Zone - 1	87.6	5.56	762.39
165	J400	560.00	Zone - 1	88.3	6.96	764.18
552	J-45	558.00	Zone - 1	88.4	0.00	762.29
190	J650	440.00	Zone - 2	88.6	6.12	644.81
191	J660	440.00	Zone - 2	88.8	6.12	645.30
159	J340	555.00	Zone - 1	88.9	6.96	760.53
161	J360	555.00	Zone - 1	89.1	6.96	760.85

FlexTable: Junction Table

Active Scenario: 2033 PHD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
470	J-14	553.11	Zone - 1	89.1	0.00	758.97
136	J110	555.00	Zone - 1	90.2	4.63	763.43
207	J820	550.00	Zone - 1	90.4	5.56	758.84
174	J490	555.00	Zone - 1	90.4	6.12	763.99
515	J-34	550.00	Zone - 1	90.5	0.00	759.12
172	J470	555.00	Zone - 1	91.4	6.12	766.17
154	J290	545.00	Zone - 1	92.7	6.96	759.18
366	J-4	430.00	Zone - 2	92.8	4.63	644.46
194	J690	430.00	Zone - 2	93.6	5.56	646.31
535	J-42	540.97	Zone - 1	94.5	0.00	759.40
156	J310	540.00	Zone - 1	94.8	5.56	759.03
155	J300	540.00	Zone - 1	94.8	5.56	759.03
153	J280	540.00	Zone - 1	94.9	6.96	759.30
198	J730	425.00	Zone - 2	95.0	4.63	644.49
144	J190	540.00	Zone - 1	95.8	5.56	761.44
127	J20	540.00	Zone - 1	96.1	5.56	762.02
176	J510	540.00	Zone - 1	96.7	4.67	763.50
152	J270	535.00	Zone - 1	97.1	6.96	759.38
549	J-44	534.00	Zone - 1	98.7	0.00	762.02
210	J850	530.00	Zone - 1	99.0	5.56	758.80
138	J130	535.00	Zone - 1	99.0	4.63	763.85
164	J390	535.00	Zone - 1	99.0	6.96	763.88
140	J150	535.00	Zone - 1	100.1	4.63	766.27
173	J480	530.00	Zone - 1	102.1	6.12	766.07
204	J790	535.00	Zone - 1	104.3	4.63	776.05
6951	J-54	517.75	Zone - 1	106.5	0.00	763.85
139	J140	510.00	Zone - 1	109.7	4.63	763.65
192	J670	390.00	Zone - 2	110.6	5.56	645.64
212	J880	500.00	Zone - 1	112.0	5.56	758.80
126	J10	500.00	Zone - 1	113.4	5.56	762.02
211	J860	495.00	Zone - 1	114.1	5.56	758.80
180	J550	500.00	Zone - 1	116.6	6.12	769.42
193	J680	375.00	Zone - 2	116.7	5.56	644.68
203	J780	505.00	Zone - 1	117.3	4.63	776.05
205	J800	485.00	Zone - 1	126.2	4.63	776.80
375	J-8	430.00	Zone - 1	150.3	4.63	777.43
206	J810	430.00	Zone - 1	150.4	0.00	777.61
213	J890	405.00	Zone - 1	153.1	5.56	758.80

FlexTable: Pipe Table

Active Scenario: 2033 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
315	860	309.23	PMP-3	J810	4.34	6.0	Ductile Iron	False
316	870	864.72	R-3	PMP-3	4.34	6.0	Ductile Iron	False
6969	P-57	160.34	J-57	T-1	2.66	6.0	Ductile Iron	False
563	1200(1)	603.11	J130	J-49	1.52	8.0	Ductile Iron	False
564	1200(2)	527.99	J-49	J980	1.52	8.0	Ductile Iron	False
245	130	359.67	J110	J130	1.46	8.0	Ductile Iron	False
560	110(1)	81.48	J100	J-48	1.43	8.0	Ductile Iron	False
561	110(2)	178.25	J-48	J110	1.43	8.0	Ductile Iron	False
531	450(2)	110.11	J-40	J450	1.64	6.0	Asbestos Cement	False
347	1210	781.29	J980	J150	1.42	8.0	Ductile Iron	False
247	160	3,735.98	J150	J160	1.65	6.0	Asbestos Cement	False
530	450(1)	48.98	J440	J-40	1.34	6.0	Asbestos Cement	False
268	370	1,520.73	J360	J370	1.39	6.0	Asbestos Cement	False
377	P-12	326.74	J-8	J810	1.56	10.0	Ductile Iron	False
376	P-11	1,085.66	J800	J-8	1.54	10.0	Ductile Iron	False
267	360	347.69	J340	J360	1.31	6.0	Asbestos Cement	False
312	830	443.46	J780	J800	1.52	10.0	Ductile Iron	False
274	440	458.31	J440	J420	1.23	6.0	Asbestos Cement	False
280	500	1,364.20	J480	J490	1.37	6.0	Ductile Iron	False
310	810	2,987.84	J560	J780	1.49	10.0	Ductile Iron	False
537	340(2)	1,042.18	J-42	J340	1.15	6.0	Asbestos Cement	False
288	580	3,263.45	J550	J560	1.28	6.0	Ductile Iron	False
6967	P-55	225.92	J450	J-55	1.50	8.0	Ductile Iron	False
6968	P-56	115.11	J-55	J-57	1.50	8.0	Ductile Iron	False
242	100	1,321.26	J80	J100	0.76	8.0	Ductile Iron	False
287	570	2,690.07	J480	J550	1.21	6.0	Asbestos Cement	False
557	80(1)	295.82	J60	J-47	0.72	8.0	Ductile Iron	False
558	80(2)	390.59	J-47	J80	0.72	8.0	Ductile Iron	False
238	60	520.40	J50	J60	0.65	8.0	Ductile Iron	False
281	510	887.52	J490	J370	0.93	6.0	Asbestos Cement	False
553	50(1)	1,110.72	J20	J-45	0.62	8.0	Ductile Iron	False
554	50(2)	370.33	J-45	J50	0.62	8.0	Ductile Iron	False
343	1170	1,578.31	J160	PRV-3	1.09	6.0	Asbestos Cement	False
344	1180	1,065.48	PRV-3	J570	1.09	6.0	Asbestos Cement	False
289	590	355.59	J560	J160	1.01	10.0	Ductile Iron	False
333	1060	928.80	J910	J420	0.90	6.0	Ductile Iron	False
332	1050	1,355.49	J410	J910	0.85	6.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2033 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
248	170	1,273.25	J100	J170	1.13	6.0	Asbestos Cement	False
271	400	614.59	J390	J400	0.69	6.0	Asbestos Cement	False
249	180	481.48	J170	J180	1.06	6.0	Asbestos Cement	False
301	720	1,396.52	J690	J670	0.72	6.0	Asbestos Cement	False
270	390	1,285.53	J370	J390	0.61	6.0	Asbestos Cement	False
538	P-53	582.53	J280	J-42	0.51	8.0	Ductile Iron	False
251	200	512.94	J180	J200	0.94	6.0	Asbestos Cement	False
260	290	977.80	J280	J290	0.47	8.0	Ductile Iron	False
309	800	2,413.23	J760	J770	0.63	2.0	PVC	False
299	700	1,204.37	J660	J670	0.59	6.0	Asbestos Cement	False
517	P-44	217.90	J-34	J290	0.43	8.0	Ductile Iron	False
252	210	454.85	J200	J210	0.87	6.0	Asbestos Cement	False
300	710	1,058.65	J670	J680	0.57	2.0	PVC	False
341	1150	1,645.01	J20	PRV-2	0.55	8.0	Ductile Iron	False
342	1160	399.53	PRV-2	J30	0.55	8.0	Ductile Iron	False
298	690	1,917.41	J650	J660	0.52	6.0	Asbestos Cement	False
273	430	1,266.81	J420	J430	0.28	6.0	Asbestos Cement	False
253	220	827.91	J210	J220	0.81	6.0	Asbestos Cement	False
302	730	2,028.96	J570	J700	0.52	6.0	Asbestos Cement	False
494	P-36	3,062.02	J570	J-23	0.51	6.0	Asbestos Cement	False
272	410	2,002.83	J400	J410	0.43	8.0	Ductile Iron	False
330	1030	2,047.17	J30	J900	0.47	8.0	Ductile Iron	False
369	P-7	133.76	J450	J-5	0.47	2.0	PVC	False
6953	140(2)	389.47	J-54	J140	0.47	2.0	PVC	False
297	680	641.20	J640	J650	0.45	6.0	Asbestos Cement	False
6943	230(2)	851.77	J-50	J230	0.75	6.0	Asbestos Cement	False
331	1040	688.05	J900	J690	0.44	8.0	Ductile Iron	False
304	750	1,292.25	J700	J720	0.40	6.0	Asbestos Cement	False
255	240	1,855.02	J230	J240	0.67	6.0	Asbestos Cement	False
534	P-52	878.79	J-41	J470	0.30	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2033 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
395	P-19	1,252.08	J490	J-10	0.37	6.0	Asbestos Cement	False
396	P-20	1,882.30	J-10	J-7	0.37	6.0	Ductile Iron	False
516	P-43	1,239.83	J300	J-34	0.35	8.0	Ductile Iron	False
296	670	490.62	J630	J640	0.31	6.0	Asbestos Cement	False
279	490	1,142.41	J470	J480	0.23	6.0	Asbestos Cement	False
277	470	2,047.82	J450	J150	0.52	8.0	Ductile Iron	False
374	P-10	1,181.08	J-7	J500	0.29	6.0	Ductile Iron	False
471	P-24	1,355.02	J300	J-14	0.28	8.0	Ductile Iron	False
472	P-25	1,789.45	J-14	320	0.28	8.0	Ductile Iron	False
499	P-38	1,114.16	J-23	J-26	0.27	8.0	Ductile Iron	False
501	P-39	450.98	J-26	J-27	0.27	8.0	Ductile Iron	False
345	1190	141.18	J430	J970	0.13	8.0	Ductile Iron	False
348	1220	909.93	J970	J980	0.13	8.0	Ductile Iron	False
6942	230(1)	309.29	J220	J-50	0.42	8.0	Ductile Iron	False
295	660	1,120.60	J600	J630	0.24	6.0	Asbestos Cement	False
536	340(1)	775.50	J270	J-42	0.24	6.0	Asbestos Cement	False
524	P-48	211.43	J-37	J-34	0.07	8.0	Ductile Iron	False
317	880	1,338.16	320	J820	0.21	8.0	Ductile Iron	False
533	P-51	1,633.61	J-40	J-41	0.17	8.0	Ductile Iron	False
305	760	670.42	J720	J730	0.21	6.0	Asbestos Cement	False
292	630	869.29	J580	J600	0.17	6.0	Asbestos Cement	False
505	P-41	915.45	J-27	J-29	0.18	8.0	Ductile Iron	False
319	910	2,195.52	J820	J840	0.18	8.0	Ductile Iron	False
519	P-45	240.88	J240	J-35	0.33	8.0	Ductile Iron	False
284	540	442.27	J500	J520	0.16	6.0	Ductile Iron	False
258	270	597.10	J260	J270	0.16	6.0	Asbestos Cement	False
306	770	953.99	J730	J740	0.16	6.0	Asbestos Cement	False
6946	790(1)	560.25	J720	J-52	0.14	6.0	Asbestos Cement	False
6950	790(2)(2)	295.46	J-53	J760	0.14	6.0	Asbestos Cement	False
320	920	1,046.94	J840	J850	0.11	8.0	Ductile Iron	False
526	P-49	1,084.51	J-35	J-38	0.18	8.0	Ductile Iron	False
507	P-42	299.85	J-29	J-30	0.09	8.0	Ductile Iron	False
521	P-46	782.54	J-35	J-36	0.15	8.0	Ductile Iron	False
257	260	1,069.05	J250	J260	0.08	6.0	Asbestos Cement	False
266	350	1,870.47	J350	J340	0.08	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2033 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
269	380	2,794.51	J370	J380	0.08	6.0	Asbestos Cement	False
6949	790(2)(1)	233.65	J-52	J-53	0.08	8.0	Ductile Iron	False
291	620	721.05	J580	J590	0.07	6.0	Ductile Iron	False
303	740	1,472.16	J700	J710	0.07	6.0	Asbestos Cement	False
365	P-5	638.70	J580	J-3	0.07	6.0	Ductile Iron	False
550	20(1)	1,127.26	J10	J-44	0.04	8.0	Ductile Iron	False
551	20(2)	454.30	J-44	J20	0.04	8.0	Ductile Iron	False
236	40	1,237.96	J30	J40	0.06	6.0	Asbestos Cement	False
239	70	1,233.32	J60	J70	0.06	6.0	Asbestos Cement	False
250	190	788.53	J180	J190	0.06	6.0	Asbestos Cement	False
262	310	1,091.01	J300	J310	0.06	6.0	Asbestos Cement	False
523	P-47	763.84	J-36	J-37	0.02	8.0	Ductile Iron	False
283	530	910.93	J500	J510	0.05	6.0	Ductile Iron	False
285	550	324.28	J520	J530	0.05	6.0	Ductile Iron	False
286	560	1,423.00	J520	J540	0.05	6.0	Ductile Iron	False
278	480	982.79	J440	J460	0.05	6.0	Ductile Iron	False
307	780	1,302.56	J740	J750	0.05	6.0	Asbestos Cement	False
311	820	1,060.57	J790	J780	0.05	6.0	Ductile Iron	False
367	P-6	258.23	J740	J-4	0.05	6.0	Ductile Iron	False
6952	140(1)	866.12	J130	J-54	0.05	6.0	Asbestos Cement	False
527	P-50	416.06	J-38	J-37	0.05	8.0	Ductile Iron	False
363	P-4	1,141.91	J640	J-2	0.04	8.0	Ductile Iron	False
321	930	184.62	J850	J860	0.04	8.0	Ductile Iron	False
322	950	1,933.27	J840	J890	0.04	8.0	Ductile Iron	False
323	960	440.71	J850	J880	0.04	8.0	Ductile Iron	False
465	P-21	721.05	320	J-11	0.04	8.0	Ductile Iron	False
466	P-22	1,599.67	J-11	J330	0.04	8.0	Ductile Iron	False
495	P-37	1,640.82	J-23	J580	0.03	6.0	Asbestos Cement	False
244	120	246.16	J110	J120	0.00	2.0	PVC	False
329	1020	705.53	R-3	PMP-2	0.00	6.0	Ductile Iron	False
328	1010	359.73	PMP-2	J810	0.00	6.0	Ductile Iron	False
326	10	89.47	R-1	PMP-1	0.00	6.0	Asbestos Cement	False
327	15	109.92	PMP-1	J10	0.00	6.0	Asbestos Cement	False
503	P-40	568.86	J-27	J-28	0.00	8.0	Ductile Iron	False
334	1070	458.75	J910	J920	0.00	8.0	Ductile Iron	False
241	90	678.03	J80	J90	0.00	6.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2033 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
371	P-8	361.67	J910	J-6	0.00	2.0	PVC	False
361	P-3	1,059.28	J600	J620	0.00	2.0	PVC	False
256	250	219.27	J240	J250	0.00	6.0	Asbestos Cement	False
6975	P-62	325.59	J-55	T-1	0.00	6.0	Ductile Iron	True
475	P-26	788.07	R-5	PMP-5	(N/A)	6.0	Ductile Iron	False
482	P-27	463.65	PMP-5	J-20	(N/A)	6.0	Ductile Iron	False
483	P-28	1,351.93	J-20	J-19	(N/A)	8.0	Ductile Iron	False
484	P-29	514.98	J-19	J-18	(N/A)	8.0	Ductile Iron	False
485	P-30	603.37	J-18	J-17	(N/A)	8.0	Ductile Iron	False
486	P-31	1,965.14	J-17	J-16	(N/A)	8.0	Ductile Iron	False
487	P-32	320.88	J-16	J-15	(N/A)	8.0	Ductile Iron	False
488	P-33	435.33	J-15	J310	(N/A)	8.0	Ductile Iron	False

FlexTable: Junction Table

Active Scenario: 2043 MDD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
476	J-15	542.00	Zone - 1	(N/A)	(N/A)	(N/A)
477	J-16	534.00	Zone - 1	(N/A)	(N/A)	(N/A)
478	J-17	480.00	Zone - 1	(N/A)	(N/A)	(N/A)
479	J-18	470.00	Zone - 1	(N/A)	(N/A)	(N/A)
480	J-19	462.00	Zone - 1	(N/A)	(N/A)	(N/A)
481	J-20	415.00	Zone - 1	(N/A)	(N/A)	(N/A)
6966	J-57	670.00	<None>	41.9	0.00	766.79
368	J-5	670.00	Zone - 1	41.9	2.39	766.80
6964	J-55	670.00	<None>	41.9	0.00	766.80
170	J450	670.00	Zone - 1	41.9	2.39	766.83
128	J30	545.00	Zone - 2	44.0	2.88	646.72
532	J-41	660.00	Zone - 1	46.2	0.00	766.80
504	J-29	536.00	Zone - 2	47.3	7.25	645.44
502	J-28	533.00	Zone - 2	48.6	0.00	645.44
506	J-30	532.50	Zone - 2	48.9	7.25	645.44
529	J-40	650.00	Zone - 1	50.5	0.00	766.83
500	J-27	528.00	Zone - 2	50.8	7.25	645.44
188	J630	520.00	Zone - 2	54.3	3.16	645.59
189	J640	520.00	Zone - 2	54.3	3.16	645.60
187	J620	515.00	Zone - 2	56.5	0.00	645.53
182	J570	515.00	Zone - 2	56.5	2.39	645.54
362	J-2	515.00	Zone - 2	56.5	3.16	645.60
169	J440	635.00	Zone - 1	57.0	2.39	766.85
518	J-35	633.00	Zone - 1	57.8	0.00	766.54
525	J-38	632.00	Zone - 1	58.2	10.87	766.53
179	J540	630.00	Zone - 1	59.0	2.42	766.38
149	J240	630.00	Zone - 1	59.1	3.60	766.57
520	J-36	625.00	Zone - 1	61.2	10.87	766.53
167	J420	625.00	Zone - 1	61.4	2.39	766.95
129	J40	500.00	Zone - 2	63.5	2.88	646.72
202	J770	490.00	Zone - 2	66.9	3.16	644.55
177	J520	610.00	Zone - 1	67.7	2.42	766.38
181	J560	610.00	Zone - 1	67.8	2.39	766.61
171	J460	610.00	Zone - 1	67.9	2.39	766.85
522	J-37	609.00	Zone - 1	68.1	10.87	766.51
221	J970	610.00	Zone - 1	68.5	0.00	768.30
200	J750	485.00	Zone - 2	69.4	2.39	645.31
142	J170	610.00	Zone - 1	69.4	2.88	770.43
166	J410	605.00	Zone - 1	70.0	3.60	766.72
195	J700	480.00	Zone - 2	71.6	2.39	645.39
216	J920	600.00	Zone - 1	72.2	0.00	766.80
498	J-26	477.00	Zone - 2	72.9	0.00	645.46
146	J210	600.00	Zone - 1	73.2	2.88	769.11
364	J-3	475.00	Zone - 2	73.8	3.16	645.48
133	J80	605.00	Zone - 1	74.3	2.88	776.62
197	J720	470.00	Zone - 2	75.9	2.39	645.33
184	J590	470.00	Zone - 2	75.9	3.16	645.49

FlexTable: Junction Table

Active Scenario: 2043 MDD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
141	J160	590.00	Zone - 1	76.4	2.39	766.61
134	J90	600.00	Zone - 1	76.4	0.00	776.62
168	J430	590.00	Zone - 1	77.1	2.39	768.21
493	J-23	467.00	Zone - 2	77.2	0.00	645.47
147	J220	590.00	Zone - 1	77.2	2.88	768.49
132	J70	600.00	Zone - 1	77.3	2.88	778.76
143	J180	590.00	Zone - 1	77.9	2.88	769.96
199	J740	465.00	Zone - 2	78.0	2.39	645.31
185	J600	465.00	Zone - 2	78.1	3.16	645.53
183	J580	460.00	Zone - 2	80.3	3.16	645.49
6945	J-52	459.29	Zone - 2	80.5	0.00	645.33
178	J530	580.00	Zone - 1	80.6	2.42	766.38
372	J-7	580.00	Zone - 1	80.7	3.60	766.42
214	J900	460.00	Zone - 2	80.7	2.88	646.58
215	J910	580.00	Zone - 1	80.8	2.39	766.80
145	J200	580.00	Zone - 1	82.0	2.88	769.50
196	J710	455.00	Zone - 2	82.4	3.16	645.39
562	J-49	578.50	Zone - 1	82.6	0.00	769.37
150	J250	575.00	Zone - 1	82.8	3.60	766.45
160	J350	575.00	Zone - 1	82.8	3.60	766.47
370	J-6	575.00	Zone - 1	83.0	0.00	766.80
6941	J-50	575.65	Zone - 1	83.4	0.00	768.43
6948	J-53	451.78	Zone - 2	83.7	0.00	645.33
556	J-47	583.00	Zone - 1	84.2	0.00	777.56
175	J500	570.00	Zone - 1	85.0	3.60	766.38
158	J330	570.00	Zone - 1	85.0	2.88	766.40
464	J-11	570.00	Zone - 1	85.0	0.00	766.40
157	320	570.00	Zone - 1	85.0	2.88	766.40
163	J380	570.00	Zone - 1	85.0	3.60	766.52
135	J100	575.00	Zone - 1	85.1	2.88	771.77
222	J980	570.00	Zone - 1	85.8	2.39	768.42
131	J60	580.00	Zone - 1	86.0	2.88	778.76
201	J760	445.00	Zone - 2	86.7	3.16	645.32
137	J120	570.00	Zone - 1	87.1	0.00	771.42
151	J260	565.00	Zone - 1	87.2	3.60	766.45
394	J-10	565.00	Zone - 1	87.2	0.00	766.48
162	J370	565.00	Zone - 1	87.2	3.60	766.53
190	J650	440.00	Zone - 2	89.0	3.16	645.73
191	J660	440.00	Zone - 2	89.1	3.16	646.02
209	J840	560.00	Zone - 1	89.3	2.88	766.38
559	J-48	565.00	Zone - 1	89.4	0.00	771.55
165	J400	560.00	Zone - 1	89.4	3.60	766.66
148	J230	560.00	Zone - 1	89.9	3.60	767.81
159	J340	555.00	Zone - 1	91.5	3.60	766.47
161	J360	555.00	Zone - 1	91.5	3.60	766.47
174	J490	555.00	Zone - 1	91.5	3.16	766.53
172	J470	555.00	Zone - 1	91.6	3.16	766.76

FlexTable: Junction Table

Active Scenario: 2043 MDD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
470	J-14	553.11	Zone - 1	92.3	0.00	766.43
366	J-4	430.00	Zone - 2	93.2	2.39	645.31
207	J820	550.00	Zone - 1	93.6	2.88	766.39
136	J110	555.00	Zone - 1	93.6	2.39	771.42
515	J-34	550.00	Zone - 1	93.7	0.00	766.47
194	J690	430.00	Zone - 2	93.7	2.88	646.54
130	J50	560.00	Zone - 1	95.3	2.88	780.24
198	J730	425.00	Zone - 2	95.3	2.39	645.32
154	J290	545.00	Zone - 1	95.8	3.60	766.47
552	J-45	558.00	Zone - 1	96.8	0.00	781.68
535	J-42	540.97	Zone - 1	97.6	0.00	766.47
176	J510	540.00	Zone - 1	97.9	2.42	766.38
156	J310	540.00	Zone - 1	98.0	2.88	766.45
155	J300	540.00	Zone - 1	98.0	2.88	766.45
153	J280	540.00	Zone - 1	98.0	3.60	766.47
144	J190	540.00	Zone - 1	99.5	2.88	769.96
152	J270	535.00	Zone - 1	100.1	3.60	766.46
164	J390	535.00	Zone - 1	100.2	3.60	766.60
204	J790	535.00	Zone - 1	100.2	2.39	766.61
140	J150	535.00	Zone - 1	100.7	2.39	767.73
138	J130	535.00	Zone - 1	102.0	2.39	770.74
210	J850	530.00	Zone - 1	102.3	2.88	766.38
173	J480	530.00	Zone - 1	102.4	3.16	766.61
127	J20	540.00	Zone - 1	106.3	2.88	785.60
6951	J-54	517.75	Zone - 1	109.5	0.00	770.74
549	J-44	534.00	Zone - 1	109.6	0.00	787.24
192	J670	390.00	Zone - 2	110.8	2.88	646.21
139	J140	510.00	Zone - 1	112.8	2.39	770.68
203	J780	505.00	Zone - 1	113.2	2.39	766.61
212	J880	500.00	Zone - 1	115.3	2.88	766.38
180	J550	500.00	Zone - 1	115.3	3.16	766.61
193	J680	375.00	Zone - 2	117.2	2.88	645.92
211	J860	495.00	Zone - 1	117.4	2.88	766.38
205	J800	485.00	Zone - 1	121.8	2.39	766.61
126	J10	500.00	Zone - 1	126.7	2.88	792.85
206	J810	430.00	Zone - 1	145.6	0.00	766.61
375	J-8	430.00	Zone - 1	145.6	2.39	766.61
213	J890	405.00	Zone - 1	156.4	2.88	766.38

FlexTable: Pipe Table

Active Scenario: 2043 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
326	10	89.47	R-1	PMP-1	5.35	6.0	Asbestos Cement	False
327	15	109.92	PMP-1	J10	5.35	6.0	Asbestos Cement	False
550	20(1)	1,127.26	J10	J-44	2.99	8.0	Ductile Iron	False
551	20(2)	454.30	J-44	J20	2.99	8.0	Ductile Iron	False
553	50(1)	1,110.72	J20	J-45	2.62	8.0	Ductile Iron	False
554	50(2)	370.33	J-45	J50	2.62	8.0	Ductile Iron	False
238	60	520.40	J50	J60	2.61	8.0	Ductile Iron	False
557	80(1)	295.82	J60	J-47	2.57	8.0	Ductile Iron	False
558	80(2)	390.59	J-47	J80	2.57	8.0	Ductile Iron	False
242	100	1,321.26	J80	J100	2.55	8.0	Ductile Iron	False
560	110(1)	81.48	J100	J-48	1.90	8.0	Ductile Iron	False
561	110(2)	178.25	J-48	J110	1.90	8.0	Ductile Iron	False
245	130	359.67	J110	J130	1.88	8.0	Ductile Iron	False
563	1200(1)	603.11	J130	J-49	1.85	8.0	Ductile Iron	False
564	1200(2)	527.99	J-49	J980	1.85	8.0	Ductile Iron	False
6969	P-57	160.34	J-57	T-1	1.73	6.0	Ductile Iron	False
347	1210	781.29	J980	J150	1.29	8.0	Ductile Iron	False
248	170	1,273.25	J100	J170	1.13	6.0	Asbestos Cement	False
249	180	481.48	J170	J180	1.10	6.0	Asbestos Cement	False
251	200	512.94	J180	J200	1.03	6.0	Asbestos Cement	False
252	210	454.85	J200	J210	1.00	6.0	Asbestos Cement	False
6967	P-55	225.92	J450	J-55	0.97	8.0	Ductile Iron	False
6968	P-56	115.11	J-55	J-57	0.97	8.0	Ductile Iron	False
253	220	827.91	J210	J220	0.97	6.0	Asbestos Cement	False
273	430	1,266.81	J420	J430	0.94	6.0	Asbestos Cement	False
6943	230(2)	851.77	J-50	J230	0.93	6.0	Asbestos Cement	False
277	470	2,047.82	J450	J150	0.92	8.0	Ductile Iron	False
255	240	1,855.02	J230	J240	0.89	6.0	Asbestos Cement	False
247	160	3,735.98	J150	J160	0.62	6.0	Asbestos Cement	False
345	1190	141.18	J430	J970	0.55	8.0	Ductile Iron	False
348	1220	909.93	J970	J980	0.55	8.0	Ductile Iron	False
274	440	458.31	J440	J420	0.53	6.0	Asbestos Cement	False
6942	230(1)	309.29	J220	J-50	0.53	8.0	Ductile Iron	False
301	720	1,396.52	J690	J670	0.49	6.0	Asbestos Cement	False
519	P-45	240.88	J240	J-35	0.48	8.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2043 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
530	450(1)	48.98	J440	J-40	0.47	6.0	Asbestos Cement	False
343	1170	1,578.31	J160	PRV-3	0.44	6.0	Asbestos Cement	False
344	1180	1,065.48	PRV-3	J570	0.44	6.0	Asbestos Cement	False
299	700	1,204.37	J660	J670	0.43	6.0	Asbestos Cement	False
298	690	1,917.41	J650	J660	0.39	6.0	Asbestos Cement	False
333	1060	928.80	J910	J420	0.39	6.0	Ductile Iron	False
332	1050	1,355.49	J410	J910	0.36	6.0	Ductile Iron	False
297	680	641.20	J640	J650	0.35	6.0	Asbestos Cement	False
341	1150	1,645.01	J20	PRV-2	0.35	8.0	Ductile Iron	False
342	1160	399.53	PRV-2	J30	0.35	8.0	Ductile Iron	False
534	P-52	878.79	J-41	J470	0.33	6.0	Asbestos Cement	False
309	800	2,413.23	J760	J770	0.32	2.0	PVC	False
330	1030	2,047.17	J30	J900	0.31	8.0	Ductile Iron	False
279	490	1,142.41	J470	J480	0.30	6.0	Asbestos Cement	False
331	1040	688.05	J900	J690	0.29	8.0	Ductile Iron	False
300	710	1,058.65	J670	J680	0.29	2.0	PVC	False
296	670	490.62	J630	J640	0.28	6.0	Asbestos Cement	False
271	400	614.59	J390	J400	0.28	6.0	Asbestos Cement	False
524	P-48	211.43	J-37	J-34	0.27	8.0	Ductile Iron	False
302	730	2,028.96	J570	J700	0.27	6.0	Asbestos Cement	False
526	P-49	1,084.51	J-35	J-38	0.25	8.0	Ductile Iron	False
295	660	1,120.60	J600	J630	0.25	6.0	Asbestos Cement	False
369	P-7	133.76	J450	J-5	0.24	2.0	PVC	False
6953	140(2)	389.47	J-54	J140	0.24	2.0	PVC	False
280	500	1,364.20	J480	J490	0.24	6.0	Ductile Iron	False
270	390	1,285.53	J370	J390	0.24	6.0	Asbestos Cement	False
521	P-46	782.54	J-35	J-36	0.22	8.0	Ductile Iron	False
292	630	869.29	J580	J600	0.21	6.0	Asbestos Cement	False
304	750	1,292.25	J700	J720	0.21	6.0	Asbestos Cement	False
395	P-19	1,252.08	J490	J-10	0.19	6.0	Asbestos Cement	False
396	P-20	1,882.30	J-10	J-7	0.19	6.0	Ductile Iron	False
533	P-51	1,633.61	J-40	J-41	0.19	8.0	Ductile Iron	False
527	P-50	416.06	J-38	J-37	0.19	8.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2043 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
516	P-43	1,239.83	J300	J-34	0.18	8.0	Ductile Iron	False
272	410	2,002.83	J400	J410	0.18	8.0	Ductile Iron	False
268	370	1,520.73	J360	J370	0.17	6.0	Asbestos Cement	False
523	P-47	763.84	J-36	J-37	0.16	8.0	Ductile Iron	False
374	P-10	1,181.08	J-7	J500	0.15	6.0	Ductile Iron	False
471	P-24	1,355.02	J300	J-14	0.15	8.0	Ductile Iron	False
472	P-25	1,789.45	J-14	320	0.15	8.0	Ductile Iron	False
494	P-36	3,062.02	J570	J-23	0.14	6.0	Asbestos Cement	False
531	450(2)	110.11	J-40	J450	0.14	6.0	Asbestos Cement	False
499	P-38	1,114.16	J-23	J-26	0.14	8.0	Ductile Iron	False
501	P-39	450.98	J-26	J-27	0.14	8.0	Ductile Iron	False
267	360	347.69	J340	J360	0.13	6.0	Asbestos Cement	False
536	340(1)	775.50	J270	J-42	0.12	6.0	Asbestos Cement	False
317	880	1,338.16	320	J820	0.11	8.0	Ductile Iron	False
305	760	670.42	J720	J730	0.11	6.0	Asbestos Cement	False
495	P-37	1,640.82	J-23	J580	0.10	6.0	Asbestos Cement	False
505	P-41	915.45	J-27	J-29	0.09	8.0	Ductile Iron	False
319	910	2,195.52	J820	J840	0.09	8.0	Ductile Iron	False
517	P-44	217.90	J-34	J290	0.09	8.0	Ductile Iron	False
284	540	442.27	J500	J520	0.08	6.0	Ductile Iron	False
258	270	597.10	J260	J270	0.08	6.0	Asbestos Cement	False
306	770	953.99	J730	J740	0.08	6.0	Asbestos Cement	False
6946	790(1)	560.25	J720	J-52	0.07	6.0	Asbestos Cement	False
6950	790(2)(2)	295.46	J-53	J760	0.07	6.0	Asbestos Cement	False
260	290	977.80	J280	J290	0.06	8.0	Ductile Iron	False
289	590	355.59	J560	J160	0.06	10.0	Ductile Iron	False
320	920	1,046.94	J840	J850	0.06	8.0	Ductile Iron	False
537	340(2)	1,042.18	J-42	J340	0.05	6.0	Asbestos Cement	False
507	P-42	299.85	J-29	J-30	0.05	8.0	Ductile Iron	False
538	P-53	582.53	J280	J-42	0.04	8.0	Ductile Iron	False
266	350	1,870.47	J350	J340	0.04	6.0	Asbestos Cement	False
269	380	2,794.51	J370	J380	0.04	6.0	Asbestos Cement	False
257	260	1,069.05	J250	J260	0.04	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2043 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
6949	790(2)(1)	233.65	J-52	J-53	0.04	8.0	Ductile Iron	False
310	810	2,987.84	J560	J780	0.04	10.0	Ductile Iron	False
291	620	721.05	J580	J590	0.04	6.0	Ductile Iron	False
303	740	1,472.16	J700	J710	0.04	6.0	Asbestos Cement	False
365	P-5	638.70	J580	J-3	0.04	6.0	Ductile Iron	False
236	40	1,237.96	J30	J40	0.03	6.0	Asbestos Cement	False
239	70	1,233.32	J60	J70	0.03	6.0	Asbestos Cement	False
250	190	788.53	J180	J190	0.03	6.0	Asbestos Cement	False
262	310	1,091.01	J300	J310	0.03	6.0	Asbestos Cement	False
283	530	910.93	J500	J510	0.03	6.0	Ductile Iron	False
285	550	324.28	J520	J530	0.03	6.0	Ductile Iron	False
286	560	1,423.00	J520	J540	0.03	6.0	Ductile Iron	False
278	480	982.79	J440	J460	0.03	6.0	Ductile Iron	False
307	780	1,302.56	J740	J750	0.03	6.0	Asbestos Cement	False
311	820	1,060.57	J790	J780	0.03	6.0	Ductile Iron	False
367	P-6	258.23	J740	J-4	0.03	6.0	Ductile Iron	False
6952	140(1)	866.12	J130	J-54	0.03	6.0	Asbestos Cement	False
363	P-4	1,141.91	J640	J-2	0.02	8.0	Ductile Iron	False
312	830	443.46	J780	J800	0.02	10.0	Ductile Iron	False
321	930	184.62	J850	J860	0.02	8.0	Ductile Iron	False
322	950	1,933.27	J840	J890	0.02	8.0	Ductile Iron	False
323	960	440.71	J850	J880	0.02	8.0	Ductile Iron	False
465	P-21	721.05	320	J-11	0.02	8.0	Ductile Iron	False
466	P-22	1,599.67	J-11	J330	0.02	8.0	Ductile Iron	False
287	570	2,690.07	J480	J550	0.02	6.0	Asbestos Cement	False
288	580	3,263.45	J550	J560	0.02	6.0	Ductile Iron	False
281	510	887.52	J490	J370	0.01	6.0	Asbestos Cement	False
376	P-11	1,085.66	J800	J-8	0.01	10.0	Ductile Iron	False
244	120	246.16	J110	J120	0.00	2.0	PVC	False
371	P-8	361.67	J910	J-6	0.00	2.0	PVC	False
315	860	309.23	PMP-3	J810	0.00	6.0	Ductile Iron	False
316	870	864.72	R-3	PMP-3	0.00	6.0	Ductile Iron	False
329	1020	705.53	R-3	PMP-2	0.00	6.0	Ductile Iron	False
328	1010	359.73	PMP-2	J810	0.00	6.0	Ductile Iron	False
377	P-12	326.74	J-8	J810	0.00	10.0	Ductile Iron	False
334	1070	458.75	J910	J920	0.00	8.0	Ductile Iron	False
6975	P-62	325.59	J-55	T-1	0.00	6.0	Ductile Iron	True
503	P-40	568.86	J-27	J-28	0.00	8.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2043 MDD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
241	90	678.03	J80	J90	0.00	6.0	Ductile Iron	False
361	P-3	1,059.28	J600	J620	0.00	2.0	PVC	False
256	250	219.27	J240	J250	0.00	6.0	Asbestos Cement	False
475	P-26	788.07	R-5	PMP-5	(N/A)	6.0	Ductile Iron	False
482	P-27	463.65	PMP-5	J-20	(N/A)	6.0	Ductile Iron	False
483	P-28	1,351.93	J-20	J-19	(N/A)	8.0	Ductile Iron	False
484	P-29	514.98	J-19	J-18	(N/A)	8.0	Ductile Iron	False
485	P-30	603.37	J-18	J-17	(N/A)	8.0	Ductile Iron	False
486	P-31	1,965.14	J-17	J-16	(N/A)	8.0	Ductile Iron	False
487	P-32	320.88	J-16	J-15	(N/A)	8.0	Ductile Iron	False
488	P-33	435.33	J-15	J310	(N/A)	8.0	Ductile Iron	False

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J240	Zone - 1	True	750.00	753.47	21.1	20.0	20.0
J-28	Zone - 2	False	750.00	617.20	20.7	20.0	20.0
J-36	Zone - 1	True	750.00	753.13	22.7	20.0	20.0
J-52	Zone - 2	False	750.00	603.58	26.5	20.0	20.0
J720	Zone - 2	False	750.00	603.58	26.5	20.0	20.0
J-27	Zone - 2	False	750.00	617.20	23.5	20.0	20.0
J-10	Zone - 1	False	750.00	719.89	48.2	20.0	20.0
J760	Zone - 2	False	750.00	603.58	29.0	20.0	20.0
J740	Zone - 2	False	750.00	492.40	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	603.58	29.0	20.0	20.0
J-23	Zone - 2	False	750.00	693.90	49.9	20.0	20.0
J520	Zone - 1	False	750.00	430.47	28.7	20.0	20.0
J-26	Zone - 2	False	750.00	678.00	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	492.40	41.5	20.0	20.0
J700	Zone - 2	False	750.00	745.90	22.2	20.0	20.0
J530	Zone - 1	False	750.00	430.46	41.0	20.0	20.0
J-7	Zone - 1	False	750.00	523.30	41.7	20.0	20.0
J500	Zone - 1	False	750.00	437.15	46.0	20.0	20.0
J510	Zone - 1	False	750.00	437.13	57.9	20.0	20.0
J600	Zone - 2	True	750.00	760.00	39.2	20.0	20.0
J-30	Zone - 2	False	750.00	581.88	20.5	20.0	20.0
J-37	Zone - 1	True	750.00	755.25	30.1	20.0	20.0
J730	Zone - 2	False	750.00	551.99	46.0	20.1	20.1
J260	Zone - 1	True	750.00	757.19	24.4	20.1	20.1
J-38	Zone - 1	True	750.00	751.59	20.0	20.1	20.1
J890	Zone - 1	True	750.00	760.00	82.5	20.5	20.5
J880	Zone - 1	True	750.00	760.00	42.3	20.5	20.5
J860	Zone - 1	True	750.00	760.00	45.9	20.5	20.5
J850	Zone - 1	True	750.00	760.00	32.0	20.5	20.5
J-35	Zone - 1	True	750.00	750.67	20.0	20.5	20.5
J300	Zone - 1	True	750.00	760.00	54.7	20.7	20.7
J-11	Zone - 1	True	750.00	760.00	25.3	20.7	20.7
J820	Zone - 1	True	750.00	760.00	31.8	20.7	20.7
J-14	Zone - 1	True	750.00	760.00	44.0	20.7	20.7
J-34	Zone - 1	True	750.00	760.00	55.4	20.7	20.7
J310	Zone - 1	True	750.00	760.00	39.5	20.7	20.7
320	Zone - 1	True	750.00	760.00	27.6	20.7	20.7
J840	Zone - 1	True	750.00	760.00	20.5	20.7	20.7
J640	Zone - 2	False	750.00	706.62	20.0	20.8	20.8
J630	Zone - 2	False	750.00	705.65	20.0	20.9	20.9
J590	Zone - 2	True	750.00	760.00	29.2	21.1	21.1
J-3	Zone - 2	True	750.00	760.00	23.8	21.1	21.1
J580	Zone - 2	True	750.00	760.00	42.7	21.1	21.1
J650	Zone - 2	True	750.00	760.00	51.4	21.1	21.1
J290	Zone - 1	True	750.00	760.00	57.9	21.5	21.5

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-29	Zone - 2	False	750.00	582.20	20.0	21.5	21.5
J-2	Zone - 2	False	750.00	679.59	20.0	22.3	22.3
J330	Zone - 1	False	750.00	737.15	20.0	22.5	22.5
J280	Zone - 1	True	750.00	760.00	60.6	22.7	22.7
J270	Zone - 1	True	750.00	760.00	56.2	23.5	23.5
J-42	Zone - 1	True	750.00	760.00	60.7	23.5	23.5
J230	Zone - 1	True	750.00	760.00	52.8	28.1	28.1
J340	Zone - 1	True	750.00	760.00	59.1	29.9	29.9
J710	Zone - 2	False	750.00	682.52	20.0	30.2	30.2
J360	Zone - 1	True	750.00	760.00	60.5	31.4	31.4
J660	Zone - 2	True	750.00	760.00	58.4	31.7	31.7
J250	Zone - 1	False	750.00	640.14	20.0	31.9	31.9
J-50	Zone - 1	True	750.00	760.00	48.6	31.9	31.9
J220	Zone - 1	True	750.00	760.00	42.7	32.3	32.3
J350	Zone - 1	False	750.00	714.71	20.0	32.5	32.5
J540	Zone - 1	False	750.00	383.36	20.0	35.8	35.8
J210	Zone - 1	True	750.00	760.00	42.1	36.0	36.0
J670	Zone - 2	True	750.00	760.00	86.7	37.8	37.8
J570	Zone - 2	True	750.00	760.00	45.4	37.9	37.9
J200	Zone - 1	True	750.00	760.00	53.5	38.3	38.3
J800	Zone - 1	True	750.00	760.00	86.5	38.5	38.5
J780	Zone - 1	True	750.00	760.00	79.0	38.5	38.5
J810	Zone - 1	True	750.00	760.00	109.0	38.5	38.5
J-8	Zone - 1	True	750.00	760.00	109.3	38.5	38.5
J790	Zone - 1	True	750.00	760.00	52.5	38.5	38.5
J160	Zone - 1	True	750.00	760.00	47.2	38.6	38.6
J750	Zone - 2	False	750.00	422.55	20.0	40.4	40.4
J470	Zone - 1	True	750.00	760.00	82.3	40.6	40.6
J490	Zone - 1	True	750.00	760.00	73.4	40.9	40.9
J190	Zone - 1	True	750.00	760.00	52.8	41.0	41.0
J180	Zone - 1	True	750.00	760.00	52.8	41.0	41.0
J-40	Zone - 1	True	750.00	760.00	47.9	41.4	41.4
J440	Zone - 1	True	750.00	760.00	53.5	41.4	41.4
J460	Zone - 1	True	750.00	760.00	48.6	41.4	41.4
J-41	Zone - 1	True	750.00	760.00	39.7	41.4	41.4
J420	Zone - 1	True	750.00	760.00	56.0	41.4	41.4
J910	Zone - 1	True	750.00	760.00	66.1	41.4	41.4
J920	Zone - 1	True	750.00	760.00	56.4	41.4	41.4
J480	Zone - 1	True	750.00	760.00	88.7	41.4	41.4
J410	Zone - 1	True	750.00	760.00	52.2	41.4	41.4
J550	Zone - 1	True	750.00	760.00	86.2	41.4	41.4
J400	Zone - 1	True	750.00	760.00	69.9	41.4	41.4
J150	Zone - 1	True	750.00	760.00	97.6	41.4	41.4
J560	Zone - 1	True	750.00	760.00	38.5	41.4	41.4
J390	Zone - 1	True	750.00	760.00	80.1	41.4	41.4

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J370	Zone - 1	True	750.00	760.00	69.6	41.4	41.4
J380	Zone - 1	True	750.00	760.00	22.7	41.4	41.4
J430	Zone - 1	True	750.00	760.00	71.5	41.4	41.4
J970	Zone - 1	True	750.00	760.00	63.7	41.4	41.4
J980	Zone - 1	True	750.00	760.00	82.3	41.4	41.4
J-49	Zone - 1	True	750.00	760.00	77.9	41.4	41.4
J170	Zone - 1	True	750.00	760.00	48.2	41.4	41.4
J130	Zone - 1	True	750.00	760.00	96.0	41.4	41.4
J-54	Zone - 1	True	750.00	760.00	87.1	41.4	41.4
J110	Zone - 1	True	750.00	760.00	87.2	41.5	41.5
J-48	Zone - 1	True	750.00	760.00	82.8	41.5	41.5
J100	Zone - 1	True	750.00	760.00	78.4	41.5	41.5
J80	Zone - 1	True	750.00	760.00	64.0	41.5	41.5
J90	Zone - 1	True	750.00	760.00	53.2	41.5	41.5
J-47	Zone - 1	True	750.00	760.00	73.2	41.5	41.5
J60	Zone - 1	True	750.00	760.00	74.2	41.5	41.5
J70	Zone - 1	True	750.00	760.00	40.6	41.5	41.5
J690	Zone - 2	True	750.00	760.00	83.2	43.4	41.5
J50	Zone - 1	True	750.00	760.00	82.5	41.5	41.5
J900	Zone - 2	True	750.00	760.00	72.3	43.4	41.5
J-45	Zone - 1	True	750.00	760.00	83.0	41.5	41.5
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.5
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.5
J20	Zone - 1	True	750.00	760.00	89.9	41.5	41.5
J-44	Zone - 1	True	750.00	760.00	92.3	41.5	41.5
J10	Zone - 1	True	750.00	760.00	106.4	41.5	41.5
J450	Zone - 1	True	750.00	760.00	41.4	45.8	41.6
J-55	<None>	True	750.00	760.00	41.6	41.6	41.6
J-57	<None>	True	750.00	760.00	41.6	41.7	41.7
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.5	41.9	41.9
J770	Zone - 2	True	0.00	10.00	62.4	44.0	41.9
J120	Zone - 1	True	0.00	10.00	86.8	41.9	41.9
J140	Zone - 1	True	0.00	10.00	112.2	41.9	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J680	Zone - 2	True	0.00	10.00	115.3	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J840	Zone - 1	False	750.00	746.65	20.9	20.0	20.0
J860	Zone - 1	False	750.00	746.65	46.4	20.0	20.0
J-28	Zone - 2	False	750.00	617.20	20.7	20.0	20.0
J290	Zone - 1	True	750.00	755.68	56.6	20.0	20.0
J890	Zone - 1	False	750.00	746.65	83.1	20.0	20.0
J850	Zone - 1	False	750.00	746.65	32.4	20.0	20.0
J880	Zone - 1	False	750.00	746.65	42.8	20.0	20.0
J240	Zone - 1	False	750.00	732.11	21.0	20.0	20.0
J260	Zone - 1	False	750.00	747.88	24.3	20.0	20.0
J-10	Zone - 1	False	750.00	728.56	48.2	20.0	20.0
J300	Zone - 1	False	750.00	746.65	54.3	20.0	20.0
J310	Zone - 1	False	750.00	746.65	39.6	20.0	20.0
J820	Zone - 1	False	750.00	746.65	32.0	20.0	20.0
J-11	Zone - 1	False	750.00	746.65	25.4	20.0	20.0
320	Zone - 1	False	750.00	746.65	27.6	20.0	20.0
J-14	Zone - 1	False	750.00	746.65	43.7	20.0	20.0
J-27	Zone - 2	False	750.00	617.20	23.5	20.0	20.0
J-34	Zone - 1	False	750.00	746.65	54.9	20.0	20.0
J720	Zone - 2	False	750.00	603.58	26.5	20.0	20.0
J-52	Zone - 2	False	750.00	603.58	26.5	20.0	20.0
J760	Zone - 2	False	750.00	603.58	29.0	20.0	20.0
J740	Zone - 2	False	750.00	492.40	28.7	20.0	20.0
J-37	Zone - 1	False	750.00	734.21	30.1	20.0	20.0
J-53	Zone - 2	False	750.00	603.58	29.0	20.0	20.0
J-36	Zone - 1	False	750.00	731.96	22.8	20.0	20.0
J520	Zone - 1	False	750.00	434.40	28.7	20.0	20.0
J-23	Zone - 2	False	750.00	693.90	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	678.00	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	492.40	41.5	20.0	20.0
J730	Zone - 2	False	750.00	552.49	46.0	20.0	20.0
J530	Zone - 1	False	750.00	434.39	40.9	20.0	20.0
J-7	Zone - 1	False	750.00	528.61	41.7	20.0	20.0
J500	Zone - 1	False	750.00	441.18	46.0	20.0	20.0
J510	Zone - 1	False	750.00	441.17	57.9	20.0	20.0
J600	Zone - 2	True	750.00	760.00	39.2	20.0	20.0
J-30	Zone - 2	False	750.00	581.88	20.5	20.0	20.0
J-38	Zone - 1	False	750.00	730.96	20.0	20.1	20.1
J-35	Zone - 1	False	750.00	729.60	20.0	20.5	20.5
J280	Zone - 1	True	750.00	760.00	59.1	20.9	20.9
J640	Zone - 2	False	750.00	706.62	20.0	20.8	20.8
J630	Zone - 2	False	750.00	705.65	20.0	20.9	20.9
J590	Zone - 2	True	750.00	760.00	29.2	21.1	21.1
J-3	Zone - 2	True	750.00	760.00	23.8	21.1	21.1
J580	Zone - 2	True	750.00	760.00	42.7	21.1	21.1
J650	Zone - 2	True	750.00	760.00	51.4	21.1	21.1

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J270	Zone - 1	True	750.00	760.00	54.8	21.8	21.8
J-42	Zone - 1	True	750.00	760.00	59.2	21.8	21.8
J-29	Zone - 2	False	750.00	582.20	20.0	21.5	21.5
J330	Zone - 1	False	750.00	726.51	20.0	21.7	21.7
J700	Zone - 2	True	750.00	760.00	24.1	21.9	21.9
J-2	Zone - 2	False	750.00	679.59	20.0	22.3	22.3
J230	Zone - 1	True	750.00	760.00	49.8	26.0	26.0
J340	Zone - 1	True	750.00	760.00	58.2	28.4	28.4
J-50	Zone - 1	True	750.00	760.00	45.1	29.8	29.8
J360	Zone - 1	True	750.00	760.00	59.7	30.0	30.0
J220	Zone - 1	True	750.00	760.00	39.1	30.1	30.1
J710	Zone - 2	False	750.00	682.52	20.0	30.2	30.2
J250	Zone - 1	False	750.00	633.41	20.0	31.0	31.0
J350	Zone - 1	False	750.00	709.48	20.0	31.5	31.5
J660	Zone - 2	True	750.00	760.00	58.4	31.7	31.7
J210	Zone - 1	True	750.00	760.00	37.8	33.6	33.6
J200	Zone - 1	True	750.00	760.00	48.8	35.8	35.8
J540	Zone - 1	False	750.00	386.61	20.0	35.9	35.9
J670	Zone - 2	True	750.00	760.00	86.7	37.8	37.8
J180	Zone - 1	True	750.00	760.00	47.6	38.3	38.3
J190	Zone - 1	True	750.00	760.00	47.6	38.3	38.3
J170	Zone - 1	True	750.00	760.00	42.4	40.7	40.7
J750	Zone - 2	False	750.00	422.55	20.0	40.4	40.4
J470	Zone - 1	True	750.00	760.00	83.0	40.9	40.9
J-40	Zone - 1	True	750.00	760.00	48.0	41.4	41.4
J440	Zone - 1	True	750.00	760.00	53.5	41.4	41.4
J460	Zone - 1	True	750.00	760.00	48.7	41.4	41.4
J420	Zone - 1	True	750.00	760.00	55.6	41.4	41.4
J-41	Zone - 1	True	750.00	760.00	40.1	41.4	41.4
J910	Zone - 1	True	750.00	760.00	65.9	41.4	41.4
J920	Zone - 1	True	750.00	760.00	56.2	41.4	41.4
J430	Zone - 1	True	750.00	760.00	69.4	41.4	41.4
J970	Zone - 1	True	750.00	760.00	61.4	41.4	41.4
J10	Zone - 1	True	750.00	760.00	72.4	41.4	41.4
J60	Zone - 1	True	750.00	760.00	56.2	41.4	41.4
J100	Zone - 1	True	750.00	760.00	70.0	41.4	41.4
J20	Zone - 1	True	750.00	760.00	62.8	41.4	41.4
J50	Zone - 1	True	750.00	760.00	62.5	41.4	41.4
J70	Zone - 1	True	750.00	760.00	22.7	41.4	41.4
J80	Zone - 1	True	750.00	760.00	48.9	41.4	41.4
J90	Zone - 1	True	750.00	760.00	38.1	41.4	41.4
J-44	Zone - 1	True	750.00	760.00	63.7	41.4	41.4
J-45	Zone - 1	True	750.00	760.00	61.1	41.4	41.4
J-47	Zone - 1	True	750.00	760.00	56.9	41.4	41.4
J410	Zone - 1	True	750.00	760.00	52.1	41.4	41.4

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-48	Zone - 1	True	750.00	760.00	74.8	41.4	41.4
J110	Zone - 1	True	750.00	760.00	79.4	41.4	41.4
J130	Zone - 1	True	750.00	760.00	89.4	41.4	41.4
J-54	Zone - 1	True	750.00	760.00	80.5	41.4	41.4
J-49	Zone - 1	True	750.00	760.00	73.7	41.4	41.4
J980	Zone - 1	True	750.00	760.00	79.8	41.4	41.4
J400	Zone - 1	True	750.00	760.00	69.9	41.4	41.4
J150	Zone - 1	True	750.00	760.00	96.6	41.4	41.4
J390	Zone - 1	True	750.00	760.00	80.1	41.4	41.4
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.4
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.4
J370	Zone - 1	True	750.00	760.00	69.9	41.4	41.4
J380	Zone - 1	True	750.00	760.00	22.9	41.4	41.4
J490	Zone - 1	True	750.00	760.00	74.2	41.4	41.4
J480	Zone - 1	True	750.00	760.00	90.7	41.4	41.4
J900	Zone - 2	True	750.00	760.00	72.3	43.4	41.4
J690	Zone - 2	True	750.00	760.00	83.2	43.4	41.4
J550	Zone - 1	True	750.00	760.00	95.7	41.4	41.4
J570	Zone - 2	True	750.00	760.00	49.7	41.5	41.5
J160	Zone - 1	True	750.00	760.00	69.9	41.5	41.5
J560	Zone - 1	True	750.00	760.00	61.4	41.5	41.5
J780	Zone - 1	True	750.00	760.00	106.8	41.5	41.5
J790	Zone - 1	True	750.00	760.00	80.2	41.5	41.5
J-55	<None>	True	750.00	760.00	41.5	41.6	41.5
J450	Zone - 1	True	750.00	760.00	41.4	45.7	41.5
J800	Zone - 1	True	750.00	760.00	115.4	41.5	41.5
J-8	Zone - 1	True	750.00	760.00	139.2	41.5	41.5
J810	Zone - 1	True	750.00	760.00	139.2	41.5	41.5
J-57	<None>	True	750.00	760.00	41.6	41.6	41.6
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J120	Zone - 1	True	0.00	10.00	84.5	41.9	41.9
J140	Zone - 1	True	0.00	10.00	110.3	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.4	41.9	41.9
J680	Zone - 2	True	0.00	10.00	115.3	44.0	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J770	Zone - 2	True	0.00	10.00	62.4	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J840	Zone - 1	False	750.00	743.17	21.2	20.0	20.0
J860	Zone - 1	False	750.00	743.17	46.7	20.0	20.0
J-28	Zone - 2	False	750.00	617.20	20.7	20.0	20.0
J290	Zone - 1	True	750.00	752.49	56.6	20.0	20.0
J890	Zone - 1	False	750.00	743.17	83.4	20.0	20.0
J850	Zone - 1	False	750.00	743.17	32.7	20.0	20.0
J880	Zone - 1	False	750.00	743.17	43.1	20.0	20.0
J240	Zone - 1	False	750.00	728.76	21.0	20.0	20.0
J260	Zone - 1	False	750.00	745.83	24.3	20.0	20.0
J-10	Zone - 1	False	750.00	724.80	48.2	20.0	20.0
J300	Zone - 1	False	750.00	743.17	54.3	20.0	20.0
J310	Zone - 1	False	750.00	743.17	39.8	20.0	20.0
J820	Zone - 1	False	750.00	743.17	32.2	20.0	20.0
J-11	Zone - 1	False	750.00	743.17	25.6	20.0	20.0
320	Zone - 1	False	750.00	743.17	27.8	20.0	20.0
J-14	Zone - 1	False	750.00	743.17	43.8	20.0	20.0
J-27	Zone - 2	False	750.00	617.20	23.5	20.0	20.0
J-34	Zone - 1	False	750.00	743.17	54.9	20.0	20.0
J720	Zone - 2	False	750.00	603.58	26.5	20.0	20.0
J-52	Zone - 2	False	750.00	603.58	26.5	20.0	20.0
J760	Zone - 2	False	750.00	603.58	29.0	20.0	20.0
J740	Zone - 2	False	750.00	492.40	28.7	20.0	20.0
J-37	Zone - 1	False	750.00	730.84	30.1	20.0	20.0
J-53	Zone - 2	False	750.00	603.58	29.0	20.0	20.0
J-36	Zone - 1	False	750.00	728.60	22.8	20.0	20.0
J520	Zone - 1	False	750.00	432.80	28.7	20.0	20.0
J-23	Zone - 2	False	750.00	693.90	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	678.00	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	492.40	41.5	20.0	20.0
J730	Zone - 2	False	750.00	552.49	46.0	20.0	20.0
J530	Zone - 1	False	750.00	432.79	40.9	20.0	20.0
J-7	Zone - 1	False	750.00	526.35	41.7	20.0	20.0
J500	Zone - 1	False	750.00	439.53	46.0	20.0	20.0
J510	Zone - 1	False	750.00	439.51	57.9	20.0	20.0
J600	Zone - 2	True	750.00	760.00	39.2	20.0	20.0
J-30	Zone - 2	False	750.00	581.88	20.5	20.0	20.0
J-38	Zone - 1	False	750.00	727.66	20.0	20.0	20.0
J-35	Zone - 1	False	750.00	726.27	20.0	20.5	20.5
J280	Zone - 1	True	750.00	760.00	58.8	20.6	20.6
J640	Zone - 2	False	750.00	706.62	20.0	20.8	20.8
J630	Zone - 2	False	750.00	705.65	20.0	20.9	20.9
J590	Zone - 2	True	750.00	760.00	29.2	21.1	21.1
J-3	Zone - 2	True	750.00	760.00	23.8	21.1	21.1
J580	Zone - 2	True	750.00	760.00	42.7	21.1	21.1
J650	Zone - 2	True	750.00	760.00	51.4	21.1	21.1

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J270	Zone - 1	True	750.00	760.00	54.5	21.5	21.5
J-42	Zone - 1	True	750.00	760.00	58.9	21.5	21.5
J-29	Zone - 2	False	750.00	582.20	20.0	21.5	21.5
J330	Zone - 1	False	750.00	724.65	20.0	21.5	21.5
J700	Zone - 2	True	750.00	760.00	24.1	21.9	21.9
J-2	Zone - 2	False	750.00	679.59	20.0	22.3	22.3
J230	Zone - 1	True	750.00	760.00	49.5	25.7	25.7
J340	Zone - 1	True	750.00	760.00	57.9	28.1	28.1
J-50	Zone - 1	True	750.00	760.00	44.8	29.5	29.5
J360	Zone - 1	True	750.00	760.00	59.4	29.7	29.7
J220	Zone - 1	True	750.00	760.00	38.9	29.8	29.8
J710	Zone - 2	False	750.00	682.52	20.0	30.2	30.2
J250	Zone - 1	False	750.00	631.90	20.0	30.8	30.8
J350	Zone - 1	False	750.00	707.57	20.0	31.3	31.3
J660	Zone - 2	True	750.00	760.00	58.4	31.7	31.7
J210	Zone - 1	True	750.00	760.00	37.6	33.4	33.4
J200	Zone - 1	True	750.00	760.00	48.6	35.5	35.5
J540	Zone - 1	False	750.00	385.31	20.0	35.9	35.9
J670	Zone - 2	True	750.00	760.00	86.7	37.8	37.8
J180	Zone - 1	True	750.00	760.00	47.3	38.0	38.0
J190	Zone - 1	True	750.00	760.00	47.3	38.0	38.0
J170	Zone - 1	True	750.00	760.00	42.1	40.4	40.4
J750	Zone - 2	False	750.00	422.55	20.0	40.4	40.4
J470	Zone - 1	True	750.00	760.00	82.7	40.7	40.7
J-40	Zone - 1	True	750.00	760.00	47.9	41.3	41.3
J440	Zone - 1	True	750.00	760.00	53.3	41.3	41.3
J460	Zone - 1	True	750.00	760.00	48.5	41.3	41.3
J420	Zone - 1	True	750.00	760.00	55.5	41.3	41.3
J-41	Zone - 1	True	750.00	760.00	39.9	41.3	41.3
J910	Zone - 1	True	750.00	760.00	65.7	41.3	41.3
J920	Zone - 1	True	750.00	760.00	56.0	41.3	41.3
J430	Zone - 1	True	750.00	760.00	69.2	41.3	41.3
J970	Zone - 1	True	750.00	760.00	61.2	41.3	41.3
J10	Zone - 1	True	750.00	760.00	72.1	41.3	41.3
J60	Zone - 1	True	750.00	760.00	55.9	41.3	41.3
J100	Zone - 1	True	750.00	760.00	69.8	41.3	41.3
J20	Zone - 1	True	750.00	760.00	62.6	41.3	41.3
J50	Zone - 1	True	750.00	760.00	62.3	41.3	41.3
J70	Zone - 1	True	750.00	760.00	22.4	41.3	41.3
J80	Zone - 1	True	750.00	760.00	48.7	41.3	41.3
J90	Zone - 1	True	750.00	760.00	37.9	41.3	41.3
J-44	Zone - 1	True	750.00	760.00	63.4	41.3	41.3
J-45	Zone - 1	True	750.00	760.00	60.9	41.3	41.3
J-47	Zone - 1	True	750.00	760.00	56.6	41.3	41.3
J410	Zone - 1	True	750.00	760.00	51.8	41.3	41.3

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-48	Zone - 1	True	750.00	760.00	74.5	41.3	41.3
J110	Zone - 1	True	750.00	760.00	79.1	41.3	41.3
J130	Zone - 1	True	750.00	760.00	89.2	41.3	41.3
J-54	Zone - 1	True	750.00	760.00	80.2	41.3	41.3
J-49	Zone - 1	True	750.00	760.00	73.4	41.3	41.3
J980	Zone - 1	True	750.00	760.00	79.5	41.3	41.3
J400	Zone - 1	True	750.00	760.00	69.6	41.3	41.3
J150	Zone - 1	True	750.00	760.00	96.3	41.3	41.3
J390	Zone - 1	True	750.00	760.00	79.8	41.3	41.3
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.3
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.3
J370	Zone - 1	True	750.00	760.00	69.6	41.3	41.3
J380	Zone - 1	True	750.00	760.00	22.6	41.3	41.3
J490	Zone - 1	True	750.00	760.00	73.9	41.3	41.3
J480	Zone - 1	True	750.00	760.00	90.3	41.3	41.3
J900	Zone - 2	True	750.00	760.00	72.3	43.4	41.3
J690	Zone - 2	True	750.00	760.00	83.2	43.4	41.4
J550	Zone - 1	True	750.00	760.00	95.3	41.4	41.4
J570	Zone - 2	True	750.00	760.00	49.7	41.5	41.4
J160	Zone - 1	True	750.00	760.00	68.7	41.4	41.4
J560	Zone - 1	True	750.00	760.00	60.2	41.4	41.4
J780	Zone - 1	True	750.00	760.00	105.4	41.5	41.5
J790	Zone - 1	True	750.00	760.00	78.9	41.5	41.5
J-55	<None>	True	750.00	760.00	41.5	41.6	41.5
J450	Zone - 1	True	750.00	760.00	41.3	45.7	41.5
J800	Zone - 1	True	750.00	760.00	114.1	41.5	41.5
J-8	Zone - 1	True	750.00	760.00	137.8	41.5	41.5
J810	Zone - 1	True	750.00	760.00	137.8	41.5	41.5
J-57	<None>	True	750.00	760.00	41.6	41.6	41.6
J-5	Zone - 1	True	0.00	10.00	41.7	41.9	41.9
J120	Zone - 1	True	0.00	10.00	84.5	41.9	41.9
J140	Zone - 1	True	0.00	10.00	110.2	41.9	41.9
J-6	Zone - 1	True	0.00	10.00	82.3	41.9	41.9
J680	Zone - 2	True	0.00	10.00	115.3	44.0	41.9
J620	Zone - 2	True	0.00	10.00	55.0	44.0	41.9
J770	Zone - 2	True	0.00	10.00	62.4	44.0	41.9

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J-28	Zone - 2	False	750.00	617.20	20.7	20.0	20.0
J-10	Zone - 1	False	750.00	743.33	48.2	20.0	20.0
J720	Zone - 2	False	750.00	603.58	26.5	20.0	20.0
J-52	Zone - 2	False	750.00	603.58	26.5	20.0	20.0
J-27	Zone - 2	False	750.00	617.20	23.5	20.0	20.0
J760	Zone - 2	False	750.00	603.58	29.0	20.0	20.0
J740	Zone - 2	False	750.00	492.40	28.7	20.0	20.0
J-53	Zone - 2	False	750.00	603.58	29.0	20.0	20.0
J520	Zone - 1	False	750.00	441.07	28.7	20.0	20.0
J-23	Zone - 2	False	750.00	693.91	49.9	20.0	20.0
J-26	Zone - 2	False	750.00	678.00	45.5	20.0	20.0
J-4	Zone - 2	False	750.00	492.40	41.5	20.0	20.0
J-7	Zone - 1	False	750.00	537.40	41.7	20.0	20.0
J730	Zone - 2	False	750.00	552.49	46.0	20.0	20.0
J530	Zone - 1	False	750.00	441.06	40.9	20.0	20.0
J500	Zone - 1	False	750.00	447.99	46.0	20.0	20.0
J510	Zone - 1	False	750.00	447.97	57.8	20.0	20.0
J600	Zone - 2	True	750.00	760.00	39.2	20.0	20.0
J-30	Zone - 2	False	750.00	581.88	20.5	20.0	20.0
J640	Zone - 2	False	750.00	706.62	20.0	20.8	20.8
J630	Zone - 2	False	750.00	705.65	20.0	20.9	20.9
J-3	Zone - 2	True	750.00	760.00	23.8	21.1	21.1
J590	Zone - 2	True	750.00	760.00	29.2	21.1	21.1
J580	Zone - 2	True	750.00	760.00	42.7	21.1	21.1
J-38	Zone - 1	True	750.00	760.00	21.0	21.1	21.1
J-36	Zone - 1	True	750.00	760.00	23.8	21.1	21.1
J650	Zone - 2	True	750.00	760.00	51.4	21.1	21.1
J240	Zone - 1	True	750.00	760.00	22.2	21.2	21.2
J-37	Zone - 1	True	750.00	760.00	31.4	21.3	21.3
J260	Zone - 1	True	750.00	760.00	25.7	21.4	21.4
J-35	Zone - 1	True	750.00	760.00	20.9	21.5	21.5
J-29	Zone - 2	False	750.00	582.20	20.0	21.5	21.5
J700	Zone - 2	True	750.00	760.00	24.1	21.9	21.9
J890	Zone - 1	True	750.00	760.00	84.2	22.2	22.2
J850	Zone - 1	True	750.00	760.00	33.7	22.2	22.2
J860	Zone - 1	True	750.00	760.00	47.6	22.2	22.2
J880	Zone - 1	True	750.00	760.00	44.0	22.2	22.2
J-2	Zone - 2	False	750.00	679.59	20.0	22.3	22.3
J-34	Zone - 1	True	750.00	760.00	57.2	22.4	22.4
J300	Zone - 1	True	750.00	760.00	56.4	22.4	22.4
J840	Zone - 1	True	750.00	760.00	22.2	22.4	22.4
J-11	Zone - 1	True	750.00	760.00	27.0	22.4	22.4
J-14	Zone - 1	True	750.00	760.00	45.7	22.4	22.4
J310	Zone - 1	True	750.00	760.00	41.2	22.4	22.4
320	Zone - 1	True	750.00	760.00	29.3	22.4	22.4

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J820	Zone - 1	True	750.00	760.00	33.5	22.4	22.4
J290	Zone - 1	True	750.00	760.00	59.6	23.2	23.2
J330	Zone - 1	False	750.00	747.48	20.1	23.4	23.4
J280	Zone - 1	True	750.00	760.00	62.4	24.3	24.3
J-42	Zone - 1	True	750.00	760.00	62.4	25.2	25.2
J270	Zone - 1	True	750.00	760.00	58.0	25.2	25.2
J230	Zone - 1	True	750.00	760.00	54.4	29.8	29.8
J710	Zone - 2	False	750.00	682.52	20.0	30.2	30.2
J340	Zone - 1	True	750.00	760.00	60.9	31.6	31.6
J660	Zone - 2	True	750.00	760.00	58.4	31.7	31.7
J250	Zone - 1	False	750.00	648.62	20.0	32.8	32.8
J360	Zone - 1	True	750.00	760.00	62.3	33.1	33.1
J350	Zone - 1	False	750.00	725.62	20.0	33.5	33.5
J-50	Zone - 1	True	750.00	760.00	50.3	33.7	33.7
J220	Zone - 1	True	750.00	760.00	44.4	34.1	34.1
J540	Zone - 1	False	750.00	392.35	20.0	36.1	36.1
J670	Zone - 2	True	750.00	760.00	86.7	37.8	37.8
J210	Zone - 1	True	750.00	760.00	43.7	37.8	37.8
J200	Zone - 1	True	750.00	760.00	55.1	40.1	40.1
J750	Zone - 2	False	750.00	422.55	20.0	40.4	40.4
J570	Zone - 2	True	750.00	760.00	49.7	41.5	41.5
J-40	Zone - 1	True	750.00	760.00	48.9	41.8	41.8
J440	Zone - 1	True	750.00	760.00	54.5	41.8	41.8
J460	Zone - 1	True	750.00	760.00	49.7	41.8	41.8
J-41	Zone - 1	True	750.00	760.00	41.1	41.8	41.8
J420	Zone - 1	True	750.00	760.00	57.0	41.8	41.8
J430	Zone - 1	True	750.00	760.00	72.9	41.8	41.8
J970	Zone - 1	True	750.00	760.00	65.1	41.8	41.8
J910	Zone - 1	True	750.00	760.00	67.4	41.8	41.8
J920	Zone - 1	True	750.00	760.00	57.7	41.8	41.8
J980	Zone - 1	True	750.00	760.00	83.8	41.8	41.8
J150	Zone - 1	True	750.00	760.00	99.3	41.8	41.8
J410	Zone - 1	True	750.00	760.00	53.6	41.8	41.8
J-49	Zone - 1	True	750.00	760.00	79.4	41.8	41.8
J470	Zone - 1	True	750.00	760.00	84.0	41.8	41.8
J400	Zone - 1	True	750.00	760.00	71.4	41.8	41.8
J170	Zone - 1	True	750.00	760.00	49.7	41.8	41.8
J180	Zone - 1	True	750.00	760.00	54.4	41.8	41.8
J190	Zone - 1	True	750.00	760.00	54.3	41.8	41.8
J130	Zone - 1	True	750.00	760.00	97.6	41.8	41.8
J-54	Zone - 1	True	750.00	760.00	88.6	41.8	41.8
J110	Zone - 1	True	750.00	760.00	88.7	41.8	41.8
J-48	Zone - 1	True	750.00	760.00	84.3	41.8	41.8
J390	Zone - 1	True	750.00	760.00	81.7	41.8	41.8
J100	Zone - 1	True	750.00	760.00	79.9	41.8	41.8

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: 2043 MDD + FF

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)
J370	Zone - 1	True	750.00	760.00	71.6	41.8	41.8
J380	Zone - 1	True	750.00	760.00	24.6	41.8	41.8
J80	Zone - 1	True	750.00	760.00	65.4	41.8	41.8
J90	Zone - 1	True	750.00	760.00	54.7	41.8	41.8
J-47	Zone - 1	True	750.00	760.00	74.7	41.8	41.8
J490	Zone - 1	True	750.00	760.00	75.7	41.8	41.8
J60	Zone - 1	True	750.00	760.00	75.6	41.8	41.8
J70	Zone - 1	True	750.00	760.00	42.1	41.8	41.8
J50	Zone - 1	True	750.00	760.00	83.9	41.8	41.8
J-45	Zone - 1	True	750.00	760.00	84.4	41.8	41.8
J480	Zone - 1	True	750.00	760.00	91.8	41.8	41.8
J20	Zone - 1	True	750.00	760.00	91.3	41.8	41.8
J-44	Zone - 1	True	750.00	760.00	93.7	41.8	41.8
J450	Zone - 1	True	750.00	760.00	41.8	46.4	41.8
J30	Zone - 2	True	750.00	760.00	43.2	47.1	41.8
J40	Zone - 2	True	750.00	760.00	49.1	43.2	41.8
J10	Zone - 1	True	750.00	760.00	107.8	41.8	41.8
J900	Zone - 2	True	750.00	760.00	72.3	43.4	41.8
J690	Zone - 2	True	750.00	760.00	83.2	43.4	41.8
J550	Zone - 1	True	750.00	760.00	96.8	41.8	41.8
J-55	<None>	True	750.00	760.00	41.8	41.8	41.8
J160	Zone - 1	True	750.00	760.00	70.2	41.8	41.8
J560	Zone - 1	True	750.00	760.00	61.6	41.8	41.8
J780	Zone - 1	True	750.00	760.00	106.8	41.8	41.8
J790	Zone - 1	True	750.00	760.00	80.2	41.8	41.8
J800	Zone - 1	True	750.00	760.00	115.4	41.8	41.8
J-8	Zone - 1	True	750.00	760.00	139.2	41.8	41.8
J810	Zone - 1	True	750.00	760.00	139.1	41.8	41.8
J-57	<None>	True	750.00	760.00	41.8	41.9	41.9
J-5	Zone - 1	True	0.00	10.00	41.9	42.1	42.0
J-6	Zone - 1	True	0.00	10.00	83.3	42.1	42.0
J140	Zone - 1	True	0.00	10.00	113.5	42.1	42.0
J120	Zone - 1	True	0.00	10.00	88.1	42.1	42.0
J680	Zone - 2	True	0.00	10.00	115.3	44.0	42.0
J620	Zone - 2	True	0.00	10.00	55.0	44.0	42.0
J770	Zone - 2	True	0.00	10.00	62.4	44.0	42.0

FlexTable: Junction Table

Active Scenario: 2043 PHD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
476	J-15	542.00	Zone - 1	(N/A)	(N/A)	(N/A)
477	J-16	534.00	Zone - 1	(N/A)	(N/A)	(N/A)
478	J-17	480.00	Zone - 1	(N/A)	(N/A)	(N/A)
479	J-18	470.00	Zone - 1	(N/A)	(N/A)	(N/A)
480	J-19	462.00	Zone - 1	(N/A)	(N/A)	(N/A)
481	J-20	415.00	Zone - 1	(N/A)	(N/A)	(N/A)
368	J-5	670.00	Zone - 1	41.7	4.87	766.45
170	J450	670.00	Zone - 1	41.8	4.87	766.54
6964	J-55	670.00	<None>	41.8	0.00	766.60
6966	J-57	670.00	<None>	41.8	0.00	766.64
128	J30	545.00	Zone - 2	44.0	5.86	646.70
532	J-41	660.00	Zone - 1	45.9	0.00	766.06
504	J-29	536.00	Zone - 2	46.8	14.77	644.25
502	J-28	533.00	Zone - 2	48.1	0.00	644.27
506	J-30	532.50	Zone - 2	48.3	14.77	644.25
529	J-40	650.00	Zone - 1	50.2	0.00	766.11
500	J-27	528.00	Zone - 2	50.3	14.77	644.27
188	J630	520.00	Zone - 2	53.8	6.45	644.44
189	J640	520.00	Zone - 2	53.8	6.45	644.46
518	J-35	633.00	Zone - 1	54.2	0.00	758.24
525	J-38	632.00	Zone - 1	54.6	22.15	758.23
149	J240	630.00	Zone - 1	55.5	7.33	758.26
187	J620	515.00	Zone - 2	56.0	0.00	644.38
362	J-2	515.00	Zone - 2	56.0	6.45	644.45
182	J570	515.00	Zone - 2	56.3	4.87	645.18
169	J440	635.00	Zone - 1	56.7	4.87	765.96
179	J540	630.00	Zone - 1	57.6	4.92	763.02
520	J-36	625.00	Zone - 1	57.6	22.15	758.23
167	J420	625.00	Zone - 1	60.7	4.87	765.41
129	J40	500.00	Zone - 2	63.5	5.86	646.70
522	J-37	609.00	Zone - 1	64.6	22.15	758.23
142	J170	610.00	Zone - 1	65.5	5.86	761.31
202	J770	490.00	Zone - 2	65.5	6.45	641.50
177	J520	610.00	Zone - 1	66.2	4.92	763.03
221	J970	610.00	Zone - 1	67.2	0.00	765.24
171	J460	610.00	Zone - 1	67.5	4.87	765.95
133	J80	605.00	Zone - 1	68.0	5.86	762.23
166	J410	605.00	Zone - 1	68.9	7.33	764.16
200	J750	485.00	Zone - 2	68.9	4.87	644.33
146	J210	600.00	Zone - 1	69.2	5.86	760.06
132	J70	600.00	Zone - 1	70.1	5.86	762.00
134	J90	600.00	Zone - 1	70.2	0.00	762.23
181	J560	610.00	Zone - 1	70.4	4.87	772.78
216	J920	600.00	Zone - 1	71.2	0.00	764.60
195	J700	480.00	Zone - 2	71.2	4.87	644.63
498	J-26	477.00	Zone - 2	72.4	0.00	644.34
364	J-3	475.00	Zone - 2	73.3	6.45	644.35

FlexTable: Junction Table

Active Scenario: 2043 PHD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
147	J220	590.00	Zone - 1	73.4	5.86	759.56
143	J180	590.00	Zone - 1	73.9	5.86	760.82
184	J590	470.00	Zone - 2	75.4	6.45	644.35
197	J720	470.00	Zone - 2	75.5	4.87	644.40
168	J430	590.00	Zone - 1	75.8	4.87	765.25
493	J-23	467.00	Zone - 2	76.7	0.00	644.36
556	J-47	583.00	Zone - 1	77.5	0.00	762.13
199	J740	465.00	Zone - 2	77.6	4.87	644.34
185	J600	465.00	Zone - 2	77.6	6.45	644.38
145	J200	580.00	Zone - 1	78.0	5.86	760.39
131	J60	580.00	Zone - 1	78.7	5.86	762.00
141	J160	590.00	Zone - 1	79.0	4.87	772.64
178	J530	580.00	Zone - 1	79.2	4.92	763.03
372	J-7	580.00	Zone - 1	79.2	7.33	763.16
150	J250	575.00	Zone - 1	79.4	7.33	758.49
6941	J-50	575.65	Zone - 1	79.6	0.00	759.52
183	J580	460.00	Zone - 2	79.8	6.45	644.35
215	J910	580.00	Zone - 1	79.9	4.87	764.60
160	J350	575.00	Zone - 1	79.9	7.33	759.77
6945	J-52	459.29	Zone - 2	80.1	0.00	644.40
562	J-49	578.50	Zone - 1	80.5	0.00	764.51
214	J900	460.00	Zone - 2	80.6	5.86	646.37
135	J100	575.00	Zone - 1	81.2	5.86	762.78
158	J330	570.00	Zone - 1	81.3	5.86	757.96
464	J-11	570.00	Zone - 1	81.3	0.00	757.96
157	320	570.00	Zone - 1	81.3	5.86	757.96
370	J-6	575.00	Zone - 1	82.0	0.00	764.60
196	J710	455.00	Zone - 2	82.0	6.45	644.62
6948	J-53	451.78	Zone - 2	83.3	0.00	644.39
163	J380	570.00	Zone - 1	83.5	7.33	762.95
137	J120	570.00	Zone - 1	83.5	0.00	763.01
175	J500	570.00	Zone - 1	83.5	7.33	763.03
151	J260	565.00	Zone - 1	83.7	7.33	758.50
222	J980	570.00	Zone - 1	84.5	4.87	765.23
209	J840	560.00	Zone - 1	85.6	5.86	757.89
559	J-48	565.00	Zone - 1	85.6	0.00	762.93
162	J370	565.00	Zone - 1	85.7	7.33	762.97
394	J-10	565.00	Zone - 1	85.8	0.00	763.40
148	J230	560.00	Zone - 1	86.1	7.33	759.06
201	J760	445.00	Zone - 2	86.3	6.45	644.39
130	J50	560.00	Zone - 1	87.3	5.86	761.88
552	J-45	558.00	Zone - 1	88.2	0.00	761.77
165	J400	560.00	Zone - 1	88.2	7.33	763.81
190	J650	440.00	Zone - 2	88.6	6.45	644.67
159	J340	555.00	Zone - 1	88.6	7.33	759.78
470	J-14	553.11	Zone - 1	88.7	0.00	758.08
161	J360	555.00	Zone - 1	88.8	7.33	760.14

FlexTable: Junction Table
Active Scenario: 2043 PHD

ID	Label	Elevation (ft)	Zone	Pressure (psi)	Demand (gpm)	Hydraulic Grade (ft)
191	J660	440.00	Zone - 2	88.8	6.45	645.20
207	J820	550.00	Zone - 1	90.0	5.86	757.93
136	J110	555.00	Zone - 1	90.0	4.87	763.01
515	J-34	550.00	Zone - 1	90.1	0.00	758.24
174	J490	555.00	Zone - 1	90.2	6.45	763.58
172	J470	555.00	Zone - 1	91.3	6.45	766.01
154	J290	545.00	Zone - 1	92.3	7.33	758.31
366	J-4	430.00	Zone - 2	92.7	4.87	644.34
194	J690	430.00	Zone - 2	93.6	5.86	646.28
535	J-42	540.97	Zone - 1	94.1	0.00	758.55
156	J310	540.00	Zone - 1	94.4	5.86	758.14
155	J300	540.00	Zone - 1	94.4	5.86	758.14
153	J280	540.00	Zone - 1	94.5	7.33	758.44
198	J730	425.00	Zone - 2	94.9	4.87	644.37
144	J190	540.00	Zone - 1	95.5	5.86	760.81
127	J20	540.00	Zone - 1	95.8	5.86	761.48
176	J510	540.00	Zone - 1	96.5	4.92	763.03
152	J270	535.00	Zone - 1	96.7	7.33	758.53
549	J-44	534.00	Zone - 1	98.4	0.00	761.48
210	J850	530.00	Zone - 1	98.6	5.86	757.89
138	J130	535.00	Zone - 1	98.9	4.87	763.48
164	J390	535.00	Zone - 1	98.9	7.33	763.48
140	J150	535.00	Zone - 1	100.0	4.87	766.12
173	J480	530.00	Zone - 1	102.0	6.45	765.84
204	J790	535.00	Zone - 1	104.1	4.87	775.60
6951	J-54	517.75	Zone - 1	106.3	0.00	763.47
139	J140	510.00	Zone - 1	109.6	4.87	763.26
192	J670	390.00	Zone - 2	110.6	5.86	645.56
212	J880	500.00	Zone - 1	111.6	5.86	757.89
126	J10	500.00	Zone - 1	113.1	5.86	761.48
211	J860	495.00	Zone - 1	113.7	5.86	757.89
180	J550	500.00	Zone - 1	116.4	6.45	769.07
193	J680	375.00	Zone - 2	116.6	5.86	644.51
203	J780	505.00	Zone - 1	117.1	4.87	775.61
205	J800	485.00	Zone - 1	126.1	4.87	776.36
375	J-8	430.00	Zone - 1	150.1	4.87	777.00
206	J810	430.00	Zone - 1	150.2	0.00	777.18
213	J890	405.00	Zone - 1	152.7	5.86	757.89

FlexTable: Pipe Table

Active Scenario: 2043 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
315	860	309.23	PMP-3	J810	4.36	6.0	Ductile Iron	False
316	870	864.72	R-3	PMP-3	4.36	6.0	Ductile Iron	False
6969	P-57	160.34	J-57	T-1	3.01	6.0	Ductile Iron	False
563	1200(1)	603.11	J130	J-49	1.59	8.0	Ductile Iron	False
564	1200(2)	527.99	J-49	J980	1.59	8.0	Ductile Iron	False
245	130	359.67	J110	J130	1.53	8.0	Ductile Iron	False
560	110(1)	81.48	J100	J-48	1.50	8.0	Ductile Iron	False
561	110(2)	178.25	J-48	J110	1.50	8.0	Ductile Iron	False
531	450(2)	110.11	J-40	J450	1.82	6.0	Asbestos Cement	False
347	1210	781.29	J980	J150	1.48	8.0	Ductile Iron	False
247	160	3,735.98	J150	J160	1.61	6.0	Asbestos Cement	False
530	450(1)	48.98	J440	J-40	1.43	6.0	Asbestos Cement	False
268	370	1,520.73	J360	J370	1.46	6.0	Asbestos Cement	False
377	P-12	326.74	J-8	J810	1.57	10.0	Ductile Iron	False
376	P-11	1,085.66	J800	J-8	1.55	10.0	Ductile Iron	False
267	360	347.69	J340	J360	1.38	6.0	Asbestos Cement	False
312	830	443.46	J780	J800	1.53	10.0	Ductile Iron	False
274	440	458.31	J440	J420	1.32	6.0	Asbestos Cement	False
280	500	1,364.20	J480	J490	1.44	6.0	Ductile Iron	False
310	810	2,987.84	J560	J780	1.49	10.0	Ductile Iron	False
537	340(2)	1,042.18	J-42	J340	1.21	6.0	Asbestos Cement	False
288	580	3,263.45	J550	J560	1.26	6.0	Ductile Iron	False
6967	P-55	225.92	J450	J-55	1.70	8.0	Ductile Iron	False
6968	P-56	115.11	J-55	J-57	1.70	8.0	Ductile Iron	False
242	100	1,321.26	J80	J100	0.79	8.0	Ductile Iron	False
287	570	2,690.07	J480	J550	1.19	6.0	Asbestos Cement	False
557	80(1)	295.82	J60	J-47	0.76	8.0	Ductile Iron	False
558	80(2)	390.59	J-47	J80	0.76	8.0	Ductile Iron	False
238	60	520.40	J50	J60	0.68	8.0	Ductile Iron	False
281	510	887.52	J490	J370	0.97	6.0	Asbestos Cement	False
553	50(1)	1,110.72	J20	J-45	0.64	8.0	Ductile Iron	False
554	50(2)	370.33	J-45	J50	0.64	8.0	Ductile Iron	False
343	1170	1,578.31	J160	PRV-3	1.16	6.0	Asbestos Cement	False
344	1180	1,065.48	PRV-3	J570	1.16	6.0	Asbestos Cement	False
289	590	355.59	J560	J160	1.02	10.0	Ductile Iron	False
333	1060	928.80	J910	J420	0.96	6.0	Ductile Iron	False
332	1050	1,355.49	J410	J910	0.90	6.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2043 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
248	170	1,273.25	J100	J170	1.19	6.0	Asbestos Cement	False
271	400	614.59	J390	J400	0.74	6.0	Asbestos Cement	False
249	180	481.48	J170	J180	1.12	6.0	Asbestos Cement	False
301	720	1,396.52	J690	J670	0.74	6.0	Asbestos Cement	False
270	390	1,285.53	J370	J390	0.65	6.0	Asbestos Cement	False
538	P-53	582.53	J280	J-42	0.54	8.0	Ductile Iron	False
251	200	512.94	J180	J200	0.99	6.0	Asbestos Cement	False
260	290	977.80	J280	J290	0.49	8.0	Ductile Iron	False
309	800	2,413.23	J760	J770	0.66	2.0	PVC	False
299	700	1,204.37	J660	J670	0.61	6.0	Asbestos Cement	False
517	P-44	217.90	J-34	J290	0.45	8.0	Ductile Iron	False
252	210	454.85	J200	J210	0.92	6.0	Asbestos Cement	False
300	710	1,058.65	J670	J680	0.60	2.0	PVC	False
341	1150	1,645.01	J20	PRV-2	0.57	8.0	Ductile Iron	False
342	1160	399.53	PRV-2	J30	0.57	8.0	Ductile Iron	False
298	690	1,917.41	J650	J660	0.54	6.0	Asbestos Cement	False
273	430	1,266.81	J420	J430	0.30	6.0	Asbestos Cement	False
253	220	827.91	J210	J220	0.86	6.0	Asbestos Cement	False
302	730	2,028.96	J570	J700	0.55	6.0	Asbestos Cement	False
494	P-36	3,062.02	J570	J-23	0.55	6.0	Asbestos Cement	False
272	410	2,002.83	J400	J410	0.46	8.0	Ductile Iron	False
330	1030	2,047.17	J30	J900	0.49	8.0	Ductile Iron	False
369	P-7	133.76	J450	J-5	0.50	2.0	PVC	False
6953	140(2)	389.47	J-54	J140	0.50	2.0	PVC	False
297	680	641.20	J640	J650	0.47	6.0	Asbestos Cement	False
6943	230(2)	851.77	J-50	J230	0.79	6.0	Asbestos Cement	False
331	1040	688.05	J900	J690	0.46	8.0	Ductile Iron	False
304	750	1,292.25	J700	J720	0.42	6.0	Asbestos Cement	False
255	240	1,855.02	J230	J240	0.71	6.0	Asbestos Cement	False
534	P-52	878.79	J-41	J470	0.40	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2043 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
395	P-19	1,252.08	J490	J-10	0.39	6.0	Asbestos Cement	False
396	P-20	1,882.30	J-10	J-7	0.39	6.0	Ductile Iron	False
516	P-43	1,239.83	J300	J-34	0.37	8.0	Ductile Iron	False
296	670	490.62	J630	J640	0.32	6.0	Asbestos Cement	False
279	490	1,142.41	J470	J480	0.32	6.0	Asbestos Cement	False
277	470	2,047.82	J450	J150	0.61	8.0	Ductile Iron	False
374	P-10	1,181.08	J-7	J500	0.31	6.0	Ductile Iron	False
471	P-24	1,355.02	J300	J-14	0.30	8.0	Ductile Iron	False
472	P-25	1,789.45	J-14	320	0.30	8.0	Ductile Iron	False
499	P-38	1,114.16	J-23	J-26	0.28	8.0	Ductile Iron	False
501	P-39	450.98	J-26	J-27	0.28	8.0	Ductile Iron	False
345	1190	141.18	J430	J970	0.14	8.0	Ductile Iron	False
348	1220	909.93	J970	J980	0.14	8.0	Ductile Iron	False
6942	230(1)	309.29	J220	J-50	0.44	8.0	Ductile Iron	False
295	660	1,120.60	J600	J630	0.25	6.0	Asbestos Cement	False
536	340(1)	775.50	J270	J-42	0.25	6.0	Asbestos Cement	False
524	P-48	211.43	J-37	J-34	0.07	8.0	Ductile Iron	False
317	880	1,338.16	320	J820	0.22	8.0	Ductile Iron	False
533	P-51	1,633.61	J-40	J-41	0.22	8.0	Ductile Iron	False
305	760	670.42	J720	J730	0.22	6.0	Asbestos Cement	False
292	630	869.29	J580	J600	0.17	6.0	Asbestos Cement	False
505	P-41	915.45	J-27	J-29	0.19	8.0	Ductile Iron	False
319	910	2,195.52	J820	J840	0.19	8.0	Ductile Iron	False
519	P-45	240.88	J240	J-35	0.35	8.0	Ductile Iron	False
284	540	442.27	J500	J520	0.17	6.0	Ductile Iron	False
258	270	597.10	J260	J270	0.17	6.0	Asbestos Cement	False
306	770	953.99	J730	J740	0.17	6.0	Asbestos Cement	False
6946	790(1)	560.25	J720	J-52	0.15	6.0	Asbestos Cement	False
6950	790(2)(2)	295.46	J-53	J760	0.15	6.0	Asbestos Cement	False
320	920	1,046.94	J840	J850	0.11	8.0	Ductile Iron	False
526	P-49	1,084.51	J-35	J-38	0.19	8.0	Ductile Iron	False
507	P-42	299.85	J-29	J-30	0.09	8.0	Ductile Iron	False
521	P-46	782.54	J-35	J-36	0.16	8.0	Ductile Iron	False
257	260	1,069.05	J250	J260	0.08	6.0	Asbestos Cement	False
266	350	1,870.47	J350	J340	0.08	6.0	Asbestos Cement	False

FlexTable: Pipe Table

Active Scenario: 2043 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
269	380	2,794.51	J370	J380	0.08	6.0	Asbestos Cement	False
6949	790(2)(1)	233.65	J-52	J-53	0.08	8.0	Ductile Iron	False
291	620	721.05	J580	J590	0.07	6.0	Ductile Iron	False
303	740	1,472.16	J700	J710	0.07	6.0	Asbestos Cement	False
365	P-5	638.70	J580	J-3	0.07	6.0	Ductile Iron	False
550	20(1)	1,127.26	J10	J-44	0.04	8.0	Ductile Iron	False
551	20(2)	454.30	J-44	J20	0.04	8.0	Ductile Iron	False
236	40	1,237.96	J30	J40	0.07	6.0	Asbestos Cement	False
239	70	1,233.32	J60	J70	0.07	6.0	Asbestos Cement	False
250	190	788.53	J180	J190	0.07	6.0	Asbestos Cement	False
262	310	1,091.01	J300	J310	0.07	6.0	Asbestos Cement	False
523	P-47	763.84	J-36	J-37	0.02	8.0	Ductile Iron	False
283	530	910.93	J500	J510	0.06	6.0	Ductile Iron	False
285	550	324.28	J520	J530	0.06	6.0	Ductile Iron	False
286	560	1,423.00	J520	J540	0.06	6.0	Ductile Iron	False
278	480	982.79	J440	J460	0.06	6.0	Ductile Iron	False
307	780	1,302.56	J740	J750	0.06	6.0	Asbestos Cement	False
311	820	1,060.57	J790	J780	0.06	6.0	Ductile Iron	False
367	P-6	258.23	J740	J-4	0.06	6.0	Ductile Iron	False
6952	140(1)	866.12	J130	J-54	0.06	6.0	Asbestos Cement	False
527	P-50	416.06	J-38	J-37	0.05	8.0	Ductile Iron	False
363	P-4	1,141.91	J640	J-2	0.04	8.0	Ductile Iron	False
321	930	184.62	J850	J860	0.04	8.0	Ductile Iron	False
322	950	1,933.27	J840	J890	0.04	8.0	Ductile Iron	False
323	960	440.71	J850	J880	0.04	8.0	Ductile Iron	False
465	P-21	721.05	320	J-11	0.04	8.0	Ductile Iron	False
466	P-22	1,599.67	J-11	J330	0.04	8.0	Ductile Iron	False
495	P-37	1,640.82	J-23	J580	0.05	6.0	Asbestos Cement	False
244	120	246.16	J110	J120	0.00	2.0	PVC	False
329	1020	705.53	R-3	PMP-2	0.00	6.0	Ductile Iron	False
328	1010	359.73	PMP-2	J810	0.00	6.0	Ductile Iron	False
326	10	89.47	R-1	PMP-1	0.00	6.0	Asbestos Cement	False
327	15	109.92	PMP-1	J10	0.00	6.0	Asbestos Cement	False
503	P-40	568.86	J-27	J-28	0.00	8.0	Ductile Iron	False
334	1070	458.75	J910	J920	0.00	8.0	Ductile Iron	False
241	90	678.03	J80	J90	0.00	6.0	Ductile Iron	False

FlexTable: Pipe Table

Active Scenario: 2043 PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Velocity (ft/s)	Diameter (in)	Material	Has Check Valve?
371	P-8	361.67	J910	J-6	0.00	2.0	PVC	False
361	P-3	1,059.28	J600	J620	0.00	2.0	PVC	False
256	250	219.27	J240	J250	0.00	6.0	Asbestos Cement	False
6975	P-62	325.59	J-55	T-1	0.00	6.0	Ductile Iron	True
475	P-26	788.07	R-5	PMP-5	(N/A)	6.0	Ductile Iron	False
482	P-27	463.65	PMP-5	J-20	(N/A)	6.0	Ductile Iron	False
483	P-28	1,351.93	J-20	J-19	(N/A)	8.0	Ductile Iron	False
484	P-29	514.98	J-19	J-18	(N/A)	8.0	Ductile Iron	False
485	P-30	603.37	J-18	J-17	(N/A)	8.0	Ductile Iron	False
486	P-31	1,965.14	J-17	J-16	(N/A)	8.0	Ductile Iron	False
487	P-32	320.88	J-16	J-15	(N/A)	8.0	Ductile Iron	False
488	P-33	435.33	J-15	J310	(N/A)	8.0	Ductile Iron	False

APPENDIX H – FINANCIAL DATA

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Appendix H - 6 year Historical Expenses - Three Lakes Water Association
Fiscal Year End, June 30

Line No.		Actual 2018	Actual 2019	Actual 2020	Actual 2021	Actual 2022	Actual 2023
1	**REVENUES**						
2	Water Rates (NIC portion transferred to Cap. Imp. Fund)	$ 617,181	$ 633,601	$ 643,101	$ 664,961	$ 726,832	$ 826,796
	a. Water Service	$ 734,127	$ 752,055	$ 754,656	$ 776,902	$ 843,767	$ 955,787
	b. Monthly residential fee specific for improvements	$ (116,946)	$ (118,454)	$ (111,555)	$ (111,941)	$ (116,935)	$ (128,991)
3	Fees and Other Service Charges	$ 82,096	$ 49,266	$ 72,312	$ 40,309	$ 57,522	$ 66,932
	b. Other	$ 82,096	$ 49,266	$ 72,312	$ 40,309	$ 57,522	$ 66,932
4	Other Revenues	$ 10,078	$ 19,536	$ 10,615	$ 6,428	$ 2,646	$ 2,763
	a. Interest earned	$ 2,768	$ 7,855	$ 10,615	$ 6,428	$ 2,646	$ 2,763
	b. Miscellaneous	$ 7,310	$ 11,681	$ -	$ -	$ -	$ -
5	**TOTAL REVENUES (Add 2-4)**	**$ 709,355**	**$ 702,403**	**$ 726,028**	**$ 711,698**	**$ 787,000**	**$ 896,491**
6	**EXPENSES**						
7	Operation & Maintenance Expenses						
8	Salaries & Other Benefits	$ 227,619	$ 250,874	$ 268,205	$ 289,245	$ 323,674	$ 360,019
9	Power & Other Utilities	$ 18,941	$ 20,423	$ 24,304	$ 26,157	$ 24,236	$ 26,267
	a. Utilities	11667	13620	13941	14498	13390	14464
	b. Telephone	7274	6803	10363	11659	10846	11803
10	Chemical & Treatment	$ -	$ -	$ -	$ -	$ -	$ -
11	Monitoring	$ 1,658	$ 1,777	$ 1,325	$ 2,388	$ 1,381	$ 847
	a. Water testing - lab work	$ 1,658	$ 1,777	$ 1,325	$ 2,388	$ 1,381	$ 847
12	Materials, Supplies and Parts	$ 171,191	$ 195,062	$ 181,705	$ 193,901	$ 242,573	$ 252,123
	a. Water purchased	$ 117,880	$ 126,568	$ 130,653	$ 152,577	$ 162,149	$ 181,525
	b. Repairs and maintenance	$ 53,311	$ 68,494	$ 51,052	$ 41,324	$ 80,424	$ 70,598
13	Transportation Expenses	$ 6,045	$ 4,755	$ 4,441	$ 2,968	$ 5,134	$ 5,778
	a. Fuel and Oil	$ 6,045	$ 4,755	$ 4,441	$ 2,968	$ 5,134	$ 5,778
14	Miscellaneous	$ -	$ -	$ -	$ -	$ -	$ -
15	Total Operation & Maintenance Expense (Add 8-14)	$ 425,454	$ 472,891	$ 479,980	$ 514,659	$ 596,998	$ 645,034
16	General and Administrative Expenses						
17	Salaries & Benefits	$ -	$ -	$ -	$ -	$ -	$ 1
18	Office Supplies & Postage	$ 11,193	$ 11,905	$ 17,651	$ 10,299	$ 11,151	$ 12,366
	a. Misc.	$ 7,231	$ 8,302	$ 13,187	$ 6,074	$ 6,998	$ 8,064
	b. Postage	$ 3,962	$ 3,603	$ 4,464	$ 4,225	$ 4,153	$ 4,302
19	Insurance - Vehicles, Liability, Worker's Comp	$ 9,797	$ 11,532	$ 11,979	$ 12,681	$ 11,191	$ 18,697
	a. Insurance	$ 9,797	$ 11,532	$ 11,979	$ 12,681	$ 11,191	$ 18,697
20	Legal & Accounting	$ -	$ -	$ -	$ -	$ -	
21	Engineering & Professional Services	$ 30,069	$ 36,906	$ 34,937	$ 25,126	$ 36,785	$ 31,311
	a. Engineering fees	$ 18,497	$ 18,705	$ 23,582	$ 14,224	$ 24,099	$ 18,103
	b. Professional fees	$ 11,572	$ 18,201	$ 11,355	$ 10,902	$ 12,686	$ 13,208
	c. Outside Services	$ -	$ -	$ -	$ -	$ -	$ -
22	Fees	$ 3,325	$ 2,930	$ 3,792	$ 2,794	$ 3,121	$ 3,660
	a. County permits	$ 3,325	$ 2,930	$ 3,792	$ 2,794	$ 3,121	$ 3,660
	b. License	$ -	$ -	$ -	$ -	$ -	$ -
23	Miscellaneous Expenses (e.g. Training)	$ 18,685	$ 15,416	$ 14,409	$ 16,154	$ 14,926	$ 17,422
	a. Dues	$ -	$ -	$ -	$ -	$ -	$ -
	b. Education	$ 1,985	$ -	$ 350	$ 1,610	$ 490	$ 1,384
	c. Meeting expense	$ -	$ -	$ -	$ -	$ -	$ -
	d. Interest Expense	$ 16,700	$ 15,416	$ 14,059	$ 14,544	$ 14,436	$ 16,038
24	Total General & Administrative Expenses (Add 17-23)	$ 73,308	$ 81,117	$ 84,402	$ 69,598	$ 79,830	$ 86,594
25	Depreciation Expense	$ 151,073	$ 147,564	$ 132,554	$ 132,142	$ 158,076	$ 160,769
26	**TOTAL EXPENSES (15+24+25)**	**$649,835**	**$701,572**	**$696,936**	**$716,399**	**$834,904**	**$892,397**
	TOTAL EXPENSES (15+24 only - NIC Depreciation)	**$ 498,762**	**$ 554,008**	**$ 564,382**	**$ 584,257**	**$ 676,828**	**$ 731,628**
27	Taxes (Property, B & O, Income)	$ 60,693	$ 65,360	$ 68,081	$ 67,528	$ 71,404	$ 79,318
	a. Taxes	$ 60,693	$ 65,360	$ 68,081	$ 67,528	$ 71,404	$ 79,318
	Reconcile with Financial Statements						
	-exclude transfer to General Facilities Charge	**$ (116,946)**	**$ (118,454)**	**$ (111,555)**	**$ (111,941)**	**$ (116,935)**	**$ (128,991)**
	NET REVENUES	**$ 115,773**	**$ 53,925**	**$ 72,566**	**$ 39,712**	**$ (2,373)**	**$ 53,767**
28	Annual Debt Payments-Loans/Bonds (Principal)	$ 88,528	$ 87,537	$ 94,472	$ 86,034	$ 84,823	$ 81,902
29	Total Outstanding Debt-Loans/Bonds (Principal)	$ 1,092,507	$ 1,004,970	$ 916,380	$ 821,908	$ 727,435	$ 632,963
30	Capital Improvement Program Expenditures						
31	New CIP Facilities	$ -	$ -	$ -	$ -	$ -	$ -
	a. Water lines and hydrants contributed						
	b. Land						
32	Renewal & Replacement Facilities	$ 208,005	$ 286,337	$ 114,020	$ 248,993	$ 124,344	$ 309,607
	a. Pipeline, services, hydrants and other	$ 208,005	$ 286,337	$ 114,020	$ 248,993	$ 124,344	$ 309,607
	b. Machinery						
	c. Construction in process						
	d. Land						
	e. Investment in CDs						
	f. Loan fees						
	g. Redemption of CDs						
	h. Purchase vehicle						

Appendix H - 6 year Historical Expenses - Three Lakes Water Association
Fiscal Year End, June 30

		Actual 2018	Actual 2019	Actual 2020	Actual 2021	Actual 2022	Actual 2023
33	Safe Drinking Water Act Facilities	$ -	$ -	$ -	$ -	$ -	$ -
34	Non-Facilities Costs (e.g., conservation program costs)	$ -	$ -	$ -	$ -	$ -	$ -
35	Capital Sources - Revenue						
36	Loan/Bonds Funds	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
37	Grants						
38	Special Charges (Connection Charges)	$ 285,046	$ 165,954	$ 206,555	$ 156,941	$ 173,935	$ 175,241
	a. General Facilities Charges	$ 130,100	$ 30,000	$ 69,000	$ 34,500	$ 43,000	$ 32,500
	b. Monthly residential fee specific for capital improvements	$ 116,946	$ 118,454	$ 111,555	$ 111,941	$ 116,935	$ 128,991
	c. Funding for water lines and hydrants	$ -	$ -	$ -	$ -	$ -	$ -
	d. Memberships purchased	$ 6,500	$ 1,500	$ 3,000	$ 1,500	$ 1,500	$ 1,000
	f. Membership meters	$ 31,500	$ 16,000	$ 23,000	$ 9,000	$ 12,500	$ 12,750
	g. Addition to long term debt	$ -	$ -	$ -	$ -	$ -	$ -
	h. Insurance proceeds from vehicle	$ -	$ -	$ -	$ -	$ -	$ -
	i. Cell Antenna Rental	$ -	$ -	$ -	$ -		
39	Withdrawal From Existing Reserves						
40	**Net CIP Expense (31+32+33+34)-(36+37+38+39)**	**$ (77,041)**	**$ 120,383**	**$ (92,535)**	**$ 92,052**	**$ (49,591)**	**$ 134,366**
		$ (94,755)	**$ (115,280)**	**$ (185,757)**	**$ (116,349)**	**$ (158,666)**	**$ (134,897)**
41	Operating Cash Reserve						
42	Minimum Balance (1/8 Line (15+24))	$ 62,345	$ 69,251	$ 70,548	$ 73,032	$ 84,604	$ 91,454
43	Annual Installment						
44	**Running Balance (Year End)**	**$ 1,444,628**	**$ 1,287,459**	**$ 1,432,290**	**$ 1,298,324**	**$ 1,302,450**	**$ 1,145,855**
	(Cash at Year Start+5-26-27-28-40-(depr+amort+reconcl)	$ (1)	$ -	$ 1	$ -	$ (1)	$ (2)
45	**Emergency Reserve**						
46	Minimum Balance (Cost of Most Vulnerable Facility)						
47	Annual Installment						
48	Running Balance (May be Alternative Financing)						
49	**Replacement Reserve (VOLUNTARY)**						
50	Target Balance (System Replacement Cost)						
51	Annual Installment						
52	Running Balance	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
53	**TOTAL REVENUE REQ. (Add 26+27+28+40+43+47+51)**	**$ 722,015**	**$ 974,852**	**$ 766,954**	**$ 962,013**	**$ 941,540**	**$ 1,187,983**
54	**BUDGET SURPLUS (DEFICIT)(5-53)**	$ (12,660)	$ (272,449)	$ (40,926)	$ (250,315)	$ (154,540)	$ (291,492)
	BUDGET SURPLUS (DEFICIT) NIC Depreciation (5-53+25)	$ 138,413	$ (124,885)	$ 91,628	$ (118,173)	$ 3,536	$ (130,723)
	Cash at Beginning of the Year	**$ 1,362,534**	**$ 1,444,629**	**$ 1,287,460**	**$ 1,432,291**	**$ 1,298,325**	**$ 1,302,451**
	Net Revenues	$ 115,773	$ 53,925	$ 72,566	$ 39,712	$ (2,373)	$ 53,767
	Depreciation and Amortization	$ 151,073	$ 147,564	$ 132,554	$ 132,142	$ 158,076	$ 160,769
	Reconciling - account receivable, prepaid, payable & prepays	$ (56,318)	$ (32,284)	$ 53,203	$ (15,793)	$ 590	$ (25,872)
	Net Cash Provided by Operating Activities	**$ 210,528**	**$ 169,205**	**$ 258,323**	**$ 156,061**	**$ 156,293**	**$ 188,664**
	Net Cash Flows from Investing Activities	**$ (208,005)**	**$ (286,337)**	**$ (114,020)**	**$ (248,993)**	**$ (124,344)**	**$ (309,607)**
	Cash Flows from Financing Activities + CIP	$ 285,046	$ 165,954	$ 206,555	$ 156,941	$ 173,935	$ 175,241
	Remove transfer to General Faciilities Charge	$ (116,946)	$ (118,454)	$ (111,555)	$ (111,941)	$ (116,935)	$ (128,991)
	Subtract Loan payment	$ (88,528)	$ (87,537)	$ (94,472)	$ (86,034)	$ (84,823)	$ (81,902)
	Net Cash Flows from Financing Activities	**$ 79,572**	**$ (40,037)**	**$ 528**	**$ (41,034)**	**$ (27,823)**	**$ (35,652)**
	Net Increase in Cash	$ 82,095	$ (157,169)	$ 144,831	$ (133,966)	$ 4,126	$ (156,595)
	Cash at End of the Year	**$ 1,444,629**	**$ 1,287,460**	**$ 1,432,291**	**$ 1,298,325**	**$ 1,302,451**	**$ 1,145,856**

Appendix H - Forecast Expenses Through 2033 - Three Lakes Water Association

Fiscal Year End, June 30

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Estimated Rate Revenue Increase (nic CFC)	4.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%
Annual Average Rate/ ERU (nic CFC)	$ 905	$ 1,026	$ 1,162	$ 1,317	$ 1,492	$ 1,690	$ 1,915	$ 2,170	$ 2,459	$ 2,786
Estimated GFC Increase	0%	3%	3%	3%	3%	3%	3%	3%	3%	3%
General Facilities Charge (GFC)	$ 13,000	$ 13,390	$ 13,792	$ 14,205	$ 14,632	$ 15,071	$ 15,523	$ 15,988	$ 16,468	$ 16,962
Capital Facility Charge (CFC)	$ 145	$ 150	$ 154	$ 159	$ 163	$ 168	$ 173	$ 179	$ 184	$ 190
Total Annual Cost - ERU with Average Use	$ 1,051	$ 1,175	$ 1,316	$ 1,476	$ 1,655	$ 1,859	$ 2,089	$ 2,349	$ 2,643	$ 2,975
Monthly increase in cost of service	$ 3.09	$ 10.40	$ 11.74	$ 13.27	$ 14.99	$ 16.94	$ 19.16	$ 21.66	$ 24.50	$ 27.71
Combined Annual Increase	3.65%	11.88%	11.99%	12.09%	12.19%	12.28%	12.37%	12.44%	12.52%	12.58%
Earned Interest Rate	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Existing/Forecast ERUs (Users, per billing records, not volume)	887	890	893	896	899	902	905	908	911	914
Forecast Growth in ERUs (%, discounted from WSP forecast)	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
Non-User Accounts	4	4	4	4	4	4	4	4	4	4
Estimated Expense Inflation (other than salaries & benefits)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Depreciation as % of Total Revenues	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Everett Charges										

Forecast - Note 3

Line No.		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
1	**REVENUES**										
2	Water Rates (NIC portion transferred to Cap. Imp. Fund)	$ 801,732	$ 911,439	$ 1,036,148	$ 1,177,906	$ 1,339,043	$ 1,522,207	$ 1,730,406	$ 1,967,060	$ 2,236,055	$ 2,541,807
3	Fees and Other Service Charges	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000
4	Other Revenues	$ 10,044	$ 10,861	$ 8,129	$ 7,135	$ 7,515	$ 9,014	$ 11,980	$ 9,768	$ 5,925	$ 4,192
5	**TOTAL REVENUES (Add 2-4)**	**$ 819,776**	**$ 930,300**	**$ 1,052,276**	**$ 1,193,041**	**$ 1,354,558**	**$ 1,539,221**	**$ 1,750,387**	**$ 1,984,828**	**$ 2,249,980**	**$ 2,553,998**
6	**EXPENSES**										
7	Operation & Maintenance Expenses										
8	Salaries & Other Benefits	$ 396,000	$ 415,800	$ 436,590	$ 458,420	$ 481,340	$ 505,407	$ 530,678	$ 557,212	$ 585,072	$ 614,326
9	Power & Other Utilities	$ 30,000	$ 30,900	$ 31,827	$ 32,782	$ 33,765	$ 34,778	$ 35,822	$ 36,896	$ 38,003	$ 39,143
10	Chemical & Treatment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
11	Monitoring	$ 2,000	$ 2,060	$ 2,122	$ 2,185	$ 2,251	$ 2,319	$ 2,388	$ 2,460	$ 2,534	$ 2,610
12	Materials, Supplies and Parts	$ 248,879	$ 271,823	$ 280,126	$ 288,694	$ 297,534	$ 306,655	$ 316,068	$ 325,782	$ 335,806	$ 346,150
13	Transportation Expenses	$ 6,000	$ 6,180	$ 6,365	$ 6,556	$ 6,753	$ 6,956	$ 7,164	$ 7,379	$ 7,601	$ 7,829
14	Miscellaneous	$ -	$ 180,000	$ 180,000	$ 180,000	$ 350,000	$ 450,000	$ 650,000	$ 800,000	$ 1,150,000	$ 1,250,000
15	Total Operation & Maintenance Expense (Add 8-14)	$ 682,879	$ 906,763	$ 937,030	$ 968,637	$ 1,171,643	$ 1,306,115	$ 1,542,120	$ 1,729,729	$ 2,119,015	$ 2,260,058
16	General and Administrative Expenses										
17	Salaries & Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
18	Office Supplies & Postage	$ 15,200	$ 15,656	$ 16,126	$ 16,609	$ 17,108	$ 17,621	$ 18,150	$ 18,694	$ 19,255	$ 19,833
19	Insurance - Vehicles, Liability, Worker's Comp	$ 20,000	$ 20,600	$ 21,218	$ 21,855	$ 22,510	$ 23,185	$ 23,881	$ 24,597	$ 25,335	$ 26,095
20	Legal & Accounting	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
21	Engineering & Professional Services	$ 34,000	$ 35,020	$ 36,071	$ 37,153	$ 38,267	$ 39,415	$ 40,598	$ 41,816	$ 43,070	$ 44,362
22	Fees	$ 7,000	$ 7,210	$ 7,426	$ 7,649	$ 7,879	$ 8,115	$ 8,358	$ 8,609	$ 8,867	$ 9,133
23	Miscellaneous Expenses (e.g. Training) - See Note 2	$ 19,477	$ 18,402	$ 17,559	$ 16,727	$ 15,905	$ 15,094	$ 15,178	$ 15,273	$ 15,380	$ 15,501
24	Total General & Administrative Expenses (Add 17-23)	$ 95,677	$ 96,888	$ 98,400	$ 99,992	$ 101,669	$ 103,431	$ 106,164	$ 108,989	$ 111,908	$ 114,924
25	Depreciation/Amortization Expense - not treated as cash	$ 163,955	$ 186,060	$ 210,455	$ 238,608	$ 270,912	$ 307,844	$ 350,077	$ 396,966	$ 449,996	$ 510,800
26	**TOTAL EXPENSES (15+24+25)**	**$ 942,512**	**$ 1,189,711**	**$ 1,245,885**	**$ 1,307,237**	**$ 1,544,224**	**$ 1,717,390**	**$ 1,998,362**	**$ 2,235,683**	**$ 2,680,919**	**$ 2,885,782**
	TOTAL EXPENSES (15+24 only - NIC Depreciation)	**$ 778,557**	**$ 1,003,651**	**$ 1,035,430**	**$ 1,068,629**	**$ 1,273,312**	**$ 1,409,546**	**$ 1,648,284**	**$ 1,838,718**	**$ 2,230,923**	**$ 2,374,982**
27	Taxes (Property, B & O, Income)	$ 80,000	$ 82,400	$ 84,872	$ 87,418	$ 90,041	$ 92,742	$ 95,524	$ 98,390	$ 101,342	$ 104,382
28	Annual Debt Payments (Principal only ex. Loan, P&I new loans) - See Note 2	$ 200,566	$ 270,104	$ 353,084	$ 348,770	$ 344,456	$ 281,320	$ 277,006	$ 272,692	$ 268,378	$ 264,064
29	Total Outstanding Debt-Loans/Bonds (Principal)	$ 1,928,689	$ 2,887,432	$ 3,801,669	$ 3,530,239	$ 3,258,809	$ 2,987,379	$ 2,774,771	$ 2,562,163	$ 2,349,554	$ 2,136,946

Appendix H - Forecast Expenses Through 2033 - Three Lakes Water Association

Fiscal Year End, June 30

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Estimated Rate Revenue Increase (nic CFC)	4.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%
Annual Average Rate/ ERU (nic CFC)	$ 905	$ 1,026	$ 1,162	$ 1,317	$ 1,492	$ 1,690	$ 1,915	$ 2,170	$ 2,459	$ 2,786
Estimated GFC Increase	0%	3%	3%	3%	3%	3%	3%	3%	3%	3%
General Facilities Charge (GFC)	$ 13,000	$ 13,390	$ 13,792	$ 14,205	$ 14,632	$ 15,071	$ 15,523	$ 15,988	$ 16,468	$ 16,962
Capital Facility Charge (CFC)	$ 145	$ 150	$ 154	$ 159	$ 163	$ 168	$ 173	$ 179	$ 184	$ 190
Total Annual Cost - ERU with Average Use	$ 1,051	$ 1,175	$ 1,316	$ 1,476	$ 1,655	$ 1,859	$ 2,089	$ 2,349	$ 2,643	$ 2,975
Monthly increase in cost of service	$ 3.09	$ 10.40	$ 11.74	$ 13.27	$ 14.99	$ 16.94	$ 19.16	$ 21.66	$ 24.50	$ 27.71
Combined Annual Increase	3.65%	11.88%	11.99%	12.09%	12.19%	12.28%	12.37%	12.44%	12.52%	12.58%
Earned Interest Rate	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Existing/Forecast ERUs (Users, per billing records, not volume)	887	890	893	896	899	902	905	908	911	914
Forecast Growth in ERUs (%, discounted from WSP forecast)	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
Non-User Accounts	4	4	4	4	4	4	4	4	4	4
Estimated Expense Inflation (other than salaries & benefits)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Depreciation as % of Total Revenues	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Everett Charges										

Forecast - Note 3

		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
30	Capital Improvement Program Expenditures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
31	New CIP Facilities	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
32	Renewal & Replacement Facilities (with escalation from 2023)	$ 1,450,271	$ 1,368,062	$ 1,253,937	$ 23,107	$ 23,800	$ 24,514	$ 444,636	$ 1,102,761	$ 1,096,701	$ 1,108,099
	Booster Pump Sta #2 CIP - Motor & starter (Project B)		$ 17,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Booster Pump Station #1 CIP - genset and roof (Project C)	$ 87,500		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Recoat Standpipe Exterior (Project E)	$ -	$ -	$ -	$ -	$ -	$ -	$ 50,000	$ -	$ -	$ -
	171st AC Water Main Replacement (Project J)	$ 1,300,000	$ 1,100,000	$ 998,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	62nd St SE Water Main Replacement (Project K)	$ -	$ 152,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	163rd Culvert Crossing (Project L)	$ -	$ -	$ 129,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	AC Main Replacement (Project M)	$ -	$ -	$ -	$ -	$ -	$ -	$ 200,000	$ 850,000	$ 820,000	$ 799,000
	Small Dia. Main Repl Program (Project N)	$ -	$ -	$ -	$ -	$ -	$ -	$ 91,000	$ -	$ -	$ -
	Blowoff & Fire Hydrant Program (Project O)	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000
	New Meter Installation Expense	$ 10,530	$ 10,530	$ 10,530	$ 10,530	$ 10,530	$ 10,530	$ 10,530	$ 10,530	$ 10,530	$ 10,530
33	Safe Drinking Water Act Facilities	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Appendix H - Forecast Expenses Through 2033 - Three Lakes Water Association

Fiscal Year End, June 30

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Estimated Rate Revenue Increase (nic CFC)	4.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%
Annual Average Rate/ ERU (nic CFC)	$ 905	$ 1,026	$ 1,162	$ 1,317	$ 1,492	$ 1,690	$ 1,915	$ 2,170	$ 2,459	$ 2,786
Estimated GFC Increase	0%	3%	3%	3%	3%	3%	3%	3%	3%	3%
General Facilities Charge (GFC)	$ 13,000	$ 13,390	$ 13,792	$ 14,205	$ 14,632	$ 15,071	$ 15,523	$ 15,988	$ 16,468	$ 16,962
Capital Facility Charge (CFC)	$ 145	$ 150	$ 154	$ 159	$ 163	$ 168	$ 173	$ 179	$ 184	$ 190
Total Annual Cost - ERU with Average Use	$ 1,051	$ 1,175	$ 1,316	$ 1,476	$ 1,655	$ 1,859	$ 2,089	$ 2,349	$ 2,643	$ 2,975
Monthly increase in cost of service	$ 3.09	$ 10.40	$ 11.74	$ 13.27	$ 14.99	$ 16.94	$ 19.16	$ 21.66	$ 24.50	$ 27.71
Combined Annual Increase	3.65%	11.88%	11.99%	12.09%	12.19%	12.28%	12.37%	12.44%	12.52%	12.58%
Earned Interest Rate	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Existing/Forecast ERUs (Users, per billing records, not volume)	887	890	893	896	899	902	905	908	911	914
Forecast Growth in ERUs (%, discounted from WSP forecast)	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
Non-User Accounts	4	4	4	4	4	4	4	4	4	4
Estimated Expense Inflation (other than salaries & benefits)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Depreciation as % of Total Revenues	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Everett Charges										

Forecast - Note 3

#		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
34	Non-Facilities Costs (with escalation from 2023)	$ 61,079	$ 56,122	$ 7,649	$ 31,514	$ 54,486	$ 122,987	$ 402,169	$ 110,209	$ 137,523	$ 161,942
	Lead service line assessment (Project P)	$ 2,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Telemetry System Upgrade (Project Q)	$ 1,000	$ -	$ -	$ -	$ 15,000	$ -	$ -	$ -	$ -	$ -
	Office Network Upgrade (Project R)	$ -	$ -	$ -	$ 5,000	$ -	$ -	$ -	$ -	$ -	$ -
	Customer Billing System (Project S	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -
	GIS (Project T)	$ 5,000	$ 5,000	$ 5,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Security (Project U)		$ 7,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Meter Repl & RR Conversion Program (Project V)	$ 39,300	$ 27,900	$ -	$ -	$ -	$ -	$ -	$ 84,000	$ 53,400	$ 37,500
	Vehicles & Equipment (Project W)	$ -	$ 10,000	$ -	$ -	$ 30,000	$ -	$ -	$ -	$ -	$ 30,000
	Office/Shop Roof (Project X)	$ -	$ -	$ -	$ -	$ -	$ -	$ 25,000	$ -	$ -	$ -
	Addn Garage (Project Y)	$ -	$ -	$ -	$ -	$ -	$ 100,000	$ 300,000	$ -	$ -	$ -
	Water System Plan Update (Project Z)	$ 10,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50,000	$ 50,000
	Rate Study annual review/update	$ 2,000	$ 3,000	$ 2,000	$ 3,000	$ 2,000	$ 3,000	$ 2,000	$ 3,000	$ 2,000	$ 3,000
35	Capital Sources - Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	Loan/Bonds Funds	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
37	Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
38	Special Charges (Connection Charges, loans, lease rev.)	$ 1,660,910	$ 1,576,826	$ 1,583,348	$ 404,418	$ 581,375	$ 688,559	$ 895,980	$ 1,053,643	$ 1,411,558	$ 1,519,731
	a. General Facilities Charges	$ 39,000	$ 40,170	$ 41,375	$ 42,616	$ 43,895	$ 45,212	$ 46,568	$ 47,965	$ 49,404	$ 50,886
	b. Monthly residential fee specific for capital improvements	$ 129,209	$ 133,534	$ 138,002	$ 142,618	$ 147,388	$ 152,314	$ 157,404	$ 162,662	$ 168,094	$ 173,705
	c. Funding for water lines and hydrants - Transfer from Op Fund	$ -	$ 180,000	$ 180,000	$ 180,000	$ 350,000	$ 450,000	$ 650,000	$ 800,000	$ 1,150,000	$ 1,250,000
	d. Memberships purchased	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500
	f. Membership meters	$ 11,700	$ 11,700	$ 11,700	$ 11,700	$ 11,700	$ 11,700	$ 11,700	$ 11,700	$ 11,700	$ 11,700
	g. Addition to long term debt (Based on draw timing)	$ 1,456,067	$ 1,185,667	$ 1,185,667	$ -	$ -	$ -		$ -	$ -	$ -
	i. Cell antenna lease revenue	$ 23,435	$ 24,255	$ 25,104	$ 25,983	$ 26,892	$ 27,833	$ 28,808	$ 29,816	$ 30,859	$ 31,939
39	Withdrawal From Existing Reserves	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
40	**Net CIP Expense (31+32+33+34)-(36+37+38+39)**	**$ (149,561)**	**$ (152,642)**	**$ (321,762)**	**$ (349,797)**	**$ (503,089)**	**$ (541,058)**	**$ (49,175)**	**$ 159,327**	**$ (177,333)**	**$ (249,690)**
41	Operating Cash Reserve	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
42	Minimum Balance (1/8 Line (15+24+27-14b))	$ 107,320	$ 113,256	$ 117,538	$ 122,006	$ 126,669	$ 131,536	$ 136,726	$ 142,138	$ 147,783	$ 153,670
43	Annual Installment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
44	**Running Balance (Year End)**	**$ 1,056,070**	**$ 782,858**	**$ 1,040,670**	**$ 1,078,690**	**$ 1,228,528**	**$ 1,525,199**	**$ 481,743**	**$ 97,444**	**$ (75,886)**	**$ (15,626)**
	(Cash at Year Start+5-26-27-28-40+25)										
45	Emergency Reserve	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
46	Minimum Balance (Cost of Most Vulnerable Facility)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	Annual Installment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Appendix H - Forecast Expenses Through 2033 - Three Lakes Water Association

Fiscal Year End, June 30

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Estimated Rate Revenue Increase (nic CFC)	4.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%
Annual Average Rate/ ERU (nic CFC)	$ 905	$ 1,026	$ 1,162	$ 1,317	$ 1,492	$ 1,690	$ 1,915	$ 2,170	$ 2,459	$ 2,786
Estimated GFC Increase	0%	3%	3%	3%	3%	3%	3%	3%	3%	3%
General Facilities Charge (GFC)	$ 13,000	$ 13,390	$ 13,792	$ 14,205	$ 14,632	$ 15,071	$ 15,523	$ 15,988	$ 16,468	$ 16,962
Capital Facility Charge (CFC)	$ 145	$ 150	$ 154	$ 159	$ 163	$ 168	$ 173	$ 179	$ 184	$ 190
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Monthly increase in cost of service	$ 3.09	$ 10.40	$ 11.74	$ 13.27	$ 14.99	$ 16.94	$ 19.16	$ 21.66	$ 24.50	$ 27.71
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Earned Interest Rate	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
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Forecast Growth in ERUs (%, discounted from WSP forecast)	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
Non-User Accounts	4	4	4	4	4	4	4	4	4	4
Estimated Expense Inflation (other than salaries & benefits)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Depreciation as % of Total Revenues	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Everett Charges										

						Forecast - Note 3					
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
48	Running Balance (May be Alternative Financing)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
49	Replacement Reserve (VOLUNTARY)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	Target Balance (System Replacement Cost)	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000
51	Annual Installment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
52	Running Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
53	**TOTAL REVENUE REQ. (Add 26+27+28+40+43+47+51)**	**$ 1,073,518**	**$ 1,389,573**	**$ 1,362,080**	**$ 1,393,629**	**$ 1,475,632**	**$ 1,550,395**	**$ 2,321,718**	**$ 2,766,093**	**$ 2,873,306**	**$ 3,004,538**
54	**BUDGET SURPLUS (DEFICIT)(5-53)**	**$ (253,742)**	**$ (459,273)**	**$ (309,803)**	**$ (200,588)**	**$ (121,073)**	**$ (11,174)**	**$ (571,331)**	**$ (781,265)**	**$ (623,326)**	**$ (450,539)**
	BUDGET SURPLUS (DEFICIT) NIC Depreciation (5-53+25)	**$ (89,787)**	**$ (273,213)**	**$ (99,348)**	**$ 38,020**	**$ 149,838**	**$ 296,670**	**$ (221,254)**	**$ (384,299)**	**$ (173,330)**	**$ 60,260**
	Operations Fund Balance	$ 373,280	$ 217,529	$ 149,503	$ 186,497	$ 177,703	$ 214,635	$ 221,213	$ 268,934	$ 186,649	$ 261,283
	Capital Fund Balance including Debt Funds	$ 682,790	$ 565,328	$ 534,006	$ 535,033	$ 693,665	$ 953,403	$ 725,572	$ 293,552	$ 202,507	$ 188,133
	Total	$ 1,056,070	$ 782,858	$ 683,510	$ 721,530	$ 871,368	$ 1,168,039	$ 946,785	$ 562,486	$ 389,156	$ 449,416

Testing:										
Balanced Budget? Budget Surplus (nic dep.) >0?	**NO**	**NO**	**NO**	**yes**	**yes**	**yes**	**NO**	**NO**	**NO**	**yes**
Operations Fund Balance > Line 42?	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**
Operations Fund over Minimum (Line 46)	$ 265,961	$ 104,273	$ 31,966	$ 64,491	$ 51,034	$ 83,099	$ 84,487	$ 126,795	$ 38,865	$ 107,613
Capital Fund Balance > $150,000?	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**
Capital Fund over Minimum (Line 50)	$ 532,790	$ 415,328	$ 384,006	$ 385,033	$ 543,665	$ 803,403	$ 575,572	$ 143,552	$ 52,507	$ 38,133

Note 2 - Excludes interest on existing long-term debt in 2012 and beyond. See Line 23d for this interest expense. Includes interest on future loans

Note 3 - Forecast based on highest actual amount - FY2023-24 Forecast based on new budget.

Note 4 - Includes affect of increased demand

APPENDIX I – ANNUAL WATER QUALITY REPORT

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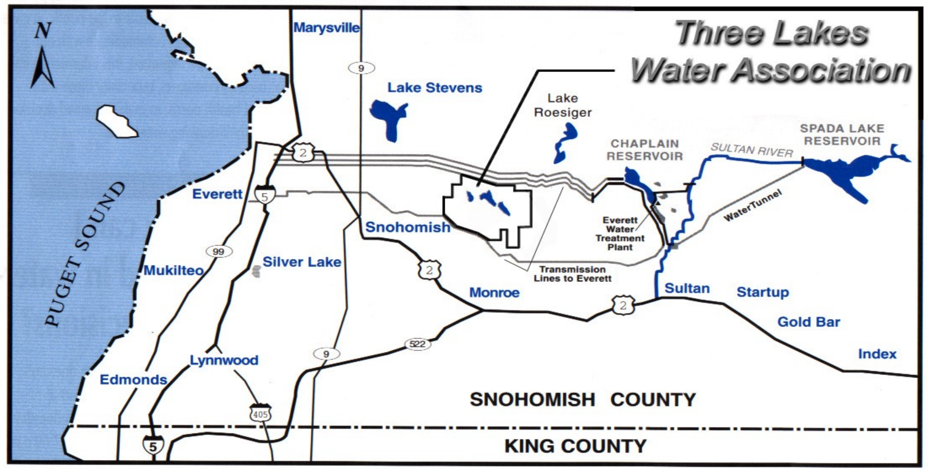
Annual Water Quality Report

Three Lakes Water Association
P.O. Box 24
Snohomish, WA 98291



Drinking Water Source

The source of your drinking water is rain and snowmelt collected in the Spada Lake Reservoir, which is located in the Sultan Basin Watershed. Water from this 50 billion gallon reservoir flows through a tunnel and pipeline to Chaplain Reservoir where it is held in preparation for treatment. The City of Everett maintains five large transmission pipelines, which run between the Chaplain Reservoir and the City. Three Lakes Water Association obtains your water from two different taps located on two separate Everett transmission mains.

Bottled Water

To ensure that tap water is safe to drink, the Department of Health and EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and the Washington Department of Agriculture regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

Standpipe Cleaning and Inspection

Three Lakes Water Association's standpipe was cleaned and inspected in July, 2018. This was the first cleaning and inspection performed by a professional diver with video recording capabilities since the standpipe was completed in 2011. The standpipe was reported to be in good condition with little sediment found and removed.

Association News

The Association's newly updated website can be found at www.3lwa.org. Members can find Association news updates, Board meeting information, water quality data, as well as an online bill payment option. We also have a Facebook page to help you stay connected. Like our page to stay informed about Association news updates.

In order for the Association to exist, we need interested Board Trustees. Please volunteer and help out your Association. Monthly Board meetings are held at the office located at 17503 58th St SE on the second Tuesday of each month at 7 p.m.

Come join us!

Three Lakes Water Association

2018 Annual Water Quality Report

March, 2019

Your Drinking Water

Three Lakes Water Association is pleased to provide our customers with our 21st annual water quality report. The purpose of this water quality report is to inform our customers about the high quality of their drinking water and their water system. We want you to know where your water comes from, what it contains, and how it compares to stringent state and federal water quality standards.

The water you drink is supplied from Spada Lake, which is managed by the City of Everett. A map located on the last page of this report illustrates the City's supply system which provides service to many water systems in the area. Drinking water quality is determined by testing for a variety of natural and man-made contaminants that can enter the water system.


Spada Lake

The City of Everett conducts an aggressive testing program which goes beyond the government requirements. Of the more than 175 substances the City tested for this past year, most were not detected and those that were detected were found at levels far below the most stringent drinking water standards. Please read through this report and if you have any questions, please contact the Water Association at (360) 568-8022.

Cross-Connection Control

On November 13, 2018 the Association's Board approved an updated Cross-Connection Control Program as required by the Washington State Department of Health (DOH). The full text of this program is available at the Association office. The program describes the purveyor's responsibility to protect the water system from contamination via cross-connections.

What's a cross-connection? Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment (boilers), systems containing chemicals (air conditioning systems, fire sprinkler systems, irrigation systems), or water sources of questionable quality. Cross-connection contamination can occur when the pressure in the equipment or system is greater than the pressure in the drinking water line (backpressure). Contamination can also occur when the pressure in the drinking water line drops due to unusual occurrences (main breaks, heavy water demand) causing contaminants to be sucked out from the equipment and into the drinking water line (backsiphonage).Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool, animal water trough or when attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may be contaminated by fertilizers, cesspools, or garden chemicals.

Water Use Efficiency

In October 2010, the State Supreme Court affirmed that the 2003 Municipal Water Law applies to privately-owned systems, including this Association. With the recent adoption of its new water system plan, the Association extended the goal to reduce annual average day demand per connection by 0.5% per year. The measures planned to achieve this goal include system-wide leak detection efforts and customer conservation. There has been a total of over 33.8 million gallons in net savings for the ten years since the goal was originally set! Please continue to do your part!

Be water smart!

Health Issues

Residential Tap Monitoring for Lead and Copper

Combined Regional Monitoring for Lead and Copper

Parameter & Units	MCLG	Action Level	90th % Level	# Homes exceeding action level
Copper, ppm	1.3	1.3	0.141	0 of 108 (0.0%)
Lead, ppb	0	15	2	0 of 108 (0.0%)

Source of Contamination: Corrosion of household plumbing system.

USEPA and state regulations require water systems to monitor for the presence of lead and copper at household taps every three years. The above data was collected in 2018. The next required round of sampling will be in 2021. The 90th% level is the highest result obtained in 90 percent of the samples collected when the results are ranked in order from lowest to highest. Results for water tested before it enters household plumbing are lower than tap result, which indicates that household plumbing may contribute to lead and copper at the tap.

The City of Everett's source waters contain virtually **no lead or copper**. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing.

Three Lakes Water Association is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at **1-800-426-4791** or **http://www.epa.gov/safewater/lead**

Although there is no detectable lead in water, tests from household taps in the distribution system show there can be low levels of lead and copper in tap water. This is primarily caused from corrosion of household plumbing systems. You may potentially have small levels of lead and copper in your home. Everett treats the water to minimize the potential for lead to enter the water and the results indicate that the program is successful.

The Three Lakes Water Association contributes to this testing by providing randomly taken water samples to the City for testing. The results provided in this report represent all testing performed by the City of Everett.

Additional Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons – such as persons with cancer who are undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, or some elderly persons and infants can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Water Drinking Hotline at **1-800-426-4791**.

During water treatment, organic polymer coagulants are added to improve coagulation and filtration processes that remove particulates from water. The particulates that are removed can include viruses, bacteria and other disease causing organisms. The USEPA sets limits on the type and amount of polymer that a water system can add to the water. In addition to the EPA limits, the State of Washington requires that all polymers used be certified safe for potable water use by an independent testing organization (NSF International). During treatment, Everett adds only NSF approved polymers and the levels used are far below the safe limits set by USEPA.

Definitions

Action Level (AL) – The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements that a water system must follow.

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Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG) - The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

N/A – Not Applicable. Means the EPA has not established MCLGs for these substances.

Turbidity—Turbidity is a measure of particulates suspended in water in Nephelometric Turbidity Units (NTU) and is an important test in determining drinking water quality. Particulates in water can include bacteria, viruses and protozoans that can cause disease.

Treatment Technique (TT) – A required process intended to reduce the level of a contaminant in drinking water.

Water Monitoring

2018 Water Quality Monitoring Results

As water travels over the land, it dissolves natural minerals and picks up other substances produced by human and animal activities. The Dept. of Health and the U.S. Environmental Protection Agency sets national standards for over 100 potential drinking water contaminants.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants, *Cryptosporidium* and potential health effects can be obtained by calling the U.S. Environmental Protection Agency's Safe Drinking Water Hotline at **1-800-426-4791.**

The results for the 2018 testing of your water supply are illustrated in the table below. The first column lists each compound tested and the units of measure. The second and third is the highest levels allowed by the U.S. EPA. The fourth column illustrates the levels found in the City of Everett's drinking water supply, including an average and a range. The last column shows the source of the compounds.

All of the compounds found in the City of Everett's water supply were found to be at **levels lower than the maximum allowed** by the U.S. EPA.

Detected Parameter & Units of Measure	**EPA's Goal** (MCLG)	**Maximum Allowed** (MCL)	**Levels in your water** Average or Highest	Range or Other	**Complies with Required Levels** Compliance	**Where does it come from?** Typical Sources
Turbidity, NTU[1]	N/A	TT	0.06	100%	**Yes**	Soil Erosion
Fluoride, ppm[2]	2	4	0.7	0.03-0.9	**Yes**	Dental health additive
Total Trihalomethanes (TTHM), ppb[3]	N/A	80	52	31-59	**Yes**	By-product of drinking water chlorination
Haloacetic Acids (5) (HAA5), ppb[3]	N/A	60	40	28-46	**Yes**	By-product of drinking water chlorination
Total Coliform Bacteria, % positive samples[4]	0	5% positive per month	none	0%	**Yes**	Naturally present in the environment
Residual Disinfectant Level (free chlorine), ppm	4.0 (MRDLG)	4.0 (MRDL)	0.6	0.2-1.1	**Yes**	Added as a drinking water disinfectant
Detected Unregulated Contaminants						
Bromodichloromethane, ppb	0	N/A	1.4	0.8-1.9	These substances are disinfection by-products for which no MCL Standard has been set, but which must be monitored to determine compliance with the USEPA Stage 2 Disinfection ByProducts Rule MCL's for Total Trihalomethanes and Haloacetic Acids (5).	
Chloroform (trichloromethane), ppb	70	N/A	36	30-47		
Dichloroacetic Acid, ppb	0	N/A	13	6-17		
Trichloroacetic Acid, ppb	20	N/A	23	19-27		

[1]Turbidity is a measure of the amount of particulates in water expressed in Nephelometric Turbidity Units (NTU). Particulates in water can include bacteria, viruses and protozoans that can cause disease. Turbidity measurements are used to determine the effectiveness of the treatment processes in removing these particulates. The EPA turbidity limit is 0.3 NTU. The values reported are the lowest monthly percentage of samples that met the EPA limit and the highest four-hour combined water turbidity measurement obtained during the year. In 2018, no filtered water turbidity results were above the EPA limit so the lowest percentage was 100 percent. The plant targets production of filtered water turbidities of 0.1 NTU or less.

[2]Fluoride is added to your water in carefully controlled levels for dental health. The minimum value of 0.03 ppm was due to a maintenance-related feed outage that lasted no more than one day in duration.

[3]Haloacetic acids and trihalomethanes form as by-products of the drinking water chlorination process that is used to kill or inactive disease-causing microbes. The TTHM and HAA5 results are from eight locations in Everett which are monitored to determine compliance with the current regulations. The range of results are taken from all eight locations. The highest locational running annual average of the eight sites that were monitored is reported here.

[4]Total coliform bacteria monitoring tracks the microbial quality in the water distribution system. Everett collects approximately 125 samples per month or 1,500 per year. No more than 5 percent of the monthly tests can be positive for total coliforms. No total coliform was detected in 2018.

Spada Lake

Three Lakes Water Association

2019 Annual Water Quality Report

March 2020

Your Drinking Water

Three Lakes Water Association is pleased to provide our members with our 22nd annual water quality report. The purpose of this water quality report is to inform our customers about the high quality of their drinking water and their water system. We want you to know where your water comes from, what it contains, and how it compares to stringent state and federal water quality standards.

The water you drink is supplied from Spada Lake, which is managed by the City of Everett. A map located on the last page of this report illustrates the City's supply system which provides service to many water systems in the area. Drinking water quality is determined by testing for a variety of natural and man-made contaminants that can enter the water system.

The City of Everett conducts an aggressive testing program which goes beyond the government requirements. Of the more than 175 substances the City tested for this past year, most were not detected and those that were detected were found at levels far below the most stringent drinking water standards. Please read through this report and if you have any questions, please contact the Association at (360) 568-8022.

Cross-Connection Control

On November 13, 2018 the Association's Board of Trustees approved an updated Cross-Connection Control Program as required by the Washington State Department of Health (DOH). The full text of this program is available at the Association office. The program describes the purveyor's responsibility to protect the water system from contamination through cross-connections.

Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment such as boilers, systems containing chemicals such as air conditioning systems, fire sprinkler systems or irrigation systems, or water sources of questionable quality.

Cross-connection contamination can occur through backpressure, which is when the pressure in the equipment or system is greater than the pressure in the drinking water line. Contamination can also occur through backsiphonage, which is when the pressure in the drinking water line drops due to unusual occurrences such as a main break or heavy water demand, causing contaminants to be sucked out from the equipment and into the drinking water line. Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool, animal water trough or when attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may be contaminated by fertilizers, cesspools, or garden chemicals.

Water Use Efficiency

In October 2010, the State Supreme Court affirmed that the 2003 Municipal Water Law applies to privately-owned systems, including this Association. With the adoption of the water system plan, the Association extended its goal to reduce annual average day demand per connection by 0.5% per year. The measures planned to achieve this goal include system-wide leak detection efforts and customer conservation. There has been a total of over 41.9 million gallons in net savings in the eleven years since the goal was originally set! Please continue to do your part!

Be water smart!

Health Issues

Residential Tap Monitoring for Lead and Copper

Combined Regional Monitoring for Lead and Copper

Parameter & Units	MCLG	Action Level	90th % Level	# Homes exceeding action level
Copper, ppm	1.3	1.3	0.141	0 of 108 (0.0%)
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Source of Contamination: Corrosion of household plumbing system.

USEPA and state regulations require water systems to monitor for the presence of lead and copper at household taps every three years. Lead and copper monitoring is conducted by Everett and many of the water systems that it supplies in the combined service area as a regional group. The above data was collected in 2018. The next required round of sampling will be in 2021. The 90th% level is the highest result obtained in 90 percent of the samples collected when the results are ranked in order from lowest to highest. In the past, the results for water tested before it enters household plumbing were lower than tap results. This indicates that there is virtually no lead or copper in the water and that household plumbing may contribute to lead and copper at the tap.

The City of Everett's source waters contain virtually **no lead or copper**. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing.

Three Lakes Water Association is responsible for providing high quality drinking water but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for thirty seconds to two minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at **1-800-426-4791** or **http://www.epa.gov/safewater/lead.**

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Water Monitoring

2019 Water Quality Monitoring Results

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The results for the 2019 testing of your water supply are illustrated in the table below. The first column lists each compound tested and the units of measure. The second and third are the highest levels allowed by the U.S. EPA. The fourth column illustrates the levels found in the City of Everett's drinking water supply, including an average and a range. The last column shows the source of the compounds.

All of the compounds found in the City of Everett's water supply were found to be at **levels lower than the maximum allowed** by the U.S. Environmental Protection Agency.

Detected Parameter & Units of Measure	**EPA's Goal** (MCLG)	**Maximum Allowed** (MCL)	**Levels in your water**		**Complies with Required Levels** Compliance	**Where does it come from?** Typical Sources
			Average or Highest	Range or Other		
Turbidity, NTU[1]	N/A	TT	0.07	100%	**Yes**	Soil Erosion
Fluoride, ppm[2]	2	4	0.7	0.3-0.7	**Yes**	Dental health additive
Total Trihalomethanes (TTHM), ppb[3]	N/A	80	49	31-56	**Yes**	By-product of drinking water chlorination
Haloacetic Acids (5) (HAA5), ppb[3]	N/A	60	38	22-42	**Yes**	By-product of drinking water chlorination
Total Coliform Bacteria, % positive samples[4]	0	5% positive per month	0%	none	**Yes**	Naturally present in the environment
Residual Disinfectant Level (free chlorine), ppm	4.0 (MRDLG)	4.0 (MRDL)	0.7	0.2-1.2	**Yes**	Added as a drinking water disinfectant
Detected Unregulated Contaminants						
Bromodichloromethane, ppb	0	N/A	1.6	1.3-2.4	These substances are individual disinfection by-products for which no MCL standard has been set, but which must be monitored to determine compliance with the USEPA Stage 2 Disinfection By-products Rule MCLs for Total Trihalomethanes and Haloacetic Acids (5).	
Chloroform (Trichloromethane), ppb	70	N/A	38	30-54		
Dichloroacetic Acid, ppb	0	N/A	13	2-18		
Trichloroacetic Acid, ppb	20	N/A	21	18-24		

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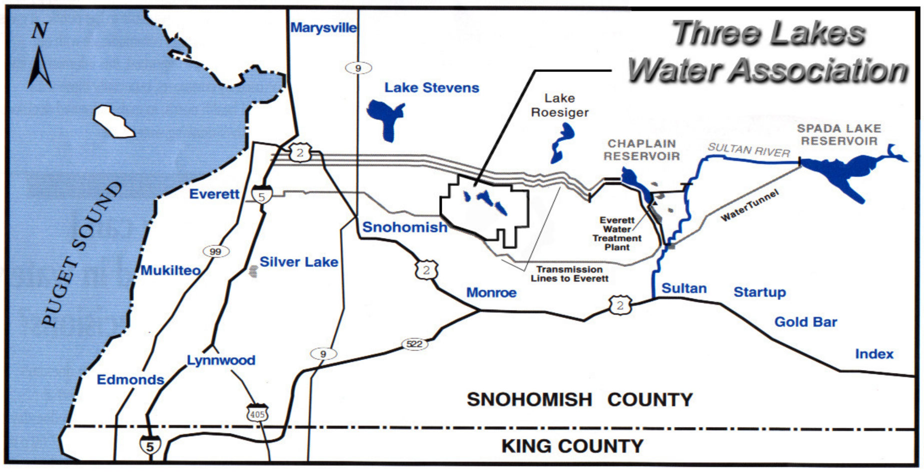
Drinking Water Source

The source of your drinking water is rain and snowmelt collected in the Spada Lake Reservoir, which is located in the Sultan Basin Watershed. Water from this 50 billion gallon reservoir flows through a tunnel and pipeline to the Chaplain Reservoir where it is held in preparation for treatment. The City of Everett maintains five large transmission pipelines, which run between the Chaplain Reservoir and the City. Three Lakes Water Association obtains your water from two different taps located on two separate Everett transmission mains.



Bottled Water

To ensure that tap water is safe to drink, the Department of Health and U.S. Environmental Protection Agency prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration and the Washington Department of Agriculture regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

Standpipe Cleaning and Inspection

Three Lakes Water Association's standpipe was cleaned and inspected in July of 2018. This was the first cleaning and inspection performed by a professional diver with video recording capabilities since the standpipe was completed in 2011. The standpipe was reported to be in good condition with little sediment found and removed.

Association News

The Association's website can be found at www.3lwa.org. Members can find Association news updates, Board meeting information, water quality data, as well as an online bill payment option. We also have a Facebook page to help you stay connected. Like our page to stay informed about Association news updates.

In order for the Association to exist, we need interested Board Trustees. Please volunteer and help out your Association. Monthly Board meetings are held at the office located at 17503 58th St SE on the second Tuesday of each month at 7 p.m.

Come join us!

Spada Lake

Three Lakes Water Association

2020 Annual Water Quality Report

March 2021

Your Drinking Water

Three Lakes Water Association is pleased to provide our members with our 23rd annual water quality report. The purpose of this water quality report is to inform our members about the high quality of their drinking water and water system. We want you to know where your water comes from, what it contains, and how it compares to stringent state and federal water quality standards. The water you drink is supplied from Spada Lake, which is managed by the City of Everett. A map is located on the last page of this report and illustrates the City's supply system, which provides service to many water systems in the area.

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The measures planned to achieve this goal include system-wide leak detection efforts and customer conservation. Over the past twelve years, there has been a total of nearly 47.7 million gallons in net savings. We encourage you all to keep up the good practices you have developed and thank you for your efforts in these past years.

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2020 Water Quality Monitoring Results

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The 2020 results of the testing of your water supply are illustrated in the table below. The first column lists each compound tested and the units of measure. The second and third are the highest levels allowed by the U.S. EPA. The fourth column illustrates the levels found in the City of Everett's drinking water supply, including an average and a range. The last column shows the source of the compounds. All of the compounds found in the City of Everett's water supply were found to be at **levels lower than the maximum allowed** by the U.S. Environmental Protection Agency.

Detected Regulated Contaminants Parameter & Unit of Measure	**Ideal Goal (MCLG)**	**Maximum Allowed (MCL)**	**Average or Highest Value**	**Range Detected**	**Did Levels Meet Compliance?**	**Major Source**
Turbidity, NTU[1]	N/A	TT	0.08	100%	**Yes**	Soil erosion
Fluoride, ppm[2]	2	4	0.7	0.2-0.8	**Yes**	Dental health additive
Total Trihalomethanes (TTHM), ppb[3]	N/A	80	49	28-50	**Yes**	By-product of drinking water chlorination
Haloacetic Acids (5) (HAA5), ppb[3]	N/A	60	38	22-49	**Yes**	By-product of drinking water chlorination
Total Coliform Bacteria, % positive samples[4]	0	5% positive per month	0%	None	**Yes**	Naturally present in the environment
Residual Disinfectant Level (free chlorine), ppm	4.0 (MRDLG)	4.0 (MRDL)	0.7	0.2-1.1	**Yes**	Added as a drinking water disinfectant
Detected Unregulated Contaminants Parameter & Unit of Measure	**Ideal Goal (MCLG)**	**Maximum Allowed (MCL)**	**Average Value**	**Range Detected**	**Did Levels Meet Compliance?**	
Bromodichloromethane, ppb	0	N/A	1.6	1.2-2.2	These substances are individual disinfection by-products for which no MCL standard has been set, but which must be monitored to determine compliance with the USEPA Stage 2 Disinfection By-products Rule MCLs for Total Trihalomethanes and Haloacetic Acids (5).	
Chloroform (Trichloromethane), ppb	70	N/A	36	26-48		
Dichloroacetic Acid, ppb	0	N/A	11	3-19		
Trichloroacetic Acid, ppb	20	N/A	21	18-27		

[1]Turbidity is a measure of particulates suspended in water in Nephelometric Turbidity Units (NTU) and is an important test in determining drinking water quality. Particulates in water can include bacteria, viruses and protozoans that can cause disease. The EPA turbidity limit is 0.3 NTU. In 2020, no filtered water turbidity results exceeded 0.3 NTU so the lowest percentage that met the EPA limit was 100 percent. The City of Everett is required to monitor the drinking water for specific parameters on a regular basis. Results of regular monitoring are an indicator of whether or not the drinking water meets health standards. During the month of July 2020, they did not complete all monitoring or testing for turbidity, and therefore cannot be sure of the quality of the drinking water during that time. There is nothing you need to do. At no time was the quality of the drinking water compromised. The plant has resolved the problem and taken steps to prevent a repeat occurrence.

[2]Fluoride is added to your water in carefully controlled levels for dental health. Due to system maintenance, there were three days during the year in which the daily average feed value was below the state minimum for dental health of 0.5 ppm.

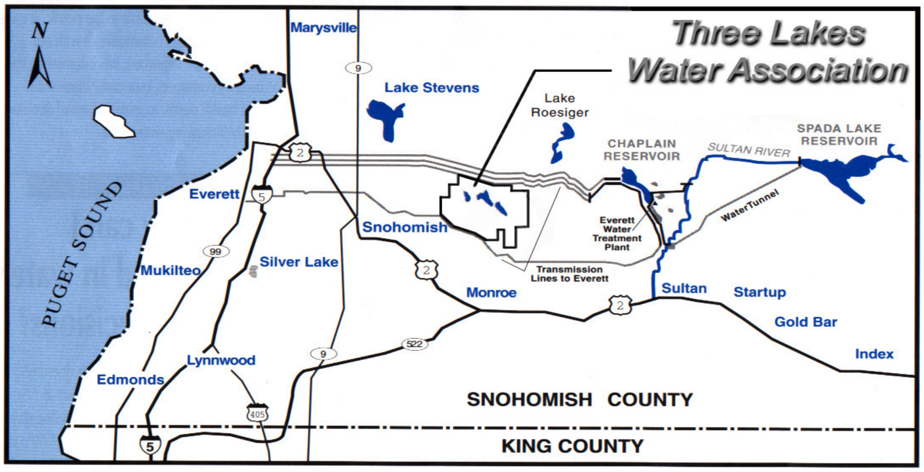
[3]Haloacetic acids and trihalomethanes form as by-products of the chlorination process that is used to kill or inactive disease-causing microbes. The TTHM and HAA5 results are from eight locations in Everett which are monitored to determine compliance with the current regulations. The range of results are taken from all eight locations. The highest locational running annual average of the eight sites that were monitored are reported here.

[4]Total coliform bacteria monitoring tracks the microbial quality in the water distribution system. Everett collects approximately 125 samples per month or 1,500 per year. No more than 5 percent of the monthly total can be positive for total coliforms. No total coliforms were detected in 2020.

Drinking Water Source

The source of your drinking water is from rain and snowmelt that is collected in the Spada Lake Reservoir, which is located in the Sultan Basin Watershed. Water from this 50 billion gallon reservoir flows through a tunnel and pipeline to the Chaplain Reservoir where it is held in preparation for treatment.

The City of Everett maintains five large transmission pipelines, which run between the Chaplain Reservoir and the City. Three Lakes Water Association obtains your water from two different taps located on two separate Everett transmission mains.



Bottled Water

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Member Assistance Program

Based on Proclamation 20-23 issued by Governor Jay Inslee in response to the COVID-19 pandemic, the Association created a Member Assistance Program to assist those experiencing difficulties paying their residential water bill during this hardship.

This program is designed to continue to provide safe, reliable, and affordable potable water to all of our members during this challenging time. The program details are posted on the Association's website. To find out more information on how to enroll, please call the office at (360) 568-8022.

Spada Lake

Three Lakes Water Association

2021 Annual Water Quality Report

March 2022

Your Drinking Water

Three Lakes Water Association is pleased to provide our members with our 24th annual water quality report. The purpose of this water quality report is to inform our members about the high quality of their drinking water and water system. We want you to know where your water comes from, what it contains, and how it compares to stringent state and federal water quality standards. The water you drink is supplied from Spada Lake, which is managed by the City of Everett. A map is located on the last page of this report and illustrates the City's supply system, which provides service to many water systems in the area.

Drinking water quality is determined by testing for a variety of natural and man-made contaminants that can enter the water system. The City of Everett conducts an aggressive testing program which goes beyond the government requirements. Of the more than 175 substances the City tested for this past year, most were not detected and those that were detected were found at levels far below the most stringent drinking water standards. The water quality monitoring results can be found on the following page. Please read through this report and if you have any questions, contact the Association at (360) 568-8022.

Cross-Connection Control

On November 13, 2018 the Association's Board of Trustees approved an updated Cross-Connection Control Program as required by the Washington State Department of Health (DOH). This program is available at the Association office and describes the purveyor's responsibility to protect the water system from contamination through cross-connections. Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment such as boilers, systems containing chemicals such as air conditioning systems, fire sprinkler systems, irrigation systems, or water sources of questionable quality.

Cross-connection contamination can occur through backpressure, which is when the pressure in the equipment or system is greater than the pressure in the drinking water line. Contamination can also occur through backsiphonage, which is when the pressure in the drinking water line drops due to unusual occurrences such as a main break or heavy water demand, causing contaminants to be sucked out from the equipment and into the drinking water line. Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool, animal water trough, or when attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may also be contaminated by fertilizers, cesspools, or garden chemicals.

Water Use Efficiency

In October 2010, the State Supreme Court affirmed that the 2003 Municipal Water Law applies to privately-owned systems, including the Association. With the adoption of the water system plan, the Association extended its goal to reduce annual average day demand per connection by 0.5% per year.

The measures planned to achieve this goal include system-wide leak detection efforts and customer conservation. Over the past twelve years, there has been a total of nearly 48.6 million gallons in net savings. We encourage you all to keep up the good practices you have developed and thank you for your efforts in these past years.

Residential Tap Monitoring for Lead and Copper

Combined Regional Monitoring for Lead and Copper

Parameter & Units	MCLG	Action Level	90th % Level	# Homes exceeding action level
Copper, ppm	1.3	1.3	0.093	0 of 108 (0.0%)
Lead, ppb	0	15	2	0 of 108 (0.0%)

Source of Contamination: Corrosion of household plumbing and erosion of natural deposits.

USEPA and state regulations require water systems to monitor for the presence of lead and copper at household taps every three years. Lead and copper monitoring is conducted by Everett and many of the water systems that it supplies in the combined service area as a regional group. The above data was collected in 2021. The next required round of sampling will be in 2024. The 90th percent level is the highest result obtained in 90 percent of the samples collected when the results are ranked in order from lowest to highest. In the past, the results for water tested before it enters household plumbing were even lower than the tap results. This indicates that there is virtually no lead or copper in the water and that household plumbing may contribute to lead and copper at the tap.

The City of Everett's source waters contain virtually **no lead or copper**. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Three Lakes Water Association is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for thirty seconds to two minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize your exposure is available from the Safe Drinking Water Hotline at **1-800-426-4791** or **http://www.epa.gov/safewater/lead.** Although there is no detectable lead in water, tests from household taps in the distribution system show there can be low levels of lead and copper in tap water. This is primarily caused from corrosion of household plumbing systems. You may potentially have small levels of lead and copper in your home. Everett treats the water to minimize the potential for lead to enter the water and the results indicate that the program is successful. Three Lakes Water Association contributes to this testing by providing randomly taken water samples to the City for testing. The results provided in this report represent all testing performed by the City of Everett.

Additional Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as persons with cancer who are undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS, other immune system disorders, or some elderly persons and infants can be particularly at risk of infection. These people should seek advice about drinking water from their healthcare providers. The USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the Safe Water Drinking Hotline. During water treatment, organic polymer coagulants are added to improve coagulation and filtration processes that remove particulates from the water. The particulates that are removed can include viruses, bacteria, and other disease causing organisms. The USEPA sets limits on the type and amount of polymer that a water system can add to the water. In addition to the USEPA limits, the State of Washington requires that all polymers used be certified safe for potable water use by an independent testing organization, NSF International. During treatment, Everett adds only NSF approved polymers and the levels used are far below the safe limits set by the USEPA.

Definitions

Maximum Contaminant Level Goal (MCLG) – The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
Maximum Contaminant Level (MCL) – The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available water treatment technology.
Maximum Residual Disinfectant Level (MRDL) – The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
Maximum Residual Disinfectant Level Goal (MRDLG) – The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
Treatment Technique (TT) – A required process intended to reduce the level of a contaminant in drinking water.
Action Level (AL) – The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements which a water system must follow.
Parts per Million (ppm)/Parts per Billion (ppb) – A part per million means that one part of a particular contaminant is present for every million parts of water. Similarly, parts per billion indicate the amount of a contaminant per billion parts of water.
Not Applicable (N/A) – Means USEPA has not established MCLGs for these substances.

2021 Water Quality Monitoring Results

As water travels over the land, it dissolves natural minerals and picks up other substances produced by human and animal activities. The Department of Health and the U.S. Environmental Protection Agency sets national standards for over 100 potential drinking water contaminants. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants, cryptosporidium and potential health effects can be obtained by calling the Safe Drinking Water Hotline at **1-800-426-4791.**

The 2021 results of the testing of your water supply are illustrated in the table below. The first column lists each compound tested and the units of measure. The second and third are the highest levels allowed by the U.S. Environmental Protection Agency. The fourth column illustrates the levels found in the City of Everett's drinking water supply, including an average and a range. The last column shows the source of the compounds. All of the compounds found in the City of Everett's water supply were found to be at **levels lower than the maximum allowed** by the USEPA.

Detected Regulated Contaminants Parameter & Unit of Measure	**Ideal Goal (MCLG)**	**Maximum Allowed (MCL)**	**Average or Highest Value**	**Range Detected**	**Did Levels Meet Compliance?**	**Major Source**
Turbidity, NTU[1]	N/A	TT	0.09	100%	**Yes**	Soil erosion
Fluoride, ppm[2]	2	4	0.7	0.5-0.8	**Yes**	Dental health additive
Total Trihalomethanes (TTHM), ppb[3]	N/A	80	47	29-46	**Yes**	By-product of drinking water chlorination
Haloacetic Acids (5) (HAA5), ppb[3]	N/A	60	37	29-49	**Yes**	By-product of drinking water chlorination
Total Coliform Bacteria, % positive samples[4]	0	5% positive per month	0.8%	0-0.8%	**Yes**	Naturally present in the environment
Residual Disinfectant Level (free chlorine), ppm	4.0 (MRDLG)	4.0 (MRDL)	0.7	0.3-1.0	**Yes**	Added as a drinking water disinfectant
Detected Unregulated Contaminants Parameter & Unit of Measure	**Ideal Goal (MCLG)**	**Maximum Allowed (MCL)**	**Average Value**	**Range Detected**	**Did Levels Meet Compliance?**	
Bromodichloromethane, ppb	0	N/A	1.6	1.2-2.2	These substances are disinfection by-products for which no MCL standard has been set, but which must be monitored to determine compliance with the USEPA Stage 2 Disinfection By-products Rule MCLs for Total Trihalomethanes and Haloacetic Acids (5).	
Chloroform (Trichloromethane), ppb	70	N/A	36	26-48		
Dichloroacetic Acid, ppb	0	N/A	11	3-19		
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[1]Turbidity is a measure of particulates suspended in water in nephelometric turbidity units (NTU) and is an important test in determining drinking water quality. Particulates in water can include bacteria, viruses and protozoans that can cause disease. The values reported are the lowest monthly percentage of samples that met the USEPA turbidity limit and the highest four hour combined filtered water turbidity measurement obtained during the year. The USEPA turbidity limit is 0.3 NTU. In 2021, no filtered water turbidity results exceeded 0.3 NTU so the lowest percentage that met the USEPA limit was 100%. The plant targets production of filter water turbidities of 0.10 NTU or less.

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[4]Total coliform bacteria monitoring tracks the microbial quality in the water distribution system. Everett collects around 125 samples per month or 1,500 per year. No more than 5 percent of the monthly total can be positive for total coliforms. One routine total coliform sample collected in October 2021 was positive. The location was retested and the results were negative. No total coliform was detected for the remainder of 2021.

Drinking Water Source

The source of your drinking water is from rain and snowmelt that is collected in the Spada Lake Reservoir, which is located in the Sultan Basin Watershed. Water from this 50 billion gallon reservoir flows through a tunnel and pipeline to the Chaplain Reservoir where it is held in preparation for treatment.

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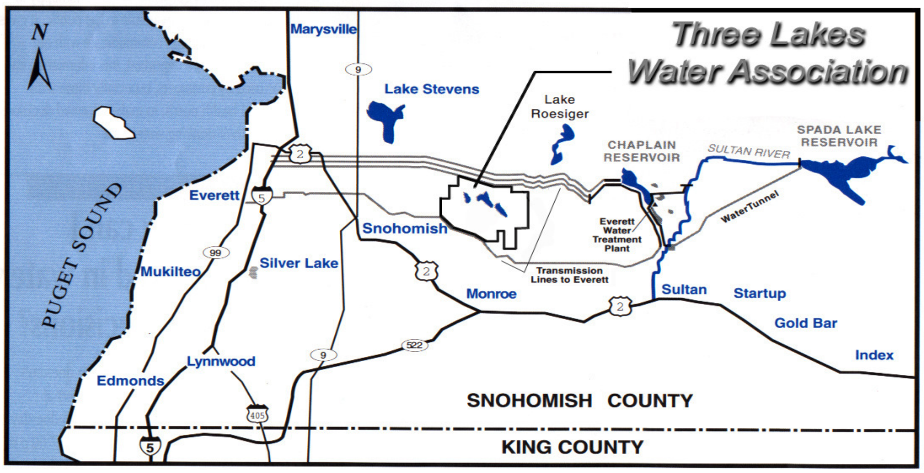

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Comprehensive Water System Plan Update

We are required to prepare a Comprehensive Water System Plan. Our plan is in the process of being updated for review and approval by the Department of Health. Once approved, it will be valid for the following ten year period. This document is used for future planning and we are expected to establish goals for water use efficiency.

These goals include a baseline for daily water consumption used by our members and actions towards conservation. A public meeting to set these goals is required as part of this update and will be held in the near future. An invite for this meeting will be mailed to our members and your input is welcome and appreciated.

Spada Lake

Three Lakes Water Association

2022 Annual Water Quality Report

April 2023

Your Drinking Water

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Lead, ppb	0	15	2	0 of 108 (0.0%)

Source of Contamination: Corrosion of household plumbing and erosion of natural deposits.

USEPA and state regulations require water systems to monitor for the presence of lead and copper at household taps every three years. Everett and many of the water systems that it supplies conduct lead and copper monitoring in the combined service area as a regional group. The above data was collected in 2021. The next required round of sampling will be in 2024. The 90th percent level is the highest result obtained in 90 percent of the samples collected when the results are ranked in order from lowest to highest. In the past, the results for water tested before it enters household plumbing were even lower than the tap results. This indicates that there is virtually no lead or copper in the water, but household plumbing may contribute to lead and copper at the tap.

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Detected Regulated Contaminants Parameter & Unit of Measure	**Ideal Goal (MCLG)**	**Maximum Allowed (MCL)**	**Average or Highest Value**	**Range Detected**	**Did Levels Meet Compliance?**	**Major Source**
Turbidity, NTU[1]	N/A	TT	0.05	100%	**Yes**	Soil erosion
Fluoride, ppm[2]	2	4	0.7	0.3-0.8	**Yes**	Dental health additive
Total Trihalomethanes (TTHM), ppb[3]	N/A	80	46	30-52	**Yes**	By-product of drinking water chlorination
Haloacetic Acids (5) (HAA5), ppb[3]	N/A	60	43	19-52	**Yes**	By-product of drinking water chlorination
Total Coliform Bacteria, % positive samples[4]	0	5% positive per month	0%	None	**Yes**	Naturally present in the environment
Residual Disinfectant Level (free chlorine), ppm	4.0 (MRDLG)	4.0 (MRDL)	0.7	0.3-1.0	**Yes**	Added as a drinking water disinfectant
Detected Unregulated Contaminants Parameter & Unit of Measure	**Ideal Goal (MCLG)**	**Maximum Allowed (MCL)**	**Average Value**	**Range Detected**	**Did Levels Meet Compliance?**	
Bromodichloromethane, ppb	0	N/A	1.7	1.1-2.6	These substances are individual disinfection by-products for which no MCL standard has been set, but which must be monitored to determine compliance with the USEPA Stage 2 Disinfection By-products Rule MCLs for Total Trihalomethanes and Haloacetic Acids (5).	
Chloroform (Trichloromethane), ppb	70	N/A	36	29-50		
Dichloroacetic Acid, ppb	0	N/A	13	3-20		
Trichloroacetic Acid, ppb	20	N/A	22	14-29		

[1]Turbidity is a measure of the amount of particulates in water expressed in nephelometric turbidity units (NTU). Particulates in water can include bacteria, viruses and protozoans that can cause disease. Turbidity measurements are used to determine the effectiveness of the treatment processes in removing these particulates. The values reported are the lowest monthly percentage of samples that met the USEPA turbidity limit and the highest four-hour combined water turbidity measurement obtained during the year. In 2022, no filtered water turbidity results were above the USEPA 0.3 NTU limit, so the lowest percentage was 100 percent. The plant targets production of filtered water turbidities of 0.10 NTU or less.

[2]Fluoride is added to your water in carefully controlled levels for dental health. Due to equipment maintenance, there were three days in 2022 when fluoride was not added to the water.

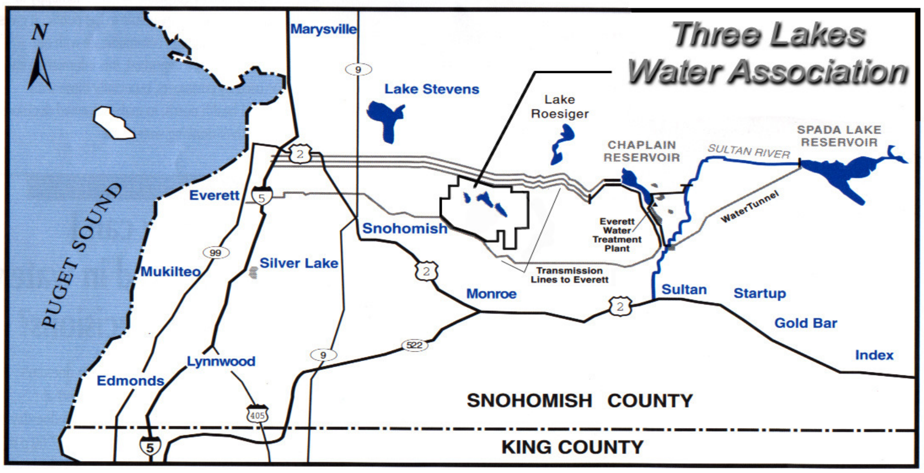
[3]Haloacetic acids and trihalomethanes form as by-products of the chlorination process that is used to kill or inactivate disease-causing microbes. The TTHM and HAA5 results are from eight locations in Everett, which are monitored to determine compliance with the current regulations. The range of results are taken from all eight locations. The highest locational running annual average of the eight sites that were monitored are reported here.

[4]Total coliform bacteria monitoring tracks microbial quality in the water distribution system. Everett collects around 125 samples per month or 1,500 per year. No total coliforms were detected in 2022.

Drinking Water Source

The source of your drinking water is from rain and snowmelt that is collected in the Spada Lake Reservoir, which is located in the Sultan Basin Watershed. Water from this 50 billion gallon reservoir flows through a tunnel and pipeline to the Chaplain Reservoir where it is held in preparation for treatment.

The City of Everett maintains five large transmission pipelines, which run between the Chaplain Reservoir and the City. Three Lakes Water Association obtains your water from two different taps located on two separate Everett transmission mains.



Bottled Water

To ensure that tap water is safe to drink, the Department of Health and the U.S. Environmental Protection Agency prescribe regulations that limit the amount of certain contaminants in water provided by a public water system.

The Food and Drug Administration and the Washington Department of Agriculture regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

Association News

The Association's website can be found at www.3lwa.org. Members can find Association news updates, Board meeting information, water quality data, as well as an online bill payment option. We also have a Facebook page to help you stay connected. Like our page to stay informed about Association news updates.

In order for the Association to exist, we need interested Board Trustees. Monthly Board meetings are currently held virtually on the second Tuesday of each month at 6 p.m. If you would like to attend a meeting to find out more about becoming a Board Trustee, contact the office for a virtual meeting link. Your input is appreciated and volunteering will help you and your fellow neighbors.

Comprehensive Water System Plan Update

We are required to prepare a Comprehensive Water System Plan. Our plan is in the process of being updated for review and approval by the Department of Health. Once approved, it will be valid for the following ten year period. This document is used for future planning and we are expected to establish goals for water use efficiency.

These goals include a baseline for daily water consumption used by our members and actions towards conservation. A public meeting to set these goals is required as part of this update and will be held in the near future. The draft chapters are available on our website for member input. We welcome any comments or questions at either our monthly board meetings or email us at WaterSystemPlan2023@3lwa.org.