



Sewer Pipes at  
Development Site

## **CHAPTER 8: UTILITIES**

### **Background**

There are a variety of utilities available on the Reservation. These include drinking water, waste water, stormwater, electricity, natural gas, solid waste and recycling, and telecommunications. The level of utilities available on the Reservation varies significantly with most of the developed utility systems existing in areas that are most frequently used by people.

The efficiency of delivery for utilities depends largely on the concentration of development. Areas that are more intensely developed produce a greater demand for utility services and likewise sparsely developed areas require considerably less utility services. Of the Reservation's approximately 22,500 acres, the greatest levels of housing and employment densities exist around the perimeter.

Due to the scattered development pattern on much of the Reservation, individual homes must rely on on-site wells and septic tanks with drainfields for service. These systems can negatively affect groundwater and surface water quality. Individual wells, if

uncontrolled, can cause impacts on reducing groundwater levels. If a septic system fails, it can pollute surface water and groundwater nearby.

Delivery of adequate water and sewer service is necessary to support the growth of residential and economic development that is expected on the Reservation in the future. In addition, adequate fire flow must be in place before development occurs to protect lives and property from fire.

The Reservation's drainage system is a combination of natural and manmade components. The built system includes Snohomish County and Tribal facilities (e.g. ditches, pipes, detention ponds, etc.). Much of the drainage for Tribal and Tribal members' lands is informal, and relies on overland sheet flow to natural or manmade systems. Overland sheet flow is the flow of water over the surface of the ground (i. e. surface run-off) in a more or less continuous sheet. Flow that occurs overland in places where there are no defined channels where the flood water spreads out over a large area, at a uniform depth, is also referred to as overland flow.

The reduction of forest cover has altered the rate at which drainage occurs and decreases water quality. Increased development over the years has resulted in more impervious surface and pollution generating activity, resulting in greater storm-water runoff volumes and potential pollutant loads than occurred previously. These factors are leading to a deterioration of ecological functions, ecosystems, and water quality on the Reservation.

Concentrating growth will make the delivery of utilities more efficient and makes it easier to manage and minimize development impacts. The cost of extending utilities comes at both a financial cost and an ecological cost. Environmental degradation is accelerated with low-density sprawl development and is lessened with more concentrated development patterns.

The intent of the Utilities Chapter is to guide:

- Location of future land uses so that future utility service areas and capacity can be planned
- Potential improvements necessary in order to provide adequate service to future development
- Regulation of domestic and community well installation
- Regulation of on-site septic system installation
- Monitoring of existing wells and septic systems
- Surface water management
- Connections to Tribal water and sewer systems

## **Water Supply and Distribution**

According to the 2007 *Tulalip Utilities Water Supply Planning Report*, the first community water system was built on the Reservation in the 1960s. Originally a surface storage pond, the only form of treatment was chlorination before water was delivered to the Tulalip Bay area. In 1974, the system was improved using groundwater, instead of surface water, and storage tanks at Waterworks and Mission Hill sites. Today, the Tulalip water system has expanded to serve southern and eastern portions of the Reservation in areas near Marine Drive Northeast, Meridian Street, Maplewood Road (14<sup>th</sup> Avenue Northeast), and Quil Ceda Village.

The Reservation's drinking water supply comes from various sources. These sources include:

- The Tulalip Utilities Authority
- The Everett Water System
- Smaller community water systems that supply specific developments
- Domestic wells (individual wells)

The extent of the existing Tribal water system is shown in **Map 8-1**. The map shows that most of the water supply infrastructure extends along Marine Drive where it serves areas of more intense development including the Tulalip Bay area, as well as the areas along the roads that serve the commercial developments in Quil Ceda Village. Individual wells and community water systems are not identified on **Map 8-1**, but exist throughout the Reservation.

One of the most pressing needs of the water systems is to procure source water. Additional withdrawal of Reservation groundwater to provide this supply is not the best alternative. Further withdrawals could negatively impact the Reservation surface water by lowering the flow during critical salmon rearing that will impair natural propagation and hatchery salmon production. Further withdrawal could also dewater existing wells. The accumulative effects of numerous private wells can contribute to negative impacts on surface water and groundwater availability.

A cost-sharing agreement was made with the City of Everett, which will supply an average of 30 million gallons of water per day (mgd). Provisions were also made for supply of up to 35 mgd during peak demand times. Design and construction of a new 48 inch pipeline is also a part of the agreement.

When the water supply improvements are in place to deliver water from the City of Everett to the Reservation, there will be adequate supply for the needs of the future development as projected in this Plan. However, because these supply improvements will take some years for the planning and construction processes, short term solutions

should be prepared to address current deficiencies. The Tribe will need to concentrate efforts in providing adequate water supply to the Reservation distribution system. The distribution system is in need of repair, and an upgrade to increase volumes and capacity of service is needed.

The Tribe is preparing two phases of a water system plan for the Reservation. Phase I included a plan for water system distribution repair and capacity increases to provide a short term solution to the water service deficiencies currently experienced on the Reservation. Phase II will plan for the long term water system improvements and the planning process is underway. This plan will assess the current system, recommend improvements, and include planning for future expansion of system capacity to support expected growth and development on the Reservation. These improvements are needed to bring newly-negotiated supplies of water to the Reservation and for system capacity improvements necessary to provide adequate service for future development.

Applications for new connections and extensions of Tribal utilities to either Tribal or non-Tribal development projects should meet minimum industry standards. The Tulalip Tribes is working to establish a priority rating criteria listing as funds for infrastructure development are limited. Proposed regulations and procedures should require an application for an extension of service prior to hooking up to Tulalip's water and/or sewer system(s).

The Washington State Department of Health identifies 33 community water systems on the Reservation. These systems primarily provide water for residential uses, but also provide water for commercial, industrial, and recreational purposes.

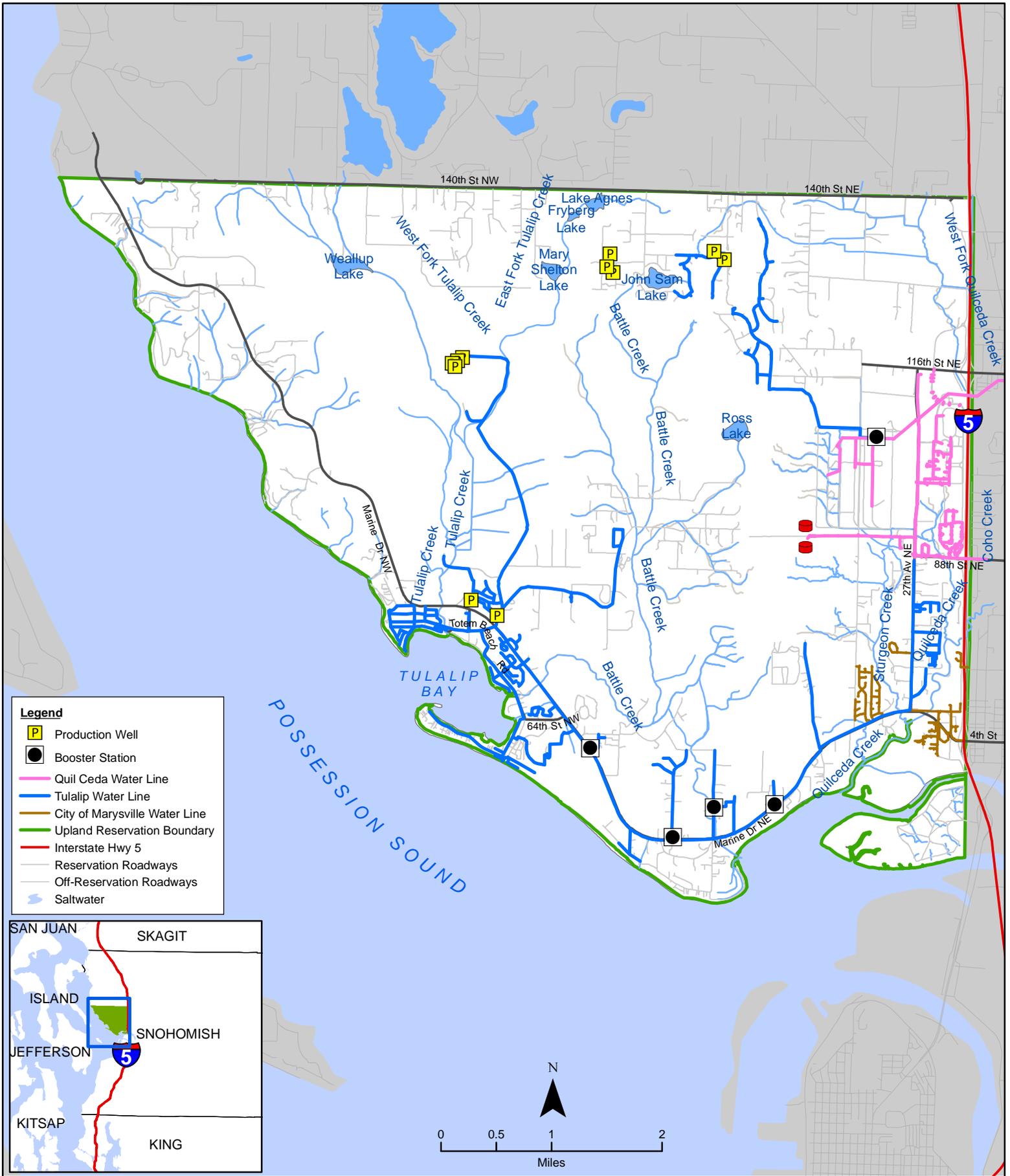
Due to the potential harm caused by installing wells, the Tribe must review installation of new wells before approval and monitor existing wells in the Reservation to determine whether they pose potential danger to the groundwater or surface waters. By having an approval system, the Tribe can keep track of the number of wells that exist, are installed, and more easily assess the cumulative impacts of all the wells.

The Tribe may consider monitoring, regulating installation, and operating individual and community wells that are failing. However, adding any of these responsibilities should be considered by the Tulalip Board of Directors, because their addition would have financial impacts on the Tribe.

### **Water System Challenges**

The *Tulalip Utilities Water Supply Planning Report* identified the following challenges regarding the Tulalip water system:

- There is currently a deficit in the existing well production as measured against demand for water by the Tribal Utility customers.



**Map 8-1 Existing Water System**



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- At least 40 percent of the water supply connections to the Tulalip Utility Water System are unmetered making the measurement of water lost through leakage impossible.
- Water is billed at a flat monthly rate which does not encourage water conservation or discourage waste.
- The altitude valve that allows the Water Works well to serve the Tulalip Utility is not functioning properly.
- The level of the aquifer supplying two of the wells has dropped significantly and the wells appear to interfere with each other, so they cannot operate concurrently.
- The water level and capacities have declined for all the Utility's wells and more frequent rehabilitation is necessary to maintain pumping rates. Rehabilitation cannot restore initial capacity, and over time, gradual capacity decline is likely.
- John Sam Lake water system is supported by a single small supply well, and has no reserved source of water supply. The level of nitrates in the well water is below the minimum contaminated level for nitrates but is at a level that mandates quarterly monitoring.

### **Water Supply Improvement Plan**

The *Tulalip Utilities Water Supply Planning Report* suggests several alternatives for addressing short-term water deficiencies. This water plan explores options for increased support of projected Tulalip Utility water system demands through external supply sources - including water sourced through the cities of Marysville and Everett.

The Water Supply Planning Report also addresses the following:

- Augments existing Tulalip Utility water supplies with external sources of water
- Corrects existing water supply deficiencies
- Provides additional water supply in support of anticipated growth and development
- Reduces reliance on existing groundwater supply

The preferred water supply improvement plan, adopted by the Board of Directors and shown on **Map 8-2**, includes combinations of improving the existing wells and adding additional water transmission lines. Descriptions of the four development phases in the water supply improvement plan are as follows:

- **Phase 1:** Extends a 12” water line south from PUD road along 19<sup>th</sup> Avenue Northeast to Marine Drive Northeast. The line will then extend southwest along Marine Drive Northeast to the southern edge of the 500 acre Maplewood housing development to serve this future housing site.
- **Phase 2:** Extends an 18” water line west from the intersection of 27<sup>th</sup> Avenue Northeast and PUD Road to Turk Drive, south to the Mission Highlands housing development, and then west to the intersection of Turk Road and Marine Drive Northwest.
- **Phase 3:** Brings water through an agreement with the City of Everett to the new 1 million gallon reservoir at QCV. This water will be brought via a 48” water line through the southeastern corner of the Reservation along Marine Drive Northeast to 27<sup>th</sup> Avenue Northeast then north to the intersection of PUD road and 27<sup>th</sup> Avenue Northeast.
- **Phase 4:** Connects an 18” water line to the terminus of Phase II (the intersection of Marine Drive Northwest and Turk Road). It will serve the new Tribal administration building and connect to a reservoir at Mission Hill. Once this phase is complete, well water that now serves the Tulalip Bay area will be dedicated to the operation of the Bernie “Kai-Kai” Gobin Fish Hatchery.

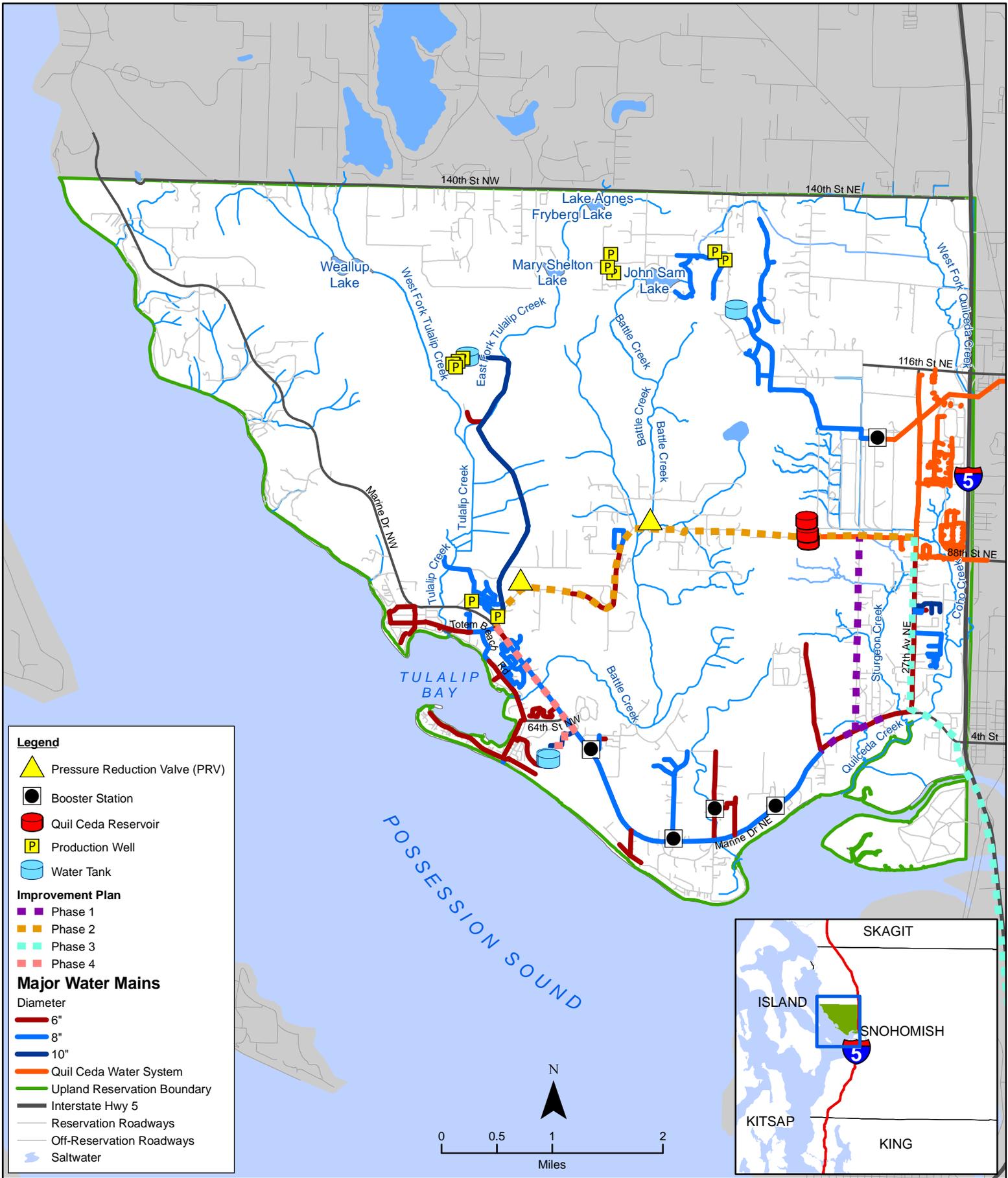
Pressure reducing valves will be placed where necessary along each phase of water system development. This water supply improvement plan would significantly reduce on-Reservation aquifer groundwater withdrawals and would likely have a positive affect on area stream flows and area groundwater supplies.

## **Water Quality**

To maintain the quality of water produced through the Tribal system, the Tulalip Utility maintains a water testing program. This program addresses reduced water quality in some of the smaller community water systems.

Treatment of domestic water for all Tribal water systems must meet or exceed Federal standards. Standardized treatment of water that is delivered through well-maintained systems is the most cost-effective way to meet these standards. However, this treatment requires funding. Funding for Tribal utilities is derived from various sources such as billing water customers, Federal grants, or by subsidies from the Tribal government. Federal grants may pay for improvements to the system, but do not pay for operating costs.

The cost of ongoing maintenance of the water system should be paid by those using the water system. Covering these maintenance costs is only possible if individual water accounts are metered. Metering accounts also rewards water conservation, as water users are more likely to be frugal with water usage if they are billed based on consumption.



## Map 8-2 Water Supply Improvement Plan



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Another issue that the Tribal Utility Department (Utility) faces is that when private satellite water systems that serve Tribal members fail, they often become the responsibility of the Utility. These systems are often dispersed and provide services to a limited number of customers. The Utility essentially subsidizes these satellite water systems operations which strains the Utility's limited resources and manpower. Therefore, the Tribe needs to adopt policies that address appropriate circumstances and outline conditions for when and how the Utility will accept responsibility for private water systems.

## **Water Pressure and Fire Flow**

A measure of water service adequacy is water pressure at the tap. A minimum of 30 pounds per square inch is generally recommended for domestic water service. The decrease of water pressure is often caused by either an inadequate water supply, restrictions in flow due to inadequate size of the main pipeline, or by reservoir water levels and storage tank elevation.

Another critical characteristic of the water supply system is the rate of fire flow. Fire flow is the amount of water needed to fight fires and is measured at fire hydrants. The fire flow requirement is based on the type of development that needs fire protection. Single-family residential developments can be adequately served by 800 to 1,000 gpm while commercial and industrial developments can require up to 2,500 gpm or more. The fire flow requirement from the system can be lowered if structures have automatic sprinkler or other fire suppression systems.

Fire flow is the result of line size as well as elevation and water level of the reservoir supplying the line. The higher the reservoir supplying the system is located relative to the point of use, the greater the water pressure will be. Land use maps are used in conjunction with engineering criteria in utility planning to determine what level of fire flow will be required in various areas.

## **Sewer System**

Sewage on the Reservation is collected and treated either in utility systems, private systems, or individual septic fields. The Tulalip Utility Authority operates and maintains a municipal sewer service which currently has approximately 958 service connections - comparatively fewer than its larger network (1,500 – 1,600) of municipal water service connections. **Map 8-3** shows the current sewer utility systems, including the Marysville sewer system that extends onto the Reservation.

Quil Ceda Village maintains a Utility Department to provide municipal sewer service within the Village. Membrane Biological Reactor (MBR) technology is used to treat sewage waste from commercial tenants located within the Village between 88th Street Northeast and 116th Street Northeast. The Quil Ceda Village MBR plant is currently treating an average of 150,000 gallons per day. The current discharge limitations of 250,000 gallons per day are set by an Environmental Protection Agency permit. The total

capacity of the current MBR facility is four million gallons per day of treated wastewater effluent. In the future, the MBR system in QCV will be accepting domestic wastewater from the surrounding community along 27<sup>th</sup> Avenue Northeast.

Due to the success of the Quil Ceda Village MBR facility, another MBR facility was built near John Sam Lake to serve residential housing development. Though it currently serves only three homes, future operations of this MBR facility will service more homes in the area.

Sewer utilities are sensitive to service density because of the high cost of treatment. It is difficult to efficiently maintain a sewer treatment plant and system with a modest customer base. Low densities of development make the cost per service even greater. Overall Reservation development is fairly low-density and not currently centralized so alternatives of centralized sewer systems should be investigated. A study of both current and future sewer collection and treatment needs to be prepared that focuses on the most effective and efficient investment to serve anticipated development.

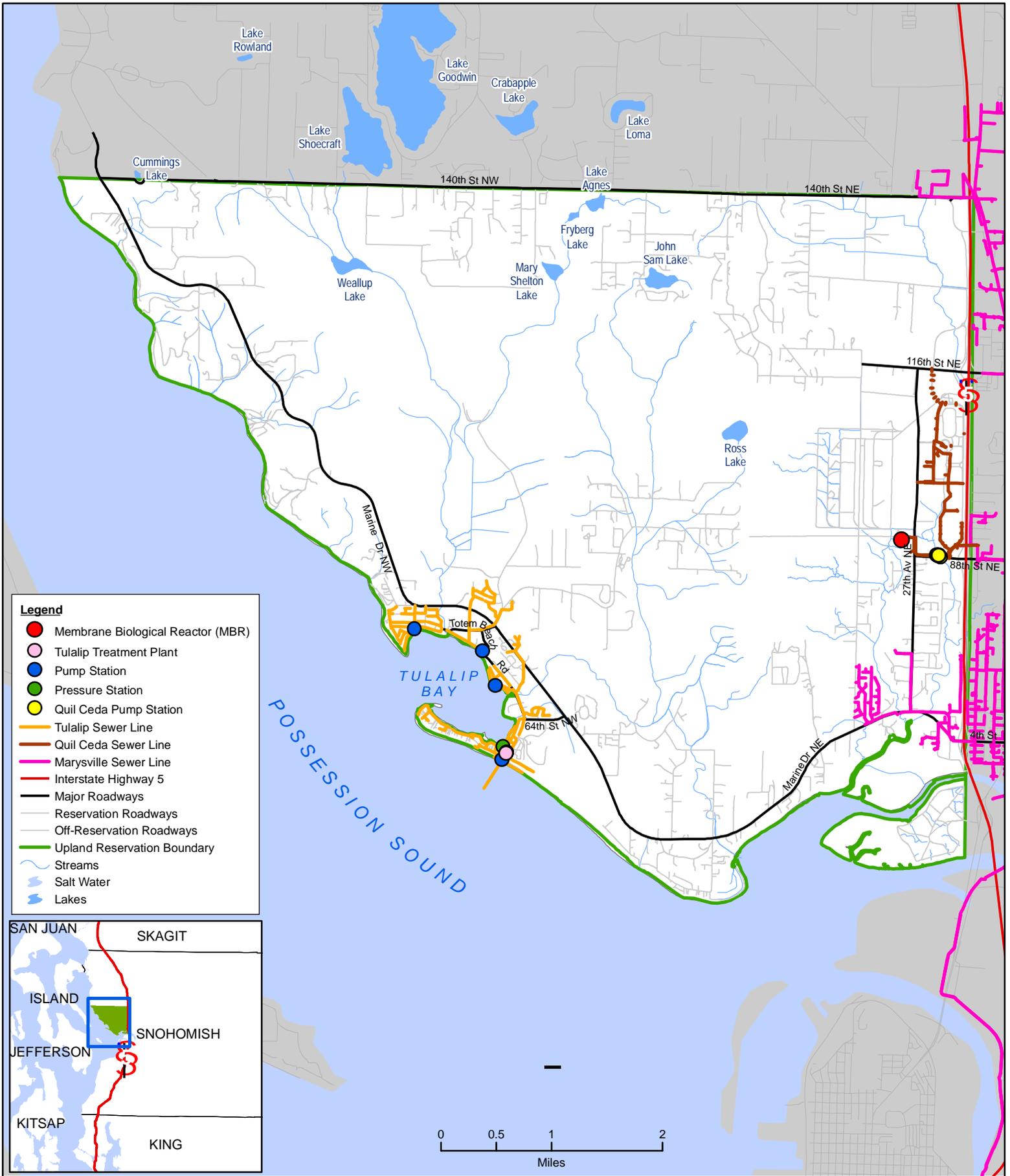
### **On-site Collection**

A prevalent method of residential sewage treatment on the Reservation is by on-site septic fields. As was discussed in the Environment Chapter, most of the soils on the Reservation are less than ideal for septic tank and drain fields and so many tanks have failed. This has led to contamination of surface and ground waters, in some cases near active wells. It is crucial to the health of Reservation residents and to the ecology of the Reservation that the location, construction, and maintenance of septic systems be regulated by the Tribe. It is crucial to the Tribe to have a plan in place to address failed and abandoned septic fields.

### **Stormwater**

Stormwater for the purposes of this Plan refers to rainfall, snowmelt, or irrigation water that runs off of surfaces (roofs, roads, parking lots, driveways, developed lots, landscaped areas, etc) and is subject to contamination from human activities. Stormwater management is significant to the quantity and quality of the Reservation's surface and groundwater resources. As the Reservation increases in levels of urban development and density, more land is converted from forested conditions to impervious surface and urban land uses. These conditions contribute to increased stormwater loads and pollution generating activities.

Clearing of native vegetation, increases in impervious surfaces, removal and/or compaction of native topsoil during construction, loss of natural storage areas, and diversion of surface waters from their natural drainage systems, contribute to accelerated sedimentation and deteriorated water quality in streams, estuaries, and coastal waters of the Reservation. The Tribal Water Quality Program examines water pollution sources and water quality management. The major areas of high stormwater pollution identified through this program include Quil Ceda Creek, the marine waters off Priest Point, Tulalip Bay, and Ebey Slough.



## Map 8-3 Existing Sewer System



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Much of the Reservation's groundwater aquifer recharge is through the central watershed areas, which are largely forested. However, some development has been occurring around the fringes of these watershed areas, which negatively impacts the recharge of the Aquifer. Removal of native vegetation and topsoil from the landscape eliminates the natural ability of the land to buffer heavy or sustained precipitation events and to infiltrate water into the soil and groundwater table.

Stormwater facilities are often associated with road rights-of-way. Natural waters such as streams and wetland corridors are often associated with these stormwater facilities which are often integrated into the stream network or wetland network. In addition, some channeled streams and wetland drainages are mis-identified as "stormwater features" and are maintained to the detriment of the stream and/or wetland.

Maintenance responsibility for stormwater facilities within rights-of-way depends mainly on right-of-way ownership. Generally, the larger roads, such as Marine Drive, Totem Beach Road, and 140<sup>th</sup> Street, are County maintained, and have County drainage facilities. Roads in Quil Ceda Village are Tribally-owned, as are many of the smaller roads on the Reservation. There is also a network of private roads, many of which do not have formal drainage or water quality treatment systems.

**Map 8-4** depicts stormwater catch basins for roadways. The map is part of a drainage system inventory on the Reservation. **Map 8-5** depicts drainage points, which mark pipe and detention facility locations in the County drainage system, and other facilities. **Map 8-6** depicts ditch points, which identify County roadside ditches, berms, bioswales and conveyance swales: all forms of passive stormwater collection and distribution.

## **Electricity**

Electricity service is provided on the Reservation by Snohomish County Public Utilities District (PUD). The electrical distribution network consists of medium-voltage power lines, transformers, and electrical meters. There are also two electrical substations on the Reservation. The majority of the electrical service is above ground along power poles within the public right-of-way, but some electrical utilities have been under-grounded – especially in the Quil Ceda Village area. The PUD is a municipal corporation of the state of Washington.

## **Telecommunications**

Land-line telephone services on the Reservation are provided by Verizon Northwest and Tulalip Data Services. Wireless carriers are provided by a host of companies that extend wireless service areas over the Reservation. Cable television and Internet on the Reservation are provided by Tulalip Broadband – a Tribally-owned and operated entity. Internet services are also provided by Verizon which has "dial-up" and digital subscriber line services which are both transmitted over phone lines and available to residents and

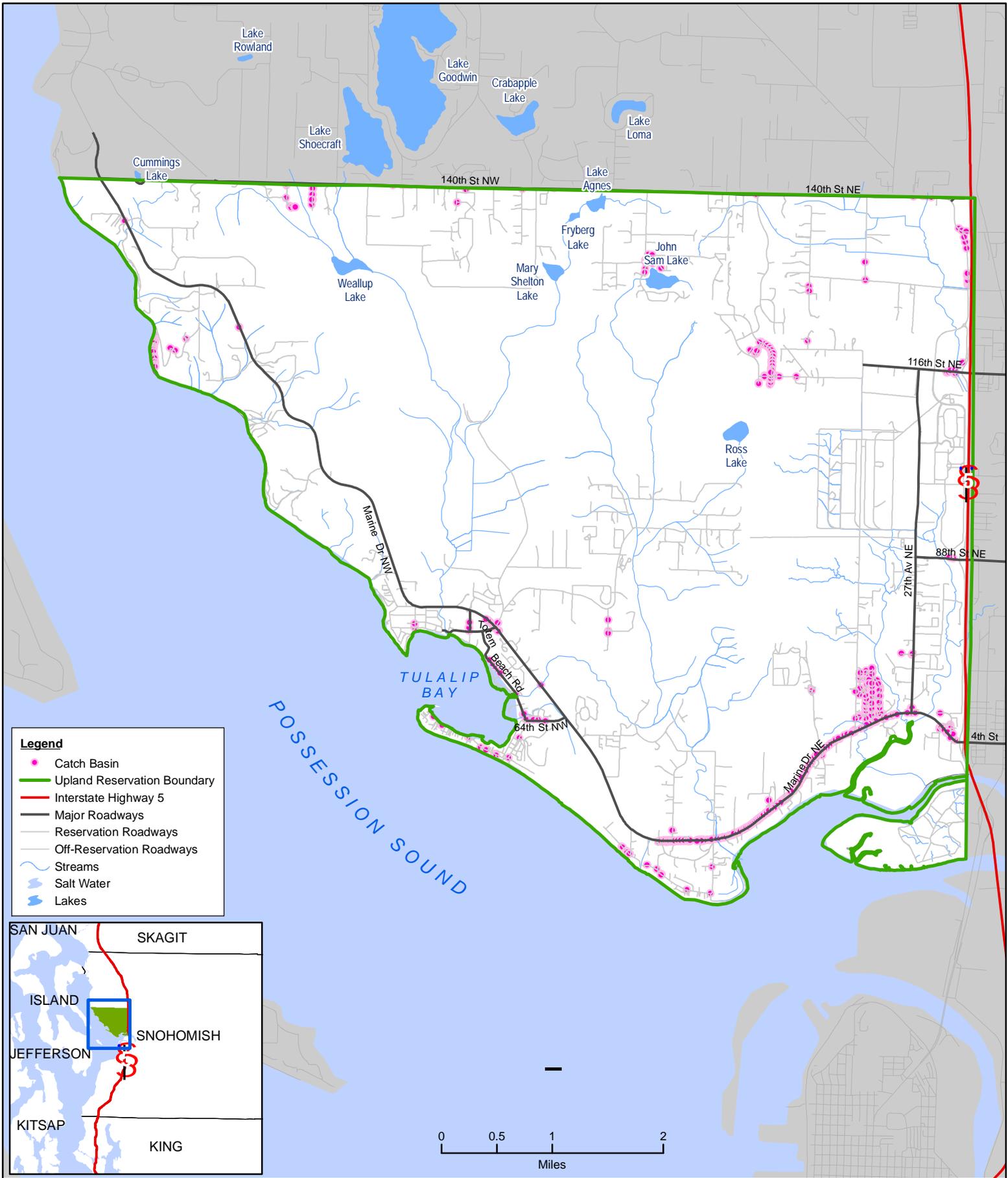
employers. Satellite television service is provided by numerous purveyors on the Reservation.

### **Solid Waste and Recycling**

Solid waste and recycling services are offered by two companies on the Reservation, as well as the Tulalip Tribes. Curbside collection service for solid waste and recycling is offered by Waste Management to residential, commercial, and industrial properties on the Reservation. Shelco operates a solid waste transfer station at Rainwater Road (19<sup>th</sup> Avenue Northeast) on Trust property under contract with the Tulalip Tribes. The Tulalip Tribes offer solid waste and recycling collection service to Tribal Elders, Tribal housing developments, and Tribal governmental buildings which is sent to the transfer station.

### **Natural Gas**

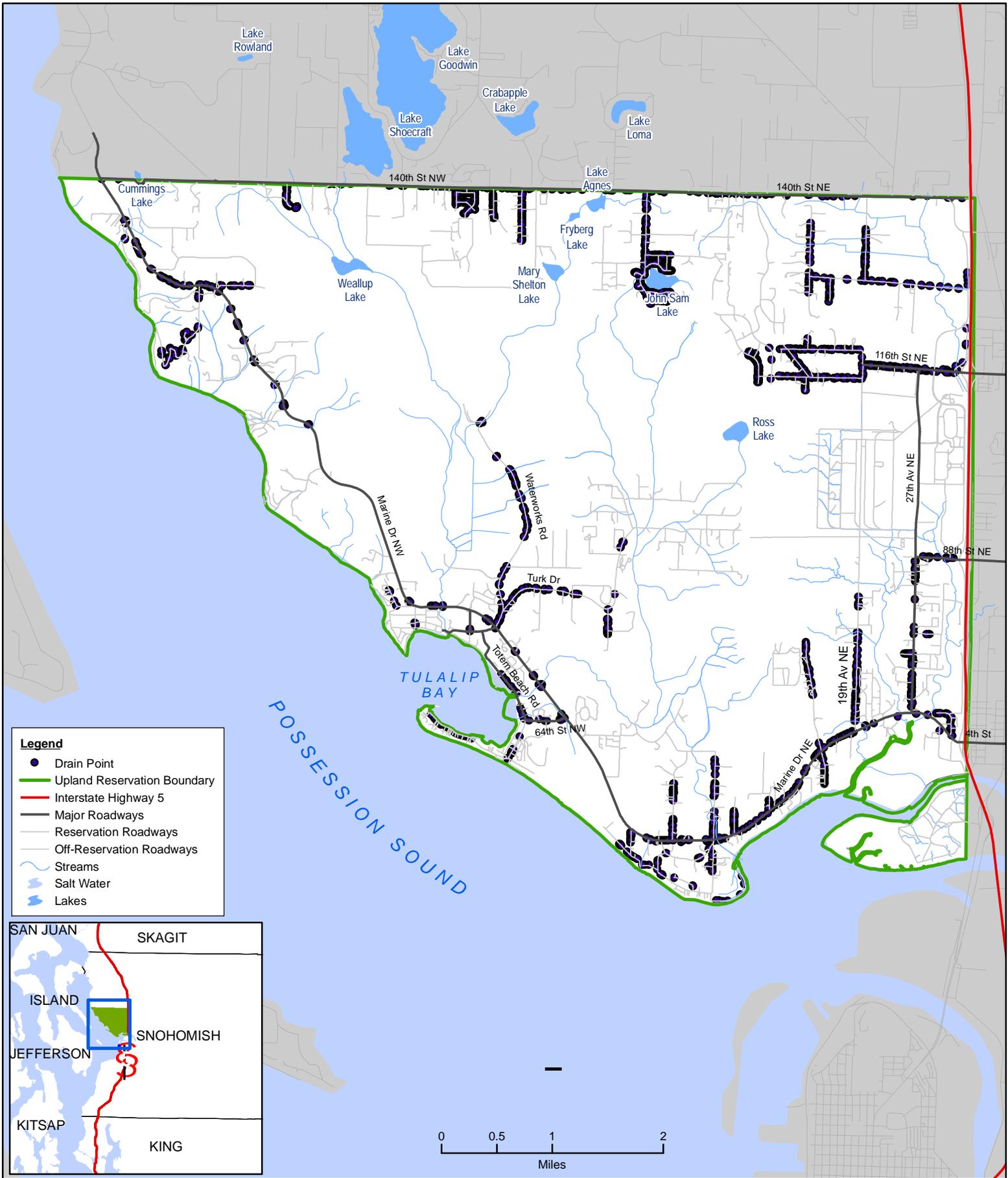
Natural gas service is available on the Reservation. The Reservation's purveyor of natural gas, Puget Sound Energy, has installed gas lines through parts of the Reservation. These gas lines were recently installed along 27<sup>th</sup> Avenue Northeast, 88<sup>th</sup> Street Northeast, and 116<sup>th</sup> Street Northeast and primarily service the Quil Ceda Village area. At the south end of 27<sup>th</sup> Ave NE, the gas line continues east to the Reservation boundary. There is also natural gas service along the northern boundary of the Reservation at Firetrail Road (140<sup>th</sup> Street Northeast).



## Map 8-4 Stormwater Utilities Catch Basins



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## Map 8-5 Stormwater Utilities Drain Points



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## Map 8-6 Stormwater Utilities Ditch Points



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## **Utilities Goals and Policies**

**GOAL UT 1:**            **Provide and maintain adequate water and sewer capacity and efficient utilities services to accommodate existing development and anticipated future growth.**

Policy UT 1-1:            Maintain an inventory of existing capital utilities for operation and maintenance, including locations and capacities of the systems.

Policy UT 1-2:            Continue timely expansion and replacement of utility infrastructure in order to meet the projected population and employment growth.

Policy UT 1-3:            Provide adequate sewer capacity and sufficient quantities of potable water at adequate pressures to meet present and future needs.

Policy UT 1-4:            Support improvements and expansion of electricity, cable, telecommunications, and natural gas services throughout the Reservation by undergrounding where physically and financially feasible.

Policy UT 1-5:            Continue coordination with other jurisdictions in water supply and distribution planning.

**GOAL UT 2:**            **Provide utility services in a safe and environmentally sound manner to protect public health and environmental quality.**

Policy UT 2-1:            Encourage the design, location, construction, operation, and relocation of utility systems in a cost effective manner.

Policy UT 2-2:            Facilitate the proper care and maintenance of septic systems to protect environmental quality and public health.

Policy UT 2-3:            Implement and promote water conservation measures through water service metering, water reutilization, and water recycling.

Policy UT 2-4:            Extend water lines and sewer lines to high density residential areas to retire private wells and septic systems.

Policy UT 2-5:            Promote co-location of utility lines or joint use of utility corridors by private and public utilities whenever possible to limit environmental impact.

**GOAL UT 3:**        **Establish and administer a regulatory scheme for utilities services including programs, processes, regulations, and standards.**

Policy UT 3-1:        Adopt water and sewer system improvement plans to serve anticipated development.

Policy UT 3-2:        Develop a program to transfer community and individual water and sewer systems to existing Tulalip Utilities systems.

Policy UT 3-3:        Ensure that water and sewer extensions, drinking water quality, and water pressure for fire protection meet industry standards.

Policy UT 3-4:        Continue to develop a Tribal recycling program to reduce waste disposal and limit environmental impacts