

Chapter 6 : Operation and Maintenance Program

6.1 Water System Management and Personnel

The Sumas water system has the following management and decision-making structure:

- *City Council.* The council is responsible for adoption of a WSP and for adoption of policies and project priorities contained therein. The council is responsible for annual budget appropriations to implement the WSP.
- *Mayor.* The mayor has overall responsibility for implementation of the WSP and operation of the water department. The Mayor prepares an annual budget identifying major water-system projects to be pursued within the year and demonstrating the financial capability to complete the projects. The mayor can authorize a major expenditure in an emergency situation.
- *Utilities Superintendent.* Responsibility for day-to-day operation of the water department is delegated to the Superintendent by the Mayor. The Superintendent assigns crew members to tasks and schedules routine tasks and minor and major projects. The Superintendent orders equipment and supplies as needed and monitors water department expenditures to ensure compliance with the budget.
- *Water Utility Crew Member.* A crew member has responsibility for operation, maintenance, and repair of system facilities on a day-to-day basis. He reports to the Utilities Superintendent and coordinates tasks under the Superintendent's supervision. A crew member notifies the Superintendent of deficiencies and operational difficulties that are of a scope or size such that significant expense and/or significant manpower is needed for correction. Some crew members are certified water system operators.
- *Utility Clerk.* The utility clerk is responsible for preparation and mailing of utility bills.

The following table identifies which of the above persons is responsible for the various tasks involved in operation of the water department. A certified operator must be involved in the performance of those tasks marked with an asterisk (*) below.

Task	Council	Mayor	Superintendent	Certified Operator	Crew Member	Utility Clerk
Day-to-day operations*			X	X	X	
Preventative maintenance*			X	X	X	
Field engineering*			X	X		
Water quality monitoring*			X	X		
Emergency response		X	X	X	X	
Cross-connection control*			X	X		
CIP implementation	X	X	X			
Budget formulation		X	X			
Response to complaints			X			
Public/press contact		X	X			

6.2 Operator Certification

Pursuant to WAC 248-55, Sumas is required to maintain the services of a State certified Water Distribution Manager 1 (WDM-1). This person must be in responsible charge of daily water-system related activities. Sumas policy is to have redundancy of qualified personnel, so the City dedicates two employees to water system operations:

- Lawrence Silvis, who has WDM-1 certification. Mr. Silvis recently retired from the position of Utilities Superintendent, but remains a part-time employee, in charge of water-quality monitoring and monitoring of wellfield operation.
- Doug Bos, who has WDM-1 certification and CCS-1 certification.

Certified operators are sent for continuing education at City expense in order to retain certification status.

6.3 System Operation and Control

Figures 3,13, and 14 show the major components of the water system. Figure 7 is an overall Sumas Wellfield map, and the others are detailed drawings of crucial components.

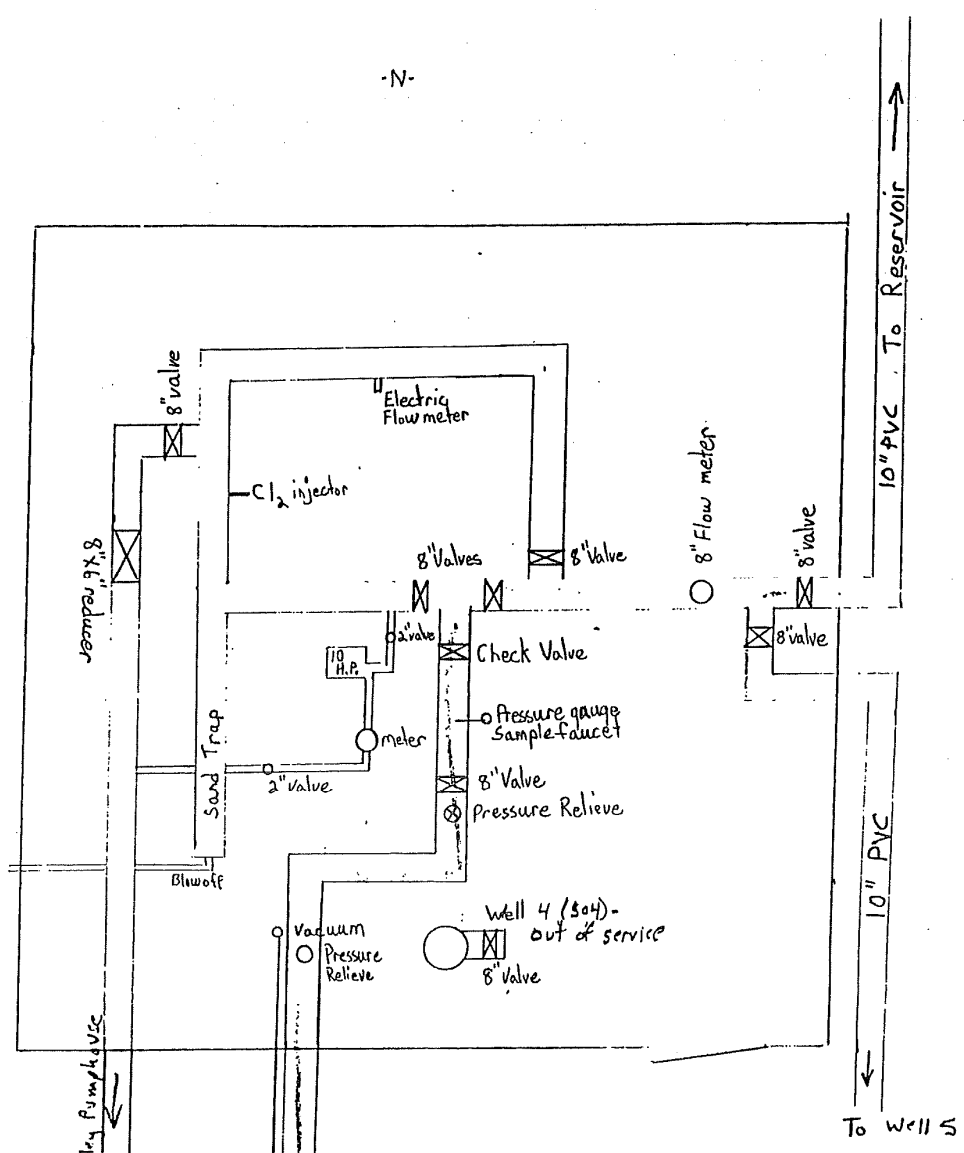
Sumas/SRWA source and storage

Routine operation. Sumas and SRWA are supplied by wells 4R and 5 (WDOH sources SO8 and SO5 respectively) at the Sumas Wellfield. Both wells pump to a 10-inch line that loops both north and east to the reservoir's and south and east to the base of Cherry Street. See Figure 7 and detail Figures 12 and 13. Once the water from the two wells is co-mingled in the 10-inch line, the source is identified as SO7. Each well is fitted with a submersible pump. Specifications and pump curves of the pumps are included within Appendix F.

The reservoir's are concrete tank's that are 60 feet in diameter and 24 feet high, located atop Moe's Hill at an elevation of 186 feet. Each tank has a capacity of 500,000 gallons one was built in 1982 and 2001. The operation of wells 4R and 5 is automatically controlled by four mercury float switches in the reservoir. The two wells operate alternately as lead pump. The lead pump is activated by a float set at a height of 20 feet within the reservoir. The lag pump and a low-water alarm are activated by a float set at a height of 19.5 feet. Both pumps are deactivated by a float set at a height of 22 feet. The high-water alarm is activated by a float set at a height of 22.5 feet.

Preventative maintenance. Routine inspection of the reservoir is performed annually and includes a complete inspection of the vents, screens, overflow drains, hatches, locks, covers, and other appurtenances important in the normal operation of the reservoir. In addition, the drain valve and overflow drain are exercised. Interior condition is inspected every five years. If silting or mineral growth is observed within the reservoir, a contractor is hired to clean the reservoir while full.

S-13-98
D. DIVISION



-N-

-E-

Figure 15
Well 4 + 4R
 All Pipe D.I.
 3-9-98

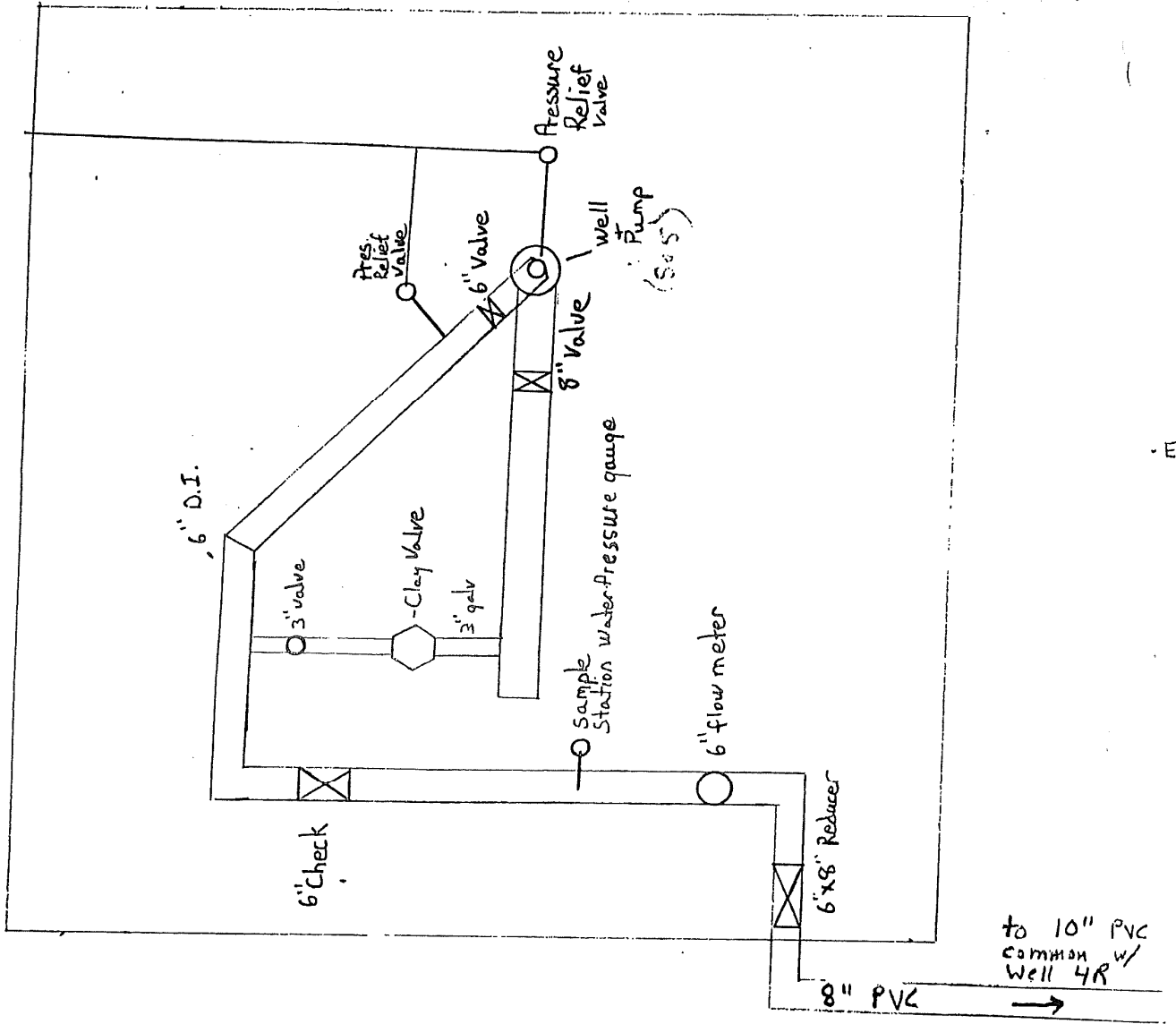


Figure 16

Well #5

3-9-98

All pipe in Bld. Ductile iron

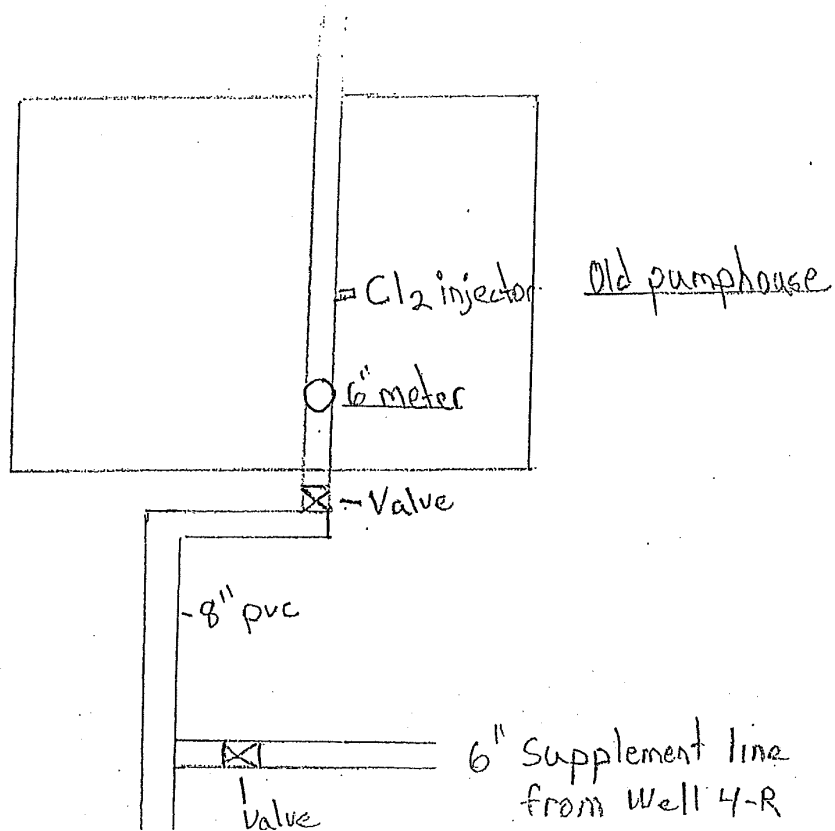
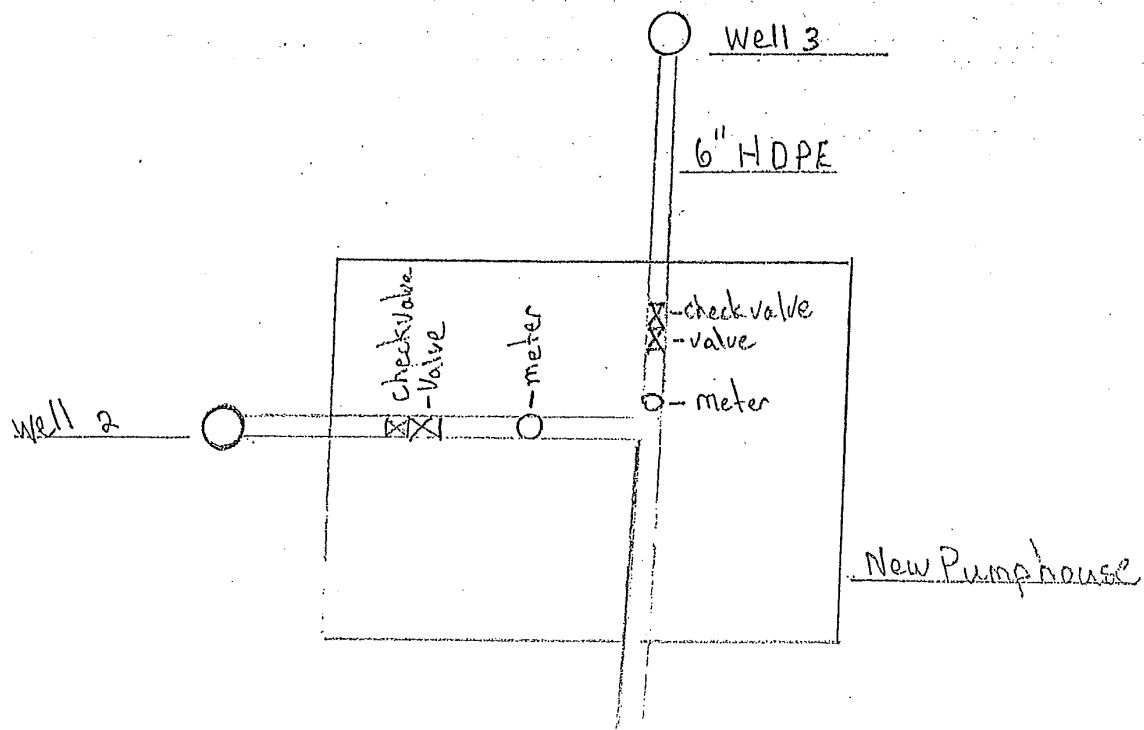


Figure 17

Wells 4R and 5 are monitored daily. Pressure is noted, as is metered volume and the time of the reading. A sand trap at well 4R is cleaned daily. On a weekly basis, an amp meter is used to verify current draw of each submersible pump.

The backup generator serving the Sumas Wellfield is tested and serviced annually, and the source meters are calibrated and tested every 5 years.

Nooksack/NVWA source

Routine operation. Nooksack and NVWA are supplied by wells 2, and 3 (WDOH sources SO₂, and SO₃, respectively) at the Sumas Wellfield. See Figure 14.

A new pumphouse was constructed in 2001 for wells 2&3, centrifugal pumps were replaced with 25hp Submersible Turbine pumps and new 6-inch Badger Turbo Meters were installed for each well. At that time a telemetry system to monitor the new Nooksack reservoir for the control of the two well pumps at the Sumas Well Field See Figure 14 for details of pump locations and piping connections. Specifications of the pumps are included within Appendix F.

Preventative maintenance. The Valley Pumphouse is monitored daily, and in periods of peak demand is monitored more often. Pressure is noted, as is metered volume and the time of the reading.

The backup generator serving the Sumas Wellfield is tested monthly and serviced annually, and the source meters are calibrated and tested every 5 years.

Sumas distribution system

Routine operation. The Sumas distribution system is normally operated with all valves fully open.

Customer meters are read monthly, on approximately the 20th day of the month. Anomalous readings are verified within a day or two, and customers are immediately notified of apparent leaks. No regular monitoring of unaccounted water is performed. The City intends to begin a monthly estimation of unaccounted water.

Preventative maintenance. The entire system is flushed annually through the hydrants. On an annual basis it is also verified that all valves are open. No regular exercising of valves is performed at this time. The City intends to begin a program of annual exercise of each valve.

Virtually all customer meters (i.e., ¾" and 1") were replaced in 2010, in conjunction with a changeover to Radio Frequency meter heads. A random group of 20 meters will be tested and calibrated at 5-year intervals in order to monitor accuracy and reliability of meters. A schedule for replacement of meters will be developed based upon the data collected. Each meter 1½" or larger will be tested and calibrated every 5 years.

May Road wells and dedicated line

Routine operation. A dedicated industrial (nonpotable) pipeline is supplied by well 3 in the May Road Wellfield. Well 1 was approved in October 2001 as a potable well the new source was designated S9- May road Well #1. Well 2 is a nonfunctioning well, used only for observation purposes. Wells 1 and 3 are outfitted with submersible pumps. Specifications and pump curves of the pumps are included within the appendix.

The water right permit for the May Road Wellfield specifies that 18 percent of the water withdrawn at the wellfield be pumped into the neighboring spring-fed stream as mitigation. Well 3 is used to supply the industrial pipeline, and well 1 is used to pump mitigation water. Source meters are monitored and discharge valves are manually adjusted so that the required mitigation ratio is maintained. Measurements are also recorded weekly of staff gauges located in the stream and of water-level readings within observation wells.

Preventative maintenance. The May Road wells are monitored daily. Pressure is noted, as is metered volume pumped for industrial use and pumped for mitigation, and the time of the reading. On a weekly basis, an amp meter is used to verify current draw of each submersible pump.

The backup generator serving the wellfield is tested and serviced annually, and the source meters are calibrated and tested every 5 years.

Summary of Regular Maintenance Activities

Task	> Daily	Daily	M, W, F	Weekly	Monthly	1 Yr.	5 Yrs.
Sumas Wellfield							
Record pressure		x					
Record source meter Q		x					
Record date/time		x					
Clean sand trap, #4R		x					
Adjust Q - pumphouse	x	x					
Bleed wells 1, 2, 3		x	x				
Check wells 4, 5 amps				x			
Check generator					x		
Service generator						x	
Calibrate source meters							x
May Rd Wellfield							
Record pressure		x					
Record source meter Q		x					
Verify mitigation Q		x					
Record date/time		x					
Check wells 1, 3 amps				x			
Read staff-gauges					x		
Check generator					x		
Calibrate source meters							x
Reservoir							
Inspect exterior						x	
Exercise drain, overflow						x	
Inspect interior							x
Distribution system							
Read meters					x		
Flush system (hydrants)						x	
Verify valves open						x	
Test backflow devices							x
Test small meters							x
Test large meters							x

Equipment, supplies, and chemicals

The City maintains an inventory of all routinely used supplies and chemicals, such as meters, meter boxes, fittings and pipe for construction of a residential tap, bands for repair of leaks, and sodium hypochlorite solution. Supplies for specific projects, such as the pipe, valves, and fittings used in a line replacement, are purchased immediately prior to use. All the above supplies and chemicals are readily available from local suppliers such as HD Fowler. Chapter 7 contains information regarding the type of equipment and materials used in the City's system.

6.4 Comprehensive Monitoring Plan

Sumas performs regular monitoring for a variety of possible contaminants, pursuant to the requirements of WAC 246-290-300. Sumas uses certified laboratories for all required monitoring.

The table below summarizes the schedule of monitoring for the period from 2010 through 2015. Following the table are details of the requirements for particular categories of contaminants.

Table 6-1. Summary of Monitoring Schedule
2006-2011

Contaminant	2006	2007	2008	2009	2010	2011
Bacteriological	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly
Inorganic chemicals	July			July		
Nitrate	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly
Lead and copper		July			July	
Synthetic organic chemicals		March			March	
EDB	March					
Volatile organic chemicals		March			March	
Radionuclides			January			

Bacteriological

- *Sampling location.* Bacteriological sampling is done at Six locations within the system, as shown on Figure 18. Six of the locations are dispersed throughout the distribution system and also at a collection point where the water enters the Sumas Rural System. The locations are:

1. Easterbrook Rd. Master Meter
2. Foot Bridge on Lawson St.
3. 220 Third Street
4. Sumas City Shop-433 Cherry St.
5. 908 Cherry Street
6. 601-A west Front Street

- *Schedule.* Sumas is required to collect two samples each month. Locations are sampled in rotation as shown below.

L1	L2	L3	L4	L5	L6
Jan	Feb	Mar	April	May	June
July	Aug	Sept	Oct	Nov	Dec
Oct	Nov	Dec	Jan	Feb	Mar
April	May	June	July	Aug	Sept

Figure 18. Coliform Monitoring Points

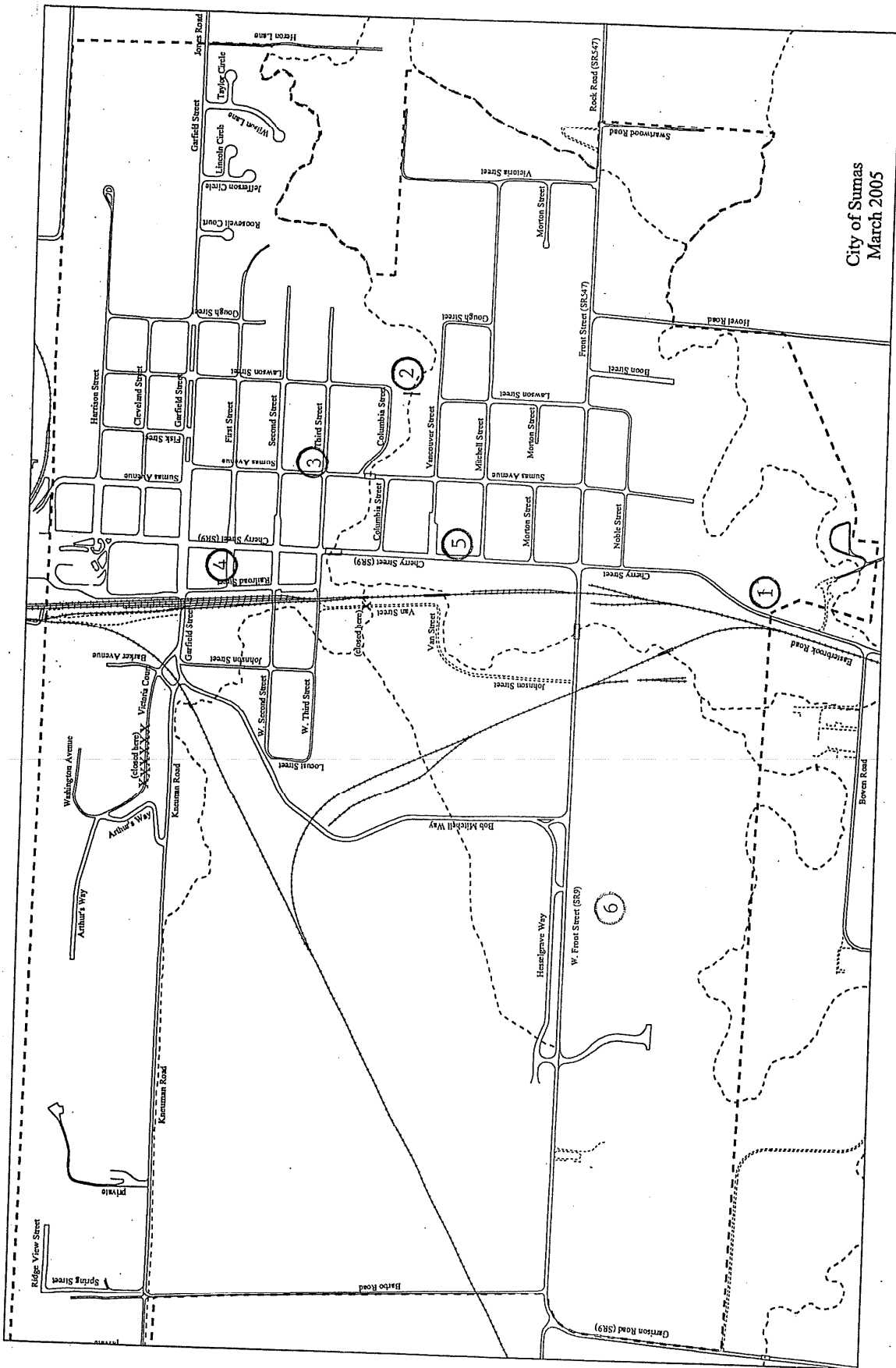


FIGURE 18

- *Follow-up action.* If coliform presence is confirmed in any routine sample, Sumas must perform follow-up actions as described in WAC 246-290-320(2). *It is important to carefully read WAC 246-290-320(2) in order to determine the appropriate action.* In general, though, the sequence is as follows: (1) re-analyze the suspect sample for E. coli or fecal coliform; (2) immediately take four repeat samples (one at original site, one within 5 services upstream, one within 5 services downstream, one at any other location); (3) notify WDOH; (4) find and correct the cause of contamination. In the month following the bad sample (and in each month thereafter until notified otherwise by WDOH), sample five locations.

With the new Ground Water Rule (GWR) of 2010 **Triggered Source Water Monitoring** is now required when one of our routine distribution samples is total coli form positive. We will test each source that was in operation at the time we collected the routine sample within 24 hours. If any of the triggered samples are E.coli positive we will take 5 additional source samples within 24 hours. If any of the 5 additional source samples are E coli positive we will take corrective action as described in Chapter 246-290 of the Groundwater Rule for the public Notification. Monitoring testing have detected no viruses in our system so no 4-log treatment is required at this time.

Inorganic chemicals (IOCs)

- *Schedule.* Sumas is required to take a complete Phase 2/5 IOC sample from each source between January 2011-December 2013. The last sample was taken in September of 2006, and the next is scheduled for September 2013. During the month that IOC sampling is done, nitrate sampling as described below can be skipped, because nitrate is included within the IOC panel.
- *Sampling location.* SO6 and SO7 and SO9(i.e., the three composite wellfield sources) are the sources to be sampled, prior to delivery of the water into the distribution system. SO6 is sampled at a faucet downstream of the point at which water from the three wells is combined. The faucet is shown on Figure 14. Because the two wells comprising SO7 pump to distinct places in the distribution system, each well is individually sampled and the samples are then mixed. The sampling faucets at wells 4R and 5 are shown on Figures 12 and 13, respectively. SO9 is sampled at a faucet in the pumphouse.

Nitrate

- *Schedule.* Because nitrate is present at a level of greater than 5 mg/l in all wells, Sumas is required to sample for nitrate once every year. Sumas chooses to sample monthly. The yearly samples are reported to WDOH, and the intervening samples are not.
- *Sampling location.* SO6, SO7 and 9 (i.e., the composite wellfield sources) are the sources required to be sampled. Sumas chooses to additionally sample each well. Individual wells are sampled at the locations identified in Figures 12, 13, and 14. The composite wellfield samples are drawn as described above for IOCs.

Lead and copper

- *Schedule.* Sumas did a first initial set of 20 samples in July of 1993 and a second initial set of 20 samples in January of 1994. The results were below action levels. A reduced set of 10 samples was taken in December 1996 and another reduced set was taken in June 1997. These results were also below action levels. Sumas must now take a reduced set of 10 samples at 3-year intervals, with sampling occurring between June and September of the year in question. The next set of 10 samples will be taken between Jan 2010 and Dec 2012
- *Sampling location.* These samples must be collected at the tap within customers' homes. Section 40 CFR 141.86 establishes the priority of which homes should be sampled. The highest priority is given to single-family homes with soldered copper plumbing installed after 1982. There were not enough such "tier 1" homes in Sumas to create an initial set of 20, so lower-priority "tier 2" and "tier 3" sites were present on the original site list. WDOH indicates that the sites sampled for the ongoing reduced-set testing should be from the original pool of 20 and should be "tier 1" homes, if possible. The 2009 samples were taken at the following locations:

Customers Sampled for Lead and Copper, 2009

Address	Occupant	In 1993 set?
705 Arthurs Way	R. Fadden	n
430 Wilson	M. Quinn	n
210 Fisk Street	D. Walser	n
427 Garfield	R. Larson	y
241 Front Street	R. TerWissch	n
1040 Victoria	H. Hanson	y
332 Mitchell	G. Boss	y
441 First Street	D. Holt	n
3870 Kneuman Rd.	G. Lewis	n
129 Mitchell Street	R. Postma	n

Synthetic organic chemicals (SOCs)

- *Schedule.* For SOCs, sampling is done within the framework of 3-year compliance periods. The upcoming compliance periods are 2008-2010. Frequency of sampling within each period is dependent upon the nature of any "area waivers" granted by WDOH. Sumas completed susceptibility assessments of its wells in 1995. Based upon those results, and upon the results of tests to date, WDOH requires that Sumas sample a single time per compliance period, using EPA method 525.2. One sample between Jan 2008- Dec 2010 is required. A copy of the area waiver is included in Chapter 10

- *Sampling location.* SO6 and SO7 and SO9 (i.e., the composite wellfield sources) are the sources required to be sampled. The samples are drawn as described above for IOCs.

EDB

- *Schedule.* Special sampling for EDB is required in Sumas because of a single detection that occurred in February of 1994 in well 4 (SO4), a component well of source SO7. One sample is required from each source between Jan 2011-Dec 2013.
- *Sampling location.* The required location for annual sampling is SO6, SO7 and SO9. Samples for SO6 and SO7 and SO9 are drawn as described above for IOCs.

Volatile organic chemicals (VOCs)

- *Schedule.* For VOCs, sampling is done within the framework of 3-year compliance periods. The upcoming compliance periods are Jan 2011-Dec 2013. Frequency of sampling within each period is dependent upon the nature of any “area waivers” granted by WDOH. Sumas completed susceptibility assessments of its wells in 1995. Based upon those results, and upon the results of tests to date, WDOH requires that Sumas sample a single time per compliance period, using EPA method 524.2. Sampling was done in March 2009. A copy of the area waiver is included in Chapter 10.
- *Sampling location.* SO6 and SO7 and SO9 (i.e., the composite wellfield sources) are the sources required to be sampled. The samples are drawn as described above for IOCs.

Radionuclides

- *Schedule.* Sumas is required to test for radionuclides each 48 months. Sampling is to be done once per quarter over the span of a year, unless initial results are less than half of the established MCL, in which case a single sample may be used. Sampling for radium-226 and radium-228 may be omitted if gross alpha particle activity is less than 5 pCi/L. The initial tests were performed in late 1996, except for well 4R, which was sampled in January of 1998. All results for gross alpha particle activity were below 5 pCi/L, so no testing for radium-226 and radium-228 was done. All results were also less than half of the established MCL, so Sumas does not need to do quarterly sampling. To put all sources on the same schedule, Sumas will sample all sources in October of 2009 and each three years thereafter.
- *Sampling location.* Sampling is conducted at each individual wellhead. The bleeder valves are used on wells 1, 2, and 3 (SO6 respectively), and the sample faucets shown on diagrams 11 and 12 are used on wells 4R and 5 and May Rd 1 (SO7 and SO9 respectively).

Maximum contaminant levels

Maximum contaminant levels (MCLs) for the various compounds are as follows (*see Appendix E for entire text of WAC and CFR cited below*):

- IOCs. As established in WAC 246-290-310(3)
- VOCs. As established in 40 CFR 141.61(a)
- SOCs. As established in 40 CFR 141.61(c)
- Radionuclides. As established in WAC 246-290-310(6)
- Bacteriological. As established in WAC 246-290-310(2)

Follow-up action upon detection

Follow-up of bacteriological detections is discussed separately above. For other contaminants, follow up shall occur as described in WAC 246-290-320. *The kind of follow-up depends upon what kind of detection occurred, and it is important to carefully read WAC 246-290-320 in order to determine the appropriate action.* In general, though, Sumas must notify WDOH as described in WAC 246-290-480 (i.e., within 48 hours for an MCL exceedance, on the same business day for a fecal coliform or e. coli detection, and within ten days for a coliform detection), notify the consumers served by the system as described in WAC 246-290-330 (i.e., newspaper notice within 14 days, notice to TV and radio within 72 hours, and direct mail within 45 days), determine the cause of the contamination, and take action as directed by WDOH. Names and addresses of important contacts are included in the Emergency Response Program elsewhere in this plan. There are follow-up actions specific to certain contaminants as follows:

- Nitrate. As established in 40 CFR 141.23(a)(4), 141.23(d)(2), 141.23(d)(3), 141.23(f)(2), 141.23(g), 141.23(m), 141.23(n), and 141.23(o)
- Nitrite. As established in 40 CFR 141.23(a)(4), 141.23(e)(3), , 141.23(f)(2), and 141.23(g)
- All other IOCs. As established in 40 CFR 141.23(a)(4), 141.23(b)(8), 141.23(c)(7), 141.23(f)(1), 141.23(g), 141.23(m), and 141.23(n)
- VOCs. As established in 40 CFR 141.24(f)(11 through 15)
- SOCs. As established in 40 CFR 141.24(b), 141.24(c), and 141.24(h)(7 through 11)

6.5 Emergency Response Program

System operators are notified of an after-hours water system emergency by automatic pagers linked to the City's voice mail system. A person leaving a message for the public works department causes the system to page the on-call staff member. All crew members and key city employees carry pagers and can be called in as needed.

Call-out list

Name	Title	Home phone	Cell	Responsibility
Rod Fadden	Utilities Superintendent		201-8328	Diagnosis of problem, formulation of response, direction of crew
Bret Warner	Lineman	988-0439	927-8040	Backup: direction of crew, & labor, backhoe, truck.
Doug Bos	Water specialist	988-5822	201-0154	Backup: diagnosis of problem, formulation of response, & labor, backhoe, truck.
Gus Gorze	Lineman		330-612-0616	Labor, backhoe, truck
Lawrence Silvis	Water specialist	966-5881	354-6116	Backup: diagnosis of problem, formulation of response
Bob Bromley	Mayor	988-8233	961-2303	OK of major expenditure
Mike Quinn	Mayor pro-tem	988-4793	988-4702	Backup: OK of major expenditure

Notification procedures

In the event of a situation in which notice must be delivered to customers, the public, the County health department, and/or WDOH, the notification shall be as specified under WAC 246-290-330. *It is important to carefully read WAC 246-290-320 in order to determine what notice needs to be given to what person or agency.* In general, Sumas must notify WDOH as described in WAC 246-290-480 (i.e., within 48 hours for an MCL exceedance, on the same business day for a fecal coli form or e. coli detection, and within ten days for a coli form detection), and notify consumers served by the system as described in WAC 246-290-330 (i.e., newspaper notice within 14 days, notice to TV and radio within 72 hours, and direct mail within 45 days). Names and addresses of important contacts are shown below:

Agencies:

Whatcom County Health Department
509 Girard Street
Bellingham, WA 98225
(360)676-6724
(360)676-7646 fax
Attn: Marcus Deyerin

Washington Department of Health
1511 Third Avenue, Suite 719
Seattle, WA 98101-1632
(206)464-7071
(206)464-7059 fax
Attn: John Thielemann

Wholesale customers:

City of Nooksack
PO Box 4265
Nooksack, WA 98276
966-2531
966-2505 fax
Attn: Bruce Likkell

Nooksack Valley Water Association
PO Box 558
Everson, WA 98247
966-7777
966-XXXX fax
Attn: Shirley McGillivray

Sumas Rural Water Association
5988 Jones Rd.
Sumas, WA 98295
988-5014
Attn: Del Heutink

Media

KGMI Radio
2219 Yew Road
Bellingham, WA 98226
(360)733-4564
(360)733-4551 fax
Attn: Brett Bonner

KVOS Television
1151 Ellis Street
Bellingham, WA 98225
(360)671-1212
(360)647-0824 fax

Bellingham Herald
PO Box 1277
Bellingham, WA 98227
(360)676-2620
(360)647-9260 fax

Lynden Tribune
113 Sixth Street
Lynden, WA 98264
354-4444
398-1731 fax

Vulnerability analysis and contingency operational plan

Following is a table containing a side-by-side listing of the major vulnerabilities of the Sumas water system, together with corresponding contingency operational plans. The contingency plans shown here are consistent with those shown in the Wellhead Protection Plan and the water shortage response plan. *In the event of any listed situation, WDOH should be notified, and the short-and long-term responses should be coordinated with WDOH.*

Vulnerability	Contingency Operational Plan
Power failure	Both the Sumas Wellfield and the May Road Wellfield are equipped with backup diesel generators capable of providing enough power to operate all pumps simultaneously. In an extended outage, the generators must be refueled as needed.
Loss of single well due to contamination, mechanical failure, or well failure.	Isolate the well from the distribution system by closing appropriate valve. System can run indefinitely with any one well out of service. If lost well is part of SO6 (i.e., the NVWA supply), it may be necessary to augment the supply to NVWA with water from well 4R. Repair mechanical failure ASAP. Develop remediation plan for contaminated well with hydrogeologist. If well is to be permanently abandoned, develop replacement well to ensure adequate reliability.
Loss of SO6 (the NVWA wells) due to contamination, mechanical failure, or well failure.	Use the component wells of SO7 to supply both the Sumas/SRWA system and the NVWA system. Well 4R (SO8) can be isolated from the Sumas system and diverted entirely to the NVWA system, and well 5 (SO5) can continue to supply Sumas. This operational mode will be sufficient except in peak demand seasons, in which case the water shortage response plan should be instituted. Use the emergency Everson/Nooksack intertie as necessary. Repair mechanical failures ASAP. Develop remediation plan for contaminated wellfield with hydrogeologist. If wells are to be permanently abandoned, develop replacement well(s) to ensure adequate reliability.
Loss of SO7 (the Sumas/SRWA wells) due to contamination, mechanical failure, or well failure	Use the SO6 wellfield to supply both the Sumas/SRWA system and the NVWA system. Cross-connect the two systems using existing valves at Garrison's Corner. SO6 is not adequate for normal supply of both systems, so the water shortage response plan should be instituted. Advise Nooksack/NVWA to open the emergency Everson/Nooksack intertie. Repair mechanical failures ASAP. For situations that can't be remedied in the short-

	<p>term, install a cross-connection at Garrison's Corner between the May Road dedicated industrial line and the Sumas distribution system. Perform required water quality tests at the May Road source, and also test the blended source for nitrate levels. If nitrate exceeds MCL, notify customers. If possible, supply industrial customers by delivering contaminated water from SO7 to Garrison's Corner through the existing NVWA supply line and installing a new cross-connection from that line to the dedicated industrial line. Develop remediation plan for contaminated wellfield with hydrogeologist. If wells are to be permanently abandoned, develop replacement well(s) to ensure adequate reliability.</p>
<p>Loss of both SO7 and SO6 (i.e., entire Sumas Wellfield) due to contamination.</p>	<p>Open the Everson/Nooksack emergency intertie. Institute water shortage response plan. Install new cross-connections at Garrison's Corner so that the May Road Wellfield supplies the potable systems and the Sumas Wellfield supplies industrial customers. Perform required water quality tests at the May Road source. Install emergency intertie with City of Abbotsford water system at Canadian border. Notify customers of exceedance of nitrate MCL. Develop permanent response (i.e., water treatment system, new wellfield).</p>
<p>Loss of reservoir.</p>	<p>Isolate Sumas/SRWA system from reservoir with existing valves. Operate wells 4R and/or 5 in manual mode to pressurize system. Reconfigure impellers and pump controllers as necessary if system must operate in this mode for long duration. Repair and/or replace reservoir ASAP.</p>

6.6 Cross-Connection Control Program

Chapter 13.38 of the Sumas Municipal Code establishes the authority to regulate any cross-connection that would endanger the potable water supply. A copy of Chapter 13.38 is included in Appendix A. Chapter 13.38 also: designates responsibility for implementation; mandates that only approved cross-connection devices be used; establishes authority for inspection by the City of all portions of a customer's premises; and establishes penalties for violations.

Implementation responsibility

Implementation of the cross-connection control program is the responsibility of the public works department. The Utilities Superintendent must ensure that program tasks are scheduled and that trained personnel are available. City policy is to have one crew member trained as a cross-connection specialist (CCS-1 certification). Currently that person is Doug Bos. If the specialist leaves the City's employment, another crew member will be trained at City expense as soon as possible. A consultant cross-connection specialist will be used as needed in the interim.

Program elements

- *Approval of new construction.* The cross-connection specialist shall review each application for a new service or for modification of an existing service. After assessing the degree of hazard associated with the cross-connection, he shall specify the necessary level of protection. He shall inspect completed installations to ensure the required device is correctly installed and operating.
- *Inventory of existing devices.* The City will develop an inventory of devices currently installed throughout the system. The inventory will be in the form of an electronic spreadsheet containing the following information: device location; device type; last test date; tester's name and certification number; test results (i.e., description of repairs or recommendations for repairs); next test date. The inventory will be a permanent City record.
- *Survey of existing facilities.* The City will survey existing facilities to determine whether retro-fitting with backflow devices is necessary. The survey will target customers in the following priority order: industrial customers; major commercial customers (i.e., > 3,000 CF per month); minor commercial customers; residential services known to contain devices of concern (i.e., automatic sprinklers). The survey process will be publicized ahead of time in the City newsletter. After a given facility has been surveyed, the cross-connection specialist will determine what measure of protection (if any) is required and provide written notice to the property owner of any required changes. The notice will establish a schedule for compliance. The specialist shall then reinspect the site. If changes have not been made, the City will meet with the owner to negotiate a compliance deadline. Water service to the property will be shut off if the owner fails to meet the second deadline. The City expects to conduct the survey during calendar year 2012.
- *Inspection and testing of devices.* The cross-connection specialist shall ensure that all backflow assemblies are tested upon installation and periodically thereafter in accordance

with WDOH requirements. A form letter will be used to identify individual customers that testing is due, instruct the customer that only a certified tester may be used, direct the customer to provide a written copy of test results, and establish a deadline. Test results will then be entered into the electronic spreadsheet.

6.7 Customer Complaint Response Program

Sumas has develop a new log of customer complaints regarding the water system. A report form will be completed and added to the log as a result of each customer complaint. The form will also contain a record of the response made by the City. A copy of the report form will be provided to the complainant upon resolution of the problem.

6.8 Recordkeeping and Reporting

Sumas maintains the following water system records:

Record	Retention schedule
<i>Billing and individual usage.</i> Customer name, service address, billing address, monthly usage and bill amount. Maintained by utility clerk.	Kept electronically for previous two years. Kept in hardcopy printout for previous 6 years.
<i>Usage by class.</i> Subtotal usage per month for customer class and for each major wholesale customer. Maintained by utilities superintendent	Electronic file permanently maintained.
<i>Customer complaints.</i> Paper records maintained by utilities superintendent.	Kept six years..
<i>Cross-connection devices.</i> Location, type, installation date, test date. Paper records maintained by utilities superintendent.	Permanently maintained.
<i>Source meters.</i> Usage per well per month. Maintained by utilities superintendent.	Hardcopy kept for 6 years, electronic version permanently maintained.
<i>May Road water right.</i> Stream levels, well water levels, volume pumped for mitigation and for industrial use. Maintained by utilities superintendent.	Hardcopy kept for 6 years, electronic version permanently maintained.
<i>Test results - Nitrate.</i> Monthly nitrate reading in each well. Maintained by utilities superintendent.	Hardcopy kept for 6 years, electronic version permanently maintained.

<i>Test results - all others.</i> VOCs, SOCs, IOCs, bacteriological, radionuclide, lead & copper. Maintained by utilities superintendent.	Hardcopy kept for 6 years.
<i>As-built drawings</i> of all distribution-related projects. Maintained by utilities superintendent.	Hardcopy permanently maintained.

For many types of records, the period of retention is established at 6 years in order to match the frequency at which this WSP is updated.

Many of the records are used in update of the WSP, and the results of the record-keeping are submitted to WDOH only within the context of a draft plan update. Source meter records and monthly usage by customer class are examples. The only records that must be submitted regularly to WDOH are water quality test results. Sumas instructs the certified testing lab to submit all such results directly to WDOH.

6.9 O & M Improvements

One improvement related to O & M are identified in this chapter:

- Train new WDM-1. Upon the death of Rob Brommer, the City only has one ceretified system operator on staff. Certification of a second staff member will be addressed.