TOWN OF HAMILTON
WATER SYSTEM PLAN

SYSTEM ID# 30700 0

Prepared For:
Joan Cromley, Mayor

Prepared By:

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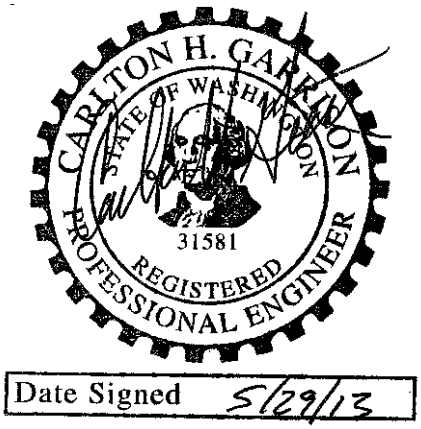
Garrison Engineering

May 6, 2013



Revised: May 29, 2013
(includes signed consistency form)

Notes, Disclaimers:

- Garrison Engineering takes no responsibility for items not specifically addressed within this report.
- Some of the documents in this report were prepared by others. Garrison Engineering makes no claims as to the accuracy or completeness of such work. These items have been included as a courtesy to the owner and review agency in an effort to present a complete water system plan.
- This water system plan is valid only for the specific project shown above and herein. Further, this report is valid only if it is bound as it originally left this office, and contains all of the sheets as originally bound. Any sheets, which are not bound to the original complete set, are not valid and shall not be used (excluding authorized, stamped addenda).
- This report includes 59 pages and 23 Appendices

TOWN OF HAMILTON

SKAGIT COUNTY, WASHINGTON

Resolution 01-13

A RESOLUTION concerning the approval by the Hamilton Mayor and Town Council of the Water System Plan for 2012 through 2018.

Whereas, the Hamilton Mayor and Town Council, in compliance with the Department of Health must submit a Water System Plan this January 2013,

Whereas, the Hamilton Mayor and Town Council haves retained the services of Garrison Engineering to coordinate the Water System Plan,

Whereas, the Hamilton Town Council have reviewed in detail this Water System Plan,

Be it resolved the Hamilton Mayor and Town Council approves this plan and returns it to Garrison Engineering for timely submittal to the Department of Health.

Dan M. Crowley	4/9/2013
Mayor	Date
Richard Haase	4-9-2013
Councilmember	Date
	4/9/13
Councilmember	Date
	4/9/13
Councilmember	Date
Ruth M McDermott	4/9/13
Councilmember	Date
	4-9-13
Councilmember	Date

Town of Hamilton Water Department Summary

This Water System Plan Update was begun under the direction of Mayor Timothy Bates, who placed Hamilton Water Department's ability to provide the best quality water and service to its customers at an affordable price as his highest priority. This vision was based on the desire for Hamilton to be a leader among very small Towns in Washington State. The Council has supported this vision and continues to place Hamilton's water system as a priority. We value our water system as one of our best community assets.

Name: Town of Hamilton Water Department

WSDOH ID#: 307000

System Owner: Town of Hamilton

Location: Northeast State Route 20, Skagit County, Washington State

Operator: Kathleen "Cas" Hancock, Cas Hancock and Associates

Address: 46451 Baker Loop Road, Concrete, WA 98237-9558

Telephone: (360) 770-4633, E-mail: waterlady@frontier.com

Certificate # 007482 WDM 2, BTO & CCS

Manager: Mayor Joan Cromley
613 Shiloh Lane
Sedro-Woolley, WA 98284
E-mail: hamilton.wa.mayor@gmail.com
Telephone: 360-826-4953 (home) / 360-840-9144 (cell)

Planning Period: The basic 6-year and 20-year planning periods, beginning in 2012.

Sources: 1 groundwater well: Well 2 (SO2)

Water rights: Please see the table below for all relevant water right information for the Town. For more information, please see Appendix IV for the water rights.

Water Right Number	Priority Date	Instantaneous Pumping Rate (Q_i) (gpm)	Annual Pumping Rate (Q_a) (acre-feet per year)	Purpose of Use
G1-20003C	3-02-1972	36	35	Municipal/Domestic
G1-24051C	3-11-1982	70	65.86	Municipal/Domestic
G1-28066A	9-30-1999	30	36	For mitigation only. As needed for stream augmentation purposes (non-consumptive use) in accordance with the Town of Hamilton water right mitigation plan for Little Carey's Creek (see Appendix VI)
	Total:	**106(+30)**	**100.86(+36)**	

Water System Demands:
ADD Design 290 gpd/ERU*
MDD Design 475 gpd/ERU*

Year	2012	2018	2032
ERU Growth/Increase projections	149	170**	184**
Peak Hour Demands Design (PHD)	100 gpm	155 gpm*	164 gpm*

* These numbers should be updated for the next Water System Plan cycle or when the Town needs more approved connections with at least 2 full years of meter readings using the presently upgraded water system. See chapter 4 for more details.
**As development begins to occur north of State Route 20, the calculations for ERU's, Storage, and Water System demands will be updated as necessary to adequately represent the number of new connections added to the Town.

Fire Flow (FF) for Single Family & Duplex Residential within the Urban Growth Area is 1000-gpm for 60 minutes duration and the fire flow for the Janicki Plant is 2,850-gpm for 120 minutes.

FF Storage for Residential 60,000 gallons
FF Storage for Commercial 342,000 gallons

System Storage: Two 290,000 gallon concrete water reservoirs, 30' Ø x 55' tall. Total storage for drinking water: 580,000 gallons. One 23,500 gallon concrete storage tank for Little Carey's Creek stream mitigation.

Equalizing Storage: Equalizing Storage (ES) for 2012 = 0 gallons, ES for 2018 =7,800 gallons, ES for 2032 = 9,300 gallons

Fire Suppression Storage: Fss = 342,000 gallons

Standby Storage: Standby Storage (SS) for 2012 = 495,637 gallons, SS for 2018 = 488,287, SS for 2032 = 486,937 gallons.

System Pumping: A 10hp submersible pump capable of delivering 136 gpm has been installed in well S02. All connections are served by gravity. (106 gpm for Municipal/Domestic use and 30 gpm for mitigation only)

Total Customers: In 2012, there were 124 metered water connections, including 109 residential connections, 3 small RV parks (serving 22 RVs through 6 meters), 6 very small, 2 small and 1 large commercial customers.

Design Year: 2012: 124 connections (serving 149 ERUs); 2018: 130 connections (serving 170 ERUs); 2032: 144 connections (serving 184 ERUs); WSDOH Approved Connections 193 (Residential), 251 (Total).

Future System Demands: Based on historical usage, the system is expected to increase by 1 new residential connection per year over the next 20 years. Janicki plant is expected to reach full development within the next 6 years (to 30 ERUs)

Existing Water Treatment: Chlorination with sodium hypochlorite followed by manganese greensand filtration (106 gpm capacity) is provided. A sufficient dosage of chlorine is added ahead of the treatment system to oxidize the iron and manganese, carrying a residual through the reservoir and an additional injection of chlorine immediately after storage to carry the residual to the extreme ends of the distribution system. Sediments in the backwash water from the filters are allowed to settle out, and the water is recycled to the treatment system.
Disinfection is still operated today but the filtration was discontinued in October 2010.

Proposed Improvements: The following summary of recommended improvements is based on the conclusions of this report. The outline describes the recommendations for the 6 and 20 year planning periods. These are discussed in more detail in Chapter 6.

System Improvements

6 year-planning period:

- Monitoring well: Reconnection of electronics and monthly monitoring of the SWL and weir levels.
- Replace Automatic Dialing System Controller
- Purchase of 10hp replacement well pump to have on hand for back-up
- Leakage Control Program
- Well Head Protection Program
- Water Conservation & Water Use Efficiency Programs
- Replacement of aging AC distribution system main along Cumberland Avenue (north of Hamilton street)

20 year-planning period:

- Development of a second source of supply
- Water main looping
- Replacement of aging distribution system main along Nolle Avenue (between Michigan Ave & Water Street) / Install new 8” pipe along Water Street between Nolle & Railroad Ave to create a loop

Town of Hamilton Water Department
Water System Plan

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Glossary of Terms

Definition	Acronym
Town of Hamilton Water Department	Town
Water System Plan	WSP
Water Service Area	WSA
Washington State Department of Health	WSDOH
Equivalent Residential Unit	ERU
Washington State Department of Ecology	WSDOE
Capital Improvement Plan	CIP
Developers Extension Agreement	DEA
Critical Water Supply Service Area	CWSSA
Safe Drinking Water Act	SDWA
Inorganic Compounds	IOC
Synthetic Organic Compounds	SOC
Volatile Organic Compounds	VOC
Radionuclides	RAD
Disinfection By-Products	DBP
Total Trihalomethanes	TTHMs
Halo Acetic Acid 5	HAA5s
Environmental Protection Agency	EPA
Average Day Demand	ADD
Maximum Day Demand	MDD
Peak Hourly Demand	PHD
Gallons Per Day	GPD
Gallons Per Hour	GPH
Gallons Per Minute	GPM
Pressure Reducing Valve	PRV
Town System Leakage	DSL
Operating Storage	OS
Equalizing Storage	ES
Standby Storage	SB
Dead Storage	DS
Fire Suppression Storage	FSS
High Density Polyethylene	HDPE
Backflow Assembly Tester	BAT
Cross Connection Specialist	CCS
Double Check Valve Assembly	DCVA
Reduced Pressure Backflow Assembly	RPBA
Fire Flow	FF
Water Treatment Plant	WTP
Lineal Foot	lf
Hydraulic Grade Line	HGL
Polyvinyl Chloride	PVC
Annual Flow Amount	Q_a
Time of Travel	TOT
Average Mean Sea Level	AMSL
Federal Emergency Management Act	FEMA
Safe Drinking Water Act	SDWA

Chapter One:
Introduction

1.1 Authorization/Objectives

The Town of Hamilton Water Department (Town) operates as a Municipal Group A water system under the laws of the State of Washington. The Town Mayor and Council authorized this updated Water System Plan in 2012. The objectives of this plan are to address the existing conditions of the Town system, determine future demands, and to develop a schedule and financial plan to upgrade the system. This information will provide the Town with the information needed to continue to meet the water needs of its customers and also meet the Washington State Department of Health (WSDOH) requirements. This plan will also replace the previous Water Plan prepared in 2002 and updated in 2007.
It is recommended that this plan is updated on an annual basis to ensure accuracy and utility.

1.2 Scope of Work

This 2012 Water System Plan (WSP) Update has been prepared according to requirements outlined in the *2009 Washington State Department of Health (DOH) Water System Design Manua*l to fulfill the water system's regulatory obligations under Washington Administrative Code (WAC) 246-290-100. Principle objectives of the WSP include the following:

- Review service area boundaries and policies
- Review minimum performance and design standards and policies
- Identify water service requirements based on projected land use and development
- Assess existing system capabilities
- Assess existing system deficiencies
- Develop a capital improvement program to provide for existing and future needs

Current system conditions are reviewed and presented, along with evaluations of the 6-year (2018) and 20-year (2032) planning horizons.

1.3 Water System Description

The Town is primarily a residential community with a limited business area. The majority of the water retail service area is located south of State Route 20, within a relatively flat floodplain just north of the Skagit River. Within the retail service area, land slopes gently to the south and west toward the river. Elevations are generally between 90 and 125 feet above mean sea level (AMSL).

In 2012, approximately 548 customers were served through 124 connections (including the commercial enterprises of Janicki Inc.).

The water supply is provided through a single well located outside of the floodplain at an elevation of approximately 250 feet. High levels of Manganese used to be filtered at the treatment facility located next the well. The system operates on gravity flow from the two main 290,000 gallon reservoirs located at the well site; Pressure Zone #1. The lower part (south of State Route 20, Pressure zone #2) is protected from too high pressure by a main Pressure Reducing Valve (PRV) Station located just north of State Route 20. This PRV station will need to be relocated south of State Route 20 so that the full head in the reservoirs would be available for fire flow for the Janicki plant. See chapter 4 & 6 for more details.

There is also an additional 23,500 gallon mitigation reservoir at the well site to supply Little Carey's Creek, a year-round fisheries habitat that flows near the well site, with water during the summer months (see chapter 2 for more details on the fisheries mitigation program)

See Map 9 - Water System Map in Appendix VIII for main sizes and infrastructure locations.

Table 1.3 -- Pressure Zones

Zone 1	295' HGL	Shiloh Lane	Gravity Service from Reservoirs.
Zone 2	250' HGL	Reduced Zone (includes Janicki Property) (1)	Pressure Reduced Service from Zone 1 Reservoirs

(1) The Janicki property will switch from zone 2 to zone 1 once the PRV station is relocated from north to south of Highway 20 at a point after the Janicki 16" pipeline connection, so that there is no PRV flow restriction serving the hydrants and Janicki plant.

1.4 Population and Water Demand Projections

In 1978, the Town reached a maximum of 174 service connections. In 2001, there were only 107 connections. Currently, the Town serves approximately 548 people with 124 connections (including 200 Janicki employees), with an average demand of 33,264 gallons per day and an estimated peak day demand of 46,816 gallons per day. The Town estimates slow growth in the retail service area with an increase of one residential connection per year for the next 20 years.

The total annual water consumption was approximately 12,217,624 gallons (from 9/1/2011 to 8/31/2012), and is expected to increase to 20,005,650 gallons by the year 2032.

The average day demand per ERU used in this report has been established by water records at 290 gallons and the maximum day demand per ERU at 475 gallons per day, based on 3 years of historical data. Please see chapter 4 for more details.

In addition to the normal growth projected by the County, there are two developments that may increase water usage above this general trend. Further discussion on development is discussed in Chapter 2.

1.5 Source Capacity

Water rights have been issued for a total of 136 gpm (New G1-20003C; Transferred G1-24051C); including 106 gpm for municipal purposes and 30 gpm (new G1-28066A) for fish mitigation (Water Rights are included as Appendix IV). A 10hp submersible pump capable of delivering 136 gpm has been installed. An automated control system restricts flow to the Town's distribution system to 106 gpm; the balance of the flow is diverted to a mitigation tank adjacent to the Town's storage reservoirs.

At this capacity and with existing reservoirs, the Town has the capacity to serve 279 ERUs or residential connections. The target number of connections for 2032 is considerably less than this, at 184 ERU's. See chapter 4.4 for more details.

1.6 Water Transmission, Pumping, and Storage

The capital improvements discussed in this report are oriented around water quality and public health improvements, additional looping of the system, and replacement of older mains and valves.

1.7 Water Quality and Treatment

The Town's water is supplied by one groundwater well. The quality of the system's water supply has been good and has met or exceeded all current DOH drinking water standards for primary contaminants. The Well source has high levels of manganese that were initially filtered to meet state DOH recommended levels for secondary contaminants. In 2009, the Mayor asked the DOH staff to assist with exploring options to reduce the exorbitant cost to the Town for operation and treatment. The DOH Engineer for Skagit County and the Town made an agreement to monitor manganese levels in both the raw (untreated) water and the finished (treated) water for 1 year. Based on the data collected and customer input, on October 13, 2010 the Town Council voted to discontinue operation of the manganese greensand filtration equipment, thereby saving the Town approximately $30,000 per year in Operator/operations costs. See Appendix XI for more details.

The Town is currently collecting raw water samples for bacterial analysis (in addition to the required distribution system samples) in anticipation of discontinuing disinfecting the drinking water. This option would further reduce treatment and operations costs. See Appendix XI for the first four laboratory results (October 2012 – January 2013).

The drinking water regulations are constantly changing and will require additional monitoring and reporting in the future in an effort to ensure safe drinking water for its customers. Therefore, it is imperative that the Town stay abreast of the regulations to maintain compliance.

1.8 Conclusions

The present water system facilities are sufficient to meet the needs of the Town for maximum day and peak hour demands for 184 ERUs through the year 2032.

Growth, for planning purposes, has been projected at 6 new residential services to the existing town retail service area by 2018, and 20 new residential services by 2032. In addition, Janicki plant is expected to reach full development within the next 6 years (to 30 ERUs).

In addition, the Town can serve upwards of 279 total ERUs with the system's existing source and storage facilities.

However, we recommend that the Town begin planning for a second source of supply. With only one well, the Town & Janicki Industries have some risk of running out of water if/when the well pump or well itself fails. At a minimum, we recommend purchasing a 10hp replacement well pump to have on hand for back-up. Additionally, the Town should budget for the development of a 2nd source.

The evaluation of the system's distribution capabilities with projected demands shows that fire flows are beyond requirements with the exception of the Janicki Plant area (northwest of the water retail service area). Relocating the PRV from the north side of SR 20 to the south side of SR 20 will allow the full head in the reservoirs to be available for fire flow for the Janicki plant. See chapter 4 for more details.

Future line extensions and loops will continue to improve the distribution system and meet and maintain fire flows as maximum day demands increase.

Fire protection of 1000-gpm is adequate under existing state and County requirements and should be adequate in the future based on the proposed Skagit County Land Use Plan for the residential zone within the Town retail service area. Improvements to the system to provide for new services (including developer extensions) will be designed to meet the required fire flows as domestic and commercial demands increase.

1.9 Ownership & Management

Town of Hamilton
584 Maple Street
PO Box 528
Hamilton, WA 98255
Phone/fax: 360-826-3027
E-mail: Townofhamilton.2010@gmail.com

The Town elected officials are listed below:

Joan Cromley- Mayor
613 Shiloh Lane
Sedro-Woolley, WA 98284
E-mail: Hamilton.wa.mayor@gmail.com
Telephone: 360-826-4953 (home) / 360-840-9144 (cell)

Ruth M. McDermott - Councilmember #1
401 Maple Street
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E-mail: mcdeerm@hotmail.com
Telephone: 360-333-7996

Jennifer Benjamin-Councilmember #2
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Bethany Henderson -Councilmember #3
PO Box 31
217 South Street
Hamilton, WA 98255
E-mail: bethanyah21@hotmail.com
Telephone: 360-770-0080

Andrew Jensen- Councilmember #4
P. O. Box 57
Hamilton WA 98255
Telephone: 360-826-4733 (home) / 360-391-2954 (cell)

P. Richard Moore- Councilmember #5
P. O. Box 432
Hamilton WA 98255
E-mail: PRMoore44@yahoo.com
Telephone: 360-929-1015 (cell)

The Town clerk is:

Susan West-Mani
33827 SR 20
Sedro-Woolley, WA 98284
E-mail: rsmani999@yahoo.com
Telephone: 360-826-3919

The Certified water operator is employed by contract. The current operator is:

Kathleen “Cas” Hancock
Cas Hancock and Associates
46451 Baker Loop Road
Concrete WA 98237-9558
E-mail: waterlady@frontier.com
Telephone: 360 770 4633
Certification # 007482, WDM 2, BTO and CCS

Chapter 2:
Service Area Description

2.1 Introduction

This chapter describes the Town of Hamilton Water Department's existing and future water retail service areas and water service agreements.

2.2 Location and Surroundings

The Town of Hamilton is a rural community located in Skagit County adjacent to State Route 20 and the Skagit River. The retail service area includes Sections 11-14 in Township 35 North, Range 6
East. The Town owns and operates a potable water system, which currently serves a population of approximately 548 through 109 residential, 22 RV (served by 6 meters) and 9 non-residential connections (includes the 200 Janicki employees).

The Town of Hamilton is located within the Skagit County Critical Water Supply Service Area. As such, Hamilton's Water System Plan is required to meet all legislated service area identification requirements of the Skagit County Coordinated Water System Plan developed under the State of Washington Water System Coordination Act. Hamilton representatives, as members of the Skagit County Water Utility Coordinating Committee, participated in revision of the County's Utility Service Review Procedures and identified a water service area boundary for Hamilton as part of the 1999 Skagit County Coordinated Water System Plan (CWSP).

The area is predominately rural and is a mix of wooded areas and open fields. The elevation of the retail service area ranges from 95 feet along the Skagit River to 125 feet along the State Highway, on the north margin of the retail service area. Several small wetland areas exist within the water system boundary.

The water system currently serves approximately 548 people with 124 service connections (2012). The retail service area of the Town consists primarily of single-family homes and a limited number of commercial connections, most of which are located within the floodway. All the residential connections are considered full time.

It is understood that among the existing 124 connections, 123 were located within the current Town retail service area boundary, and one outside (Parcel # P41080 – see full size map #9 in Appendix VIII for location). It is understood that this lot has been served and has paid the water fees since 2002. At the time of original connection of the above referenced property to the Hamilton Water System in 2002, the Town Council agreed to waive the normal hook-up and connection fees and charges in return for easement and construction of the water system transmission line through the above mentioned property.
The lot owners and the Town have agreed to include the property in the Town retail service area using this Water System Plan update (see agreement letter signed by both parties in Appendix V).

A consistency statement based on the updated retail service area including the subject lot and provided by Gary Christensen from Skagit County Planning Department is included in Appendix V.

Map 9 - Water System Map in Appendix VIII

2.3 Town Service Area Zoning and Skagit County Land Use

The land use zoning within the Town retail service Area has been defined by the Board of Skagit County Commissioners as Incorporated areas and Commercial/Industrial within the Urban Growth Area. There are also two pieces of land defined as Hamilton Residential and Hamilton Urban Reserve north of State Route 20 to allow the Town to eventually move out of the floodplain in the future. See maps 2, 3, 4, & 5 in Appendix VIII.

Future land use is expected to follow existing patterns and the zoning currently in place, based on Skagit Planning Department projections. Please see maps 2, 3, 4, & 5 in Appendix VIII which presents the relevant section of the Current and Future land use map prepared by Skagit County for the Town of Hamilton area.

After numerous flooding incidents, a number of properties were purchased by Federal Emergency Management Agency (FEMA) funds and can no longer be used as building sites for residential or commercial uses. See map 1 in Appendix VIII.

Map 1-Flood Warning Map for the Skagit River Valley (See Appendix VIII)

Map 2-Skagit County Comprehensive Plan Designations and Zoning Districts Map (See Appendix VIII)

Maps 3 & 4 -Town of Hamilton Retail Service Area (See Appendix VIII)

Map 5 – Town of Hamilton Urban Growth Area (See Appendix VIII)

2.4 History

The Town is primarily a residential community with a limited business area. The majority of the retail service area is located south of State Route 20, within a relatively flat floodplain just north of the Skagit River. Within the retail service area, land slopes gently to the south and west toward the river. Elevations are generally between 90 and 125 feet above mean sea level (AMSL).

The Town was originally founded as a series of homesteads with accompanying water rights filed under the 1881-1889 Homestead Act. When the Seattle Northern Railroad came to Hamilton in 1891, the Town was incorporated with a population of 327. In 1935 a new 20-ft well and elevated 4,000-gallon storage tank were constructed to serve the Town. At the same time, the Town began acquiring private water rights. In 1978, the Town reached a maximum of 174 service connections. In 2012, approximately 548 customers were served through 124 connections (including Janicki employees).

The Town experiences regular flooding, and the flood of 1980 prompted construction of a new well and 65,000-gallon reservoir. In 1982, the Town acquired the current water rights (certificate G1-24051C) for this well. In 1993, the installation of a new 8-inch water line allowed for the Town to expand north of State Route 20. More recently, the Town extended the corporate limits and the retail service area to include additional land north of State Route 20 with the intention of gradually shifting growth and development to this higher elevation.

In 1997, the well was classified as a "Groundwater Under the Influence of Surface Water" (GUI) source and the Town was required to consider installing filtration treatment or relocating its source of supply. In 1999, the Town drilled a new production well about one mile north of the existing well. The new well is located outside of the floodplain at an elevation of

approximately 250 feet. Switchover to this new source occurred in December 2002 following the construction of the chlorination and greensand filtration facilities that were required to treat elevated levels of manganese. While manganese is not a health threat, it is of esthetic concern and treatment techniques were developed. Chlorination with sodium hypochlorite followed by manganese greensand filtration (106 gpm capacity) was provided. A sufficient dosage of chlorine was added ahead of the treatment system to oxidize the iron and manganese, as well as carrying a residual through the reservoir and to the extreme ends of the distribution system. Sediments in the backwash water from the filters are allowed to settle out, and the water is recycled to the treatment system. This system is currently being bypassed with permission of the DOH to avoid having the cost of a special classification of operator.

Along with the treatment facilities, a 290,000 gallon concrete reservoir (55 ft high and 30 ft in diameter) was installed at the well-site. The overflow elevation of the reservoir is 305 feet. With annexation of the Janicki Industries (JI) property (formerly Crown Pacific property) in 2007, a second similar 290,000 gallons of storage was constructed next to the first one to provide adequate fire-flow.

In addition, addressing concerns for impact on Little Carey's Creek, a year-round fisheries habitat that flows near the well site, a fisheries mitigation program was developed by the Town and Washington Department of Fish and Wildlife (WDFW), which was accepted by the Washington Department of Ecology and 30 gpm of water rights (GI-28066A), were issued to implement the plan.

A 2-inch diameter pipeline was constructed from the well/mitigation tank site to the vicinity of the springs, and when the flow in Little Carey's Creek drops below an agreed rate (during the months of May through October, as measured at a WDFW stream gauge), the Town provides additional water flow to the springs through the 23,500 gallon mitigation reservoir and pipeline (only un-treated water is provided for fish mitigation). The mitigation flow rate is 1 gpm (or 1,440 gallons per day) for fish mitigation for each 10,000 gallons per day of water sent to the Town's distribution system. For example, if the Town's usage is 30,000 gallons per day, the continuous rate of flow through the fish mitigation pipeline would be 3 gpm (fisheries mitigation applies May through October). The daily demands are routinely determined and fish mitigation flows are adjusted accordingly and recorded on a daily basis. See Little Carey's Creek Water Right Mitigation Plan in Appendix VI and Typical Stream Mitigation Daily Log in Appendix VII.

There are historical records for three earlier efforts for Water System Planning: Group A Comprehensive Water System Plan was prepared for the Town in the years 1994 and 2002. An Amendment to the Group A Water System Plan was prepared in 2007.

2.5 Population

Growth, for planning purposes, has been projected at 6 new residential services to the existing Town retail service area by 2018, and 20 new residential services by 2032. This projection was based on growth from 1990 to 2000, the number of vacant properties available within the system boundaries, and Skagit County growth projections for the Skagit area. The commercial connections are expected to stay the same except for the Janicki plant which is expected to reach full development within the next 6 years (to 30 ERUs). The basis for these projections has been discussed among the Town Council and it was agreed that one new residential connection per year is a reasonable assumption based on past experience and their knowledge of the community.

Some of the assumptions made include the following:

- Zoning will not change during the 20-year period
- Growth will continue at a rate similar to the last 10 years
- Slower growth in the floodplain will be offset by growth at the higher elevations
- Water service area will expand to the north of SR 20.
- No major development will take place north of SR20 during the 20-year period.
- Shangri La Community Club Water System will not be annexed by the Town during the 20-year period.

If any of these assumptions are changed, the projections of future service connections should also be modified to reflect the changes. Calculations for ERU's, Storage, and Water System demands will be updated as necessary to adequately represent the number of new connections added to the Town.

2.6 Topography and Geography

The Town of Hamilton retail water service area includes the upland areas of Shiloh Lane (north of State Route 20) and the portions that lie outside the floodway (south of State Route 20) and the Town proper. The retail service area includes steep slopes along low bank portions of the shoreline of the Skagit River and the lowland floodway to the east and west. The topography rises from 90 to approximately 125 feet northeast of the State Highway. Several wetland areas are found within the retail service area. The old growth timbered lands were all logged off in the mid 1800's and were converted to the Town site and residential home sites with some vacant parcels and several farms.

Map 6 -USGS Topographic Map (See Appendix VIII)

2.7 Climate

The Town of Hamilton is in the Pacific Mountain Climate Zone. Hamilton experiences a mild climate with few extremes in high and low temperatures. The average daily temperature varies from 31 degrees in January to 77 degrees in August. The average annual precipitation in the Town of Hamilton is approximately 67 inches, mostly occurring from October through June.

2.8 Proposed Development Projects

The Town's existing retail service area is shown graphically in map 7 (See Appendix VIII). There are several problem private wells within the Town's retail service area on Bella and Division Streets, as well as two small residential areas that could be annexed in the future:

- Shangri La Community Club Water System # 77486U- 65 approved connections
- Punkin Center- 25 residential connections served by individual wells

The residential development of Shangri-La is a plat with 65 approved connections located along the north bank of the Skagit River just east of Hamilton. This community currently operates their own well, although flooding is a recurring problem. The Shangri La Community showed some interest in joining the Town of Hamilton Water System a few years ago but made repairs and do not lean toward that direction anymore. The Punkin Center residents have not expressed interest but the changing climatic conditions may require this move in the future. These annexations are

unlikely to happen during the next 20 years and are not part of the 20-year forecast for the Town. The Water System Plan will be updated if either of the projects move forward.

Map 7- Proposed Development Vicinity Map (See Appendix VIII)

2.9 Water Service Area Agreements

All water purveyors located within a Critical Water Supply Service Area (CWSSA) are required to have a water service area agreement that identifies the external boundary of their water service area. The Town of Hamilton was incorporated into the Skagit County Coordinated Water System Plan of 1999. The Town's current retail service area (including parcel # P41080) was approved by Skagit County.

Maps 3 & 4 -Town of Hamilton Water Service Area (See Appendix VIII)

2.10 Retail Service Area Policies

Retail service area Policies directly or indirectly affect the provision of water service to Hamilton customers. These defined policies have accumulated over the years and are designed to guide the growth of the system and establish how the Town will respond to requests for water service within the water system retail service area.

An extension of service must be in accordance with the Skagit County CWSP (1999). The cost of water distribution mains, fire hydrants, and a portion of the cost of general facilities will be paid for by the owners of the land that is being benefited. Additional details about system extension policies are described in Ordinance No. 297 (see Appendix II).

Conditions of Service address specific requirements that facilitate the implementation of the Town's service area policies. These conditions, which are formalized in the Ordinance, must be met prior to an applicant receiving water service.

The Hamilton water system is not interconnected in a manner to enable it to wheel water to other entities. There are no interties between the Hamilton water system and adjacent systems.

General Water Service Policies adopted by the Town are as follows:

General Facility charges- The Town has a nominal charge for new water service connections. This is discussed in Chapter 7 Financial Program.

Cost Recovery and Late Comers- Water system extensions constructed by a developer sometimes have the potential for other customers to connect for water service. The Town allows for the creation of a late comers/cost recovery contract with an eligible Developer who may construct a new water main across or along properties that are not involved with the Developer's work. New water customers that connect to the new water main may be subject to the late comer/cost recovery contract. These cost recovery contracts are subject to review by the Council, and equitable distribution of the costs and benefits of the proposed water main extension. Requests to create a late comer/cost recovery contract must be submitted by the Developer to the Town before construction begins, outlining the preliminary construction costs and plans. The Town will develop the final benefit area, cost allocation to properties, recording of the contract with the county clerk, hold a public meeting, and charge the Developer direct costs related to administration of the contract.

Surcharges for Water Service Outside of the Corporate Limits- The Town does levy a rate or fee surcharge against water customers outside of the Town's corporate limits.

New Construction Standards and Requirements - The Town's construction standards, as well as the Policies and Procedures for Developers, are presented in Chapter 8 of this document. Requirements for cross connection control devices, inspection, testing and new water services can be found in the Town of Hamilton Water Service Ordinance #297, provided in Appendix II.

Urban Growth Area- All of the Town system is within its own Urban Growth Area (UGA).

Wholesale and Wheeling Water Supplies

The Town does not maintain interties with neighboring systems; this precludes the possibility of buying, selling, or wheeling water. The Lyman water system is the closest municipal system, located approximately 4 miles west of Hamilton on the north bank of the Skagit River. Skagit County Water No. 1 (Birdsview Water System) is situated approximately one mile to the east of Hamilton's retail service area. The residential development of Shangri-La is a plat with 65 approved connections located along the north bank of the Skagit River just east of Hamilton. This community currently operates their own well, although flooding is a recurring problem. Punkin Center is a development located just north of Hamilton with 25 residential connections served by individual wells. The prospective Centennial Annexation development is located northeast of Hamilton. This area is currently undeveloped and without a water source. There are also several individual problematic wells located both within and outside of the Town retail service area boundaries.

The Town is open to regional planning efforts, and will consider actions that are consistent with State and regional goals, and those that protect the rate payers and customers of the Town, as well as the aquifer that it uses for supply.

Priorities for New Water Service- the Town's water source supply is limited by the water rights as delineated on page 3. The Town grants new water meters for individual new service and water connection and water facilities improvements for commercial and residential construction.

Town Financial Participation in Developer Extension- the Town may participate in cost sharing and contribution with a new Developer Extension which will convey the improvement to the Town for ownership and operation. The amount of participation by the Town will be based upon the proportion of benefit to the Town (such as pipeline over sizing) as well as the availability of Town funds and will be in accordance to the State Revised Code of Washington and Town procedures.

New Water Service Requests- the Town will consider all new water service requests from residents, property owners, or for parcels that are located within, or partially within, the Town's retail service area. The Town may consider new water service requests for parcels outside of the Town's retail service area if the request is consistent with the Town's policies, and consistent with county and regional agency policies, and adjacent utilities.

New water service will be reviewed for consistency with local land use plans and county development regulations. Issues of inconsistency or conflict will be referred to the applicant and the county for resolution before a water service request is processed.

New water service requests will be considered by the Council as well as other information when evaluating new water service request(s).

New water service is available to the extent of available, unallocated water rights for the new service. If the application for new water service exceeds the unallocated water rights for the Town's sources, the applicant must investigate a new water source supply and may be required to develop additional source capacity.

New water service will be subject to the policies and procedures of the Town, to the requirements for new construction, subject to payment of all fees, charges, and obtaining permits and water rights where applicable and construction of the required system improvements or new water mains.

Duty to Serve Requirements- the Town commits to provide water service to all new connections within the retail water service area when the circumstances meet the four threshold factors listed below:

1. The Town has sufficient capacity to serve water to the customer in a safe and reliable manner.
2. The proposed service request is consistent with adopted local plans and development regulations.
3. The Town has water rights capacity (or sufficiency) to serve the proposed service request.
4. The Town commits to provision of water (or deny availability of water supply) to the proposed service request in a timely and reasonable manner.

New water service will not be denied without cause and will be based upon the four threshold factors as listed above and compliance with the Town's development standards.

The appeals process established in the Skagit County Coordinated Water System Plan is available for use by applicants.

Annexation- the Town of Hamilton does not have a formal annexation policy. In practice, if properties are annexed, the annexed property owners pay the costs of expanding the water facilities. Connection fees are charged in addition to the cost of system expansion. (See Appendix II- Ordinance 297, Chapter 13.28) Annexation of properties is currently limited to properties within the retail water service area boundary.

Chapter 3:
Existing System

3.1 Introduction

The previous chapter described the areas served by the Town of Hamilton water system. This chapter will detail the system components and how water is supplied, distributed and stored.

The Town's system consists of a distribution grid and transmission mains along with two 290,000 gallon above ground concrete storage reservoirs. Water is provided to the system from one well that is controlled by the water level in the main storage tank. The system is divided into 2 pressure zones, #1 and #2, to provide acceptable working pressure at all elevations throughout the retail service area. The map #9 (See Appendix VIII) shows the Water System as well as the storage tanks and well location. The following sections inventory the system's existing facilities.

The Town's well source (SO2) is located on property that is owned by the Town.

3.2 Source

The Town obtains all of its water from one well within the study area. The wellhead protection plan for the Town is included in Appendix XIV. The existing well is currently capable of supplying the total authorized Q_a of 100.86 acre-feet per year for domestic/industrial usage and 36 acre-feet per year for the Little Carey's Mitigation Plan.

3.2.1 Well S02

The well was drilled in 1999, as an 8" diameter steel casing to a depth of 200.5 feet. There is a 20 foot segment of stainless steel "Johnson" brand Screen with a slot size 60. The Well static water level is at 83.3 feet below top of well. The well penetrates an aquifer that was test pumped under the supervision of Associated Earth Sciences (AES), who estimated that the well is capable of producing 525 gpm (AES's *Well Completion Report* is included in a September 1999 *Project Report Update for Water Production Facilities* produced by Wilson Engineering).

Picture 1- Well S02 in treatment house

Water rights have been issued for a total of 136 gpm, including 106 gpm for municipal purposes and 30 gpm for fish mitigation (Water Rights are enclosed as Appendix IV). A 10hp submersible pump capable of delivering 136 gpm has been installed. An automated control system restricts flow to the Town's distribution system 106 gpm; the balance of the flow is diverted to a mitigation tank adjacent to the Town's storage reservoir.

The Town holds water rights from one source as seen in the summary of this WSP. Well S01 is no longer in use, and its water rights have been transferred to Well S02.

3.2.2 Monitoring Well

A preliminary permit was issued by the Department of Ecology (DOE) to the Town in 1999 as part of the Change of Use application for Water Right Certificate G1-2003C. The purpose of the preliminary permit was to determine if water was available to transfer another Water Right Certificate to the new well and to estimate the impacts of that withdrawal to Little Carey's Creek. During drilling of the production well, a shallow unconfined aquifer was encountered and DOE required drilling of two monitoring wells (one shallow, one deep) as part of the preliminary permit to gather data for the aquifer test concerning the production well's influence on the Carey's Lake-Carey's Creek-Hamilton Slough drainage system.

No data was able to be gathered from the shallow well and it was abandoned. Monitoring of the deeper well was used to estimate the impacts of production well withdrawal. The data collected did indicate that the new well is recharged when production well pumping occurs. It was concluded that the leakage is likely being supplied by the shallow unconfined aquifer. Provisions attached to authorizing the October 2000 Change of Use of Certificate G1-2003C include using production well meter reading and monthly recording of the static water level (SWL) in the observation/monitoring well to analyze the impacts to Little Carey's Creek. The mitigation plan referred to in section 2.4 of this WSP Update was implemented based on this data.

The static water levels in the monitoring well have inadvertently not been collected since operator changeover in 2007. Hard copies, if ever printed, of data do not exist and all computer files were erased before handover to a new operator. No mention was made that there were such requirements, only instructions about the seasonal use of the mitigation tank and stream weir readings.

The data logging function has not been attached to the monitoring well since early 2008. Discovery of the data logging software was made in 2013. Re-connecting the electronics and monthly monitoring of the SWL and weir levels is the top priority for the Town.

Detailed well logs can be found in Appendix XVII.

3.3 Water Quality

The Town of Hamilton Water system monitors the system's water quality in accordance with Washington State Department of Health (DOH) requirements and consistently meets or exceeds all testing criteria for primary contaminants. The Safe Drinking Water Act (SDWA) and its amendments have increased the monitoring requirements to include trihalomethanes, radionuclides, and Volatile and Synthetic Organic Compounds. The Town used chlorination and pressure filtration for treatment of iron and manganese from well SO2 until October 2010.

Additional bacteriological analyses of non-treated water from the well are underway to provide data in support of eliminating the need for chlorination now that the filtration system has been disabled. These analyses of "raw" water show no contamination to date.

3.3.1 Radionuclides

The Town sources are in compliance with federal radionuclide maximum contaminant criteria. Testing is done every 3 years and the last testing was in September 2010. See laboratory results in Appendix XV.

3.3.2 Volatile Organic Chemicals

Testing is done every 3 years and the last testing was in September 2012. Since sampling began, none of the regulated chemicals have been detected. See laboratory results in the Appendix XV.

3.3.3 EDB & other fumigants

The last testing was in September 2010. Since sampling began, none of the regulated chemicals have been detected. See laboratory results in the Appendix XV.

3.3.4 General SOC's

State waiver for general SOC's.

3.3.5 Herbicides, Insecticides, & general pesticides.

The last testing was in October 2005. Since sampling began, none of the regulated chemicals have been detected. See laboratory results in the Appendix XV.

3.3.6 Asbestos

The Town distribution piping has asbestos cement walled pipe in use. Results of samples taken were within maximum contaminant levels and were last tested in August of 2009. See laboratory results in the Appendix XV.

The Town is expecting to replace the last sections of asbestos cement pipe in use in the near future (see chapter 6 for more details)

3.3.7 Inorganic Compounds

State guidelines require that the source water is tested for IOC's once every three years. The Well source has high levels of manganese that were initially filtered to meet state DOH recommended levels for secondary contaminants. Manganese is classified as secondary and does not pose a risk to the health of those who drink the water. IOC's were last tested in September of 2007. The Town received a waiver in 2010. Next testing is due in September 2013. See laboratory results in the Appendix XV.

3.3.8 Nitrates

Nitrate testing is due each year. The last test for nitrates was in September 2012. Since sampling began, none of the regulated chemicals have been detected. See laboratory results in the Appendix XV.

3.3.9 Lead and Copper

The Town completed both initial rounds of lead and copper sampling in accordance with the EPA regulations. They were within maximum contaminant levels and were last tested in December of 2010. A copy of the Lead & Copper Monitoring Plan and several test results are provided in the Appendix X.

3.3.10 Bacteriological

Samples taken for coliform bacteria are collected at several sites throughout the system monthly. A copy of the Coliform Monitoring Plan and several test results are provided in the Appendix X.

3.3.11 Total Trihalomethanes and Halo Acetic Acid 5s

The Town is required to monitor the disinfection byproducts in the water following the Disinfection Byproducts Monitoring Plan found in Appendix X. Since sampling began none of the regulated chemicals have exceeded the maximum contaminant levels and were last tested in July of 2012. See last laboratory results in the Appendix X.

3.4 Source Treatment

Picture 2 - Treatment house

3.4.1 Disinfection

Well SO2 is treated with sodium hypochlorite to prevent microbial contamination. Sodium hypochlorite is first added to the water in the treatment house before entering the reservoirs and then added through a flow-proportional post chlorination system on the discharge side of the reservoirs to ensure that a free chlorine residual of at least 0.20 mg/L is maintained in the distribution system
See DOH Ground Water Treatment Plant Reports for 2012 in Appendix XVI.

3.4.2 Iron and Manganese Treatment

In 2009 the Mayor asked the DOH staff to assist with exploring options to reduce the exorbitant cost to the Town for operation and treatment. The DOH Engineer for Skagit County and the Town made an agreement to monitor manganese levels in both the raw (untreated) water and the finished (treated) water for 1 year. Based on the data collected and customer input, on October 13, 2010 the Town Council voted to discontinue operation of the manganese greensand filtration equipment, thereby saving the Town approximately $30,000 per year in Operator/operations costs.

Although the source is currently not treated for removal of iron and manganese, the equipment is kept available for use should the Town decide the filtration process is necessary. When the

equipment is in use, the iron and manganese is oxidized with hypochlorite followed by pressure filters.

The treatment process uses two-30-inch diameter pressure filters assembled in a parallel process train. The treatment equipment is housed in the Town's control facility, which is a cement block building at the well site with the dimensions of: 24 feet wide by 30 feet long.

Sediments in the backwash water from the filters are allowed to settle out in a 4,000 gallon reservoir located in the treatment house and the water is recycled to the treatment system. Backwash solids are disposed outdoors into a concrete evaporation basin.

3.5 Distribution and Pressure Zones

Since the Town's well is not located within the distribution grid, there is approximately 3,800 lf of a dedicated transmission main. Distribution pipes throughout the system have service connections. The system is comprised primarily of 16", 12" 8", 6" and 4" pipe. Copies of the distribution system easements are attached in Appendix III. A copy of the Skagit County Franchise for operating the utility system within County rights of way is included in Appendix XXI.

The Town has the following water main sizes and footages:

4" PVC	1,700 linear feet (lf)
4" Asbestos Cement	2,700 lf
6" PVC	800 lf
8" PVC	8,700 lf
12" PVC	6,000 lf
16" PVC	3,800 lf

Total length of existing Water Mains is approximately 4.5 miles.

The system also includes19 fire hydrants (not including the private fire hydrants located on the Janicki property), 9 blow offs, and approximately 10 water main valves.

3.5.1 Proposed Pipelines

There are a few future projects that include installation of pipelines in the Town retail service area. The proposed pipelines are as follows:

- ✓ Replacement of asbestos cement pipe along Cumberland Street (6-year planning period): Approximately 1,550 lf of 8" PVC
- ✓ Replacement of aging pipe along Nolle Ave & creation of a loop (20-year planning periods): Approximately 2,000 lf of 8" PVC
- ✓ 8-inch water main looping along California, Maple and Petit Street (20-year planning period): Approximately 1,000 lf of 8" PVC

The amount of installed pipeline may vary, depending upon the order of completion.

All water sold is metered at its point of use. There are the following meters in the system:
(115) 3/4" residential meters
(6) ¾" commercial meters
(2) 1-1/2" commercial meters
(1) 2" commercial meter

Note: RV parks are equipped with meters. Individual RV connections are not individually metered.

See updated Water Facility Inventory (WFI) form in Appendix I (signed by Kathleen "Cas" Hancock, the certified water operator of the system)

3.5.2 Pressure Zones

The system operates on gravity flow from the two main 290,000 gallon reservoirs located at the well site: Pressure zone 1 serves elevation areas above elevation 120' foot north of SR20. Maximum water pressure in the zone is approximately 78 psi.
Pressure zone 2 serves areas below 120' elevation. Pressure ranges from 58 psi to 69 psi at 90 foot contour when the storage reservoirs are completely full.

The 12" PRV station is recommended to be relocated south of State Route 20 between the 16" diameter Janicki waterline and the 8" Bella Street connections so that the full head in the reservoirs would be available for fire flow for the Janicki plant. See chapter 4 for more details.

See Map 9 - Water System Map in Appendix VIII for main sizes and infrastructure locations.

Table 1.3 -- Pressure Zones

Zone 1	300' HGL	Shiloh Lane	Gravity Service from Reservoirs.
Zone 2	250' HGL	Reduced Zone (includes Janicki Property) (1)	Pressure Reduced Service from Zone 1 Reservoirs

(1) The Janicki property will switch from zone 2 to zone 1 once the PRV station is relocated from north to south of Highway 20 after the Janicki 16" pipeline connection. Individual PRVs may be required along the 16" pipe to keep the water pressure below 80 psi.

3.6 Storage

Storage is provided to the system by two 290,000-gallon Mount Baker cast in place concrete reservoir tanks located next to the well. The control facility, treatment system, and one reservoir were constructed in 2002. The second reservoir was constructed in 2008. The reservoirs are 55' high and 30' in diameter.

Total water storage capacity is 580,000 gallons. Well S02 fills the reservoirs.

Picture 3 – Treatment house and concrete reservoirs

3.7 Control/Telemetry

The main distribution reservoirs at the treatment facility site are filled by operation of well S02. The well pump is controlled by level sensors.
Control panel at the treatment house shows:

- Level of water in reservoirs
- If chlorination injectors are malfunctioning

The dialer at the treatment house is currently out of order and is expected to be replaced in 2013.

3.8 Operation & Maintenance Schedule

The Operation & Maintenance Schedule is provided in Appendix XXIII.

Chapter 4:
System Analysis

4.1 Introduction

This chapter describes the types of customers the Town of Hamilton Water Department serves and their historical water usage patterns.

4.2 Water Usage

The population projections presented in Chapter 2 will be used in this analysis.

The system serves primarily residential users. Commercial use is limited to 9 businesses at this time. Water use by Town residents shows seasonal variations. Water use is generally higher in the summer months due to outside water use and seasonal use by RV park visitors.

4.3 Historical and Existing Demands

The Hamilton water system is a completely metered system. As of September 2012, Hamilton serves 124 metered accounts. This is composed of:

- 109 residential meters serving 109 residences (109 ERUs)
- 6 residential meters serving 22 RV users (11 ERUs) (For purposes of this analysis, each RV is estimated to represent 0.5 ERU).
- 9 commercial meters serving 9 commercial users.

Water usage records for the past 3 years were reviewed to obtain historical data on water system usage. (See exhibit IX for detailed water usage records)

The first step was to evaluate the non-residential water usage in order to determine the total number of ERUs served by the water system.

Table 4.3.1 – Number of ERUs served by system

Year	water usage for ¾" residential water meters (gallons)	Resid. Connec.	RVs served by ¾" residential meters	Total ERUs served by ¾" residential meters	ADD for resid. connec. (without water losses) **(1)**	Total water usage – Connection meter readings (gallons)	Total number of ERUs served by water system	Non-Residential ERUs **(2)**
9/1/09-8/31/10	6,584,203	109	22	120	150	8,723,670	159	39
9/1/10-8/31/11	6,111,399	109	22	120	140	8,436,080 **(3)**	166	46
9/1/11-8/31/12	5,525,379	109	22	120	126	6,847,543	149	29

Notes:

(1) Calculations in table 4.3.1 are based on the connection water meter readings. The calculated Average Day Demand for the residential connections (ADD) does not take into account water losses in the water system.

(2) Non-Residential ERUs = Total number of ERUs served– Number of Residential ERUs

(3) Water usage lowered by approximately 800,000 gallons to take into account a large leak located after one of the ¾" commercial meters.

As of August 2012, the Town had 9 active non-residential connections serving a total of 34 ERUs. 2012 water usage readings are available for these connections, as summarized in table 4.3.2.

Table 4.3.2 – Non-Residential Water Use Summary for 2012.

Meter type		Water Usage (gallons) (9/1/11 to 8/31/12)	Total number of ERUs served per size of water meter **(2)**
¾" commercial (6 meters)	Bank building	190,187	4
	Bar/Lounge		
	Restaurant / Store		
	Post Office		
	Frontier Telephone Building		
	Unimin Plant **(1)**		
	Lumber Shop		
1-½" commercial (2 meters)	Janicki Lumber	467,979	10
	Skagit Ready-Mix		
2" commercial	Janicki Plant	664,000	15
Total of non-residential ERUs			**29**

Notes:
(1) Closed since May 2012
(2) ERU = Water Usage/(Residential ADD*366) = Water Usage/(123 gpd * 366 days)

The Average Day Demand (ADD) and Maximum Day Demand (MDD) were determined using data collected from the source and connection meters and are summarized in Table 4.3.3.

Table 4.3.3 – Water Usage

Year	Annual Gal. Pumped from well S02	Annual metered Cons. (gallons)	Annual Unaccounted / loss (gallons)	ADD (gal/day/ERU) (include water losses in water system)	MMAD- Max month average day (gal/day/ERU) (include water losses in water system)	MDD/ERU Calculated via 1.7 x MMAD (gal/day)
9/1/09-8/31/10	19,888,800	8,723,670	11,165,130	343	434	737
9/1/10-8/31/11	21,359,220	8,436,080	12,923,140	353	371	631
9/1/11-8/31/12	11,999,300 **(1)**	6,847,543	5,151,757	220	185 **(2)**	314
Design				**290 (3)**		**475 (3)**

Notes:

1. The Town's annual water usage has been reduced from 21,359,220 gallons in 2011 to 11,999,300 gallons in 2012 while the number and type of connections were staying approximately the same (a 44% reduction in water use). This significant reduction in demand is a result of the following aggressive efforts to save water:
    - ✓ Find and repair leaks (Professional leak detection serviced the entire system in December 2011 - Survey Report in provided in Appendix XIX)
    - ✓ The PRV reduces excessive pressure in the older portion of the distribution system
    - ✓ Installation of meters on all service connections (RV parks have a master meter, individual RVs are not metered),
    - ✓ Implementation of an increasing block rate structure intended to encourage conservation
    - ✓ Repair of leaks on private property
    - ✓ Distribution of water conservation materials.

    The annual volume of water pumped from the well is expected to decrease even more once we have a full year of data with the upgraded distribution system.

2. Most of the leaks were repaired by the end of March 2012, leading to a substantial decrease of volume of water pumped from the well starting in April 2012. The Town has decided to use the month of August 2012 to calculate the MMAD for 2012 even if all the monthly water usages between September 2011 and March 2012 were higher because of the leaks (August was the month with the highest water usage in 2010 and 2011)

3. Using current information, it appears that an Average Daily Demand of 290 gpd / ERU and a Maximum Daily Demand of 475 gpd / ERU are reasonable for future water usage projections (average of 2011 and 2012 figures). We understand that these numbers are very conservative as they are partially based on water usage readings dated before April 2012 (period of high leakage). These numbers should be updated for the next Water System Plan cycle or when the Town needs more approved connections with at least 2 full years of meter readings using the upgraded water system.

The use of these numbers would allow the system to serve additional connections; however a request for increased ERUs is not the purpose of this Water System Plan, nor is the Town seeking additional water rights at this time.

4.4 Water System Future Demands

The approach used to calculate the projected system demand was first to determine the demand per connection for average and peak days. Based on historical usage, the system is expected to increase by 1 new residential connection per year over the next 20 years. Janicki plant is expected to reach full development within the next 6 years (to 30 ERUs). Future water use per ERU is expected to decrease if the Town goes on with its water conservation efforts. The ADD and MDD values should be updated after 2 full years of meter readings using the upgraded water system.

<u>Average Day and Maximum Day Demands</u>

ADD= 290 gpd/ERU MDD= 475 gpd/ERU

Both numbers include water leakage.

Peak Hour Demands (PHD)

As water meters are not read daily, the Peak Hourly Demands are not recorded by the utility. To calculate them, Garrison Engineering used Equation 5-1 from the WSDOH Design Manual.
PHD = (MDD/1440) [(C)(N) + F] + 18 (Equation 5-1 of WSDOH Design Manual)

Where PHD = Peak Hourly Demand, (gallons per minute)
C = Coefficient associated with ranges of ERUs
N = Number of ERUs
F = Factor associated with ranges of ERUs
MDD = Maximum Day Demand, (gpd/ERU)

Table 1.3.2– Coefficients

Number of ERUs (N)	C	F
15-50	3.0	0
51-100	2.5	25
101-250	2	75
251-500	1.8	125
>500	1.6	225

The calculated Peak hour demand for the year 2011/2012, 2018, and 2032 is:
$PHD_{2011/2012}$ = 100 gpm
PHD_{2018} = 155 gpm
PHD_{2032} = 164 gpm

Annual Water Usage
Expanding the annual water usage and projected increase in new connections, the annual water usages are developed to the year 2018 as well as out to the year 2032.

Table 4.4.1 – Summary of Water Demands

	2011/2012	2018 6-year Planning	2032 20-year Planning
Maximum Day Demand (MDD)	46,786 gpd	80,750 gpd	87,400 gpd
Total Annual Water Usage	11,997,480 gal/yr (36.8 acre-feet per year)	18,043,800 gal/yr (55.4 acre-feet per year)	19,529,760 gal/yr (59.9 acre-feet per year)
Average Day Demand/ERU (ADD/ERU)	220 gpd	290 gpd	290 gpd
Max Day Demand/ERU (MDD/ERU)	314 gpd	475 gpd	475 gpd
Peak Hour Demand (PHD)	100 gpm	155 gpm	164 gpm
# ERUs	149	170	184

4.5 Supply

The primary supply consideration is that the well and pumps, in coordination with the reservoirs, are able to meet the System's peak hour and peak day demands.

There are several factors to consider when calculating what the source capacity will be. They include the following:

- **Replenishing Depleted Fire Suppression**

For reliability purposes, supply sources should also be able to replenish depleted fire suppression storage within 72 hours while concurrently supplying the MDD of the water system (Chapter 7.1 of the WSDOH Water System Design Manual). To be clear, it means that if a fire were to occur during the summer (when the regular water demand is the highest), the Fire Flow Suppression Storage of 60,000 gallons protecting the Town should be replenished within 72 hours (FSS protecting the Janicki site is not included in our calculations). This is to help prevent running out of water if, for example, a second fire happens soon after the first one.

Water flow required to replenish depleted fire suppression storage within 3 days = FSS (Town) / (3 days) = 60,000 / (1440 x3) = 13.9 gpm.

- **Distribution System Leakage**

ADD and MDD values include distribution system leakage.

- **Water Right limits**

The maximum annual volume to be pumped from the wells shall not be over the Water Rights limits as explained in table on page 3 (ADD criteria)

The sources for a water system must be able to meet the water system's Maximum Day Demand (MDD) (WAC 246-290-222(4)). (MDD criteria)

Thus, the source capacity will be:

Source Capacity – MDD criteria= ((Qs-13.9) x 1440 minutes) / (MDD) = (106-13.9) x 1440 / 475 = 279 ERU's

Source Capacity – ADD criteria= Qa / (ADD x 365 days) = 32,865,375 / (290 x 365) = 310 ERU's

Where Qs = Maximum Instantaneous Flow rate from well S02, (gallons per minute)
Qa = Maximum Annual Volume (gallons)
MDD = Maximum Day Demand, (gpd/ERU)
ADD = Average Day Demand, (gpd/ERU)

Source Capacity – MDD criteria= 279 ERU's
Source Capacity – ADD criteria= 310 ERU's

Thus, the source is capable of the lower of the two methods or 279 ERUs.

Based on the growth projections in Chapter 2, the existing supply would meet all system demands through the year 2032.

- **Redundancy**

The Town has one well, 2 reservoirs and a partially looped distribution system. We recommend that the Town begin planning for a second source of supply. With only one well, the Town & Janicki Industries have some risk of running out of water if/when the well pump or well itself fails. At a minimum, we recommend purchasing a 10hp replacement well pump to have on hand for back-up. Additionally, the Town should budget for the development of a 2nd source.

The system's water supply characteristics can best be summarized as:

- ground water source
- a limited, finite water supply
- requires careful management to preserve both quality and quantity

The Town has implemented a management plan for the protection of the existing ground water supply.

4.6 Water Quality Issues

Issues of concern include manganese removal, Disinfection By-Products, SDWA amendments, and wellhead protection. The following is a discussion of the approach and criteria for each:

The inorganic quality meets DOH requirements and the bacteriological tests regularly show lack of any contamination. The Town's Water Quality Monitoring Schedule, Coliform Monitoring Plan, Disinfection By-Products Monitoring Plan, and Lead and Copper Monitoring Plan are attached in Appendix X.

4.6.1 Wellhead Protection

Since the Town obtains all of its water from the well, protection of the source aquifer is critical to the long term viability of the system. The Town has prepared a wellhead protection plan (see Appendix XIV) and implemented the initial public education phase of the program in 1999.

4.6.2 Safe Drinking Water Act

All required tests have been completed and the Town is in compliance with all requirements.

4.6.3 Manganese

Water from the well showed elevated levels of manganese. Chlorination with sodium hypochlorite followed by manganese greensand filtration (106 gpm capacity) was originally provided. In 2009 the Mayor asked the DOH staff to assist with exploring options to reduce the exorbitant cost to the Town for operation and treatment. The DOH Engineer for Skagit County and the Town made an agreement to monitor manganese levels in both the raw (untreated) water and the finished (treated) water for 1 year (see Appendix XI). Based on the data collected and customer input, on October 13, 2010 the Town Council voted to discontinue operation of the manganese greensand filtration equipment, thereby saving the Town approximately $30,000 per year in Operator/operations costs. Prior to discontinuing the filtration system operation, sediments in the backwash water from the filters were allowed to settle out, and the water was recycled to the

treatment system. The greensand filters are currently backwashed monthly to prevent any accumulation of bacteria in the filter media. The filters may be re-activated in the future if the raw water manganese levels rise again.

A sufficient dosage of chlorine is still added ahead of the storage system to oxidize the iron and manganese and carry a residual through the reservoirs; and an additional dose of chlorine is added as the water enters the transmission line to carry the residual to the extreme ends of the distribution system.

4.7 Power Supply

The Town is dependent upon electrical power to pump water and the system vulnerability to power outages is considered moderate. Water is supplied to the system from the storage tanks by gravity, so short term outages do not impact the users; however, historically, the area has been without power for as long as eight days. A 25 kW Kohler propane generator is installed near the treatment facility as a back-up to run the controls and the well pump in case of a power outage. The generator automatically starts every Tuesday for 15 minutes (self-testing) to be sure it is operational.

4.8 Control

The current automatic system provides the Town with efficient and effective control of the chlorine injectors and well production. The pump switches are set such that the tanks remain nearly full at all times (to 50'). Keeping the tanks full provides excess standby storage and helps maintain system pressures in all areas.

The control system for the filters has been temporarily disabled and can be enabled quickly if the Town decided to re-instate operation of the filtration equipment. The operator currently manually activates the infrequent backwash cycles for the filters.

4.9 Distribution System Requirements

The criteria used to determine the adequacy of the existing distribution system is based upon facilities designed to assure that pressure meets the Town distribution standard. During peak flow conditions, the pressure at each meter should be approximately 60 psi, and in no case lower than 30 psi. The distribution system must also be able to deliver the required fire flow during peak demand conditions at a minimum residual of 20 psi.

A general rule in system design is that a looped system comprised of moderately sized mains providing multiple (or alternate) routes to any area is much more reliable and efficient than a system comprised of a few large mains. A looped system also increases circulation of the water, which minimizes poor water quality associated with stagnant water. The Town is currently implementing replacement of aging distribution system piping and is incorporating looping segments within the project.

The current design standards, the Town's Standard Specifications for Developer Extensions and the Town's Water Policies are included in the Town Services Ordinance No. 297 in Appendix II.

4.10 Hydraulic Evaluation

4.10.1 Scenarios

The existing water system was modeled using 2010 KY Pipe hydraulic modeling software to examine the system performance during peak hour consumptive demands, and also during fire flow conditions. Elevations are based on different previous documents by others and on Google Earth. Four scenarios regarding water use were analyzed. Please see below for more details on each scenario.
For all the scenarios, we have made the following assumptions:

- The model of the main Cla-val PRV is unknown. The Cv factor of 810 has been estimated based on manufacturer specification sheets for similar models.
- All scenarios have been simulated with current development and water usage

Scenario #1:
Simulation of a fire event at the Janicki site with the main PRV station at its current location (north of SR20). A demand of 2,850 gpm has been added on fire hydrant J-4 in addition to the 100 gpm representing the Peak Hour Demand (PHD). The water level in the reservoirs is at elevation 265.5' (Bottom of Fss for Janicki)

Scenario #2:
During PHD with the main PRV station relocated south of SR20.
The reservoir is full, with a water level at elevation 300'.

Scenario #3:
Simulation of a fire event at the Janicki site with the main PRV station relocated south of SR20.
A demand of 2,850 gpm has been added on fire hydrant J-4 in addition to the 100 gpm representing the PHD. The water level in the reservoirs is at elevation 265.5' (Bottom of Fss for Janicki)

Scenario #4:
Simulation of a fire event on California Street with the main PRV station relocated south of SR20.
A demand of 1,000 gpm has been added on fire hydrant J-6 in addition to the 100 gpm representing the PHD. The water level in the reservoirs is at elevation 292.3' (Bottom of Fss for the Town)

Figure 8 - Storage Elevations (See Appendix VIII)

4.10.2 Model Results & Analysis

1. <u>Fire event at Janicki Plant:</u>

Scenario #1 (main PRV station at its current location):

A demand of 2,850 gpm has been added on fire hydrant J-4 in addition to the 100 gpm representing the PHD. The pressures along the 16" diameter main are between 12 and 16 psi. The pressure at the fire hydrant J-4 itself is approximately 10 psi which is well below the minimum required pressure of 20 psi.

Simulation shows that the pressure drop through the PRV station is approximately 13 psi. This report recommends relocating the PRV from the north side of SR 20 to the south side of SR 20 so

that the full head in the reservoirs would be available for fire flow for the Janicki plant. See scenario #3 below and chapter 6 for more details.

Note: The fire hydrants at the Janicki plant area are currently capable of approximately 2,500 gpm with minimum calculated pressure above 20 psi. See hydraulic analysis in Appendix XIII for more details.

Scenario #3: (main PRV station relocated south of SR20):

Fire hydrants at Janicki plant are all capable of at least 2,850 gpm with minimum calculated pressure above 20 psi. The maximum water velocity is approximately 8.4 ft/s under fire flow conditions.

2. Normal operations:

Scenario #2 (main PRV station relocated south of SR20)

During Peak Hourly Demand (PHD) with the main PRV station relocated south of SR20.
The minimum pressure in the system will be approximately 56 psi under normal operations.
The maximum pressure in the system will be approximately 82 psi under normal operations. All connections upstream of the main PRV station and below 115 feet should have PRV's installed at their meters to keep operational pressure under 80 psi.

3. Fire Event in the Town:

Scenario #4 (main PRV station relocated south of SR20)

The pressure at the fire hydrant J-6 is approximately 26.2 psi.

Fire conditions have been simulated at all the other hydrants in the Town and they are all capable of at least 1,000 gpm with minimum calculated pressure above 20 psi. Maximum water velocity is approximately 6.8 ft/s under fire flow conditions.

A copy of the KY Pipe model input and output files are attached in the Appendix XIII.

4.11 Water Loss

Distribution System Leakage (DSL) or water losses in the distribution system can be estimated by comparing records of volumes of water pumped, all authorized consumption, metered water treatment process water uses, and water sold. Table 4.3.3 summarizes the results of the water loss for 2010, 2011 and 2012.

The Town installed water meters on all customer connections in 2006. Prior to 2006, there were no customer water meters and water use and losses were estimated. Customers paid a flat rate water charge prior to the year 2006.

After meters were installed, the years 2006 through 2011 observed very high water losses or distribution system leakage. Acoustical leak detection service in December 2011 and aging pipeline/service line repairs in 2012 have significantly reduced the overall leakage rate. The Town monitors water usage records monthly to identify overall water usage and for distribution system leakage. Monthly DSL reports for 2011 and 2012 are included in Appendix XIX. This monitoring and evaluation effort is on-going.

4.12 Storage

4.12.1 Total Storage Capacity

The reservoirs are 30' Ø x 55' tall for a total capacity of 580,000 gallons. The tanks are filled to a maximum of 50'. Thus, the total storage capacity (TS) will be approximately 527,272 gallons.
TS = 527,272 gallons.

The State Department of Health requires that all four storage elements be added together to calculate the total storage. Minimum design standards specify that the storage facility be sized to provide for the larger of standby storage or fire storage plus equalizing storage. The total storage (TS) requirement is also further modified by the Skagit County Coordinated Water System Plan to allow nesting of the fire suppression and standby storage volumes.
Therefore, since FSS can be nested within storage volume, the larger of the two components (SB or FSS) is used to determine the TS.

TS = DS + OS + ES + (the larger of either SB or Fss)

Where: DS: Dead Storage
OS: Operational Storage
ES: Equalizing Storage
Fss: Fire Suppression Storage
SB: Standby Storage

4.12.2 Dead Storage

Dead Storage (DS) is the volume of stored water not available to all consumers at the minimum design pressure (WAC 246-290-230(5) & (6))

The highest connection served by the system is at 170' of elevation and the highest fire hydrant served is at 130' of elevation. The tank floor is at elevation 250 feet. The outlet pipe is going through the floor of the reservoir and has a 4" silt stop. With a minimum water level of 251 feet, the minimum pressure will be approximately 52 Psi at the highest hydrant and 35 Psi at the highest connection which meets DOH requirements for distribution system pressure.
DS = 10,545 gallons.

4.12.3 Operational Storage

The top 2 feet of the reservoirs is the operational swing between pumps off and call for the well on. This result is a total operational storage of 21,090 gallons.
OS = 21,090 gallons

4.12.4 Equalizing Storage

Equalizing storage must be provided for when the source pumping capacity cannot meet the periodic demands placed on the water system. Over a 24 hour period the supply and demand volumes should equalize. The volume of equalizing storage needed depends upon several factors including peak system demand, diurnal variation in system demand and the source production rate. Detailed daily variations in demand are not known for this water system.

Equalizing Storage is determined in accordance with the DOH Design Manual using Equation 9-1.

ES = (PHD-Qs) x (150 minutes), but in no case less than zero.

The ES equation compares the PHD with the source capacity. If PHD exceeds the source capacity (Q_s), then an allocation of storage volume is made. The ES value has been calculated for the design years 2012, 2018, and 2032 which represents the current, 6-year, and 20-year design periods.
The total Q from the well is 106 gpm. Peak Hour Demands (PHD) from Table # 4.4.1 (Page 32) are: PHD 2012 = 100 gpm, PHD 2018 = 155 gpm, & PHD 2032 = 164 gpm
ES_{2012} = 0 gallons
ES_{2018} = 7,350 gallons
ES_{2032} = 8,700 gallons

4.12.5 Fire Suppression Storage

Reserve storage for firefighting is necessary to provide large volumes of water for fire flow without disrupting service to customers. The fire flow requirements for the Town of Hamilton per Skagit County Code are the following:

FF Storage for residential within UGA 1,000-gpm for 60 minute = 60,000 gallons
FF Storage for Janicki Plant 2,850-gpm for 120 minutes = 342,000 gallons
Fss = 342,000 gallons

4.12.6 Standby Storage

Standby Storage is reserved to provide a measure of reliability should the well sources fail or if extreme water demands are experienced.

Skagit County Coordinated Water System Plan allows consolidating standby and fire suppression storage which means that the Town can exclude the SB or FSS component, whichever is smaller, from the water system's total storage requirement.

SB = TS-OS-DS- ES

Thus, the standby storage available per ERU for the current, 6-year, and 20-year design periods are:

2012	SB (gallons)	ERUs served	SB Gallons / ERU / day for 2 days
2012	495,637	149	1,663
2018	488,287	170	1,436
2032	486,937	184	1,323
Sometime after 2032	477,787	279 (maximum source capacity)	856

Table 4.12 - Summary of storage requirements (in gallons)

Year	**2012**	**2018**	**2032**
Operational Storage (OS)	21,090	21,090	21,090
Equalizing (ES)	0	7,350	8,700
Standby (SB)	495,637	488,287	486,937
Fire Suppression (Fss)	342,000*	342,000*	342,000*
Dead Storage (DS)	10,545	10,545	10,545
Total (TS)	527,272	527,272	527,272

*Skagit County Coordinated Water System Plan allows consolidating standby and fire suppression storage which means that the Town can exclude the SB or FSS component, whichever is smaller, from the water system's total storage requirement.

4.13 Review of Source, Storage and ERU Capability

The existing water storage facility has sufficient capacity to serve the system through the 6 and 20-year planning periods. The ERU capability is summarized against the following components of the water system:

Source Capacity – ADD criteria = 310 ERU's
Source Capacity – MDD criteria= 279ERU's
Storage Capacity > 279 ERUs

Chapter 5
Water Conservation Plan, Water Use Efficiency Program & Water Rights Analysis

5.1 Introduction

The Town recognizes that water is a valuable and essential natural resource that needs to be used wisely. This water conservation plan provides an approach to increase water use efficiency within the Town's retail water service area.

5.2 Background

5.2.1 State Conservation Planning Requirements

The Conservation Planning Requirements published by the State Department of Ecology (Ecology) and State Department of Health (DOH) in March 1994 and 2009 Update, identify the water use reporting, forecasting, and conservation program requirements for public water systems. A water conservation plan meeting these requirements is a necessary element of a Water System Plan as required by DOH and is necessary to obtain water rights permits from Ecology. The *Conservation Planning Requirements* defines the necessary components of a water conservation plan as (1) water use data collection, (2) water demand forecasting, and (3) water conservation program. The planning requires the water conservation program to identify its goals and objectives, evaluate alternative conservation measures, and identify the selected measures including their schedule, cost, monitoring requirements, and estimated water savings.

5.3 Water Conservation Program

As described above, the three elements of a water conservation plan are water use data collection, demand forecasting, and the conservation program. The water use data and system-wide demand forecasts are contained in Chapter 4 of the Town's Comprehensive Water System Plan, and the conservation program is presented here. The Town will continue to collect water use data for evaluation of its conservation program and water use patterns, and for forecasting demands for future facility requirements. The following program includes a statement of the goals and objectives, an evaluation and selection of alternative conservation measures, the conservation program schedule and budget, and the method of program monitoring.

The Town's Emergency Response Plan is found in Appendix XII. (Includes Water Shortage Response Plan)

5.3.1 Conservation Program Goals and Objectives

The goals and objectives of this water conservation program consist of:

- Increase awareness among all water users of the value and importance of conserving water and of the methods available to achieve reductions in water use.
- Reduce overall system withdrawal from the well.

The Town will achieve these goals and objectives through the implementation of the water conservation program that follows.

5.3.2 Evaluation and Selection of Alternative Conservation Measures

The Town's evaluation of conservation measures and selected levels of implementation are presented below.

Public Education

School Outreach - This conservation measure is only required for larger systems. This measure requires educational programs that increase awareness of local water resources and encourage water conservation.

Speakers Bureau

This conservation measure is described in the Conservation Planning Requirements as "Seeking speaking opportunities and making speakers available to a wide cross-section of services, community and other groups."

The Town will encourage and make information available about upcoming water conservation speakers or meetings to their customers. As resources allow, the Town will strive to schedule speakers for their monthly Council meetings to discuss water conservation measures and benefits.

Program Promotion

This conservation measure is a required element of all water conservation programs. The planning requirements provide the following definition for this measure: "Publicize the need for water conservation through television and radio public service announcements, news articles, public water systems' bill inserts, or other means. This includes promoting efficient indoor and outdoor water usage, distribution of conservation brochures, informing customers, builders and contractors of new plumbing code regulations requiring efficient plumbing fixtures, and other efforts."

The Town includes conservation brochures in water bills at the beginning of summer, which includes lawn watering calendars, and conservation tips. The Town also includes tips on water conservation and phone numbers for other conservation resources in the annual Consumer Confidence Report. See Appendix XX for the 2012 Consumer Confidence Report and for some samples of conservation brochures.

Theme Shows and Fairs

This measure requires that a portable display be made, along with educational materials to be exhibited at local fairs and theme shows.

The Town will evaluate opportunities for more public education.

5.3.3 Technical Assistance

Purveyor Assistance

This item is described in the planning requirements as "assistance from wholesale suppliers to aide wholesale customers in developing and implementing conservation programs tailored to their needs, and in carrying out the wholesale suppliers' conservation program."

The Town does not have any current wholesale customers.

Customer Assistance

This measure is described as the utility providing "assistance and information to customers which facilitates water conservation." A great deal of the information on water conservation will be disseminated to customers in the distribution brochures and mailings described above under "program promotion".

The Town will continue to have lawn watering tips, informational brochures and other conservation information available at their monthly Council meeting.

Technical Studies

This measure requires that "Studies would be designed and conducted by the public water system and/or regional organization."

The Town will utilize studies conducted by larger water systems such as the Skagit County PUD #1. These studies will be used to evaluate the latest water conservation techniques applicable to the Town's water system and how they can best be implemented.

Bill Showing Consumption History

According to this conservation plan requirement, water billing should display a comparison of current water use with the past use from the same period of the previous year, and show a percent increase or decrease.

The Town will explore implementing water bills that show the previous meter reading, current meter reading, usage in gallons, average daily use and usage for the same period last year for comparison.

5.3.4 System Measures

Source Meters

Metering of all sources is required for all water systems.

The Town's source is currently equipped with a meter and the readings are recorded five days per week. The meters are periodically tested and repaired or replaced, as necessary.

Meters are installed on the water treatment plant backwash and rinse drain lines to monitor process water used by the treatment equipment for filter backwash and rinse.

Service Meters

All of the system's service connections are metered, with installation having occurred in 2006. All new services will be metered.

The Town has already begun water conservation and leakage reduction efforts by:

- Installing water meters on all services in 2006

- New water meters with remote read or radio read technology will be considered when Town funding allows
- Performing leak repairs as leaks are identified

The Town experienced a running average of approximately 65.9% percent leakage/lost water for the years 2009 through 2011. This is a very high rate of lost water. Such a loss appears to have been attributed to two leaks discovered near the end of 2011 and repaired in early 2012, as well as leaky, aging distribution mains which are currently being replaced.

The Town's goal of reducing overall system withdrawal from the well requires an ongoing effort. The Town recently purchased inexpensive but efficient acoustical leak detection equipment to monitor suspected water main leaks throughout the system.

5.3.5 Incentives and Other Measures

Single-Family/Multi-Family Kits

This includes the distribution of kits containing easily installed water saving devices to single-family residential homes. These kits could include shower flow restrictors, toilet tank water displacement bags, leak detection dye tablet for toilets, and informational brochures.

The 1993 State Plumbing Code requires all new construction to install fixtures that comply with the following maximum water usage: toilets – 1.6 gallons per flush, urinals – 1.0 gallons per flush, shower heads and faucet aerators – 2.5 gallons per minute.

The Town will evaluate the efficacy of distributing Conservation Kits before deciding to have these available to customers at their office and at the Council meetings.

Nurseries/Agriculture

This measure is defined as encouraging and/or requiring the application of current technology for water use practices of large agriculture/irrigation operations. Examples include nurseries and commercial agriculture.

There are no large nurseries or commercial agriculture users in the Town system. However, the Town will continue billing increased rates for high water users. (See below under Conservation Pricing).

Landscape Management/Playfield – Xeriscaping:

"Promote low water demand landscaping in all retail customer classes (private, public, commercial, industrial, etc.)."

The Town will have literature explaining the importance of low water demand landscaping at Town Hall and will include similar information in the annual Consumer Confidence Report.

Conservation Pricing

All conservation programs are required to consider the benefits and costs of implementing rate design techniques to provide economic incentives to conserve water.

The Town's water rates are structured to increase incrementally in cost as the consumption increases. Such rate structures have been effective in reducing water use.

Utility Financed Retrofit

This measure requires that the purveyor "install water efficient fixtures in existing residences and commercial/industrial facilities by: (a) providing fixtures at no cost, (b) giving a rebate for consumer purchased fixtures, or (c) arranging for suppliers to provide fixtures at a reduced price."

The Town Council will consider implementation of a low or no cost distribution of low flow toilets, plumbing fixtures and appliances.

Seasonal Demand Management

This includes conservation measures aimed at controlling peak seasonal demand.

The evaluation of this measure is not required for Hamilton, because the Plan requires this of large systems only.

Recycling/Reuse

Ecology requires that the Town "Examine opportunities for water reuse and recycling as an approach to providing additional water."

The Town currently wastes all filter process backwash water to a settling swale. When the filter process is activated, recovery of most of the back wash water is recycled back through the filter system instead of wasting it.

5.3.6 Conservation Program Monitoring

The Town will continue to monitor overall water use, per capita water use, and the amount of distribution system leakage on a monthly basis. The Town will monitor the success or failure of its water conservation program by analyzing this data and determining the long-term trend in per capita water usage. If the results of the program monitoring show that the water savings' goals are not being met, more rigorous program implementation or additional program items will be considered.

5.4 Water Use Efficiency Program

In 2003 the Washington State Legislature enacted ESSHD 1338, a bill that requires the state Office of Drinking Water to encourage Water Use Efficiency (WUE). On January 22, 2007, the State Department of Health Office of Drinking Water instituted the new WUE Rule—WAC 246-290-800. Municipal water suppliers are now required to set WUE goals through a public process and report annually on their performance to customers and to DOH, and also make the information available to the public.

Limiting and controlling water loss is important to the Town because of the financial costs of the extra pumping and treatment (when activated), as well as the increased pumping and mitigation demands on the nearby Little Carey's Creek. Hamilton is committed to a leakage reduction program. The Town has incorporated the guidelines and rules in the WAC 264-290-810 Water Use Efficiency Program and WAC 246-290-820 Distribution System Leakage Standard in the preparation of its own efficiency efforts.

On July 13, 2010 the Town afforded its water customers the opportunity to set demand side goals for WUE. Those customers present agreed to reduce customer water usage by 10% by the year 2013. The supply side goal was also set at 10% reduction in water pumped by 2013.
The annual Distribution System Leakage (DSL) average for 2011 was 48.8%. The DSL had been reduced to 22% for 2012 (and even 8.5% between June and December 2012). In addition, household usage has been reduced by 15.3% between 2010 and 2012.
The Town anticipates an even greater and steadier improvement in water savings as it continues to replace old distribution piping. Although the Town has achieved the original WUE goals, it is committed to improving the DSL percentage. Coupled with the WUE program, Water Conservation is encouraged periodically with educational mailings and posters as well as being included in the Annual Water Quality Report that is delivered to all customers by July 1st of each year. Data regarding the DSL is listed in Appendix XIX.

5.5 Water Rights Analysis

The groundwater rights held by the Town have three conditions on their use, in addition to concerns over Little Carey's Creek mitigation:

- Maximum rate of withdrawal limitations
- Maximum annual withdrawal quantity limitations
- Area to be served

As part of this water plan, the water rights limitations are compared against current and future use patterns.

The Town's water supply is within the annual withdrawal limitation of Claim G1-24051C, Claim G1-20003C, and Claim G1-28066A which allow for up to 136 gpm instantaneous demand or 136.86 acre feet per year. The Water Right documents are located in Appendix IV.

The Town's maximum mechanical pumping rate from the well totals 136-gpm (106 gpm maximum for domestic demand and 30 gpm for Little Carey's Creek Mitigation when required), which does not exceed the allowable water right limitations. The current pumping rate of the well is less than the water right limitations and the Town is in compliance with the issued water rights. The Town retail service area has been referenced in the current Water Right Claims as the approved place of use.

Chapter 6
Proposed System Improvement Program

6.1 Introduction

The Town of Hamilton strives to provide the best quality water and fire protection to its customers at the most efficient and affordable price. This chapter explains the short-term and long-term goals for the water system.

6.2 Improvement Criteria

System improvements for the Town of Hamilton Water System are classified into either a 6-year or 20 year Planning Period. Each Capital Improvement Plan (CIP) is prioritized to meet the requirements set forth by the Washington State Department of Health to improve the system and to meet the present and future needs of the retail service area to the years 2018 (6- Year Planning) and 2032 (20-Year Planning) and beyond. From this, six General Categories of water system improvements are identified in the CIP program. They are:

- Water distribution main replacement and looping improvements.
- Treatment facility improvements (M-series) – replace aging electronic equipment
- Policy Initiatives - to increase water conservation and water use efficiency education efforts and future planning efforts
- "Going Green" Power Supply Efforts – an outline of new facilities to provide electrical power supply to the Town's treatment plant facility and eventually to the entire water service area, and to provide guidance for the Town
- Continued revitalization of the water system infrastructure to provide fire protection and to accommodate innovative use of the non-buildable properties within the floodway
- New source for water supply redundancy / back-up

Over the last 10 years Hamilton has made significant improvements to the Town's water system including new water mains, a new well, new water treatment facilities, additional storage capacity, and the addition of individual service meters.

The projects included in this plan continue the past effort to provide economical healthful water supply and fire protection to the Town's residents.

6.3 Project Proposals

A series of proposed improvements have been scheduled over the length of the planning period.

6.4 Immediate

These immediate project improvements are important and can be implemented in the short term. These recommended improvements are:

- Monitoring well: Reconnection of electronics and monthly monitoring of the SWL and weir levels
- Replace automatic dialer in the existing water treatment plant
- Purchase of 10hp replacement well pump to have on hand for back-up

The replacement of the automatic dialer and purchase of the replacement well pump are intended to be funded with current and on-going Water Department Capital Improvement funds.

6.5 Six Year Capital Improvements

The following water distribution improvements are proposed over the next 6 years:

- Replacement of aging AC distribution system main along Cumberland Street, north of Hamilton Ave.
- Relocation of the PRV from the north side of SR 20 to the south side of SR 20 so that the full head in the reservoirs would be available for fire flow for the Janicki plant.

The replacement of aging distribution lines (the Cumberland Street Avenue project) shall be funded by any available short-term loan/grant program.

The relocation of the PRV station shall be paid by Janicki.

Table 6.5 - 6-year Planning Period (Est. costs based on 2012 dollars)

CIP No.	Project Location	Description	Est. Cost	Year
1	Monitoring well	Reconnection of electronics and monthly monitoring of the SWL and weir levels	$2,000	2013
2	PRV Station	Relocation of the PRV from the north side of SR 20 to the south side of SR 20 to get the required fire flow at Janicki site (PRV station shall be installed between SR 20 and the Bella Street connection in order to keep the pressure below 80 psi at the Bella & Division Street meters) All connections upstream of the main PRV station and below 115 feet should have PRV's installed at their meters to keep operational pressure under 80 psi.	All cost by Janicki	2013
3	Replace WTP Automatic Dialer		$ 7,500	Before 2014
4	Well site	Purchase of 10hp replacement well pump to have on hand for back-up	$5,000	2014
5	Leakage Control Program	Meter Calibration and Leak detection	$ 1,000	Between Present & 2018
6	Well Head Protection Program	Annual Informational program	$ 200/yr	Present to 2018

7	Water Conservation Water Use Efficiency	Annual Informational programs	$ 200/yr	Present - 2018
8	Cumberland Avenue pipeline replacement project (north of Hamilton Ave) / Connection to the 8" main on Hamilton Ave to add a loop to the system.	1,550 LF of 8-inch C900 PVC pipe + Fire Hydrants	$125,000	2016

6.6 Twenty Year and beyond Capital Improvements

The 20 Year and beyond Capital Improvement plans have not been completely developed for the Town at this time. However, a series of water distribution and control improvements are proposed. These projects are:

- Development of a second source of supply

The Town has one well, 2 reservoirs and a partially looped distribution system. We recommend that the Town begin planning for a second source of supply. With only one well, the Town & Janicki Industries have some risk of running out of water if/when the well pump or well itself fails.
The project will be funded by the Water Department Capital Improvement funds or by any available short-term loan/grant program, should that be needed.

- Water main looping & Water main replacement

  - ✓ Creation of loop between the corner of Hamilton and California and the corner of Petit and Noble Streets by installing 8" C900 PVC pipe along California, Maple and Petit Street - Project #9.
  - ✓ Replacement of aging AC distribution system main along Nolle Street (between Hamilton Ave & Michigan Ave) – Project #13.
  - ✓ Replacement of aging distribution system main along Nolle Avenue (between Hamilton Ave & Water Street) / Install new 8" pipe along Water Street between Nolle & Railroad Aves to create a loop – Project #14.

All these projects shall be funded by any available short-term loan/grant program.

- Development of a "Destination RV Park"

It is the desire of the Town to convert the undevelopable FEMA owned properties, and any other vacated properties within the floodway, into a seasonal RV park owned by the Town. Replacement of aging pipelines and additional looping of the existing water mains within the floodway is necessary to ensure excellent water quality at the present time but it also extends the life of the water system infrastructure far into the future. The Town believes the expense for both circumstances can be recaptured if the land within the floodway is used to its fullest extent. As growth shifts north of the floodway, historical sites may be preserved, but a majority of the existing structures would be razed and the properties would be unused.

- Wind / Solar Power Generation Facility

It is the desire of the Town to go "green" by developing a wind and solar power facility on the property that houses the Water Treatment plant. The green facility would provide the opportunity to reduce the Town's carbon footprint and water system operating expenses by reducing the need for purchasing conventional power. The Town would like to find a way to eventually provide power to the entire retail water service area.

- Development out of the Floodway

Development out of the floodway, to the north of State Route 20, is listed in the CIP to identify major water main improvements above and beyond normal looped water main improvements that land developments typically construct for the direct benefit of their project. These specific improvements should be incorporated into future land development activities along higher elevation property frontage within the current retail service area or within the proposed higher elevation land development north of State Route 20.

These 3 last projects are not anticipated to be funded by the Water Utility and are not incorporated in the long-term funding and water rate analysis. We expect that these improvements will be incrementally constructed as land use development occurs.

Table 6.6.2 - 20-year Planning Period (Est. costs based on 2012 dollars)

CIP No.	Project Location	Description	Est. Cost	Year
9	Treatment house site	Development of a second source of supply	$20,000	Within the next 10 years
10	Along California, Maple and Petit Street	8-inch Water main looping	$70,000	Beyond 2018
11	Downtown Hamilton	Development of a "Destination RV Park"	TBD	Beyond 2018
12	Treatment Plant site	Wind / Solar power generation facility	TBD	Beyond 2018
13	Development out of Floodway	8-inch WM	All cost by developer	Beyond 2018
14	Nolle Avenue pipeline replacement project (north of Hamilton Ave)	1,000 LF of 8-inch C900 PVC pipe + Fire Hydrants	$75,000	Beyond 2018
15	Replacement of aging distribution system main along Nolle Avenue (between Hamilton Ave & Water Street) / Install new 8" pipe along Water Street between Nolle & Railroad Aves to create a loop	1,000 LF of 8-inch C900 PVC pipe + Fire Hydrants	$75,000	Beyond 2018

Map 10 – Water System Map including improvement projects #2, 7, 8, &9 (See Appendix VIII)

6.6 Improvement Schedule

Capital improvements for the 6-Year and 20-Year period are scheduled for rate making and cash flow purposes. These projections are incorporated into Chapter 7, Rates and Financial Recommendations.

Chapter 7
Financial Program

7.1 Introduction

The Town of Hamilton Water Department is a rate supported municipal water system incorporated in the State of Washington.

The Town's water system revenue is derived from monthly service charges, new customer connection charges and miscellaneous fees and charges relating to new connections.

The Town of Hamilton Water System Policies (including water rates) are included in the Ordinance # 297 adopted on November 13, 2012. This ordinance is provided in Appendix II.

7.2 Monthly Service Charges

The monthly base service fee is based upon the size of the meter plus an increasing block commodity charge. Water meters are read monthly.

There are two classes of customers: residential customers and commercial customers. The customers pay according to meter size and water usage according to the following water rates. There is also an on-going annual 5% increase in the Rate for Water Consumption.

Table 7.2 Water Rates

Meter Size	Base Customer Charge	Water Rate for Consumption (price per 100 cf.)
3/4-inch	$30.00	$1.89@ 1-300 cf $2.76 @ 301-600 cf $3.94@601-1,000 cf $5.51 @ > 1000 cf
1-inch	$57.00	$2.84 up to 5,000 cf $5.51 > 5,000 cf
1-1/2-inch	$102.00	$2.84 up to 1,000 cf $5.51 > 1,000 cf
2-inch	$120.00	$3.15 up to 5,000 cf $5.51 > 5,000 cf
3-inch	$372.00	$3.15 up to 1,000cf $5.51 > 1,000 cf
Fire Hydrant Use	$25.00	$2.77 up to 100cf $1.89 per 100 cf > 100cf

7.3 Capital Improvement Charges

The Town currently has varied System Development Fees (SDF) for new connections. These fees were developed to pay for any water system improvements.

Table 7.3 System Development Fees

Meter Size	ERUs	SDF Amount
¾ inch	1	$3,150
1-inch	2.5	$7,875
1-1/2 inch	5	$15,750
2-inch	8	$25,200
3-inch	20	$63,000

The Town's current system value of its water mains, valves, hydrants, Reservoirs, well and water treatment facilities are estimated as:

Distribution Water mains	24,200 linear feet ($80/lf)	$ 1,936,000
Reservoirs	2 each at 290,000 gallons	$ 600,000
Water Treatment Plant		$ 400,000
Well	2 @ $30,000	$ 60,000
Total Estimated System Value		$ 2,996,000

7.4 Financial Status

Summaries of each past year's (2011 & 2012) budget and projected budget (2013-2018) may be reviewed in Appendix XXII.

As of January 1, 2013, the Town had a savings of approximately $55,000 in a Capital Improvement Fund. Some of this money may be available for the water system in order to finance some of the capital improvement projects described in chapter 6.

In addition, this report recommends that the Town start transferring money to:

- An emergency fund to cope with unexpected events
- A fund to be able to drill a second well within the next 10 years
- A Water System Plan fund to finance the update of this Water System Plan every six years.

See Appendix XXII for more details.

Chapter 8 Construction Standards

8.1 Introduction

Construction Standards including topics covering new extensions are included in the Town of Hamilton Ordinance#297 located in Appendix II.

8.2 Service Applications

All new water service applications follow the Town's Adopted Policies and Procedures.

The steps for implementation are listed below:

1. Water service desired by property owner or developer.
2. Applicant completes water service application form and submits to the Town Council.
3. Council reviews application and determines if water main extension is required:
4. If main is needed go to step #6
5. If no extension required go to step #14
6. The applicant then is subject to the facility improvement and extension policy and completes and executes the facility extension contract and pays the $1,000 retainer for engineering review services.
7. The applicant selects the licensed professional engineer for preparation of plans.
8. The water main extension plans are prepared in accordance with the Town construction Standards.
9. The plans are reviewed by the Town's engineer. The engineer makes recommendations for acceptance to the Town Council.
10. When plans are approved, the applicant selects contractor and submits name with references to the Council for review. The applicant and contractor sign the Contractor Agreement.
11. New water main extension construction performed.
12. Send a satisfactory coliform sample, satisfactory pressure test, as-built drawings, and a construction completion report to the Town. The Town forwards applicable copies to the Washington State Department of Health
13. At the end of construction, a Bill of Sale and Recovery Contract (if any) are signed, and the Council transmits the letter of terms and conditions.
14. Applicant pays meter and hookup fees
15. Applicant signs usage contract
16. The final connection of water service is made by the Town staff

8.3 Construction and Design Standards

The Town has adopted design standards from the current edition of the "Standard Specifications for the American Public Works Association" (APWA) and the American Water Works Association (AWWA). New facility designs shall be in accordance with Skagit County, WSDOH and the current Town WSP criteria. The Town's design standards, technical standards, and standard details are included in Appendix II.

8.3.1 Scheduled improvements

Improvements that have been identified in the WSP will be prepared by a Washington State licensed professional engineer and include construction plans, specifications, and a cost estimate. No WSDOH review is required for water main construction and/or improvement that is listed in an

approved WSP. WSDOH review is required, however, for water storage, pumping, and/or water treatment facilities and other improvements.

8.3.2 Unscheduled Improvements

Improvements that have not been identified in the WSP will be prepared as outlined above for scheduled improvements and will all require WSDOH review.

Payment of the WSDOH review fees and expenses will be the developer's responsibility when the developer initiates water system improvements. After construction is complete, and accepted by the Council, the Town will submit the following to the WSDOH:

- Certification by the professional engineer of record that construction complied with the Town's Standards, State standards, and any additional requirements developed during review.
- Documentation of passing the pressure tests and disinfection procedures, Coliform test and water quality sample results must be obtained before placing the new main into service.

8.4. Performance Standards

The water system performance standards are as follows:

- Flow – Meet Peak Hourly Demand (PHD) with pipeline velocities less than 10 fps.
- Pressure – minimum 30 psi throughout distribution system at peak hour, max 80 psi downstream of system PRV at minimum demand period.
- Fire Flow – residential service 1,000-gpm for 60 minutes duration, commercial service per fire marshal, sustain distribution main residual pressures with 20-psi minimum residual, with pipeline velocities less than 10 fps.
- Water Mains – All water mains shall comply with the chapter 13.08.020 of the Town of Hamilton Ordinance # 297 provided in Appendix II and with the chapter 4.6 of the 2000 Skagit County Coordinated Water System Plan.
- Fire hydrants – All fire hydrants shall comply with the chapter 13.08.030 of the Town of Hamilton Ordinance # 297 provided in Appendix II and with the chapter 4.6 of the 2000 Skagit County Coordinated Water System Plan.

8.5. Construction Procedures

New Developer construction will follow the following procedures:

- Design Review: All construction plans and specifications will be reviewed by the Town's engineer prior to release for construction. If WSDOH or other State or County review is required, the developer must obtain review and approval, and pay any related fees before construction may begin.
- Construction: Inspection may be required by the Town, and is to be provided at the developers cost, utilizing qualified inspector personnel using either the Town's consultant engineer or other technical staff approved by the Town.
- Flushing, pressure testing, and water quality sampling: testing and water main tie-ins will be performed under the supervision of Town staff. Upon approval by the Town the new facility shall be put into service.

Record drawings are required with field revisions noted on the documents. Record drawings will be signed and dated by the Engineer of Record and conveyed to the Town's engineer in both paper and electronic format (PDF & AutoCAD)

8.6. System Design Standards

The major design requirements of the Washington State Department of Health (WSDOH) and Skagit County are summarized by the following criteria (submitted in a previous WSP):

Distribution

- The system shall provide a minimum of 30 psi operating pressure to all customers during peak hour demand (PHD) conditions, with the equalizing component of storage depleted. The calculation of PHD shall be based on WA DOH guidelines.

- The system shall provide more than 20 psi residual pressure at all operating fire hydrants during Peak Hourly Demand (PHD) plus fire flow conditions. The calculation of PHD shall be based on WA DOH guidelines.

- All new or expanding water systems in Skagit County shall provide fire hydrants according to the table 4-3 of the 2000 Skagit County Coordinated Water System Plan.

- Water Mains – All water mains shall comply with the chapter 13.08.020 of the Town of Hamilton Ordinance # 297 provided in Appendix II and with the chapter 4.6 of the 2000 Skagit County Coordinated Water System Plan.

- The system shall be equipped with adequate isolating valves, air release valves, blow-off assemblies, etc., for proper system operation and maintenance.

- An individual well or service booster pump is allowed if approved by the Council and as an interim measure where distribution system pressure is deficient.

Supply

- The minimum production capacity shall equal the average day demand (ADD).
-
- The 2000 Skagit County Coordinated Water System Plan recommends the establishment of a water conservation program. The program should follow the latest edition of "Water Conservation Planning Handbook for Public Water Systems", and "Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs".

Storage

- The minimum standby (i.e., emergency) storage shall be equal to the maximum day demand (MDD).

- Where multiple sources of supply are available, the standby storage may be reduced by the existing pumping capacity of the wells, assuming the highest capacity well is out of service.

A minimum standby storage of 200 gpd/ ERU should be provided regardless of the number of, and/or excess capacity of, the sources available.

- The minimum equalizing storage shall be provided based on the formula: 150 min x (PHD-Q), where 'Q' is the sum of the capacities of the active sources of supply.

- The minimum fire protection storage for the Janicki plant shall be based on a fire flow of 2,850 gpm for 120 minutes (342,000 gallons). Standby storage may be used for fire protection storage.

Pressurization of System

- The operating cycle of any booster pump shall not exceed 6 cycles per hour.

- The booster pumps shall have capacity to supply peak hour demand (PHD), with the highest capacity pump out of service.

- The booster pumps shall have capacity to supply fire flow plus a maximum day demand (MDD), with the highest capacity pump out of service.

- Hydro pneumatic tanks shall be ASME approved (labeled) and equipped with an ASME relief valve. Small (up to 120 gallons), non-approved ASME tanks may be used if equipped with an ASME relief valve.

- Hydro pneumatic tanks shall be sized in accordance with WSDOH guidelines.

Treatment Systems

- All treatment facilities must be pilot plant tested at the site (or full scale tested after installation)
-
- The maximum filter unit application rate and minimum backwash application rate shall be not more than or less than set by manufacturer's recommendations, respectively.
-
- Documentation must be provided that the method of waste disposal (backwash) is acceptable to the WSDOE.
-
- All treatment vessels and media must have NSF approval, or be recommended by a licensed engineer and approved by the WSDOH for use.

Chlorination

- A WSDOH Hypochlorination Facilities for Small Systems checklist shall be submitted where chlorination is provided.

Chapter 9
Source Protection

9.1 Introduction

Protection of the source of drinking water supply is of primary importance to all public water systems. The Town is required by RCW 70.119A.060 (b) (i) "to protect the water sources used for drinking water"; (iv) "Plan for future growth and assure the availability of safe and reliable drinking water"; and (vi) "Take whatever investigative or corrective action is necessary to assure that a safe and reliable drinking water supply is continuously available to users."

The State Departments of Health and Ecology, Skagit County, Town, the Skagit County Coordinated Water System Plan and Ground Water Management Plan of Skagit County recognize that there are capacity and quality limitations of the aquifer serving the Town retail service area and surrounding area of Skagit County.

9.2 Ground Water Contamination Initial Assessment

The Town has developed and included in this report the "Ground Water Susceptibility Initial Assessment" on the Well #2 (S02). Using the WSDOH guidelines, the ground water movements were estimated using the calculated fixed radius method.

The Wellhead Protection Plan is attached in Appendix XIV.

9.3 Wellhead Protection Program

The Town understands that there will not likely be revisions of its wellhead protection program unless development occurs in the area surrounding the well. Should that event come to pass, the Town will review and revise this program.

9.4 Resource Protection

The Town has the overall goal of protecting the aquifer in the region. This includes protecting the aquifer for the other approved public water systems and private wells within the geographic area of the approved water system retail service area, as well as the surrounding areas of Skagit County.

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX I
WATER FACILITY INVENTORY FORM (WFI)

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 2
Updated: 03/27/2012
Printed: 2/6/2013
WFI Printed For: On-Demand
Submission Reason: No Change

RETURN TO: Northwest Regional Office, 20425 72nd Ave S STE 310, Kent, WA, 98032

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
30700 0	HAMILTON WATER DEPARTMENT	SKAGIT	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS	8. Owner Number 002382
CAS HANCOCK [OPERATOR/MANAGER] 46451 BAKER LOOP RD CONCRETE, WA 98237-9558	HAMILTON WATER DEPARTMENT JOAN CROMLEY TOWN OF HAMILTON PO BOX 528 HAMILTON, WA 98255	TITLE: MAYOR
STREET ADDRESS IF DIFFERENT FROM ABOVE ATTN ADDRESS CITY STATE ZIP	STREET ADDRESS IF DIFFERENT FROM ATTN ADDRESS 584 MAPLE ST CITY HAMILTON STATE WA ZIP 98255	

9. 24 HOUR PRIMARY CONTACT INFORMATION	10. OWNER CONTACT INFORMATION
Primary Contact Daytime Phone: (360) 770-4633	Owner Daytime Phone: (360) 826-3027
Primary Contact Mobile/Cell Phone: (360) 770-4633	Owner Mobile/Cell Phone:
Primary Contact Evening Phone: (xxx) xxx-xxxx	Owner Evening Phone: (xxx) xxx-xxxx
Fax:(360) 853-7497 | E-mail: XXXXXX	Owner Fax Phone: | E-mail: XXXXXX

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

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

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed — SMA NAME: _____ SMA Number:
- [ ] Managed Only
- [ ] Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

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

13. WATER SYSTEM OWNERSHIP (mark only one)

- [ ] Association
- [x] City / Town
- [ ] County
- [ ] Federal
- [ ] Investor
- [ ] Private
- [ ] Special District
- [ ] State

14. STORAGE CAPACITY (gallons): 291,000

15	16	17	18 SOURCE CATEGORY										19 USE			20	21 TREATMENT						22	23	24 SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED,	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL	SPRING	SPRING FIELD	SPRING IN	SEA WATER	SURFACE WATER	RANNEY/INF.	OTHER	PERMANEANT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	InAct 06/24/2004 Well #1		X										X				X						58	70	NE SE	14	35N	06E
S02	Well #2 AEN137		X										X			Y		X					185	105	SW NW	12	35N	06E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
30700 0	HAMILTON WATER DEPARTMENT	SKAGIT	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?)	0	118	180
A. Full Time Single Family Residences (Occupied 180 days or more per year)	103		
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	6		
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)	22	65	65
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	9	6	6
28. TOTAL SERVICE CONNECTIONS		189	251

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per: 328

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?	210	210	210	210	210	210	210	210	210	210	210	210
B. How many days per month are they present?	31	28	31	30	31	30	31	31	30	31	30	31

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

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: Cas Hancock

DATE: 3-8-13

PRINT NAME: Cas HANCOCK

TITLE: Operator

WS ID	WS Name
30700	HAMILTON WATER DEPARTMENT

Total WFI Printed: 1

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX II – TOWN OF HAMILTON WATER SYSTEM POLICIES

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

ORDINANCE 297

AN ORDINANCE of the Town of Hamilton REPEALING Ordinance Numbers 141, 189, 228, 260, 268 and 283 AND ADOPTING a new Title 13, Water Services consisting of a complete Water Utility Code with Chapters updating Goals and Policies, General Provisions, Construction Standards, Connections, Cross Connections, Extensions, Private Systems, Rates and Charges, Utility Services Outside Town Limits, Special Arrangements for Short-Term Water Usage, Degradation of Water Quality and Constitutionality and Saving Clause.

WHEREAS, the Town of Hamilton is updating the comprehensive water system plan, and

WHEREAS, it is prudent to repeal previous Ordinances referring to portions of Title 13, and

WHEREAS, the Town Council of the Town of Hamilton has requested an on-going increase in Water Rate for Consumption by 5% per year effective January 1 of each year, without further action of the Town Council, that is necessary to operate and maintain the water system.

WHEREAS, it is timely to update the water codes by adopting a new Title 13, and

WHEREAS, the Town Council of the Town of Hamilton has determined that it is in the public interest to repeal out of date ordinances, add a small, affordable increase in water consumption rates to help insure that adequate funds are available for continued operation and maintenance of the water system and adopt a new water code,

NOW, THEREFORE, THE TOWN OF HAMILTON DO ORDAIN AS FOLLOWS:

Section 1. Ordinance numbers 141, 189, 228, 260, 268 and 283 are hereby repealed.

Section 2. An on-going 5% increase in the Rate for Water Consumption is hereby adopted.

Section 3. A new Hamilton Water Services ordinance is hereby adopted to read as follows:

Title 13
WATER SERVICES

Chapters:

Chapter 13.01
GOALS AND POLICIES.

Sections:

13.01.010 Goals.

The Town of Hamilton has adopted this title to provide a guide for present and future customers of the Hamilton Water System. The document also contains information for customers, property owners, builders and developers who may seek water service from Hamilton. The goal of the Hamilton Water System is to provide safe and reliable service to all customers in an efficient, reliable and economical manner. In pursuing this goal, the guiding principles include the following:

(a) The Hamilton Water System will strive to provide for all of its customers: safe drinking water at flows and pressures meeting all applicable standards and regulations.
(b) The Hamilton Water System will encourage and promote water conservation and water use efficiency to be incorporated into all practices where it is reasonably practicable and cost-effective. The Hamilton Water System may require conservation practices be utilized by customers when necessary to preserve limited water resources and to protect the environment.
(c) The Hamilton Water System shall endeavor to communicate with its customers and provide all customers with responsive, high-quality and courteous service in all of its activities.
(d) To preserve property values and maintain the high quality of life in the Hamilton Water Service Area, the Hamilton Water System shall be operated as an efficient, financially viable water utility, which includes investing in and maintaining the system at a level that provides reliable and quality service.

13.01.020 Related Policies.

The Hamilton Water System's intent is to provide water service on a first come, first served basis within The Hamilton Water System's defined service area, to provide water for land uses approved by the Town of Hamilton or Skagit County under an applicable land use plan. Provided however, that factors beyond the direct control of the Hamilton Water System, such as water right approvals from Washington State may limit or restrict the timing and number of customers served. A Comprehensive Plan (Plan) for the Hamilton Water System has been approved by the Washington Department of Health (DOH). The Plan projects the total number of customers that may be served and it identifies capital improvements and operational features needed to serve such customers. This Plan together with subsequent updates, studies and revisions shall guide the Town Council in determining when and what new and/or replacement facilities are required.

13.01.030 Scope of Title.

This Title outlines the policies, procedures, fees and charges, standards, expectations and goals to be used in providing water service to existing and future customers served by the Hamilton Water System. Nothing in this Code shall be interpreted to apply to other, non-water system business of the Town of Hamilton.

13.01.040 Obtaining Water Service.

Water service can be obtained through purchase of a water meter and service connection. The following chapters of this Title discuss details involved in this process.

13.01.050 Application of Policies and Procedures.
The Town of Hamilton shall apply the policies and procedures in a fair and impartial manner for the benefit of the entire community. However in specific instances, the Town Council may, at their discretion, waive or modify the application of the policies and procedures described herein, including the application of standard fees and charges, provided that such waiver or modification allows for more effective or efficient achievement of the Town of Hamilton Water System's goals and principles. At a minimum, the fees and charges contained in this Code shall be reviewed in conjunction with adoption of an annual Hamilton Water System operations and capital budget. The Town Council may adjust fees and charges in response to an emergency, extraordinary expenses and/or needs identified in the budget. Several fees and charges in this Title are indexed to the Construction Cost Index for the Greater Seattle Area, which is adjusted annually based on data presented in the November issue of the *Engineering News Record.* Such fees and charges (as defined in Section II and shown in Exhibit A) will be adjusted annually (effective January 1st) without specific action of the Town Council.

13.01.060 Revision.
The policies and procedures in this Title may be revised, supplemented or otherwise modified by action of a majority of the Town Council; except in an emergency situation the Hamilton Water System Manager or designated Town official may make such reasonable modifications as he/she deems necessary; provided, however, such modifications are reported to and ratified by the Town Council at their next meeting.

Chapter 13.04
GENERAL PROVISIONS

Sections:

13.04.010 Definitions.
As used in this title, the terms set out in this section shall be defined as follows:
(a) "Approving authority," for the several requirements of this code, shall be the Town Engineer.
(b) "Town" means the Town of Hamilton, Washington.
(c) "Town Council" means the elected council of the Town of Hamilton.
(d) "Town Water System" means the water system belonging to the Town of Hamilton, Washington.
(e) "Code" means this water utility code of the Water System of the Town of Hamilton.
(f) "Commercial and industrial properties" include, but are not necessarily limited to, retail and wholesale stores, warehouses, service stations, manufacturing facilities, garages, theaters, hotels, motels, restaurants, bars and taverns, banks, showrooms, barber and beauty shops.
(g) "Engineer" means the duly appointed or employed Town Engineer of the Town of Hamilton or his authorized representative.
(h) "Fire Department" means any recognized fire department normally responding in the area, to include private fire brigades organized, trained and equipped to protect specified property. (i) "Institutional properties" include, but are not necessarily limited to, places of worship, private schools, parochial schools, institutions of higher learning, public and private hospitals, nursing homes, lodges and fraternal orders, unless the structure contains a function of a commercial or industrial nature.

(j) "Living unit" means a single-family living area including an apartment, motel, or hotel unit or a trailer pad.
(k) "Manager" means the duly appointed Manager of the Water Department of the Town of Hamilton, Washington.
(l) "Owner" means the person, partnership, or corporation owning the particular premises to which water is being or to be furnished.
(m) "Premises" is defined as the land and building together with such other service buildings as are used only by the occupants of the principal building, except that "premises" may be otherwise defined in writing in a special contract between the owner and the Town for the furnishing of water to such premises through a master meter.
(n) "Private fire protection systems" include pipes, hydrants and associated facilities located on private property, such as automatic fire sprinkler systems, wet standpipes, and/or dry standpipes which are not owned or maintained by the Town.
(o) "Private hydrant" is a fire hydrant so situated and maintained as to provide water for firefighting purposes with restrictions for its use limited to certain defined property or properties. The location may be such that it is not readily accessible for immediate use by the responding Fire Department. Such hydrants shall be used for fire protection only, and shall not be used as a service of water supply for truck washing, process water or dust control unless specifically approved by the Town.
(p) "Public hydrant" is a fire hydrant so situated and maintained as to provide water for firefighting purposes without restriction as to use. The location is such that it is accessible for immediate use of the Fire Department.
(q) "Public properties" include civic buildings, public schools, playgrounds, public parks and appurtenances.
(r) "Residential properties" are those intended for human habitation. Whenever the words "single-family dwelling" are used, they shall also include the structures known as a "duplex" (two-family dwelling). A residence constructed and equipped for occupancy by more than 2 families shall be defined as a multifamily dwelling or high density dwelling, the terms being identical in meaning.

13.04.020 Application for water service.
(a) The owner of any property who desires to connect to the Hamilton Water System shall make application for the connection on the standard form for water service and at that time, the applicant shall pay all connection charges, fees, or assessments required by the Water System Code.
(b) Any owner of any rental property connected, or to be connected, to the water system, shall agree to have their name appear on all billing for that property by the Water Department and such billings shall be mailed to said owner and shall become delinquent if not paid within 30 days of the day indicated on the billing.
(c) Existing unused water connections shall obtain a meter and pay connection fees as prescribed in this code.
(d) Water services that are inactive and not paying monthly fees for three years shall be required to submit a new application and pay connection fees per code.

13.04.025 Water system extension – Expiration of inactive applications.
Water system extension application files or permits shall be closed and deemed "inactive" if there has been no applicant activity for any twelve (12) month period after the date the application is deemed sufficient, or from the date the active permit was issued, or within a specified time which has been mutually approved in writing by the applicant and the Town. The applicant shall be responsible for notifying the Town, in writing, if delays or unforeseen circumstances are impacting the completion of the application and review process. Upon such notification, the Town shall extend the application for an additional six(6) months. If after this extension there is no activity, the application shall be closed by the Town. If an application file or permit has been closed by the Town, the applicant must submit a new application and fee based on the rules and regulations of the currently adopted code in order to begin the review process of that proposed development.

13.04.030 Compliance with state requirements.
All design, construction, maintenance and operation shall be in accordance with the requirements of Chapter 248.54 WAC, Rules and Regulations of the State Board of Health Regarding Public Water Supplies and Chapter 246.290- 246.296 WAC, Rules and Regulations of the State Board of Health Regarding Public Water Systems.

13.04.050 Repair or replacement of certain unmetered lines.
If any repair or replacement of an unmetered private water line or fire protection line is not made after official notice has been given to make such corrections including a time frame for making such repair or replacement, the Town may forthwith cause the same to be disconnected, without further notice.

13.04.060 Changes or additions to water systems.
Any future changes or additions to Hamilton Water System, whether inside or outside the legal limits of the Town, must conform to the adopted comprehensive water system plan.

13.04.070 Refusal or discontinuance of service.
(a) The Town may refuse or may discontinue service after appropriate notice to any customer for violation of any provision of this title, or for failure to pay bills when due. The Town may limit, refuse, or discontinue service to any customer who requires or uses such volume of water that water service to any other customer may be thereby impaired. The Town shall discontinue service to any customer who makes an unauthorized connection to the Town's water line, bypasses a Town water meter, or in any other way misappropriates Town water.
(b) Discontinuance of service for any cause stated in this code shall not release the customer from his obligation to the Town for the payment of bills or charges. Whenever service is discontinued, as provided above, or at the request of the customer, the customer shall be charged for the turnoff in accordance with the Section 13.24.130 C. Restoration of service shall be accomplished within 24 hours of payment of amounts owed, excluding weekends and holidays and payment for reconnecting the service.

13.04.080 Limits of Town responsibility.
At no time shall it be the responsibility of the Town Water Department to enter upon private property to work on or do anything to mains, service lines, *or* appurtenances which are not an accepted part of the Town Water System and lying within an easement running to the Town for the purpose of maintaining the Town Water System. Town responsibility ends at the customer's side of the water meter.

Chapter 13.08
CONSTRUCTION STANDARDS

Sections:

13.08.010 Standards adopted.

The most recent edition of the Standard Specifications for the American Public Works Association (APWA) and the American Water Works Association (AWWA) are hereby adopted by this reference. All construction covered by these standards shall conform to its specifications and the International Fire Code and Appendices. Iri the event any other standard has been adopted by the Town which conflicts with the most recent Standard Specifications adopted in this section, the standard which better protects the public health, safety, and welfare as determined by the Town shall control.

13.08.020 Pipe – Size, type and location.

(a) Every new water main served by the Town Water System shall be at least 8 inches in diameter, except that 4-inch pipe may be installed as a connecting line between 2 larger existing dead-end mains for the sole purposes of improving circulation in the system, and except that 4-inch pipe extending not more than 250 feet beyond a fire hydrant may be installed in a dead-end street; provided, that no fire hydrant is required by code, and provided the dead-end street terminates in a cul-de-sac surrounded by platted lots; and provided, that there is no foreseeable need for extending the water main to connect to mains in adjacent property for mutual improvement of water service. Lines shall be sized so that minimum delivery and residual pressure at any hydrant shall be 1000 GPM at 20 psi.

(b) In all cases, the Town Engineer shall determine the size of supply and transmission mains, guided by the adopted comprehensive plan. If a developer is required to install a portion of a supply or transmission main, the Town will reimburse the developer for the material cost of oversizing when funds are available and after receiving the bill of sale. For the purpose of determining oversizing, maximum-size main which may be required of the developer at his expense alone shall be 8 inches in single-family residential areas, and 12 inches in commercial and multiple-family residential areas. The developer shall submit the oversizing costs for approval prior to the beginning of construction. Water- main sizing for commercial and multiple residential developments shall be as specified by the Town Engineer.

(c) All water mains shall be constructed of ductile iron pipe, class 52, class C-900 PVC, or for mains sized 8 inches or less; and class 50 or 52, class C-900 PVC, or High Density Polyethylene (HDPE) for mains larger than 8 inches in diameter. In general, all water mains shall be located 15 feet north or east of centerline in a 40-foot or 50-foot right-of-way and 20 feet north or east of centerline in a 60-foot right-of-way.

13.08.030 Fire hydrants.

(a) Definitions.

1. "Approving authority" is the Town Engineer of the Town of Hamilton.
2. "Water authority" is the Town Engineer.
3. "A.W.W.A." is the American Water Works Association.
4. "U.L." is the Underwriter's Laboratories.
5. "I.B.C." is the International Building Code and Amendments, as adopted by the Town.
6. "Public hydrant" is a fire hydrant situated and maintained to provide water for
7. firefighting purposes without restriction as to use for that purpose. The location is such that it is accessible for immediate use of the fire authority at all times.
8. "Private hydraut" is a fire hydrant situated and maintained to provide water for firefighting purposes with restrictions as to use. The location may be such that it is not readily accessible for immediate use by the fire authority for other than certain private property.
9. "Fire flow" is the measure of the sustained flow of available water for
10. firefighting at a specific building or within a specific area at 20 pounds per square inch residual pressure.
11. "Fire Chief' is the Town of Hamilton Fire Chief or his appointee.

(b) Fire Hydrants Required. All buildings constructed withiu the Town shall be served by fire hydrants installed in accordance with the requirements of this chapter. In addition, presently existing fire hydrants which do uot conform with the requirements and standards of this section when replaced, shall be replaced with hydrants which do conform to the standards and requirements of this section. All fire hydrants shall be served by a municipal water system, or as otherwise approved by the Town Engineer.

All hydrants shall be subject to testing, inspection and approval by the Town Engineer.

(c) Installation Requirements. The installation of all fire hydrants shall be in accordance with sound engineering practices, and the standards of the Skagit County Fire Marshal, Public Utility District #1 and the Coordinated Water Supply Plan, illustrated in Appendix A as may be amended and the standards identified in Section 13.08.010. In addition, the following requirements shall apply to all building construction projects:

1. Three (3) copies of detailed plans or drawings, accurately dimensioned in feet and inches, indicating the location of all mains, valves and hydrants to be installed shall be submitted to the Town Engineer prior to the commencement of any construction.
2. All fire hydrants must be approved by the Hamilton Water System Manager prior to installation.
3. All construction of the fire hydrant installation and its attendant water system connection shall conform to the approved design standards and specifications.
4. Fire hydrant installations shall be adequately protected against vehicular damage.
5. Construction plans must be approved by the appropriate water authority prior to the commencement of construction.
6. The water authority and the Fire Department shall be notified in writing of the date the fire hydrant installation and its attendant water connection system will be available for use.
7. The Fire Chief shall be notified when all newly installed hydrants or mains are placed in service.

(d) Special Requirements. An approved water supply capable of supplying required fire flow for fire protection shall be provided to all premises upon which buildings or portions of buildings are hereafter constructed based on International Fire Code Appendix B Fire Flow Requirements for Buildings, herein adopted by reference. When any portion of the building protected is in excess of 150 feet from a water supply on a public street, there shall be provided, when required by the chief, on-site fire hydrants and mains capable of supplying the required fire flow. Hydrant location and spacing shall be determined by consultation between the Fire Chief and Town Engineer, based on International Fire Code Appendix C Fire Hydrant Locations and Distribution, herein adopted by reference.

(e) Hydrant Accessibility. Hydrants shall not be obstructed by any structure or vegetation, or have hydrant visibility impaired within a distance of 150 feet in any direction of vehicular approach to the hydrant. A "blue" reflector will be placed on the centerline of the roadway in line with all hydrants where appropriate.

(f) Issuance of Building Permits. No building permit shall be issued until plans required under this chapter have been submitted and approved in accordance with the provisions contained in this chapter. When fire hydrants and mains are to be installed as part of a development, such facilities, including all roadways, shall be constructed to grade and made accessible to the Town of Hamilton emergency vehicles prior to the issuance of any building permit. Exceptions may be approved by the Town Engineer or his appointee only.

13.08.040 Blow-off assemblies.

Blow-off assemblies shall be installed at the end of all dead-end lines that do not have fire hydrants already installed at the end. Blow-off assemblies shall conform to the approved standard detail and be approved by the Manager.

13.08.050 Gate or water control valves.

Valves shall be placed on all branches from feeder mains, between mains and hydrants, between mains and reservoirs, and between mains and pumps. No length of pipe greater than 600 feet shall be left without valve control unless otherwise approved by the Town Engineer. A gate valve shall be located at the end of all dead-end lines when a future extension is anticipated by the Town Engineer.

13.08.060 Tees and crosses.

Tees and crosses including appropriate valves shall be provided where future extensions are expected by the Town Engineer.

13.08.070 Pressure-reducing valves.
(a) Main line pressure reducing stations, built according to the approved standard details and approved as to size by the Town Engineer, shall be installed where required to maintain suitable pressure and flow conditions.
(b) Individual pressure-reducing valves are the responsibility of the owner for all services on mains with a pressure of more than 80 psi and should *be* located according to approved standard detail.

13.08.080 Water mains - Easement requirements.
All easements necessary for the construction and operation of a proposed main shall be obtained by the owner, but shall run to the Town of Hamilton as grantee. Mains shall be located in easements only when it is not possible or feasible to locate them in a public right-of-way.

13.08.090 Contractors' Requirements.
All work to be done in Town streets shall be done by a contractor holding a current State of Washington Utility Contractor's License, Bond and Insurance in the amount of no less than $1 million. All required insurance policies shall name the Town of Hamilton as an additional insured.

Chapter 13.12
CONNECTIONS

Sections:

13.12.010 Frontage requirements.
Any owner desiring a permanent connection to a main served by the Town Water System must have not less than a 20-foot frontage on the street, public road or easement in which the main is situated. A legal description of the property to be served must be given and verified by proper authority. Water mains served by the Town Water System shall extend across the full frontage of the legally described property whose owner desires a permanent connection and across the full frontage of any property that may lie between the legally described property to be served and the street or road in which the main lies. If the property to be served is part of a recorded plat, the water mains serving or about to serve the plat must be laid across the full frontage of all lots before any water service connections will be made to any of the lots. On dead-end streets, the Town Water System must extend all the way to the curb-line at the street's end before any property at the end of the street may be connected to water mains.

13.12.020 Temporary connections.
(a) Temporary connections may be obtained for property which does not meet the requirements of 13.12.010 as to frontage; provided, that the owner shall make payment to the Town of $30.00 per foot of equivalent frontage, in addition to the established charges for service connection, and shall convey to the Town by easement such rights- of-way as set forth in this chapter. The Town Engineer shall approve temporary connections, and shall use 1 of the following methods to determine the equivalent frontage:

1. The average width of the tract, measured parallel to the water main to which connection is desired;
2. The actual frontage on another street or road right-of-way in which no water main exists, but where the construction of such main may be reasonably anticipated;
3. The actual frontage on a proposed street or road for which the owner shall convey a 30-foot right-of-way to the Town by easement for road and utility purposes.

(b) The payment shall be used by the Town Water Department for new construction but shall be considered as "unearned surplus by plant donations" for accounting purposes. Receipt therefor shall be given by the Town, describing the property for which payment has been made, and the Town shall agree in writing to pay the owner's fair share of the cost of constructing a standard water main which enables the property to become permanently connected if and when such a main is constructed. After the new main has been constructed, the owner shall connect to it by installing a new service line to the new meter location set by the Town.

(c) There shall be a service connection charge of $300.00 for the relocation of the connection by the Town. The temporary service will be disconnected. All payments received for temporary connections shall become deferred liabilities of the Town Water System and shall be so recorded in the Water System records until the liability shall have been discharged by the construction of the standard water main. No refund shall be made if the owner's fair share of the cost is less than the payment to the Town.

13.12.030 Meter and service connection sizes.

(a) The size of a service connection and meter shall be determined by the number of dwelling units and shall not be less than the following:

Number of Dwelling Units	Meter Size (inches)	Rated Capacity (gallons per minute)
2	3/4	30
6	1	50
7 to 20	1-1/2	100
21 to 50	2	160
Over 50	Submit Design for Approval	

(b) All multiple unit residences, apartments and motels shall be serviced by 1 connection and 1 meter, except that duplexes or row houses shall be treated as separate single residences with individual meters.

(c) The pipe size for a service connection shall be not less than the size of the meter as set forth in the water application. At the discretion of the Water Manager, larger pipes may be installed to provide water to more than 1 meter from a single connection, provided such single pipe installation results in appreciable savings in total installation cost.

(d) The maximum allowable distance from the water main to the meter shall be 60 feet.

Any service connection of greater length shall be designed by an engineer and be approved by the Town Engineer prior to installation. Any owner who requires a longer service connection to the meter from the main shall pay all costs involved to extend the service the extra distance.

13.12.040 Water meter locations.

(a) Water meters belonging to the Town Water System shall be placed in service in the public right-of-way or easement in which the mains of the Town Water System are situated. Special exceptions may be made where, in the opinion of the Town Manager, it would be of mutual benefit to the Town and the owner to locate the meter on private property. In the event that a meter is located on private property, it shall be understood that the Town has the right of entry to read, service or remove the meter at any time. At no time shall access to the meter be obstructed. It shall be the responsibility of the owner to protect the meter from damage. Where a meter is located on private property, the Town shall install a valve at the property line.

(b) All water meters to be serviced and read by the Town shall be purchased through the Town to insure compliance with standard specifications regarding accuracy of connectors and interchangeability.

13.12.050 Developer-installed service connections.

(a) Developers of all new subdivisions who desire a connection to the Town water main shall be required to install all of the service connections before paving the street.
(b) Developers shall install all their own service connections, excluding meter, in compliance with specifications of the Town. All service connections shall be installed and tested. The service connections shall be shown on the water extension drawing and shall be subject to approval by the Water Manager. These service connections must be conveyed to the Town as a condition to obtaining water service. All service connections shall be installed to Town standards.
(c) Upon building a home on a lot, the standard system development fee shall be paid when application for water service is made.

13.12.060 Town-installed service connections.
All taps of a line to an existing town main shall be made by the town crews or under direct supervision of the town personnel, with material supplied by the owner, contractor or the city. A deposit for the estimated cost of the work must be made in advance for this work and for any material required, if done by the city, and the difference between the deposit and the actual cost plus fifteen percent will be billed by the city, if the cost exceeds the deposit. A hydrostatic test shall be made by the applicant under the supervision of the town. The town will obtain water samples and send them to the health department.

Chapter 13.13
CROSS CONNECTIONS

Sections:

13.13.010 Purpose.
The purpose of this section is to protect the health of the water consumer and potability of the water in the distribution system. Inspection and regulation of all actual or potential cross connections between potable and non-potable sources is required in order to minimize the danger of contamination or pollution of the public water supply. Controlling and preventing cross connections is accomplished by either removing the cross connection or installing an approved backflow prevention assembly or device to protect the public potable water supply. Based on a review of the actual use and plumbing fixtures installed, the Town Manager shall make a determination of the appropriate level of backflow prevention for each premise.

It is the responsibility of all property owners and their renters to abide by the conditions of this Code. In the event of any changes to the plumbing system, it is the responsibility of the property owners and their renters to notify the Town of Hamilton Water Department.

All cost associated with this Ordinance and the purchase, installation, testing and repair of assemblies and devices is the responsibility of the property owner and their renters.

13.13.020 Definitions.

(a) "Air Break"- An air break is a physical separation between the free flowing discharge ends of a waste line, never on a potable water line. The air break is also referred to as an indirect waste. The air break may extend into a trap but must terminate to atmosphere, never a direct connection. The air break must always be preceded by an air gap on the potable end of the waste piping.

(b) "Air Gap (AG)" - The vertical physical separation between the free flowing discharge end of the potable water supply line and the overflow rim of the receiving vessel. The separation must be at least twice the inside diameter of the supply line, but never less than one inch. When located near walls, the air gap separation must be increased.

(c) "Approved/Approval"- Approved in writing by the agency having jurisdiction.

(d) "Atmospheric Pressure"- The pressure exerted by the 7-1/2 mile layer of air resting on the surface of the earth. At sea level, the atmospheric pressure is 14.7 psi.

(e) "Atmospheric Vacuum Breaker (AVB)" - A device which contains a float check (poppet) a check seat and air inlet vent. When water pressure is reduced to a gauge pressure of zero or below, air enters the device, preventing backsiphonage. It is designed to protect against backsiphonage only.

(f) "Auxiliary Water Supply" - Any water supply on or available to premises other that the purveyor's approved public potable water supply.

(g) "Auxiliary Water Supply-Approved"- Any water supply which has been investigated and approved by the health authority, meets water quality regulations and is accepted by the water purveyor.

(h) "Auxiliary Water Supply- unapproved"- An auxiliary water supply which is not approved by the health authority.

(i) "Backflow"- The flow of water or other liquids, gasses or solids from any source back into the distribution piping of the public potable supply system.

(j) "Backflow Prevention Assembly"- A backflow prevention assembly such as a pressure vacuum breaker, a double check valve or reduced pressure principle assembly plus the attached resilient seated shut off valves in the inlet and outlet ends of the assembly and the appropriate test cocks for testing the assembly.

(k) "Backpressure"- Water pressure which exceed the operating pressure of the potable water supply.

(l) "Backsiphonage"- Backflow due to a negative or reduced pressure within the public potable water supply.

(m) "Bore sight to Daylight"- Providing adequate drainage for backflow prevention assemblies installed in vaults through the use of unobstructed drain pipe.

(n) "Certified Backflow Assembly Tester"- A person who is certified by the health authority, or other approval agency, to test backflow prevention assemblies.

(o) "Certified Cross Connection Specialist"- A person who is certified by the health authority or other approval agency, to administer a cross connection control program and conduct cross connection surveys.

(p) "Confined Space"- Means a space that is large enough and so configured that an employee can bodily enter and perform assigned work and has limited or restricted means fur entry or exit and is not designed for continuous occupancy.

(q) "Contamination"- impairment of the quality of the potable water by a physical,. chemical, biological or radiological substance that would present an unreasonable risk to health. Also defined as high hazard.

(r) "Critical Level"- The point on a vacuum breaker which determines the minimum elevation above the flood level rim of the fixture or receptacle served at which the vacuum breaker may be installed.

(s) "Cross Connection"- A point in the plumbing system where the potable water supply is connected directly or has the potential of being connected to a source of non- potable substance that is not part of the public potable water supply.

(t) "Degree of Hazard"- The low or high classification that shall be attached to all actual or potential cross connections.

(u) "Double Check Detector Assembly (DCVA)" - An approved assembly consisting of two approved double check valve assemblies, set in parallel equipped with a meter on the bypass line to detect small amounts of water leakage or use. This unit must be purchased as a complete assembly. The assembly may be allowed on fire line water services in place of an approved double check valve assembly upon approval by the local water authority.
(v) "Double Check Valve Assembly (DCVA)" - An approved assembly consisting of two independently operating check valves loaded to closed position by weights or springs and installed as a unit and between two resilient seated shut-off valves and having suitable connections for testing.
(w) "Flood Level"- The highest level to which water or other liquid will rise within a tank or fixture (i.e. the overflow rim of the receiving vessel).
(x) "Health Authority"- The appropriate state or provincial department or districts of public health.
(y) "Health Hazard"- An actual or potential threat of contamination of a physical or toxic nature to the public potable water system or the consumer's potable water system that would be a danger to health.
(z) "High Hazard"- A condition, device or practice which is conducive to the introduction of waterborne disease organisms or harmful chemical, physical or radioactive substances into a public water system, and which presents an unreasonable risk to health.
(aa) "In-Plant Protection"- The practice of installing backflow prevention assemblies at the point of hazard to protect one or more actual or potential cross connections within the premises.
(bb) "Internally- Loaded Check Valve"- A check valve which is internally load either by springs or weights to the extent it will be drip tight with a 1 psi differential in the direction of flow.
(cc) "Local Enforcement Authority"- Authorized agent of the regulatory authority and/or the water purveyor.
(dd) "Low Hazard"- An internal or plumbing-type cross connection in a consumer's potable water system that may be either a polluting or a contamination-type hazard.
(ee) "Non-Potable Fluid"- Any water, other liquid, gas or other substance which is not safe for human consumption or is not part of the public potable water supply as described by the health authority.
(ff) "Plumbing Hazard"- An internal or plumbing-type cross connection in a consumer's potable water system that may be either a polluting or a contamination-type hazard.
(gg) "Point-of-Use Isolation"- The appropriate backflow prevention within a consumer's water system at the point at which an actual or potential cross connection exists.
(hh) "Pollution Hazard"- An actual or potential threat to the physical properties of the water system or the potability of the public or the consumer's potable water system, but which doesn't constitute a health or system hazard, as defined. The maximum degree of intensity of pollution to which the potable water system could be degraded under this definition would cause nuisance or be aesthetically objectionable or could cause minor damage to the system or its appurtenances.
(ii) "Potable Water"- Water which is safe for human consumption, free from harmful or objectionable materials, as described by the health authority.
(jj) "Premises Isolation"- The practice of protecting the public water supply by installing backflow prevention assemblies at or near the point where water enters the premises. This type of protection does not provide protection to personnel on the premises.
(kk) "Pressure"- Force per unit area.
(ll) "Pressure Vacuum Breaker Assembly (PVBA)"- An approved assembly consisting of a spring-loaded check valve loaded in the closed position an independently operating air inlet valve loaded to the open position and installed *as* a unit with and between two resilient seated shut-off valves and suitable connections fur testing. It is designed to protect against backsiphonage only.
(mm) "Private Hydrant"- Any hydrant which is not owned, operated, or maintained by the local water purveyor or his agent.
(nn) "Public Water System"- Any public or privately owned water system which supplies water fur public domestic use. The system lllUSt meet the entire health requirement set forth by the state health division, The System will include all services, reservoirs, facilities and any equipment used in the process of producing, treating, storing or conveying RPBA water for public consumption.

(oo) "Reduced Pressure Backflow Assembly (RPBA)" - An approved assembly consisting of two independently operating check valve, spring loaded to the closed position, separated by a spring loaded differential pressure relief valve loaded to the open position, and installed as a unit with and between two resilient seated shut-off valves and suitable connections fur testing.
(pp) "Reduced Pressure Detector Assembly {RPDA)"- An approved assembly consisting of two approved reduced pressure backflow assemblies, set in parallel, equipped with a meter on the bypass lone to detect small amounts of water leakage or use. This unit must be purchased as a complete assembly. The assembly may be allowed on fire line water services in place of an approved reduced pressure backflow assembly upon approval by the local water purveyor.
(qq) "Service Connection"- The point of delivery at which the water purveyor loses control of the water.
(rr) "System Hazard"- An actual or potential threat of severe danger to the physical properties of the public or consumers potable water supply or of a pollution or contamination that would have a detrimental effect on the quality of the potable water in the system.
(ss) "Thermal Expansion"- The pressure created by heated water or fluid that is not given the room to expand.
(tt) "Used Water"- Any potable water which is no longer in the purveyor's distribution system. In most cases the potable water that has moved past (downstream) of the meter and/or property line.
(rr) "Vacuum"- Pressure below atmospheric pressure. The tenn vacuum includes all degrees of partial vacuum.
(uu) "Water Purveyor"- Any agency, subdivision of the state, municipal corporation, firm, company, mutual or corporative association, institution, partnership, person or other entity that owns or operates a public potable water system. It also means the authorized agents of such entities as listed above.

13.13.030 Requirements.
If a residential or commercial property has been determined to have an actual or potential cross connection or, if the nature and extent of any activity on the premises or the materials used in connection with any activity on the premises or materials stored on the premises, could contaminate or pollute the drinking water supply in any way, an approved Air Gap or Backflow assembly or device will be required.

All Unified Plumbing Codes must be maintained.

An approved backflow assembly, device or air gap will be required if, but not limited to:

(a) A residential or commercial property has been determined to have an actual or potential cross connection.
(b) On premises having any cross connections as that term is defined under definitions.
(c) A repeated history of cross connections being established or reestablished.
(d) Unduly restricted entry so that inspections for cross connections cannot be made with frequency or sufficient notice to assure that cross connections do not exist.
(e) Materials of a toxic or hazardous nature being used such that, if backsiphonage should occur, a health hazard could result.
(f) FAILURE TO FILL OUT AND RETURN THE CROSS CONNECTION REPORT FORM.
(g) Fire sprinkler systems using non-potable piping.
(h) Used water systems.

MOBILE UNITS:
Any mobile apparatus which uses the Town of Hamilton Water Departments Water from any premises within its water system must obtain a permit from the Water Department.

CAR WASHES:
Car washes are considered high hazard facilities and shall be required to have an approved Air Gap and Reduced Pressure Backflow assembly.

MULTIPLE CONNECTIONS:
Each connection will be required to have an assembly or device if any is required.

UNINTERRUPTIBLE SERVICE CONNECTIONS:
A parallel or side by side assembly of the same type and size as the main line assembly shall be required. There can be no bypass arrangement without equal protection, even if it is a temporary arrangement.

13.13.040: Installation.
If a residential or commercial property has been determined to have an actual or potential cross connection an Air Gap or Backflow Assembly or Device will be required commensurate to the degree of hazard as determined by the Town of Hamilton Water Department.

(a) No person shall install any water operated equipment or mechanism or use any water treating chemical or substance if it is found that such equipment, mechanism, chemical or substance may cause pollution or contamination of the domestic water supply. Such equipment or mechanism may be permitted only when equipped with an approved backflow prevention assembly or device.

(b) Before any assembly or device is installed for the prevention of backflow, it shall have first been approved by the Town of Hamilton Water Department.

(c) All assemblies and devices installed in a potable water supply system for protection against backflow shall be maintained in good working by the person or persons having control of such devices or assemblies. The Administrative Authority or other department having jurisdiction may inspect such devices or assemblies and if round to be defective or inoperative, shall require the repair or replacement thereof. No device or assembly shall be removed from use or relocated or other device or assembly substituted without the approval of the Town of Hamilton Water Department.

(d) The premise owner or responsible person shall have the assembly tested by a certified backflow assembly tester at the time of installation, repair or relocation and at least on an annual schedule thereafter or more often when required by the Administrative Authority.

(e) Access and clearance shall be provided for the testing, maintenance and repair. Access and clearance shall require a minimum of one (1) foot between the lowest portion of the assembly and grade, floor or platform. Installations elevated more than five (5) feet above the floor or grade shall be provided with a permanent platform capable of supporting a tester or maintenance person.

(f) Direct connections between potable water piping and sewer connected wastes shall not exist under any condition with or without backflow prevention. Where potable water is discharged to the drainage system it shall be by means of an approved air gap ,of two (2) pipe diameters of the supply inlet. But in no case shall the gap be less than one (1) inch. Connection may be made to the inlet side of a trap provided that an approved atmospheric vacuum breaker is installed not less than six (6) inches above the flood level rim of such trapped fixture, so that at no time will any such device be subjected to any back-pressure.

(g) Backflow preventers for hot water over 110 degrees F (43.3 degrees C) shall be a listed type designed to operate at temperatures of 110 degrees (43.3 degrees C) or more without rendering any portion of the assembly inoperative.

(h) Fixtures, appliances or appurtenances with integral backflow preventers or integral air gaps manufactured as a unit shall be installed in accordance with their listing requirements.

(i) In cold climate areas, backflow assemblies and devices shall be protected from freezing by a method acceptable to the Administrative Authority.

(j) Backflow preventers shall not be located in any area containing fumes that are toxic, poisonous or corrosive.

(k) Non-potable water piping. In cases where it is impractical to correct individual cross-connections on the domestic water line, the line supplying such outlets shall be considered a non-potable water line. No drinking or domestic water outlets shall be connected to the non-potable water line. Whenever possible, all portions of the non-potable waterline shall be exposed and all exposed portions shall be

properly identified in a manner satisfactory to the Administrative Authority. Each outlet on the non-potable water line which may be used for drinking or domestic use shall be posted; DANGER- UNSAFE WATER.

(l) Deck mounted vacuum breakers shall be installed in accordance with their listing and the manufacturer's instructions, with the critical level not less than one (1) foot above the flood level rim.

(m) Potable water supply to carbonators shall be protected by listed reduced pressure principle backflow preventers as approved by the Administrative Authority.

(n) Faucets with hose attached sprays shall vent to atmosphere under back siphonage conditions. Hose end sprayers and radiator flush kits and etc., are not permitted without proper backflow prevention and shall be at least a DCVA.

(o) Potable water outlets with hose attachments other than water heater drains and clothes washer connections shall be protected by a listed non-removable hose bib type backflow preventer or by a listed atmospheric vacuum breaker installed at least six (6) inches above the highest point of usage and located on the discharge side of the last valve. Where freezing temperatures occur, a listed self-draining frost proof hose bib with integral backflow preventer shall be used.

(p) Water closet flush-o-meter tanks shall be protected against backflow by an approved backflow prevention assembly, device or method.

(q) Water closet and urinal flush-o-meter valves shall be equipped with a listed atmospheric vacuum breaker installed on the discharge side of the flush-o-meter valve with the critical level at least six (6) inches or the distance according to its listing above the overflow rim of a water closet bowl or the highest part of a urinal.

(r) Heat exchangers and other assemblies or methods of construction using potable water shall be of listed construction and materials. Potable water shall be separated from the fluids and gasses by a minimum of two separate walls, with a positive, vented leak detection path. The sections in contact with potable water shall be of materials and weights suitable for potable water.

(s) Inlets to tanks, vats, sumps, swimming pools and other receptors when protected by a listed atmospheric vacuum breaker shall have such atmospheric vacuum breaker installed on the discharge side of the last valve with the critical level not less than six (6) inches or in accordance with its listing above the flood level rim of such equipment and all downstream piping. Water supply inlets not protected by atmospheric vacuum breakers shall be protected by an approved air gap. Where atmospheric vacuum breakers or air gaps are not installed other backflow preventers suitable for the possible contamination or pollution may be installed.

(t) Potable water makes up connections to steam or hot water boilers shall be provided with a listed backflow preventing assembly.

(u) Water inlets to water supplied aspirators shall be equipped with a listed atmospheric vacuum breaker mounted at least six (6) inches above the aspirator unit or equipped with a listed backflow preventer installed in accordance with its listing requirements. The discharge shall drain through an air gap. When using a tailpiece of a fixture to receive the discharge of an aspirator, the air gap shall be located above the flood level rim of the fixture.

(v) Water cooled compressors, degreasers or any other water cooled equipment shall be protected by a listed backflow preventer installed in accordance with this chapter.

(w) Lawn sprinkler systems using only potable water and piping shall be equipped with listed atmospheric vacuum breakers installed on the discharge side of each of the last shut off valves. Where atmospheric vacuum breakers cannot be installed because of piping elevation or valves, other listed backflow preventers shall be installed.

(x) Lawn Sprinkler Systems having or using any type of injection port or not potable water piping shall have an approved air gap or RPBA installed.

Further minimum installation guidelines and a list of approved devices and assemblies shall be made available upon request from the Town of Hamilton Water Department.

13.13.050: Adoption of the Uniform Plumbing Code.
The rules, regulations and standards of the Uniform Plumbing Code, Sections 702, 1002 and 1003, as they presently exist and as they may, from time to time, be amended in the future, will be used by Building Official or his representative to insure all building plans submitted to the Town provide for adequate backflow prevention, and are adopted by this reference. ALL STATE AND LOCAL PLUMBING CODES AND STANDARDS SHALL BE MET.

13.13.060: Access to premises.
Authorized employees of the Town of Hamilton or its agents shall have free access at reasonable hours of the day to all parts of a premise or within buildings to which water is supplied. Failure to comply with any provisions of this Code or to allow access to any premise or property receiving water from the Town of Hamilton may result in water service being denied or terminated or that a listed backflow assembly be installed at the meter service to such property with the cost of purchase, installation, testing, maintenance, replacement or repair being the responsibility of the property owner.

13.13.070: Testing of assemblies.
All backflow assemblies or devices shall be required to be tested at least annually and all air gaps installed in lieu of an approved back flow prevention assembly shall be inspected at least annually. Completed test reports shall be returned to The Town of Hamilton Water Department within 45 days after receiving a test notification.
(a) Backflow assemblies and devices shall also be required to be tested upon installation, assembly is moved, repaired or a backflow incident is believed to have occurred.
(b) All Cross Connection Control Specialists and Backflow Assembly Testers operating within the Town of Hamilton or its service area must be certified by the State of Washington or other governing Agency.
(c) The Town of Hamilton has the right to ask inspectors and testers to maintain liability insurance and have confined space training.

13.13.080: Freezing, flooding, thermal expansion.
It is the responsibility of the property owner to maintain and protect assemblies and devices from freezing and flooding and to eliminate the possibility of thermal expansion.

13.13.090: Pressure loss.
The user will experience some flow and pressure loss when an approved backflow prevention assembly or device is installed on the users supply or branch line. When flow and pressure are critical to the function of fire sprinkler systems processing systems or cooling systems, consulting with a hydraulic engineer is recommended.

13.13.100: Installation Guidelines.
Atmospheric Vacuum Breaker (AVB):
(a) Atmospheric vacuum breakers are approved fur very low hazard situations only as they provide minimal protection. AVBs protect against backsiphonage only and should not be installed where the potential fur Backpressure exists.
(b) The AVB assembly should be installed a minimum of 6 inches above the highest use outlet or overflow level downstream from the assembly.
(c) Downstream shut-off valves are not permitted.
(d) The use of AVBs is permitted only in situations where there is less than 12 hours per day of continuous use.
(e) An AVB should not be installed in any area which may be subject to flooding or where damage could occur from water discharging through the assembly.
(f) All State and Local Plumbing codes must be maintained.

Pressure Vacuum Breaker (PVB):

(a) Pressure vacuum breakers may be installed at premises where substances used would be objectionable, but not hazardous to health, if they entered the potable water system. A PVB protects against backsiphonage only. It should not be installed where the potential for back pressure exists.

(b) A PVB must be installed between two (2) resilient seated shut off valves. The PVB assembly should be installed a minimum of 12 inches above the highest outlet or overflow level downstream from the assembly.

(c) No PVB should be installed in an area which may be subject to flooding or where damage could occur from water being discharged through the assembly.

(d) The assembly must be protected from freezing, and other severe weather conditions.

(e) Each assembly must be readily accessible for testing and maintenance and should be installed with a minimum clearance of 12 inches all around the assembly.

(f) The PVB should be installed between 12 and 60 inches above ground level prior to installation. All lines should be thoroughly flushed. Installation of a strainer with a removable screen ahead of the assembly may be required.

(g) All PVB assemblies must be tested immediately upon installation and at least once per year thereafter by an approved certified tester. Having tests performed is the responsibility of the assembly owner. The water department must be informed by the owner whenever any backflow assembly is installed.

(h) Variance from these specifications will be evaluated on a case by case basis. Any deviations must have prior approval of the water department. All State and Local plumbing Codes must be maintained.

Double Check Valve Backflow Prevention Assembly (DCVA):

(a) Double check valve assemblies may be installed at premises where substances used would be objectionable, but not hazardous to health if they entered the potable water system.

(b) A DCVA must be installed between two (2) resilient seated shut off valves.

(c) Flow characteristics for DCVAs are not standard, so manufacturer's specifications should be consulted fur specific performance data The DCVA must be sized to provide an adequate supply of water and pressure for the premises being serviced. They should be sized so that either assembly can provide the minimum water requirements when installed and the two together will provide the maximum flow required.

(d) Whenever interruption of the water supply is critical, two parallel assemblies should be installed They should be sized so that either assembly can provide the minimum water requirements and the two together will provide the maximum flow required.

(e) Bypass lines on assemblies are prohibited. Pipe fittings which could be used for connecting a bypass line must not be installed.

(f) Each assembly must be readily accessible and installed with adequate room for testing and maintenance. DCVAs may be installed below grade, as long as all test cocks are fitted with brass pipe plugs. All vaults should be constructed of suitable materials, well drained and should be sized to allow for the minimum clearances established below.

(g) Assemblies 2 inches and smaller should have at least a 3 inch clearance below and on both sides of the assembly. The bottom of the assembly should not be more than 24 inches below grade, if installed in a vault. All assemblies larger than 2 inches should allow a minimum clearance of 12 inches of space on the backside, 24 inches of space on the test cock side and 12 inches underneath the assembly. In vaults without a fully removable top, minimum headroom of 6 feet 0 inches is required. An access opening of a minimum of 24 inches square is required on all vault lids.

(h) Assemblies installed more than 5 feet above floor level must have a platform suitable for use by testing and maintenance personnel.

(i) Vertical installations are allowed on sizes up to and including 4 inches, provided they meet the following requirements.

1. The check valves are internally spring loaded. Water flow is upward through assembly. Manufacturer acknowledges a specific assembly can be used in a vertical position.
2. The assembly must be protected from freezing and other severe weather conditions.

3. Prior to installation, all lines should be thoroughly flushed. Installation of a strainer with a removable screen ahead of the assembly is recommended and may be required.

4. All responsibility for leaks and damage is assumed by the property owner. The owner is also responsible for keeping the vault reasonably clean.

(j) All DCVA assemblies must be tested immediately upon installation and at least once per year thereafter by an approved certified tester. Having tests performed is the responsibility of the owner of the assembly. The water department must be informed by the owner whenever any backflow assembly is installed.

(k) Variances from these specifications will be evaluated on a case-by-case basis. Any deviations must have prior written approval of the Water Department. All State and Local codes shall be maintained.

Reduced Pressure Principle Backflow Prevention Assembly (RPBA):

(a) Reduced pressure assemblies may be installed at premises where substances used would be hazardous to health if they entered the potable water system. An RPBA is effective against both backsiphonage and backpressure and is generally used in locations where an air gap is impractical

(b) A RPBA must be installed between two (2) resilient seated shut off valves.

(c) Flow characteristics for RPBAs are not standard, so manufactures specifications should be consulted for specific performance data. The RPBA must be sized to provide an adequate supply of water and pressure for the premises being served.

(d) Whenever the interruption of the water supply is critical, two parallel assemblies should be installed. They should be sized so that either assembly can provide the minimum water requirements and the two together will provide the maximum flow required.

(e) Bypass lines on assemblies are prohibited. Pipe fittings which could be used for connecting a bypass line must not be installed.

(f) Each assembly must be readily accessible fur testing and maintenance and should be located in an area where relief valve discharge will not produce water damage to buildings or furnishings. An approved air gap funnel assembly may be used to control minor discharge while drain lines to handle flow from optimal relief valve discharge should be considered.

(g) An RPBA is generally installed above grade in a well-drained area. It may be installed below grade if adequate drainage to daylight is provided.

(h) Enclosures for assemblies must allow ready access and be sized according to the minimum clearances shown below. Smaller assemblies can be protected by removable covers or enclosures. Adequate drainage to daylight must be provided to accommodate full pressure discharge from the assembly.

(i) All assemblies larger than 2 inches shall allow a minimum of 12 inches space on the back side and 24 inches of space on the test cock side. The relief ·valve opening shall be at least 12 inches plus nominal size of assembly above the floor or above the highest possible water level In vaults without a fully removable top, minimal headroom of *6* feet 0 inches is required. An access opening of 24 inches square is required on all vault lids.

(j) Assemblies installed more than 5 feet above floor level must have a platform suitable for use by testing and maintenance personnel.

(k) The assembly must be protected from freezing and other severe weather conditions.

(l) Vertical installation is prohibited.

(m) Prior to installation all lines should be thoroughly flushed. Installation of a strainer with a removable screen ahead of the assembly may be required.

(n) All responsibility for leaks and damage is assumed by the property owner. The owner is also responsible for keeping the vault reasonably clean.

(o) All RPBA assemblies must be tested immediately upon installation and at least once per year thereafter by an approved certified tester. Having test performed is the responsibility of the assembly owner.

(p) The Water Department must be informed by the owner whenever any backflow prevention assembly is installed.

(q) Variances from these specifications will be evaluated on a case-by-case basis. Any deviations must have prior written approval of the water department. All State and Local codes must be maintained.

Air Gap Separation:

(a) Air gap separations provide maximum protection from backflow hazards. They may be utilized at premises where substances could be hazardous to health if they entered the potable water system.

(b) The distance of the air gap between the supply line and the top rim of the receiving vessel is usually at least 2 times the diameter of the supply line. It should never be less than 1 inch.

(c) Tubular screens may be attached or the supply line may be cut at a 45 degree angle if splashing is a problem. The air gap distance is measured from the bottom of the angle. Hoses are not permitted.

(d) Air gap separations should not be altered in any way without prior approval from the water department. They must be available for inspections at all reasonable times.

13.13.110: Fire Systems

An approved double check valve assembly shall be the minimum protection for fire sprinkler systems using piping material that is not approved fur potable water use and/or does not provide for periodic flow through during each 24 hour period, unless a variance has been issued in writing by the water department. An RPBA assembly must be installed if a solution other than potable water can be introduced into the sprinkler system.

13.13.120: Enforcement and Penalties.

The Mayor of the Town of Hamilton shall enforce the provisions of this Code. The Mayor may delegate responsibilities to a Certified Cross Connection Control Specialist. The provisions of this ordinance may supersede State regulations but in no case shall they be less stringent. All approved prevention assemblies and devices required by this ordinance shall be a model approved by the Department of Health at the time of installation. Approved prevention assemblies required by this ordinance shall be installed and maintained under the direction of the Town of Hamilton Water Department or under the supervision of a Cross Connection Specialist per Town of Hamilton Water Department standards.

Failure of the customer to cooperate in the installation. maintenance, repair inspection or testing of backflow prevention assemblies required by this Ordinance shall be grounds for terminating of water service to the premise or the requirement that an reduced pressure assembly to be installed at the service or meter with installation. All maintenance and testing costs are to be borne by the property owner.

13.13.140 Right to require installation.

The water utility of the Town of Hamilton reserves the right to require any customer to install, as a condition of water service, a pressure reducing valve, backflow preventive device, pressure relief valve or similar devices at any location where the Town Engineer or his designated representative determines a need to

protect the utility's facilities; provided, that such requirements shall be consistent with the codes adopted by this chapter.

Chapter 13.16
EXTENSIONS

Sections:

13.16.010 Construction- Financing.

Owners of property who desire to have the Town Water System extended to provide service to the property shall have such extensions constructed by a licensed bonded and insured utility contractor at the owner's expense.

13.16.030 Project requirements.

In order to qualify for Town approval, the proposed project must satisfy all requirements of this Code relating to pipe size, hydrant spacing and minimum property frontage. If the proposed extension is to serve property being platted, the project shall include construction of mains to the plat and across the full frontage of the plat, unless such mains are in existence. "Frontage of the plat" includes frontage of small tracts lying between a portion of the plat and such roads or streets, commonly identified as "exceptions."

13.16.040 Connection charges.

(a) Prior to commencing construction, the owner shall pay to the Town the amount of connection charges for the frontage of the project on existing mains, less any waivers recommended by the Town Engineer and granted by the Town Council.

(b) The sum shall be used by the Town to pay the developer's portion of a future extension past the frontage not covered by the partial extension. No refund shall be made if the owner's fair share of the cost is less than the payment to the Town.

13.16.050 Permits.

The Town Engineer will obtain the necessary permits for water mains to be laid in State, County, or railroad rights-of-way. The applications will be prepared by the owner, signed by the Town Engineer. The cost of obtaining such permits shall be paid by the property owner(s) who desire the water main extension.

13.16.060 Application procedure.

(a) Generally. The owner requesting permission to extend the system shall complete a standard "Application for Water Main Extension" in triplicate, indicating frontages which are to be subject to a recovery contract and connection charges is requested.

(b) Drawings. Each application shall be accompanied by 3 prints of an engineered drawing showing the location and details of the proposed improvements.

(c) Variances. The applicant may, by letter accompanying the application, request a variance from the Code's requirements.

(d) Submittal. Application, drawings and request for variance shall be submitted to the Engineer and the Manager for their review.

(e) Plan Check. Plans shall be checked by the Engineer. He shall determine whether the plan is adequate and conforms to the Comprehensive Plan for the Town Water System.

(f) Corrections. Any corrections or additions deemed necessary by the Engineer will be shown on the plan and one copy, and the application will be returned to the applicant. Three (3) copies of the corrected original shall be submitted along with the original application. The amount of Town connection charges will also be indicated on the approved copy of the drawing together with any recommended waivers.

13.16.065 Standards authorized.

The Town Engineer is authorized to establish standards for the construction of water, storm sewer and sanitary sewer extensions. The Town Engineer is authorized to amend these standards from time to time. These standards shall be consistent with the standard specifications for municipal construction adopted by the Town. A copy of these standards and all revisions shall be maintained in the Town Clerk's office for use and examination by the public.

13.16.070 Testing.

Upon completion of the construction, the improvement shall be inspected by the Town Engineer or Manager and tested in accordance with the A.P.W.A. Specifications. Responsibility for providing line and grade and measuring for the as-built drawings shall rest upon the owner's Engineer.

13.16.080 As-built drawings.

As-built drawings of the completed installation shall be submitted by the owner's engineer to the Town Engineer for approval before the improvement is presented to the Town Council for acceptance as a part of the Town Water System. These as-built drawings shall be drawn using materials and scale satisfactory to the Town Engineer. The drawings must show lot, street/alley and easement dimensions. They must also show the location of all mains, valves, hydrants, etc., giving pertinent information on each.

13.16.090 Conveyance to Town.

Upon completion of the improvement and acceptance of the as-built drawings, the title to the improvement shall be conveyed to the Town by the owner, together with an affidavit that there are no unsatisfied liens, unpaid bills, or claims of any kind on any of the materials used in its construction.

13.16.100 Recommendation for acceptance.
When all the stipulations and requirements as set forth in this chapter have been fulfilled, the Engineer shall recommend to the Town Council that the title to the improvement along with all franchises, permits and easements be accepted.

Chapter 13.20
PRIVATE SYSTEMS

Sections:

13.20.010 Private fire protection.
(a) An owner desiring to connect private fire protection systems to the Town Water System shall make a permit application in the same manner as required by 13.04.020. In addition, owner shall submit a plan of the complete system showing or listing the size and type of all lines, and the size, age and number of fire hydrants. This plan must be approved by the Town Engineer before application may be approved and connection allowed.
(b) Private fire protection shall meet the requirements of current edition of the International Building Code and the following:

1. All automatic sprinkler systems or private fire hydrants must have separate connections to the Town Water System. Shut-off valves shall be located between the Town main and the property line, but if such location is not practicable, it may be located upon private property immediately adjacent to the property line.
2. All required Fire Department connections shall be so located as to be readily accessible from the street. Any connection to the Town main shall be made under the supervision of the Town.
3. All private fire protection systems shall be equipped with a meter capable of recording leakage or unauthorized use. Upon completion, the owner shall submit I set of prints of as-built drawings of the system to the Manager as a condition of the continuance of water service to the installation. The Town shall in no way be responsible or liable for any failure of water service to the property.

(c) Service charges for private fire protection, as stated in 13.24.100, shall be considered payment in full for all water used for fire protection purposes and for testing the system, provided the owner reports the use of the system for an emergency and also advises the Manager in advance of any testing or flushing.

13.20.020 Existing private systems.
(a) Any owner wishing to connect a private water system to the Town system shall convey to the Town all right and title to the private water system. The Town's acceptance of such private system shall be made on the following conditions:

1. Certification shall be given by the owner that the construction and all materials used, meets or exceeds current Town standards and the requirements of this code.
2. An accurate and full set of as-built drawings shall be submitted to the Town Engineer.
3. Written approval of the Health Department as to the suitability of the lines for public use shall be obtained and submitted to the Town Engineer.

4. The requirements of the Comprehensive Plan shall have been met with respect to size, type and general location of mains, valves and hydrants.

5. Payment of the cost of integrating the systems, metering (if required) and system development fees as determined by the Town Engineer.

(b) The Town Engineer may require a leakage test, and shall require existing private systems to be upgraded to meet all current requirements before conveyance of the system will be accepted by the Town.

Chapter 13.24
RATES AND CHARGES

Sections:

13.24.010 System Development Fees.

At the time of connection to the water system, System Development Fees (SDF) shall be paid based on meter size as specified in Table 13.24-01. The applicant for water service shall pay all installation costs including but not limited to tapping the main and running the service to meter and box.

TABLE 13.24-01
General Facilities Charges by Meter Size

Meter Size	ERUs	SDF Amount
¾ inch	1	$3,150
1-inch	2-5	$7,875
1-1/2 inch	5	$15,750
2-inch	8	$25,200
3-inch	20	$63,000

13.24.015. Abandonment of Connection.

(a) Any water service for which the account charge is 36 months or more in arrearages, or for which no service charge has been paid for 36 months or more, shall be deemed abandoned, and the service connection and meter may be removed by the Town.

(b) Any water service for which the owner of the property requests that the service be terminated shall be deemed voluntarily abandoned, and the service connection and meter may be removed by the Town.
(c) Prior to resumption of service to any parcel or residence for which service was deemed abandoned, a new system development fee, together with any other applicable charges, shall be paid in full and a connection and new meter, if needed, shall be installed at the expense of the property owner.

13.24.020 Additional connection charge.
In addition to the charges for installing the connection and meter, an owner of property fronting on a main for which the property has neither been assessed nor otherwise paid its pro rata share of the cost of the main shall be required to pay a pro-rata share of the cost of the main to the Town as a condition to the right to connect to the main. The charges may be collected either for the benefit of the Town Water System or for private persons who have paid the cost of constructing the main and have entered into a recovery contract with the Town.

13.24.030 Connection charge to Town-owned mains.
All connection charges for service from water and sewer mains owned by the Town that are installed after the effective date of this ordinance, and when the cost of such mains was not assessed to adjacent parcels, shall be based on the actual construction cost apportioned according to front footage or any other equitable method of apportionment. These charges are declared to represent a fair pro rata share of the cost of construction of a main with appurtenances, without regard to the actual size of mains constructed.

13.24.040 Connection charge for partial water line extensions.
Under special circumstances, such as at pressure zone separations, the Town may permit only a portion of a water extension to be constructed. In such cases, the developer shall deposit a sum of money calculated at a rate established under 13.24.030 for the portion of frontage not covered by the extension but required to be covered under 13.12.010. The sum shall be used by the Town to pay the developer's portion of a future extension past the frontage not covered by the partial extension. No refund shall be made if the owner's fair share of the cost is less than the payment to the Town.

13.24.050 Private Fire Protection charges.
Private Fire Protection, Automatic Sprinkler System, Wet or Dry Standpipes. The rates for water supplied for fire protection of standby service shall be as established in Table 13.24-02.

Table 13.24-02
Private Fire Systems

Size	Monthly
2-inch	20.00
3-inch	40.00
4-inch	100.00

13.24.060 Service installation fees.
(a) No service installation fee shall be levied against any building in which there is an existing water service, including meter and meter box, which was installed by a developer or other agency and meets the requirements of this Code as to location and materials used.

(b) Type One- A water service installation that requires the Town to tap the water main, provide and install the service piping, meter with remote read device, and meter box and associated appurtenances. The service fee for a Type One 5/8-inch or 3/4-inch metered water service has been established to be six hundred twenty-five dollars ($625.00). The service fee for a Type One 1-inch metered service has been established to be six hundred ninety dollars ($690.00)

(c) Type Two- The water service line has been installed to the meter box location at the customer's property line as part of a water main extension by the developer/contractor and included in the water main extension cost. The Town will provide and install the meter with remote read device, meter box and associated appurtenances. The water service and meter fee for a 5/8-inch or 3/4-inch Type Two metered water service has been established to be three hundred fifty five dollars ($355.00).

(d) Type Three -The water service line, meter box, and associated appurtenances, less the meter with remote read device, have been installed to the customer's property line by the developer/contractor as part of a water main extension and included in the main extension cost. The meter will be provided and installed by the Town. The service fee for 5/8-inch or 3/4-inch Type Three meter service has been established to be one hundred eighty dollars ($180.00). The service fee for a Type Three 1-inch metered service has been established to be two hundred eighty five dollars ($285.00).

13.24.070 Water rates- Generally.

(a) The consumption and use of all water except for fire suppression taken from the Town Water System, or from the water system of any water district or association which obtains its water from the Town Water System, shall be metered at every connection to the water system.

Table 13.24-03
Meter Capacity by Size

Meter Size	Flow Capacity	Equiv. Res. Units (ERUs)
3/4-inch	20 gpm	1
1-inch	50 gpm	2.5
1-1/2-inch	100 gpm	5
2-inch	160 gpm	8
3-inch	400 gpm	20

Table 13.24-04
Base Rates by Meter Size

This does not include meters on Fire Service Lines shown on Table 13.24-02

Meter Size	Fixed Customer Charge	Variable Customer Charge	Total
3/4-inch	$12	$18	$30
1-inch	$12	$45	$57
1-1/2-inch	$12	$90	$102
2-inch	$12	$108	$120
3-inch	$12	$360	$372

(b) Rates or charges for water use shall be based on the quantity consumed during each billing period as hereinafter defined. The base charge for any billing period shall not be less than the amounts set forth in the table of base charges based on meter size, provided that from one to four recreational

vehicle spaces shall constitute one base customer charge. See Table 13.24-05. Rates for Consumption listed here include the 5% increase set for January 1, 2013.

Table 13.24-05
Water Rates

Meter Size	Base Customer Charge	Water Rate for Consumption (per 100 cf)
3/4" -inch	$30.00	$1.89 - 1 - 300 cf $2.76 - 301- 600 cf $3.94 - 601- 1,000 cf $5.51 - > 1000 cf
1-inch	$57.00	$2.84 up to 5,000 cf $5.51 > 5,000 cf
1-1/2-inch	$102.00	$2.84 up to 1,000 cf $5.51 > 1,000 cf
2-inch	$120.00	$3.15 up to 5,000 cf $5.51 > 5,000 cf
3-inch	$372.00	$3.15 up to 1,000cf $5.51 > 1,000 cf
Fire Hydrant Use	$25.00	$2.77 up to 100cf $1.89 per 100 cf > 100cf

(c) Billing Period. The normal billing period shall be 1 month, which for accounting purposes shall be on the first day of the month during which the meters are read. Charges for periods of less than 1 month shall be prorated both as *to* base charge and as to consumption. All meters installed on the system shall pay the base charge whether turned on or off.

13.24.080 Water rates- Delinquent.
All water rates will be charged against the premises for which the service was installed. All charges for water, when the same become delinquent and unpaid, shall be a lien against the premises to which water has been furnished.

13.24.090 Accounts.
(a) It shall be the duty of the Town's Finance Director to keep accounts with all consumers of water, and to enter on such accounts all charges and penalties. The Finance Director shall cause to be kept proper accounts with all consumers of water, and, every 60 days or less, compile a statement of the names and property of such consumers as are delinquent, and shall forthwith cause that service of these consumers to be discontinued.
(b) An account shall be deemed delinquent if not paid within 30 days of the due date. Delinquent accounts shall be subject to a 10 percent service charge. There shall be a further 10 percent service

charge for each additional 30 days of delinquency. Water connections shall be shut off 30 days after an account becomes delinquent.

(c) There shall be a $75 charge to reconnect service. This shall be accompanied by a $150 deposit that shall be refunded after two years of payment history.

13.24.100 Annual Review of Fees.

Water fees shall be reviewed annually by the Town and adjusted as needed to meet the goals of the water utility for independent operation and maintaining the capital improvement fund.

13.24.110 Obligation of Owner.

Any unpaid charge, fee or obligatiou arising under this Title shall be an obligation of the owner(s) of the property to which service is provided, and shall constitute a lien on the property, which shall be recorded and foreclosed in the manner required by law.

Chapter 13.28
UTILITY SERVICES OUTSIDE TOWN LIMITS

Sections:

13.28.010 Limitations on new connections.

13.28.010 Limitations on new connections.

(a) With respect to the provision of utility services outside the corporate limits of the town, it shall be the policy of the Town to hereafter approve requests for water and sewer connections when:

1. The application is for the replacement of an existing water or sewer connection; or
2. The application is to provide water service to property which presently fronts any water main or its replacement, and that the applicant pay any amounts required by an existing Town-approved recapture contract; or
3. The application concerning property which is the subject of any recapture contract is approved by the Town, and the applicant shall pay any amounts required by such recapture contract; or
4. The application is for property within the Town's urban growth area and/or water service area.

(b) If an application is approved under the conditions of subsection (a)(2), (a)(3), or (a)(4) of this section, then the following conditions shall also apply:

1.If the property boundary is contiguous to the corporate limit line of the Town, the property shall annex into the Town prior to service being granted in the form of a water availability certificate.

2. If the property boundary is not contiguous to the corporate limit line of the Town, and is within a potential annexation area of the Town, and has had a health hazard declared by the appropriate authority related to their water system, then the applicant shall sign an agreement of no protest as to any proposed annexation of the applicant's property to the Town as a condition of providing water service only for the then existing land use. Agreements shall be filed and recorded with the county auditor.

3. If the property boundary is not contiguous to the corporate limit line of the Town, and is within a potential annexation area of the Town, and has not had a health hazard declared by the appropriate authority related to their water system, then service shall be denied until the property is annexed to the town.

4. Service being provided outside the Town limits under contracts executed prior to the effective date of the ordinance codified in this section are allowed to continue without requiring annexation.

(c) All connections and extensions regulated by this chapter shall conform to all Town codes governing such connection or extension.

(d) The Town shall charge 150% of the rates and fees to retail customers outside the Town Limits.

(e) Applications falling outside the circumstances of any of the above conditions in subsection A of this section, and/or not complying with applicable utility code provisions or other Town ordinances will be denied.

(f) It shall further be the Town's policy to make no extension of water or sewer, or connection to water or sewer, when such extension or connection overtaxes the Town's water or sewer system.

CHAPTER 13.30
SPECIAL ARRANGEMENTS FOR SHORT-TERM WATER USAGE

Sections:

13.30.010 Temporary Water Service.

At the Town's discretion, temporary water service may be provided to accommodate special needs for water at a fixed site on a short-term basis (e.g. on-site needs for construction or dust control activities). Temporary water service may be provided from a Town main or from a fire hydrant specifically designated for this purpose by the Town (see Section 13.30.020). Only Town personnel are authorized to install a connection to a Town main or fire hydrant for this purpose.

Temporary service may be authorized for a period not exceeding six months at a time. Upon expiration of the initial six-month period, a customer may request an extension of temporary service for one additional six-month period. No more than one extension will be granted, unless authorized by the Town Mayor.

A customer obtaining temporary water service will not be required to pay a System Development Charge. However, a customer obtaining temporary water service will be required to pay a deposit for the estimated costs of installation and removal of the equipment required for temporary service, as well as a damage or security deposit. In addition, temporary service will be metered and the customer shall be required to pay both a meter-reading charge and a charge for water usage in accordance with the

appropriate rate schedule (see Section 13.24, Table 13.24-05). Arrangements for metering and billing will be established on a case-by-case basis.

Upon termination of temporary service, the Town will disconnect the temporary water service and take possession of the associated Town equipment, or, if appropriate, convert the temporary service to permanent water service. Following disconnection or conversion, and payment of all outstanding charges for water usage, the Town shall return any surplus of installation and removal charges that exceed the actual costs incurred by the Town. In addition, the Town shall refund any damage or security deposits, less the amount needed to replace or repair Town equipment. However, in the event the customer fails to pay outstanding charges for water usage, the Town may retain an amount equal to such outstanding charges.

13.30.020 Hydrant Use.

No person shall operate or tamper with a fire hydrant connected to the Town's water system, without the express written approval of the Town or, in the case of an emergency threatening life or property, the approval of an authorized representative of the appropriate fire department. In addition to the penalty established in Section 13.30.050, any person violating this provision shall pay for the amount of water used, as estimated by the Town and based on the applicable rate schedule.

At the Town's discretion, authorization may be granted to take water from a fire hydrant connected to the Town's water system. Procedures for authorizing use of fire hydrants shall be as follows:

(a) When a customer desires to use a fire hydrant for Temporary Water Service (short-term water service at a fixed site) the procedures in this Section (13.30.020) shall be followed. The customer shall utilize only the hydrant specifically designated by the Town for this purpose, and will obtain water through a separate valve and meter installed by the Town on that hydrant.

(b) When a customer desires to use a fire hydrant for short-duration purposes at a fixed site (i.e. not exceeding three days), or for intermittent use by a mobile water tank (e.g. tanks on hydro-seeding or public works maintenance vehicles), the following procedures shall apply: The customer shall obtain a Hydrant Use Permit (See Appendix B) from the Town. A permit will be issued either for a daily (one to three days); monthly; or six-month period. The customer shall pay a fee established by the Town for the Permit (see Section 13.24, Table 13.24-05). However, at the Town's discretion, the fee may be adjusted if the quantity of water deviates by more than 50 percent from the following:

Daily Permit 2,500 gallons total
Monthly Permit 10,000 gallons total
Six-Month Permit 10,000 gallons/month

Metering will be required for all such use. A charge for water use shall be based on the amount of water used.

The customer shall utilize only those hydrants specifically designated by the Hydrant Use Permit. The customer shall provide backflow-prevention methods as approved by the Town. As a condition of obtaining a Hydrant Use Permit, the customer shall permit Town inspection of equipment to be used, to ensure backflow-prevention devices are adequate.

Chapter 13.32
13.32. UNAUTHORIZED TAKING OF WATER, TAMPERING WITH EQUIPMENT AND UNAUTHORIZED CONNECTION TO THE TOWN'S SYSTEM

Sections:

13.32.010 Unauthorized Taking of Water, Tampering with Equipment, and Unauthorized Connection to the Town's System.

Tampering with any equipment with the intent of defrauding or illegally diverting service is a Class D Felony in the State of Washington. When appropriate, the Town will seek prosecution for theft of water, destruction of Town property and other violations of law affecting delivery of its services, and may pursue collection for its losses, damages, and costs related to such actions to the full extent provided by law. In addition:

(a) There may be levied an investigation or service and/or commodity charge (See Section 13.30.040) against any person, firm or corporation who shall take water or knowingly received the benefit of water taken from any water line, reservoir, or fire hydrant, or any facility of the Town without the Town's consent and without first having obtained from the Town a permit to take such water. Such sum shall be due and payable immediately upon the taking of such water.

(b) There may be levied an investigation, service and/or commodity charge (See Section 13.30.040) against any person, firm or corporation who shall tamper with any water meter, fire line meter, service line, or any meter related appurtenances of the Town. Such sum shall be payable at the time of discovery by the Town of such tampering.

(c) There may be levied an investigation, service and/or commodity charge (See Section 13.30.040) against any person, firm or corporation who shall take water from an angle stop, service lead, angle check valve, or related appurtenances intended for a future meter installation without consent from the Town to take such water. A meter will not be installed to serve such property until such charge is paid together with the standard meter installation fees. If a meter application has been purchased from the Town and, prior to installation of such meter, it is determined by the Town that water has been taken in violation of this section then such meter will not be installed and the meter application will be held until the purchaser of such meter application pays the charge.

(d) There may be levied an investigation, and service and/or commodity charge (See Section 13.30.040) against any person, firm or corporation who shall operate any valve in the Town's system without the Town's consent. Such sum shall be due and payable at the time of discovery by the Town of such unauthorized operation.

13.32.020 Standard Penalties.

(a)	Unauthorized Taking of Water	Minimum of $200
(b)	Tampering with Equipment	Minimum of $200
(c)	Unauthorized Valve Operation	Minimum of $200
(d)	Unauthorized Use of Town Hydrant	$200
(e)	Tapping Main without Advance Notification	Minimum of $200

Chapter 13.34
DEGRADATION OF WATER QUALITY

Sections:

13.34.010 Contamination prohibited.

Any person, firm, corporation or other legal entity causing contamination of the Town's public water supply shall be responsible for remedial action as set forth in this chapter.

13.34.020 Remedial action.

Remedial action shall include all steps determined necessary by the Town Council to bring the water quality standards to the level existing prior to the contamination. Remedial action may include, but is not limited to, the cleanup of the pollutant, costs of filtration or treatment and as a final option relocation of Town well facilities. The polluter shall be responsible for all costs of remediation.

13.34.030 Contamination defined.

"Contamination" as used in this chapter shall mean introduction into the water supply of the Town of Hamilton of any of the contaminants listed in the water quality standards as established by the State Department of Health in Chapter 246-290 WAC as now exist or as may hereafter be amended or modified.

13.34.040 Penalties.

Any person violating any of the provisions of this chapter shall be guilty of a civil infraction and shall be subject to a civil penalty of up to $10,000 per day. Each and every day of violation shall be considered a separate violation punishable as set forth herein. Imposition of a civil penalty as provided herein shall not relieve the violator of the requirement to remediate the cause of the pollution as required in 13.34.020.

CHAPTER 13.38
Constitutionality and Saving Clause

Sections:
13.38.010: Constitutionality and Saving Clause

13.38.010: Constitutionality and Saving Clause.
That if any provision, section, sentence, clause or phrase of this ordinance or the application of same to any person or set of circumstances are for any reason held to be unenforceable, the validity of the remaining portions of this ordinance or its application to other persons or circumstances, shall not be affected thereby, it being the intent of the Town Council of the Town of Hamilton in adopting and the Mayor in approving this Ordinance that no portion hereof or provision or regulation contained herein shall become inoperative or fail by reason of any unconstitutionality or invalidity of any portion provision or regulation.

Section 4. This ordinance shall be in full force and effect after its passage, approval and publication as provided by Law.

INTRODUCED AND PASSED and approved at a regular meeting of the Town Council this 13 day of December ,2012.

THE TOWN OF HAMILTON

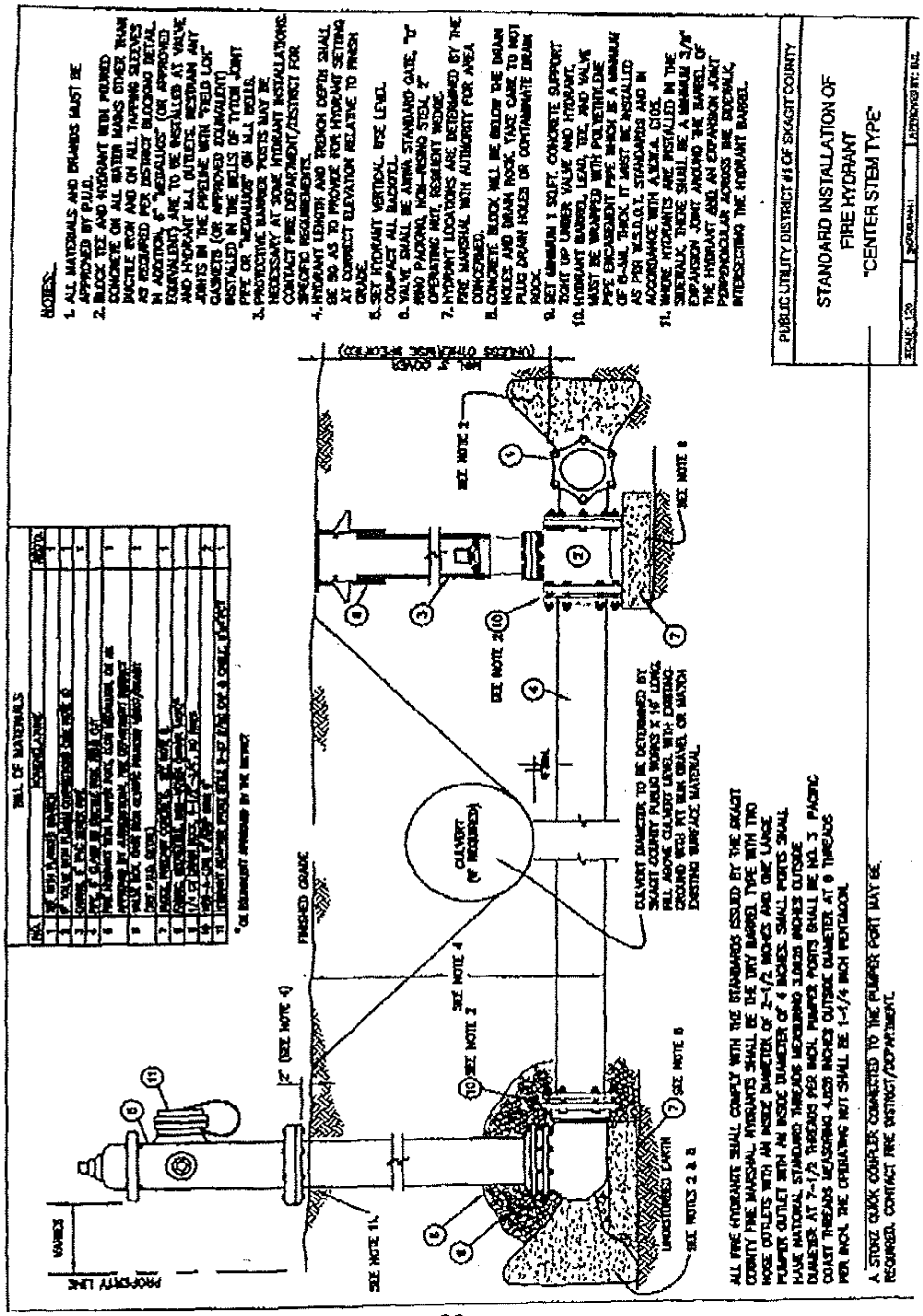
Timothy A. Bates, Mayor

ATTEST:

Susan West-Mani, Town Clerk

Stat. Ref.: For provisions authorizing all cities to provide for the water supply thereof, and to establish, construct and maintain a system of water supply within or without the corporate limits and to control, regulate and manage the same, see RCW 35.21.210; for provisions regarding the management of a municipal water and sewer system, see Chapters 35.67 and 35.91 RCW; for the provisions regarding the acquisition and operation of municipal utilities generally, see Chapter 35.92 RCW.

Appendix A


BILL OF MATERIALS
PROPERTY LINE
VARIES
FINISHED GRADE
2" (SEE NOTE 4)
SEE NOTE 11
SEE NOTE 4
SEE NOTE 2
SEE NOTE 8
SEE NOTES 2 & 8
UNDISTURBED EARTH
CULVERT (IF REQUIRED)
CULVERT DIAMETER TO BE DETERMINED BY SKAGIT COUNTY PUBLIC WORKS X 18' LONG. FILL ABOVE CULVERT LEVEL WITH EXISTING GROUND WITH PIT RUN GRAVEL OR MATCH EXISTING SURFACE MATERIAL.
(UNLESS OTHERWISE SPECIFIED)
ALL FIRE HYDRANTS SHALL COMPLY WITH THE STANDARDS ISSUED BY THE SKAGIT COUNTY FIRE MARSHAL. HYDRANTS SHALL BE THE DRY BARREL TYPE WITH TWO HOSE OUTLETS WITH AN INSIDE DIAMETER OF 2-1/2 INCHES AND ONE LARGE PUMPER OUTLET WITH AN INSIDE DIAMETER OF 4 INCHES. SMALL PORTS SHALL HAVE NATIONAL STANDARD THREADS MEASURING 3.0625 INCHES OUTSIDE DIAMETER AT 7-1/2 THREADS PER INCH. PUMPER PORTS SHALL BE NO. 3 PACIFIC COAST THREADS MEASURING 4.625 INCHES OUTSIDE DIAMETER AT 6 THREADS PER INCH. THE OPERATING NUT SHALL BE 1-1/4 INCH PENTAGON.
A STORZ QUICK COUPLER CONNECTED TO THE PUMPER PORT MAY BE REQUIRED. CONTACT FIRE DISTRICT/DEPARTMENT.
NOTES:
1. ALL MATERIALS AND BRANDS MUST BE APPROVED BY P.U.D.
2. BLOCK TEE AND HYDRANT WITH POURED CONCRETE ON ALL WATER MAINS OTHER THAN DUCTILE IRON AND ON ALL TAPPING SLEEVES AS REQUIRED PER DISTRICT BLOCKING DETAIL. IN ADDITION, 6" "MEGALUGS" (OR APPROVED EQUIVALENT) ARE TO BE INSTALLED AT VALVE AND HYDRANT M.J. OUTLETS. RESTRAIN ANY JOINTS IN THE PIPELINE WITH "FIELD LOK" GASKETS (OR APPROVED EQUIVALENT) INSTALLED IN THE BELLS OF TYTON JOINT PIPE OR "MEGALUGS" ON M.J. BELLS.
3. PROTECTIVE BARRIER POSTS MAY BE NECESSARY AT SOME HYDRANT INSTALLATIONS. CONTACT FIRE DEPARTMENT/DISTRICT FOR SPECIFIC REQUIREMENTS.
4. HYDRANT LENGTH AND TRENCH DEPTH SHALL BE SO AS TO PROVIDE FOR HYDRANT SETTING AT CORRECT ELEVATION RELATIVE TO FINISH GRADE.
5. SET HYDRANT VERTICAL. USE LEVEL. COMPACT ALL BACKFILL.
6. VALVE SHALL BE AWWA STANDARD GATE, "O" RING PACKING, NON-RISING STEM, 2" OPERATING NUT, RESILIENT WEDGE.
7. HYDRANT LOCATIONS ARE DETERMINED BY THE FIRE MARSHAL WITH AUTHORITY FOR AREA CONCERNED.
8. CONCRETE BLOCK WILL BE BELOW THE DRAIN HOLES AND DRAIN ROCK. TAKE CARE TO NOT PLUG DRAIN HOLES OR CONTAMINATE DRAIN ROCK.
9. SET MINIMUM 1 SQ.FT. CONCRETE SUPPORT TIGHT UP UNDER VALVE AND HYDRANT.
10. HYDRANT BARREL, LEAD, TEE, AND VALVE MUST BE WRAPPED WITH POLYETHYLENE PIPE ENCASEMENT PIPE WHICH IS A MINIMUM OF 8-MIL THICK. IT MUST BE INSTALLED AS PER W.S.D.O.T. STANDARDS AND IN ACCORDANCE WITH A.W.W.A. C105.
11. WHERE HYDRANTS ARE INSTALLED IN THE SIDEWALK, THERE SHALL BE A MINIMUM 3/8" EXPANSION JOINT AROUND THE BARREL OF THE HYDRANT AND AN EXPANSION JOINT PERPENDICULAR ACROSS THE SIDEWALK, INTERSECTING THE HYDRANT BARREL.
PUBLIC UTILITY DISTRICT #1 OF SKAGIT COUNTY
STANDARD INSTALLATION OF FIRE HYDRANT "CENTER STEM TYPE"

Appendix B

Town of Hamilton

P.O. Box 528
584 Maple Street
Hamilton, WA 98255
Phone: (360) 826-3027

PERMIT FOR TEMPORARY WITHDRAWAL OF WATER FROM FIRE HYDRANTS

Provisional permission is given to _____ to withdraw water from a fire hydrant located at _____

Valid from: _____ to _____

The Permittee agrees to pay to the Town all costs for repair of damage to its facilities and any increased costs due to negligence during operation of the hydrant.

The Permittee agrees to pay to the Fire District or the Town all costs for repairs of the fire hydrant if it is damaged by the Permittee as a result of its use.

Fire hydrants will be used only during regular working hours except by special written permission. A standard hydrant wrench is to be used when operating the hydrant and a District issued meter assembly with a gate valve placed on the 2-1/2-inch port to be used. The hydrant shall be fully in the open position when in use in order to avoid damage to the hydrant. Water flow shall be regulated by the gate valve on the meter assembly. The meter assembly shall be removed and the hydrant completely closed at the end of each day.

The Town's water contains chlorine, a mild disinfectant. The disinfectant water can be deleterious to aquatic life. The water must be neutralized prior to discharge to an environmentally sensitive area.

The above Permittee, in exchange for permission to operate and obtain water from the above indicated fire hydrant and for other good and valuable considerations, does hereby agree to indemnify and hold the Town harmless from any and all claims, action, losses or liability on behalf of any person whomever relating to the use of said hydrant. The Permittee recognizes that all use of this facility at any time is at their own risk. In the event any claims are made or liability is established, the Permittee hereby agrees to defend and hold harmless the Town, its Council Members, Management and Employees from any acts or omissions whatsoever, and will defend the Town from any claims made against the Town.

Check Out Date: 12/01/2012 Initial Fee Paid: $25.00

Permittee Signature: _____

Printed Name: _____

Permittee Address: _____

_____

Permittee Telephone: _____

Meter#: 12345

Meter read: 175

Hydrant meter service charge per month is $25.00, no proration for partial months. Example: 2.5 months is charged as 3 months.

Water usage is charged per month at a rate of $2.77 per hundred cubic feet for the first 100 cf each month, then at a rate of $1.89 per hundred cubic feet in excess of 100 cf.

The Hydrant meter is to be brought in and read monthly to obtain the most advantageous rate.

Note: Rates subject to change without notice.

Comments or Special Conditions:

If the Hydrant Meter is not checked in each month the total monthly usage will be averaged.

Water Department

Accounting Department

cc Fire District _____ Notified _____

APPENDIX III – EASEMENTS

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

2-35-4

23

Bla

Incl EZ
Sue doc

KATHY ...
SKAGIT ...

'99 FEB -1 P3:56

9902010167

RETURN TO:

Patrick M. Hayden
Attorney at Law
P. O. Box 454
Sedro-Woolley, WA 98284

ORIGINAL

ISLAND TITLE CO. SB-13393 ✓

DOCUMENT TITLE(S) *(or transactions contained herein)*:

Combined Quit Claim Deeds and Agreement Conveying Real Property

REFERENCE NUMBERS(S) OF DOCUMENTS ASSIGNED OR RELEASED:

27634/27635
SKAGIT COUNTY WASHINGTON
Real Estate Excise Tax
FEB 01 1999
Amount Paid $ 0
Skagit Co. Treasurer
By Lp Deputy

GRANTOR(S) *(Last name, first name and initials)*:

1. Crown Pacific Limited Partnership, a Delaware Limited Partnership
2. Town of Hamilton, a Washington Municipal Corporation

GRANTEE(S) *(Last name, first name and initials)*:

1. Town of Hamilton, a Washington Municipal Corporation
2. Crown Pacific Limited Partnership, a Delaware Limited Partnership

LEGAL DESCRIPTION *(Abbreviated: i.e., lot, block, plat or quarter, quarter, section, township and range)*.

A. The North ½ of the East ½ of the West ½ of the Southwest ¼ of the Northwest ¼ of Section 12, Township 35 North, Range 6 East, W.M. Situated in Skagit County, Washington.

B. The West ½ of the Southwest ¼ of the Northwest ¼ of Section 12, Township 35 North, Range 6 East, W.M. Situated in Skagit County, Washington; except the North ½ of the east ½ of said parcel.

ASSESSOR'S PARCEL/TAX I.D. NUMBER: ~~/350612/12-004-0001/~~(P41087)
350612-2-004-0001

9902010167

COMBINED QUIT CLAIM DEEDS
AND AGREEMENT CONCERNING REAL PROPERTY

1. Quit Claim Deed: Crown Pacific to Town of Hamilton

The Grantor, Crown Pacific Limited Partnership, a Delaware Limited Partnership, conveys and quit claims to the Town of Hamilton, a Washington Municipal Corporation, the following described real property, including any after-acquired interest of Grantor, situated in Skagit county, Washington, describes as follows:

The North ½ of the East ½ of the West ½ of the Southwest ¼ of the Northwest ¼ of Section 12, Township 35 North, Range 6 East W.M.

2. Quit Claim Deed: Town of Hamilton to Crown Pacific.

The Town of Hamilton, a Washington Municipal Corporation, conveys and quit claims to Crown Pacific Limited Partnership, a Delaware Limited Partnership, the following described real property, including any after-acquired interest of Grantor, situated in Skagit County, Washington, described as follows:

The West ½ of the Southwest ¼ of the Northwest ¼ of Section 12, Township 35 North, Range 6 East, W.M., except the North ½ of the East ½ of said parcel.

This conveyance is a boundary line adjustment. **The property described above shall be aggregated with adjoining property of Grantee, and shall not constitute a separate building lot** without compliance with the Skagit County subdivision ordinance.

3. Easements. Crown Pacific Limited Partnership hereby conveys and quit claims to the Town of Hamilton an easement for ingress, egress, utilities, water mains and related appurtenances, for access, construction, repair, maintenance, and operation of municipal facilities, including a water line, and for timber production, over, across and under that real property of Crown Pacific located East of the existing County road in the NE ¼ of Section 11 and the NW ¼ of Section 12, Township 35 North, Range 6 East, W.M., situated in Skagit County, Washington. Said easements shall be located by the Town Engineer in consultation with Crown Pacific, as necessary to serve said municipal facilities, in a manner which impacts the property of Crown Pacific as little as is reasonably possible under all circumstances.

Ether Crown Pacific or the Town of Hamilton may limit the use of any access road on that property legally described herein to use by the parties hereto, and not by the general public.

4. Restrictions. The parties covenant and agree that the real property described in paragraphs 1 and 2 herein shall not be used for residential purposes, but for timber production and related purposes, and for municipal facilities, including a municipal water supply, well, and related facilities, and communications facilities.

5. Right of First Refusal. The parties each grant and convey a right of first refusal to the other, to purchase the real property described in Sections 1 and 2 herein, on the same terms and conditions as offered to any other party. However, this right of first refusal shall not apply to a sale of this property by Crown Pacific if part of a sale of substantially all adjoining property, in conjunction with a sale of its real estate assets outside the normal course of business, nor to a conveyance by the Town of Hamilton to another municipal corporation.

6. Successors. The covenants and obligations described herein shall be binding on and inure to the benefit of the parties, their heirs, assigns and successors in interest, and shall be covenants running with and appurtenant to the lands described herein.

Approved as a boundary line adjustment:

Town of Hamilton Planning Director, by: Margaret Clark

Date 12/3/98

Approved as a boundary line adjustment:

Skagit County Planning Director, by: Grace S. Roeder

Date 12/10/98

Dated December 8, 1998

TOWN OF HAMILTON
a Washington Municipal Corporation

by Ronald A Batt mayor
Mayor

Attest:

by Deborah Sutton
Town Clerk

CROWN PACIFIC LIMITED PARTNERSHIP
a Delaware Limited Partnership

by [illegible]
Authorized Agent

State of Oregon)
) ss.
County of Multnomah)

On this day personally appeared before me ROGER L. KRAGE, to me known to be the authorized agent of Crown Pacific Limited Partnership, described in and who executed the within and foregoing instrument on behalf of Crown Pacific Limited Partnership and acknowledged that he/she signed the same as his/her free and voluntary act and deed, for the uses and purposes therein mentioned, and on oath stated that he/she was authorized to execute said instrument for Crown Pacific Limited Partnership.

Given under my hand and official seal this 25th day of November, 1998.

OFFICIAL SEAL
LILY KENNEDY
NOTARY PUBLIC-OREGON
COMMISSION NO. 309790
MY COMMISSION EXPIRES FEB 23, 2002

Lily Kennedy
Notary Public in and for the State of Oregon, residing at Vancouver WA
My Commission Expires: 2-23-02
Print Name Lily Kennedy

State of Washington)
) ss.
County of Skagit)

On this date personally appeared before me Tim Bates and Delilah Sutton, to me known to be the Mayor and Clerk of the Town of Hamilton, described in and who executed the foregoing instrument on behalf of said municipal corporation, and acknowledged that they signed the same as the free and voluntary act and deed of said municipal corporation, for the uses and purposes therein mentioned.

GIVEN Under My Hand and Official Seal this 8 day of December, 1998.

Patricia M. Hayden
Notary Public in and for the State of Washington, residing at Sedro Woolley
My Commission Expires: 10-1-2000
Print Name: Patricia M. Hayden

200109180007
, Skagit County Auditor
9/18/2001 Page 1 of 7 8:50:22AM

RETURN ADDRESS:
P. Hayden
City of Sedro-Woolley
720 Murdock Street
Sedro-Woolley, WA 98284

ORIGINAL

EASEMENT FOR WATER MAIN AND RELATED ACCESSORIES

GRANTOR: **Crown Pacific Ltd., a Delaware Limited Partnership**

GRANTEE: **Town of Hamilton, a Washington Municipal Corporation**

SHORT LEGAL: **Ptn South ½ of NE ¼ of Sec. 11, Twp. 35 N., Rng. 6 E., W.M., and Ptn of W ½ of SW ¼ of NW ¼ of Section 12, Twp 35 N., Rge 6 E., W.M.; Situated in Skagit County, Washington; together with Easement.**

ASSESSOR'S PROPERTY TAX PARCEL: **R41027; R41087**

For and in consideration of the mutual promises set forth herein, **Crown Pacific Ltd., a Delaware Limited Partnership** ("Grantor" herein), hereby conveys and quit claim to **Town of Hamilton, a Washington Municipal Corporation** ("Grantee" herein), for the purposes hereinafter set forth, a nonexclusive perpetual easement, including any after-acquired interest therein, over, under, along across and through the following described real property ("Property" herein) in Skagit County, Washington:

> An Easement Area 20 (twenty) feet in width having 10 (ten) feet of such width on each side of a centerline described on the attached Exhibit A, incorporated herein by reference as though set forth in full (shown for illustrative purposes on the attached Exhibit B) as the same is located on property of Grantor; All situate in the County of Skagit, State of Washington.

Except as may be otherwise set forth herein Grantee's rights shall be exercised upon that portion of the Property ("Easement Area" herein) described above.

In addition, Grantee shall have an easement to use the existing roads located on Grantor's property in Sections 11 and 12, Section 12, Twp 35 N., Rge 6 E. W.M.; Situated in Skagit County, Washington, to access grantor's property and the waterline.

1. **Purpose.** Grantee shall have the right to construct, operate, maintain, repair, replace, improve, remove, enlarge, and use the easement area for one or more utility systems for purposes of transmission, distribution and sale of water. Such systems may include, but are not limited to:

> Water mains, pipes, junctions, meters, valves, fire hydrants; conduits, lines, cables, vaults, switches and transformers for electricity; fiber optic cable and other lines, cables and facilities for communications; semi-buried or ground-mounted facilities and pads, manholes, meters, fixtures, attachments and any and all other facilities or appurtenances necessary or convenient to any or all of the foregoing.

Following the initial construction of all or a portion of its systems, Grantee may, from time to time, construct such additional facilities as it may require for such systems. Grantee shall have the right of access to the Easement Area over and across the adjoining property of Grantor to enable Grantee to exercise its rights hereunder. Grantor shall allow Grantee access over the Easement Area such that Grantee can exercise its rights hereunder and access its systems at all times. Grantee shall compensate Grantor for any damage to the Property caused by the exercise of such right of access by Grantee.

2. **Easement Area Clearing and Maintenance.** Grantee shall have the right to cut, remove and dispose of any and all brush, trees or other vegetation in the Easement Area. Grantee shall also have the right to control, on a continuing basis and by any prudent and reasonable means, the establishment and growth of brush, trees or other vegetation in the Easement Area. Grantee shall not spray pesticides or herbicides without written consent of Grantors.

3. **Trees Outside Easement Area.** Grantee shall have the right to cut, trim remove and dispose of any trees located on the Property outside the Easement Area that could, in Grantee's sole judgment, interfere with or create a hazard to Grantee's systems. Grantee shall, prior to the exercise of such right, identify such trees and make a reasonable effort to give Grantor prior notice that such trees will be cut, trimmed, removed or disposed of (except that Grantee shall have no obligation to identify such trees or give Grantor such prior notice when trees are cut, trimmed, removed or otherwise disposed of in response to emergency conditions). Grantor shall be entitles to no compensation for trees cut, trimmed, removed or disposed of except for the actual market value of merchantable timber (if any) cut and removed from the Property by Grantee.

4. **Grantor's Use of Easement Area.** Grantor reserves the right to use the Easement Area for any purpose not inconsistent with the rights herein granted, provided, however, Grantor shall not construct or maintain any buildings, structures or other objects on the Easement Area and Grantor shall do no blasting within 300 feet of Grantee's facilities without Grantee's prior written consent.

5. **Indemnity.** Grantee agrees to indemnify Grantor from and against liability incurred by Grantor as a result of Grantee's negligence in the exercise of the rights herein granted to

Grantee, but nothing herein shall require Grantee to indemnify Grantor for that portion of any such liability attributable to the negligence of Grantor or the negligence of others.

6. Abandonment. The rights herein granted shall continue until such time as Grantee ceases to use the Easement Area for a period of five (5) successive years, in which event, this easement shall terminate and all rights hereunder, and any improvements remaining in the Easement Area, shall revert to or otherwise become the property of Grantor; provided, however, that no abandonment shall be deemed to have occurred by reason of Grantee's failure to initially install its systems on the Easement Area within any period of time from the date hereof.

7. Successors and Assigns. Grantee shall have the right to assign, apportion or otherwise transfer any or all of its rights, benefits, privileges and interests arising in and under this easement to any public utility or municipal service providers, but such assignment shall not expand the scope of the easement. Without limiting the generality of the foregoing, the rights and obligations of the parties shall inure to the benefit of and be binding upon their respective successors and assigns.

#42914
SKAGIT COUNTY WASHINGTON
Real Estate Excise Tax
PAID

SEP 17 2001

Amount Paid $
Skagit County Treasurer
By: Deputy

DATED this 27th day of August, 2001.

GRANTOR:

CROWN PACIFIC LTD., a Delaware Limited Partnership

Russell Paul

Authorized Agent
Print Name: Russell Paul
Title: Land + Timber Manager

STATE OF WASHINGTON)
) ss
COUNTY OF SKAGIT)

On this day before me, the undersigned, a Notary Public in and for the State of WASHINGTON, duly commissioned and sworn, personally appeared RUSSELL PAUL, to me known to be the Authorized Agent of Crown Pacific Ltd., a Delaware Limited Partnership, that executed the within and foregoing instrument, and acknowledged said instrument to be his/her free and voluntary act and deed and the free and voluntary act and deed of said Limited Partnership, for the uses and purposes therein mentioned; and on oath stated that he was authorized to execute the said instrument on behalf of said Town.

IN WITNESS WHEREOF I have hereunto set my hand and official seal this 27TH day of AUGUST, 2001.

David W Lambert
(Signature of Notary)
DAVID W LAMBERT
(Print name of Notary)
NOTARY PUBLIC in and for the State of WASHINGTON, residing at SEDRO-WOOLLEY
My Appointment Expires: 1-5-2003

GRANTEE:

TOWN OF HAMILTON, a Washington Municipal Corporation

Mayor

Attest:

Town Clerk

STATE OF WASHINGTON)
) ss
COUNTY OF SKAGIT)

On this 21 day of August, 2001, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Timothy Bates and Delilah Sutton, to me known to be the Mayor and Clerk of the Town of Hamilton that executed the within and foregoing instrument, and acknowledged said instrument to be his/her free and voluntary act and deed and the free and voluntary act and deed of said Town, for the uses and purposes therein mentioned; and on oath stated that they was authorized to execute the said instrument on behalf of said Town.

IN WITNESS WHEREOF I have hereunto set my hand and official seal the day and year first above written.

(Signature of Notary)
Patrick M. Hayden
(Print or stamp name of Notary)
NOTARY PUBLIC in and for the State of Washington, residing at Sedro-Woolley
My Appointment Expires: 10-1-04

Skagit Surveyors & Engineers

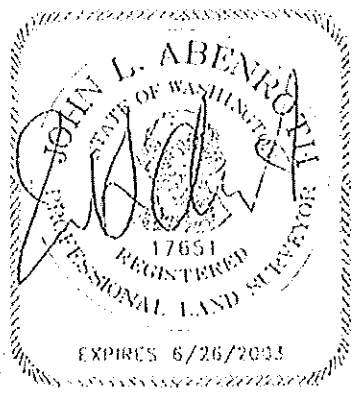
[illegible]

LEGAL DESCRIPTION FOR TOWN OF HAMILTON OF CENTERLINE OF WATER LINE ROUTE

July 30, 2001

An easement for installation, operation and maintenance of a water line, over, under, and through a portion of the southwest quarter of the northwest quarter of Section 12, Township 35 North, Range 6 East, W.M., and a portion of the east half of Section 11, Township 35 North, Range 6 East, W.M., the centerline of which is described as follows:

Commencing at the southwest corner of the east half of the northwest quarter of the southwest quarter of the northwest quarter of said Section 12; thence N 2°08'21"E along the west line of said east half of the northwest quarter of the southwest quarter of the northwest quarter of Section 12, a distance of 110.00 feet and the initial point of this centerline description; thence S 83°28'39"W, a distance of 81.82 feet; thence S 72°13'39"W, a distance of 118.46 feet; thence S 60°58'39"W, a distance of 45.05 feet; thence S 15°58'39"W, a distance of 234.43 feet; thence N 74°01'21"W, a distance of 44.69 feet to a point on the west line of said Section 12 which bears N 2°10'02"E a distance of 471.36 feet from the west quarter corner of said Section 12; thence continuing N 74°01'21"W , a distance of 365.26 feet; thence S 60°58'39"W, a distance of 137.66 feet; thence S 27°13'39"W, a distance of 454.94 feet; thence S 4°43'39"W, a distance of 604.68 feet; thence S 15°58'39"W, a distance of 174.02 feet; thence S 27°13'39"W, a distance of 107.92 feet; thence S 60°58'39"W, a distance of 81.17 feet; thence S 38°28'39"W, a distance of 128.51 feet; thence S 60°58'39"W, a distance of 41.80 feet; thence S 72°13'39"W, a distance of 44.28 feet; thence S 83°28'39"W, a distance of 67.38 feet; thence S 72°13'39"W, a distance of 141.35 feet; thence S 46°44'37"W, a distance of 26.45 feet; thence S 12°44'37"W, a distance of 97.83 feet; thence S 1°29'37"W, a distance of 84.78 feet; thence S 23°59'37"W, a distance of 37.74 feet; thence S 46°29'37"W, a distance of 33.99 feet; thence S 68°59'37"W, a distance of 32.10 feet to a point on the centerline of the south 30 feet of the northwest quarter of the southeast quarter of said Section 11; thence S 88°30'24"W along the centerline of said south 30 feet, a distance of 315.90 feet to the right of way of Hamilton Cemetery Road and the terminal point of this centerline description.



8/1/2001

y, Washington.

Exhibit A

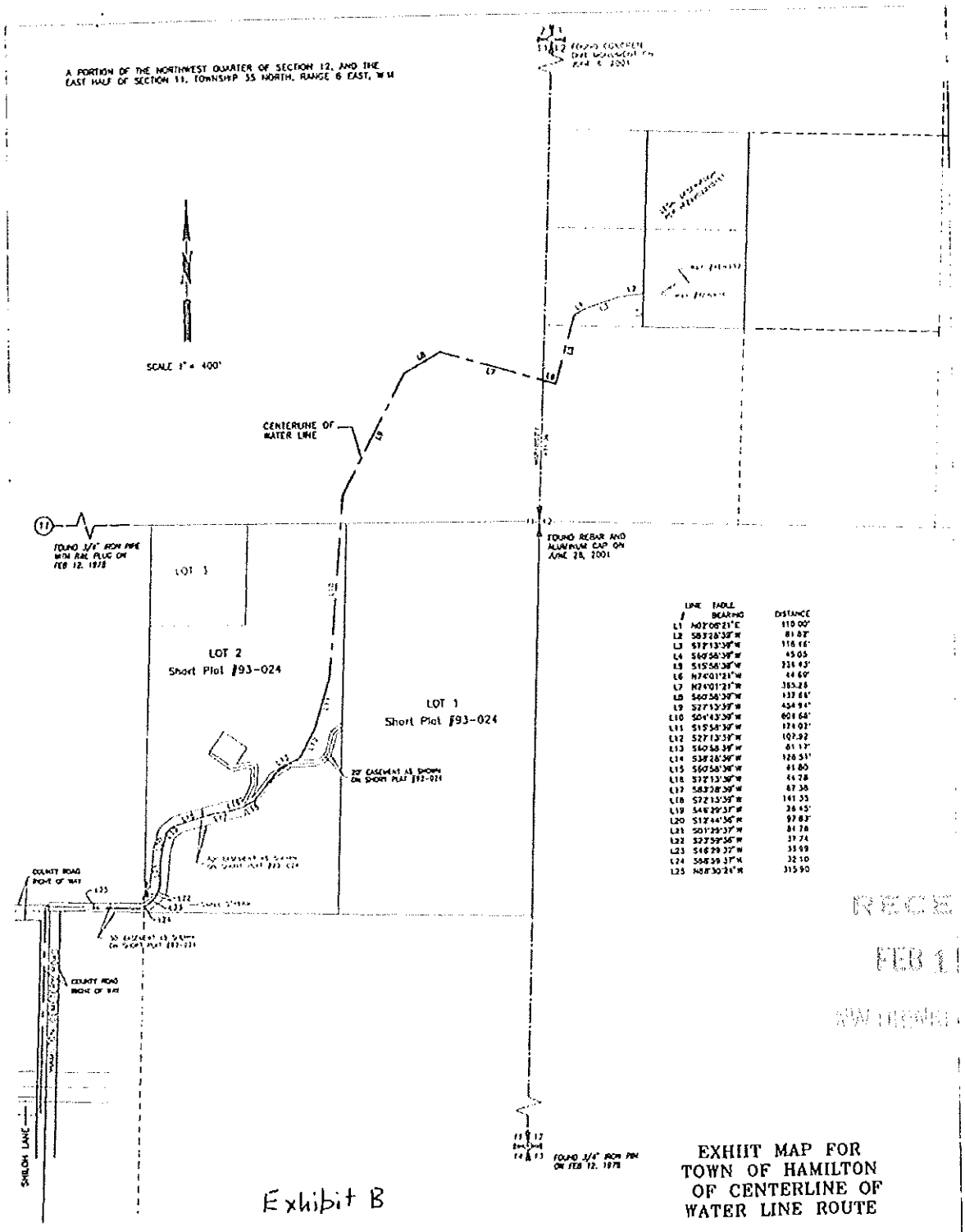


Exhibit B

SKAGIT SURVEYORS, INC 806 METCALF ST. SEDRO-WOOLLEY, WA 98284 855-2121 30JUL01 JN200322

200109180007
, Skagit County Auditor
9/18/2001 Page 7 of 7 8:50:22AM

200108240072
, Skagit County Auditor
8/24/2001 Page 1 of 11 11:19:50AM

RETURN ADDRESS:
P. Hayden
City of Sedro-Woolley
720 Murdock Street
Sedro-Woolley, WA 98284

ORIGINAL

EASEMENT FOR WATER MAIN AND RELATED ACCESSORIES

GRANTOR: **Frances M. Adams**, as her separate estate; **Grady H. Mathis and Teresa (Terry) L. Mathis**, husband and wife, and **Marion L. Adams and Leona W. Adams**, husband and wife; **Jason Mathis and Kelli Chase Mathis**, husband and wife;

GRANTEE: **Town of Hamilton, a Washington Municipal Corporation**

SHORT LEGAL: **Ptn. Sec. 11, Twp. 35 N., Rng. 6 E., W.M., including Ptn Lot 2, Short Plat No. 93-24; Situated in Skagit County, Washington**

ASSESSOR'S PROPERTY TAX PARCEL: **R41049; R41051;** R 41080

For and in consideration of the mutual promises set forth herein, **Frances M. Adams**, as her separate estate; **Grady H. Mathis and Teresa (Terry) L. Mathis**, husband and wife, and **Marion L. Adams and Leona W. Adams**, husband and wife; **Jason Mathis and Kelli Chase Mathis**, husband and wife; (all in both their joint and several capacities, as well as on behalf of their marital communities, as their interests appear) ("Grantor" herein), hereby conveys and quit claim to **Town of Hamilton**, a Washington Municipal Corporation ("Grantee" herein), for the purposes hereinafter set forth, a nonexclusive perpetual easement, including any after-acquired interest therein, over, under, along across and through the following described real property ("Property" herein) in Skagit County, Washington:

> An Easement Area 20 (twenty) feet in width having 10 (ten) feet of such width on each side of a centerline described on the attached Exhibit A, incorporated herein by reference as though set forth in full (shown for illustrative purposes on the attached Exhibit B) as the same is located on property of Grantors; All situate in the County of Skagit, State of Washington.

Except as may be otherwise set forth herein Grantee's rights shall be exercised upon that portion of the Property ("Easement Area" herein) described above.

Said Easement Area shall not encroach on that property (one acre, excluding easement) owned by Marion L. Adams and Leona W. Adams, husband and wife, legally described in that deed dated June 4, 1979, and recorded June 11, 1979, in Skagit County Auditor's File No. 7906110006, nor on Lot 1, Skagit County Short Plat 93-024.

In addition, Grantee shall have an easement to construct facilities to return water to a small stream located near the SE corner of property owned by Jason Mathis and Kelli Chase Mathis, North of the private road described in that deed dated June 4, 1979, and recorded June 11, 1979, in Skagit County Auditor's File No. 7906110006, said location to be selected by Grantee's engineer.

1. Purpose. Grantee shall have the right to construct, operate, maintain, repair, replace, improve, remove, enlarge, and use the easement area for one or more utility systems for purposes of transmission, distribution and sale of water. Such systems may include, but are not limited to:

> Water mains, pipes, junctions, meters, valves, fire hydrants; conduits, lines, cables, vaults, switches and transformers for electricity; fiber optic cable and other lines, cables and facilities for communications; semi-buried or ground-mounted facilities and pads, manholes, meters, fixtures, attachments and any and all other facilities or appurtenances necessary or convenient to any or all of the foregoing.

Following the initial construction of all or a portion of its systems, Grantee may, from time to time, construct such additional facilities as it may require for such systems. Grantee shall have the right of access to the Easement Area over and across the adjoining property of Grantors to enable Grantee to exercise its rights hereunder. Grantor shall allow Grantee access over the Easement Area such that Grantee can exercise its rights hereunder and access its systems at all times. Grantee shall compensate Grantor for any damage to the Property caused by the exercise of such right of access by Grantee.

2. Easement Area Clearing and Maintenance. Grantee shall have the right to cut, remove and dispose of any and all brush, trees or other vegetation in the Easement Area. Grantee shall also have the right to control, on a continuing basis and by any prudent and reasonable means, the establishment and growth of brush, trees or other vegetation in the Easement Area. Grantee shall not spray pesticides or herbicides without written consent of Grantors.

3. Trees Outside Easement Area. Grantee shall have the right to cut, trim remove and dispose of any trees located on the Property outside the Easement Area that could, in Grantee's sole judgment, interfere with or create a hazard to Grantee's systems. Grantee shall, prior to the exercise of such right, identify such trees and make a reasonable effort to give Grantor prior notice that such trees will be cut, trimmed, removed or disposed of (except that Grantee shall have no obligation to identify such trees or give Grantor such prior notice when trees are cut, trimmed, removed or otherwise disposed of in response to emergency conditions). Grantor shall be entitles to no compensation for trees cut, trimmed, removed or disposed of except for the

actual market value of merchantable timber (if any) cut and removed from the Property by Grantee.

4. Grantor's Use of Easement Area. Grantor reserves the right to use the Easement Area for any purpose not inconsistent with the rights herein granted, provided, however, Grantor shall not construct or maintain any buildings, structures or other objects on the Easement Area and Grantor shall do no blasting within 300 feet of Grantec's facilities without Grantee's prior written consent.

5. Indemnity. Grantee agrees to indemnify Grantor from and against liability incurred by Grantor as a result of Grantee's negligence in the exercise of the rights herein granted to Grantee, but nothing herein shall require Grantee to indemnify Grantor for that portion of any such liability attributable to the negligence of Grantor or the negligence of others.

6. Abandonment. The rights herein granted shall continue until such time as Grantee ceases to use the Easement Area for a period of five (5) successive years, in which event, this easement shall terminate and all rights hereunder, and any improvements remaining in the Easement Area, shall revert to or otherwise become the property of Grantor; provided, however, that no abandonment shall be deemed to have occurred by reason of Grantee's failure to initially install its systems on the Easement Area within any period of time from the date hereof.

7. Successors and Assigns. Grantee shall have the right to assign, apportion or otherwise transfer any or all of its rights, benefits, privileges and interests arising in and under this easement to any public utility or municipal service providers, but such assignment shall not expand the scope of the easement. Without limiting the generality of the foregoing, the rights and obligations of the parties shall inure to the benefit of and be binding upon their respective successors and assigns.

8. Consideration. In consideration for the foregoing grant of easement, the Grantee shall provide the following to Grantor:

a. Upon completion of the water system improvements, Grady H. Mathis and Teresa (Terry) L. Mathis shall have 3 (three) single family residential water connections from meters to be located at a point on the roadway between the Mathis and Adams residences as determined by the Grantee. Their use shall be limited to property owned by Mathis or their successors in interest. No initial connection fee or facility improvement charge shall be assessed for these connections, but the right to withdraw water from these three connections shall be subject to the fees, regulations and ordinances of the Town of Hamilton, on the same basis as applicable to other similarly situated users. No fee shall be charged for these connections until water is first drawn from them. Said water connections shall be utilized in a manner consistent with the Skagit County subdivision and development codes.

b. Upon completion of the water system improvements, Marion L. Adams and Leona W. Adams shall have 3 (three) single-family residential water connections from meters to be located at a point on the roadway between the Mathis and Adams residences as determined by the Grantee. Their use shall be limited to property owned by Adams or their successors in interest. No initial connection fee or facility improvement charge shall be assessed for these connections, but the right to withdraw water from these two connections shall be subject to the fees,

regulations and ordinances of the Town of Hamilton, on the same basis as applicable to other similarly situated users. No fee shall be charged for these connections until water is first drawn from them. Said water connections shall be utilized in a manner consistent with the Skagit County subdivision and development codes.

c. Upon completion of the water system improvements, Jason Mathis and Kelli Chase Mathis shall have 1 (one) single-family residential water connections from a meter to be located at a point on the roadway in front of their residence as determined by the Grantee. Their use shall be limited to property owned by Mathis or their successors in interest. No initial connection fee or facility improvement charge shall be assessed for this connection, but the right to withdraw water from the connection shall be subject to the fees, regulations and ordinances of the Town of Hamilton, on the same basis as applicable to other similarly situated users. No fee shall be charged for this connection until water is first drawn from them. Said water connection shall be utilized in a manner consistent with the Skagit County subdivision and development codes.

d. Grantee shall have the dividing line between Lots 1 and 2, SP #93-024 staked by a licensed surveyor within 120 days of the recording of this easement.

e. Upon completion of the water system improvements Grantee shall prepare, gravel, and grade the existing roadway described in that deed dated June 4, 1979, and recorded June 11, 1979, in Skagit County Auditor's File No. 7906110006, from Hamilton Cemetery Road to the SW corner of the real property described in said deed.

f. Upon completion of the water system improvements Grantee shall install a fire hydrant at a location on the private road described in that deed dated June 4, 1979, and recorded June 11, 1979, in Skagit County Auditor's File No. 7906110006, said location to be selected by Grantee's engineer.

g. Upon completion of the water system improvements Grantee shall locate an electrical junction box on the private road described in that deed dated June 4, 1979, and recorded June 11, 1979, in Skagit County Auditor's File No. 7906110006, said location to be selected by Grantee's engineer. Grantors may use said junction box for an electrical source in a manner consistent with the rules and regulations of the electrical provider, so long as such use does not interfere with the ability of Grantee to also use said electrical utility services.

The parties agree that the consideration provided to Grantors has a value equal to or in excess of the value of the easement. Grantors hereby waive their rights to an appraisal and offer of fair market value, and stipulate that this offer is fair compensation for the conveyance of the easement. Grantee shall pay the costs of recording fees, title insurance and excise tax, if any, for this conveyance. Grantors shall sign any additional documents to perfect Grantee's title to the easement, at no additional cost to Grantors.

DATED this 9 day of August, 2001.

GRANTORS:

Frances M. Adams

STATE OF WASHINGTON)
) ss
COUNTY OF SKAGIT)

On this 12 day of August, 2001, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared **Frances M. Adams**, to me known to be the person that executed the within and foregoing instrument, and acknowledged said instrument to be his/her free and voluntary act and deed, for the uses and purposes therein mentioned.

IN WITNESS WHEREOF I have hereunto set my hand and official seal the day and year first above written.

(Signature of Notary)

(Print or stamp name of Notary)
NOTARY PUBLIC in and for the State of Washington, residing at
My Appointment Expires: 10-1-04

SKAGIT COUNTY WASHINGTON
Real Estate Excise Tax

AUG 2 4 2001

Amount Paid $
Skagit Co. Treasurer
By Deputy

RECEIVED
FEB 1 5 2002
NW DRINKING WATER

200108240072
, Skagit County Auditor
8/24/2001 Page 5 of 11 11:19:50AM

Grady H. Mathis

Teresa (Terry) L. Mathis

STATE OF WASHINGTON)
) ss
COUNTY OF SKAGIT)

On this 12 day of August, 2001, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Grady H. **Mathis and Teresa (Terry) L. Mathis,** to me known to be the person that executed the within and foregoing instrument, and acknowledged said instrument to be his/her free and voluntary act and, for the uses and purposes therein mentioned.

IN WITNESS WHEREOF I have hereunto set my hand and official seal the day and year first above written.

(Signature of Notary)

Patricia M. Hayden

(Print or stamp name of Notary)
NOTARY PUBLIC in and for the State of Washington, residing at Sedro-Woolley
My Appointment Expires: 10-1-05

Marion L. Adams

Leona W. Adams

STATE OF WASHINGTON)
) ss
COUNTY OF SKAGIT)

On this 9th day of August, 2001, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared **Marion L. Adams and Leona W. Adams,** to me known to be the person that executed the within and foregoing instrument, and acknowledged said instrument to be his/her free and voluntary act and, for the uses and purposes therein mentioned.

IN WITNESS WHEREOF I have hereunto set my hand and official seal the day and year first above written.

(Signature of Notary)

BRIAN L. STILES

(Print or stamp name of Notary)
NOTARY PUBLIC in and for the State of Washington, residing at Sedro-Woolley
My Appointment Expires: 4-1-2001

200108240072
, Skagit County Auditor
8/24/2001 Page 7 of 11 11:19:50AM

Jason Mathis

Kelli Chase Mathis

STATE OF WASHINGTON)
) ss
COUNTY OF SKAGIT)

On this 12 day of August, 2001, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared **Jason Mathis and Kelli Chase Mathis,** to me known to be the person that exeeuted the within and foregoing instrument, and acknowledged said instrument to be his/her free and voluntary act and, for the uses and purposes therein mentioned.

IN WITNESS WHEREOF I have hereunto set my hand and official seal the day and year first above written.

(Signature of Notary)

(Print or stamp name of Notary)
NOTARY PUBLIC in and for the State of Washington, residing at Cedar Woolley
My Appointment Expires: 10-1-05

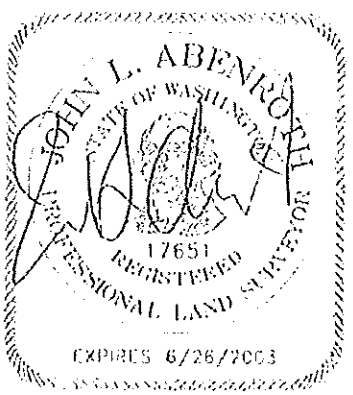
Skagit Surveyors & Engineers

LEGAL DESCRIPTION FOR TOWN OF HAMILTON OF CENTERLINE OF WATER LINE ROUTE

July 30, 2001

An easement for installation, operation and maintenance of a water line, over, under, and through a portion of the southwest quarter of the northwest quarter of Section 12, Township 35 North, Range 6 East, W.M., and a portion of the east half of Section 11, Township 35 North, Range 6 East, W.M., the centerline of which is described as follows:

Commencing at the southwest corner of the east half of the northwest quarter of the southwest quarter of the northwest quarter of said Section 12; thence N 2°08'21"E along the west line of said east half of the northwest quarter of the southwest quarter of the northwest quarter of Section 12, a distance of 110.00 feet and the initial point of this centerline description; thence S 83°28'39"W, a distance of 81.82 feet; thence S 72°13'39"W, a distance of 118.46 feet; thence S 60°58'39"W, a distance of 45.05 feet; thence S 15°58'39"W, a distance of 234.43 feet; thence N 74°01'21"W, a distance of 44.69 feet to a point on the west line of said Section 12 which bears N 2°10'02"E a distance of 471.36 feet from the west quarter corner of said Section 12; thence continuing N 74°01'21"W , a distance of 365.26 feet; thence S 60°58'39"W, a distance of 137.66 feet; thence S 27°13'39"W, a distance of 454.94 feet; thence S 4°43'39"W, a distance of 604.68 feet; thence S 15°58'39"W, a distance of 174.02 feet; thence S 27°13'39"W, a distance of 107.92 feet; thence S 60°58'39"W, a distance of 81.17 feet; thence S 38°28'39"W, a distance of 128.51 feet; thence S 60°58'39"W, a distance of 41.80 feet; thence S 72°13'39"W, a distance of 44.28 feet; thence S 83°28'39"W, a distance of 67.38 feet; thence S 72°13'39"W, a distance of 141.35 feet; thence S 46°44'37"W, a distance of 26.45 feet; thence S 12°44'37"W, a distance of 97.83 feet; thence S 1°29'37"W, a distance of 84.78 feet; thence S 23°59'37"W, a distance of 37.74 feet; thence S 46°29'37"W, a distance of 33.99 feet; thence S 68°59'37"W, a distance of 32.10 feet to a point on the centerline of the south 30 feet of the northwest quarter of the southeast quarter of said Section 11; thence S 88°30'24"W along the centerline of said south 30 feet, a distance of 315.90 feet to the right of way of Hamilton Cemetery Road and the terminal point of this centerline description.



Situated in Skagit County, Washington.

Exhibit A

TOWN OF HAMILTON, a Washington Municipal Corporation

Timothy A Bates
Mayor

Attest: Delilah Sutton
Town Clerk

STATE OF WASHINGTON)
) ss
COUNTY OF SKAGIT)

On this 14 day of August, 2001, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Timothy Bates and Delilah Sutton, to me known to be the Mayor and Clerk of the Town of Hamilton that executed the within and foregoing instrument, and acknowledged said instrument to be his/her free and voluntary act and deed and the free and voluntary act and deed of said Town, for the uses and purposes therein mentioned; and on oath stated that they was authorized to execute the said instrument on behalf of said Town.

IN WITNESS WHEREOF I have hereunto set my hand and official seal the day and year first above written.

Patrick M. Hayden
(Signature of Notary)
Patrick M. Hayden
(Print or stamp name of Notary)
NOTARY PUBLIC in and for the State of Washington, residing at Sedro-Woolley
My Appointment Expires: 10.1.04

RECEIVED
FEB 15 2002
NW DRINKING WATER

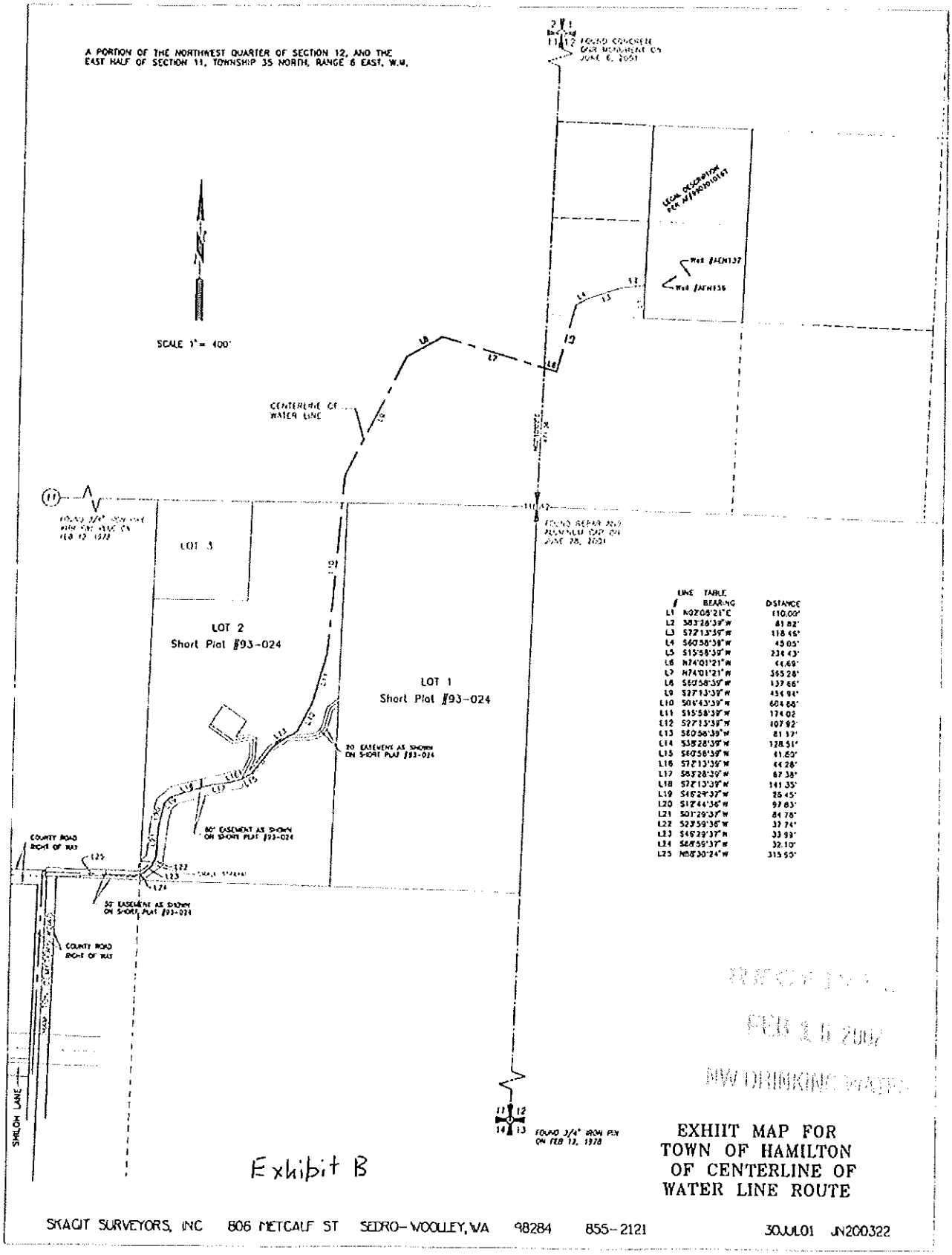


Exhibit B

RECEIVED
FEB 2 5 2002
NW DRINKING WATER

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX IV – WATER RIGHTS AND WATER RIGHT SELF ASSESSMENTS

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE OF WATER RIGHT

TO PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 11, 1982	G1-24051A	G1-24051P	G1-24051C

own of Hamilton

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P. O. Box 528	Hamilton	Washington	98255

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	70	65.86

QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal Supply - Continuous

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
00 feet south and 400 feet east of the northwest corner of Section 12, Township 35N, Range 6E., W.M. in Skagit County.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW1/4 NW1/4	12	35	6E	3	Skagit

RECORDED PLATTED PROPERTY

	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The land within the Town of Hamilton, in Sections 11, 12, 13, and 14, Township 35N, Range 6E., W.M. in Skagit County, Washington.

DESCRIPTION OF PROPOSED WORKS

The proposed works is to move the point of withdrawal for the Town of Hamilton's municipal well out of the Skagit River floodplain. The new well is 8"x200', the pump is a submersible 35 hp, the storage tank(s) will have a 500,000 gallon capacity, and the distribution system is proposed at installation of 2,600 feet of 12-inch and 1,730 feet of 10-inch transmission main connecting the new well site to the existing distribution system.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Within two years of issuance of permit	1/1/2005	1/1/2020

REPORT

REPORT OF EXAM FOR CHANGE TO WATER RIGHT

CHANGE REQUEST

On February 29, 1996, the Town of Hamilton submitted a change request to Ground Water Certificate G1-24051C. The change request is as follows:

Instantaneous Quantity (Qi):	**200 gallons per minute**
Annual Quantity (Qa):	65.86 acre-feet per year
Point of Diversion:	**SW1/4 NW1/4, Section 12, Township 35N, Range 6E., W.M. in Skagit County**
Use:	Municipal Supply
Place of Use:	**All of the land within the Town of Hamilton, within Sections 11, 12, 13, and 14, of Township 35N, Range 6E, W.M. is Skagit County**
Published:	April 29 and May 6, 1999, in the Skagit Valley Herald
Protestants:	None

BACKGROUND OF G1-24051C

Applicant:	Town of Hamilton
Certificate Number:	G1-24051C
Certificated Right:	
Qi:	70 gallons per minute
Qa:	65.86 acre-feet per year
Point of Diversion:	NE1/4 SE1/4, Section 14, Township 35N, Range 6E., W.M. in Skagit County
Use:	Municipal Supply – Continuously
Place of use:	Town of Hamilton as recorded in following plats: Section 14 of Township 35, Range 6E. W.M. in Skagit County
Priority Date:	March 11, 1982

The Town of Hamilton originally applied for a ground water right on March 11, 1982. A field investigation on August 19, 1982, recorded that the 8 inch 58 foot cased well would replace a 35-foot dug well. A report of exam was issued on December 14, 1982, a permit was issued February 15, 1983, and a Proof of Appropriation was accepted by Ecology on June 17, 1983. Water Right Certificate G1-24051C for municipal water use of 70 gallons per minute and 65.86 acre-feet per year was issued to the Town of Hamilton on August 15, 1983.

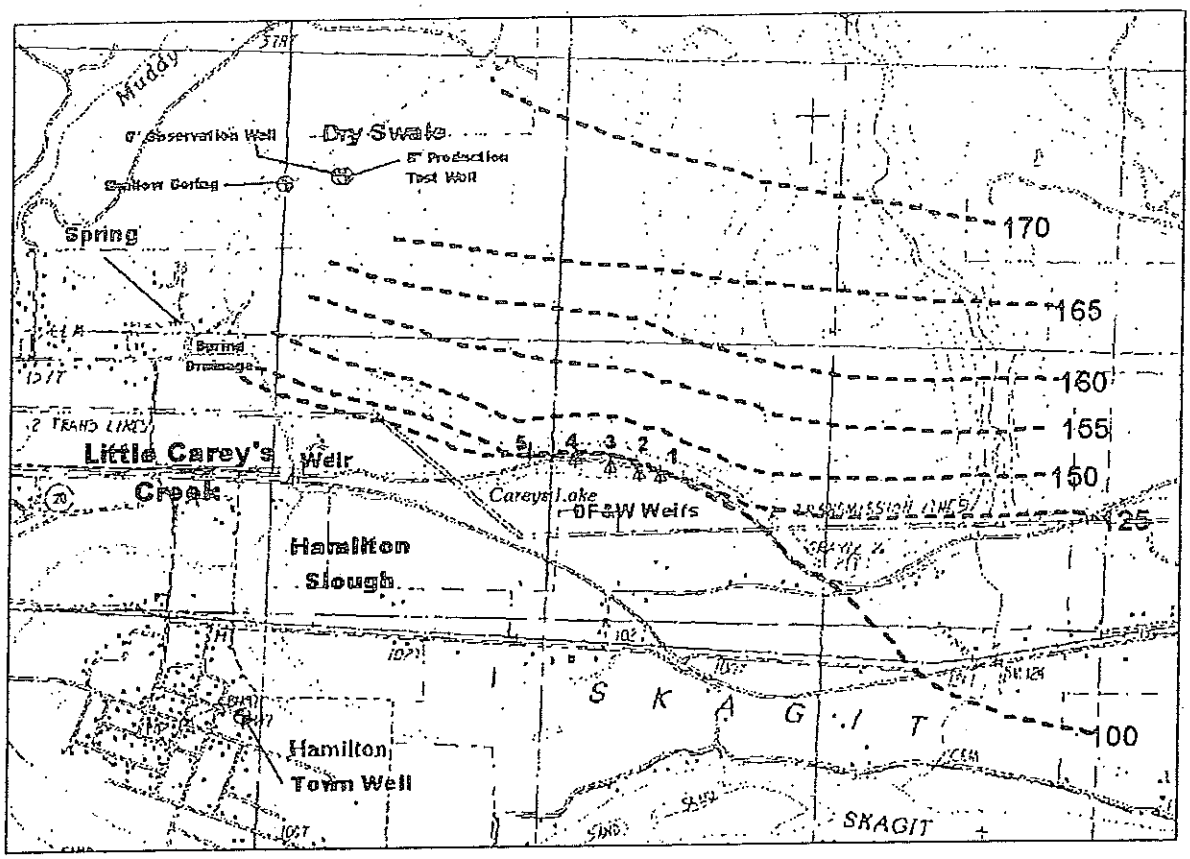
INVESTIGATION

In considering this application for change, the investigation included, but is not limited to, research and/or review of: (1) State Water Code, (2) the Certificate of Water Right G1-24051C for the existing system and the change application as submitted, (3) topographic and vicinity maps, (4) water well reports for the applicant's well and logs on neighboring wells (records on other water rights in the vicinity), (5) site visit, (6) hydrogeologic reviews, which includes the Department of Ecology review and data from Wilson Engineering's Project Report, (7) conversations and multiple meetings with applicant, consultants and attorney, (8) the Health and Safety letter received from the State Department of Health on March 19, 1996, (9) a meeting with Department of Fish and Wildlife (DFW), the Skagit Cooperative and Ecology staff.

State Water Code

Chapter 90.03 RCW and Chapter 90.44 RCW authorize the appropriation of public water for beneficial use and describes the process for obtaining water rights including the process to amend or change existing rights. Changes or amendments to these rights are covered under RCW 90.03.380 and 90.44.100.

RCW 90.44.100 conditions the approval of changes in that the replacement well must tap the same body of ground water as the original well, the use of the original well shall be discontinued and decommissioned according to state well decommissioning regulations, the construction of a new well shall not enlarge the original right and other existing rights shall not be impaired.



application requests an increased instantaneous withdrawal rate (Q_i) of 200 gpm from the well at the new location. Because the ificate authorizes a Q_i of 70 gpm, any increase would require an application for a new water right. Accordingly, at this time, the aximum withdrawal rate that Ecology could approve at the proposed well location is 70 gpm.

e new well location is in the SW ¼ NW ¼, Section 12, Township 35 North, Range 6 East, approximately 360 feet from a dry swale presenting Little Careys Creek. Little Careys Creek is part of the Careys Lake-Careys Creek-Hamilton Slough drainage system. The rainage provides high-quality spawning and rearing habitat for coho, chum, and sea-run and resident cutthroat trout. In addition, the inage provides quality habitat for a wide variety of wildlife (personal communication with Chris Detrick, DFW).

ie spring-fed system drains an area of approximately 4 ½ square miles between Muddy and Alder Creeks on a portion of the southern lope of Mt. Josephine. The drainage is primarily undeveloped.

e Department of Fish and Wildlife installed five weirs at spring locations along Crown Pacific's haul road adjacent to Careys Lake in he early 1990s. Discharge measurements collected between December 1991 and August 1996 indicate that the springs flow at a tively constant rate, even during the drier months of July through September.

ologic Setting

e geology in the area of the new wells consists of silty sands, sands, and gravels approximately 100 feet thick overlying a clay layer th interbedded water-bearing sands and silty sands approximately 80 feet thick. The production and observation wells were completed n a confined sand and gravel aquifer beneath the clay layer.

ie applicant's consultant (Associated Earth Sciences, Inc. (AES)) concludes that the well sites are located on a delta deposit formed ring recession of the Vashon Glaciation. As the glaciers were receding, streams were blocked by ice and deltas were formed in the ice-lammed lakes. As the glaciers melted, the delta deposits slumped and formed the kettle- and kame-type topography present in the area.

ie Change Application - Change In Place of Use

tween 1982 and 1992, the Town of Hamilton experienced serious flooding which resulted in the loss of water service areas as described he following paragraph (Perfection of Ground Water Right G1-24051C). On July 27, 1999, during my initial site visit, Mayor Tim ...tes explained that the updated description of the Town of Hamilton's service area includes the relocations and trend to build outside the kagit River floodplain. This change in service area will not increase instantaneous (Q_i) or acre-feet per year (Q_a) quantities for Ground ater Right G1-24051C.

The possibility of future connections may be realized with a completed and implemented conservation plan. Installing a system of meters would provide tracking for compliance of the conservation plan and water rights for the Town of Hamilton.

Health and Safety Issue

The current point of withdrawal for the Town of Hamilton's water system is within the Skagit River flood plain, as noted in the March 19, 1996, letter from Ethan Moseng of the State of Washington Department of Health (DOH) . The Health letter further notes that "the utility was determined that the source of supply must be changed to meet drinking water standards and to avoid unacceptable treatment costs, and DOH has determined that the existing source is unacceptable for continued use." The Health letter requests expediting the review of the change to G1-24051C in accordance with the joint DOE/DOH policy titled *Public Health Criteria for Prioritizing the Processing of Water Right Applications.*

Preliminary Permit

Ecology issued a preliminary permit to drill and test the new production well at the proposed location on May 26, 1999. In addition to the standard conditions in a ground water preliminary permit, Ecology required the applicant to collect information that can be used to estimate the impacts of the proposed withdrawal on nearby surface waters. The preliminary permit required monitoring of observation wells screened in the shallow unconfined aquifer which is assumed to be in direct hydraulic continuity with Little Careys Creek and the aquifer in which the new well is screened. In addition, the preliminary permit required monitoring the existing weirs and a new weir that was installed on Little Careys Creek by the Department of Fish and Wildlife earlier this year.

Pursuant to the preliminary permit, three wells were drilled by Dahlman Pump and Well Drilling in June 1999. Details regarding the wells are listed in the following table.

Well	Location	Depth	Screened Interval	Static Water Level (bgs)
8" Production	SW ¼ NW ¼ Section 12	200.5'	185.5 – 200.5	83.3
6" Observation	SW ¼ NW ¼ Section 12	199	184 - 199	85
Shallow Boring	SE ¼ NE ¼ Section 11	80	N/A	DRY

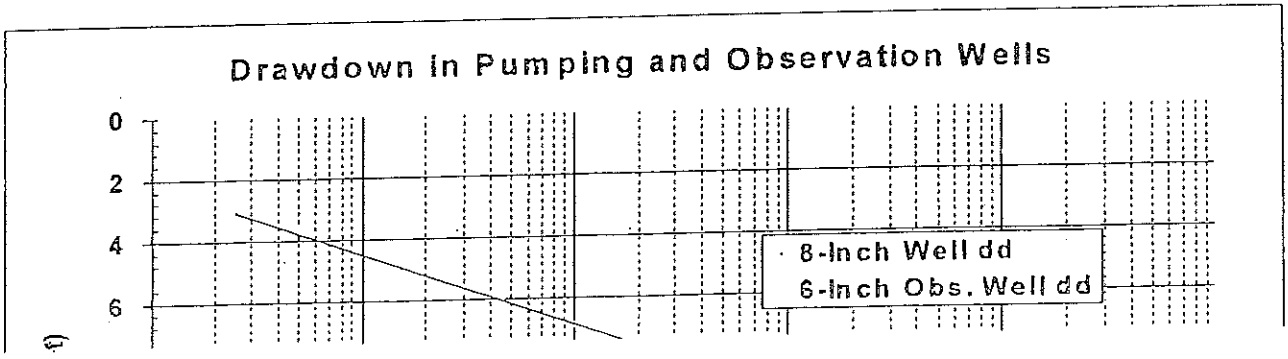
The 6-inch observation well is located approximately 46 feet west of the production well. The shallow boring was drilled approximately 700 feet from the production well adjacent to Little Careys Creek swale (creek was dry at this location when the boring was drilled). The purpose of the shallow boring was to construct a well for the purpose of monitoring the perched aquifer during the test. No perched water was found at this location.

AES reports that perched groundwater was detected above the confining layer at both the 8-inch production well and 6-inch observation well. This perched ground water is thought to be in direct hydraulic continuity with the springs that feed Little Careys Creek. One of the conditions of the preliminary permit was to monitor this shallow water-bearing zone to determine the amount of drawdown in the shallow perched ground water. This could have been used to confirm whether or not the perched ground water is supplying water to the production well and to get a better estimate on the volume of vertical leakage through the confining unit.

Because the shallow boring was drilled in an area where perched ground water was not found, the shallow perched ground water was not monitored during the test. **This is an important data gap that needs to be addressed before any additional water rights should be granted for the new production well.**

Aquifer Testing

A step drawdown test was performed on the production well at pumping rates of 109, 175, 233, and 321 gpm. Each step was pumped for approximately 30 minutes with no recovery between steps. Specific capacity decreased from 18.8 to 13.3 gpm per foot of drawdown during the test. The reduction in specific capacity is indicative of decreased well efficiency at higher pumping rates.



On June 29, 1999, a 24-hr constant rate-pumping test began with a pumping rate of 220 gpm. During pumping and recovery, water level surements were collected in the production and observation wells using pressure transducers and data loggers. Backup hand surements were also collected during the test to verify the data recorded by the data loggers. The time-drawdown graph for the umping data is shown in the above graph.

ulated transmissivities for both the drawdown and recovery data (shown on the following page) ranged between 16,800 $^{gpm}/_{ft}$ to ,900 $^{gpm}/_{ft}$ with an average value of 19,066 $^{gpm}/_{ft}$. Storage coefficients for the confined aquifer ranged from $8x10^{-6}$ to $2.4x10^{-5}$ with an verage value of $1.7x10^{-5}$.

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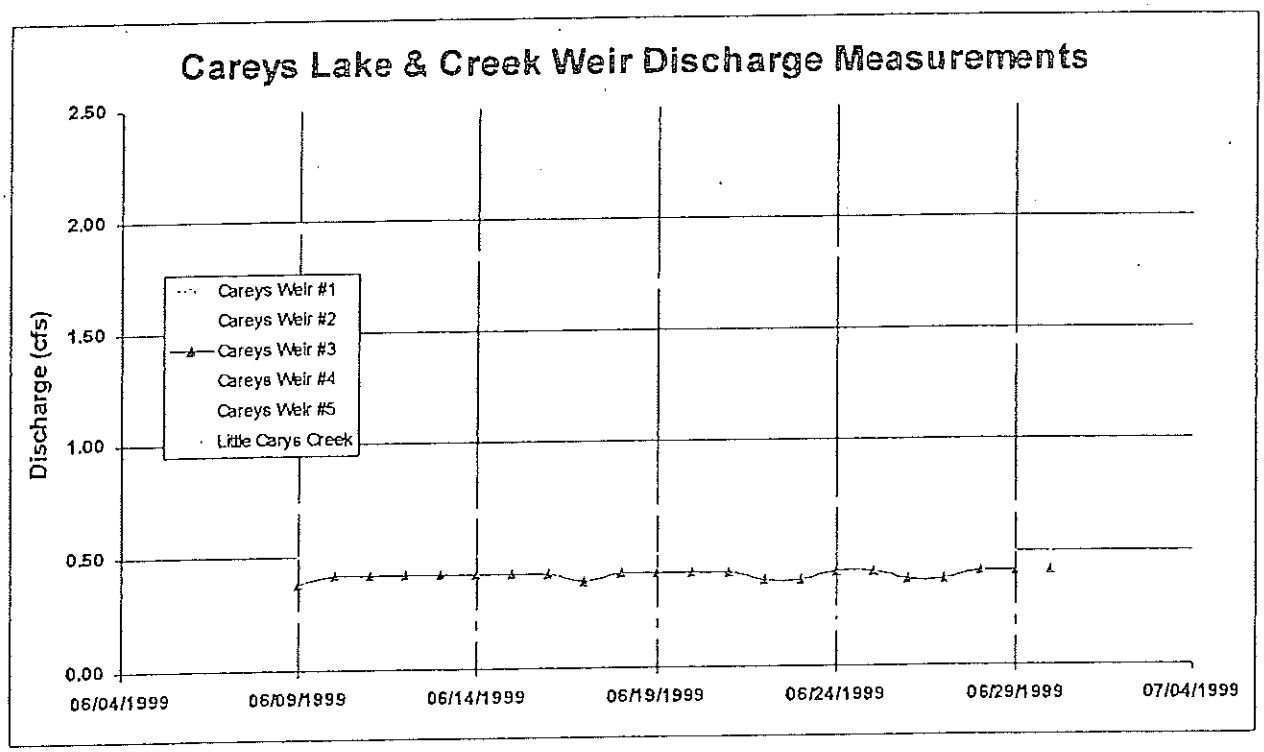
S estimates the vertical hydraulic conductivity of the confining unit to be $1x10^{-6}$ $^{ft}/_{min}$ and the storage coefficient to be 0.005.

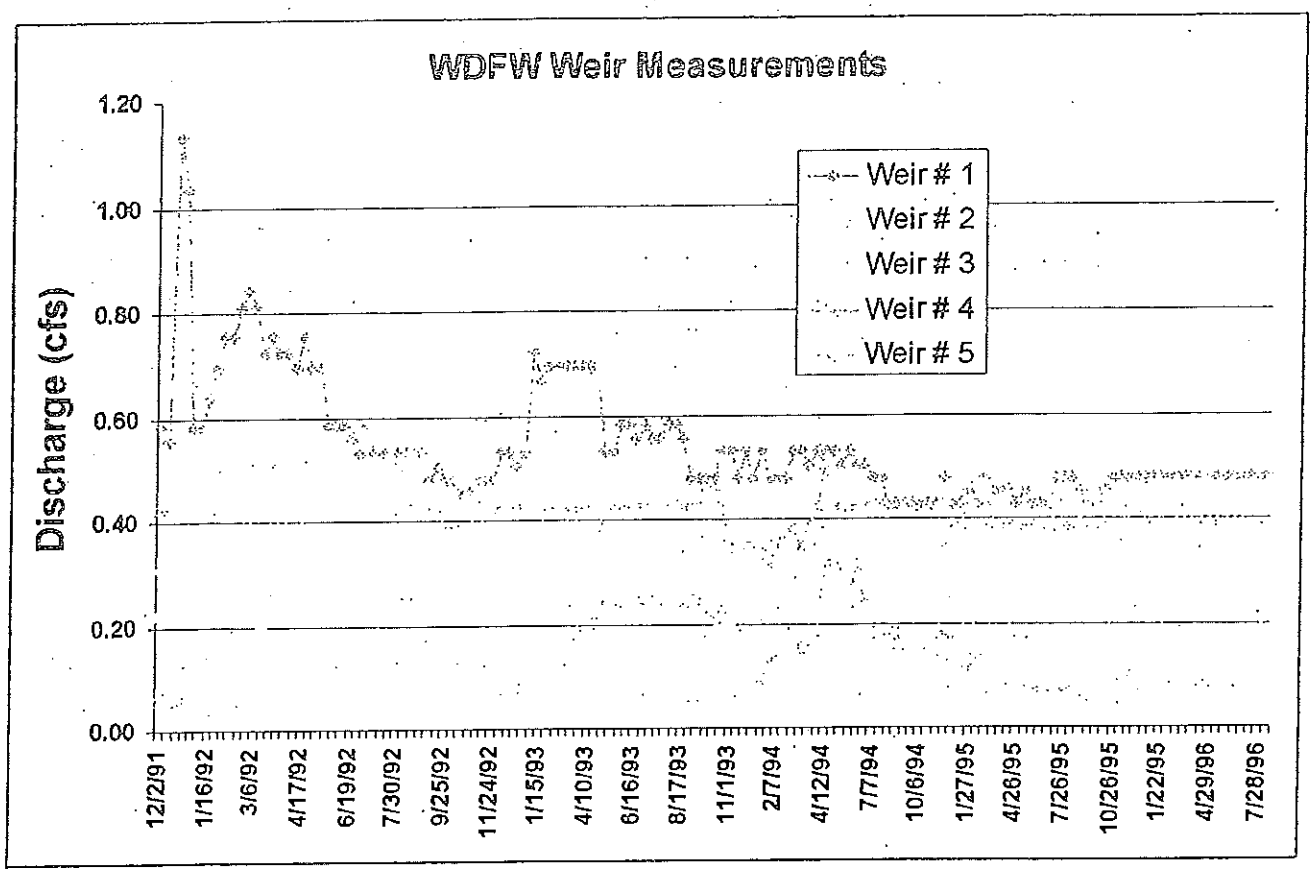
ring Flow Monitoring

a requirement of the preliminary permit, the applicant monitored discharge at six weirs below five springs nears Little Carey Lake and spring feeding Little Careys Creek. The springs at Careys Weirs number 1-5 discharged at a fairly constant rate without much variation ng the month of June. This is consistent with the data collected by DFW (Department of Fish and Wildlife) that indicate that charge at the springs is relatively stable year-round. The weir measurements of Little Carey Creek are much more variable than the weir measurement taken at the springs near Little Carey Lake. Because the weir is located approximately ½ mile downstream of the ring feeding Little Careys Creek and there is an open pasture next to the creek upstream of the weir, it is likely that the variation is in ponse to precipitation events rather than changes in spring discharge.

Chris Detrick, Department of Fish and Wildlife's fish biologist in the Habitat Program stated in a letter of November 30, 1999, that the ult of his field measurements and flow calculations made through November 15, 1999, show the total flow at the weirs dropped nificantly in later summer. This reduced flow is typical of western Washington streams. Little Careys Creek provided more than one alf the total flow and probably functions more as a surface tributary than a spring. Flows at the other weirs feeding Careys Lake mained quite constant both in 1999 and the earlier recorded period.



As shown on the graph above, the springs (Careys Weirs # 1-5) discharged at a fairly constant rate without much variation during the onth of June. This is consistent with data collected by DFW that indicate that discharge at the springs is relatively stable year-round



Associated Earth Sciences, Inc. (AESI) reports that perched ground water was detected above the confining layer at both the 8-inch production well and 6-inch observation well. This perched ground water is thonght to be in direct hydraulic continuity with the springs that feed Little Careys Creek. One of the conditions of the preliminary permit was to monitor this shallow water-bearing zone to determine the amount of drawdown in the shallow perched ground water. This could have been used to confirm whether or not the perched ground water is supplying water to the production well and to get a better estimate on the volume of vertical leakage through the confining unit.

Monitoring And Augmentation Of The Streamflow In Little Careys Creek.

AESI reports the possible impacts (of pumping from the new well) to Little Careys Creek spring outflow may result in a mitigation amount of 5 gallons per minute (gpm) for a pumping rate of 70 gpm, and 12 gpm for a pumping rate of 169 gpm. To mitigate the estimated impact, a discharge point of the spring outflow has been identified and the Town of Hamilton will purchase the easement to the discharge point. A diffuser will be installed to lessen the impact of well-water dissolved gases to the Little Careys spring.

On February 25, 2000, the Town of Hamilton sent a copy of their Water Right Mitigation Plan For Little Careys Creek. The Town of Hamilton proposes a mitigation plan as part of the development and operation of the new Town water system. Chris Detrick, of the Department of Fish and Wildlife, recommended augmentation to Little Careys Creek to begin when the flow in Little Careys Creek drops below 0.3 cfs. The rate of augmentation will be five gallons per minute, when the Hamilton well is pumping at 70 gallons per minute and Little Careys Creek's flow drops below 0.3 cfs, measured at the Little Careys Creek weir.

The Town of Hamilton's continuous monitoring of Little Careys Creek's weir will be made available to the Department of Ecology, the Department of Fish and Wildlife and/or the Skagit Cooperative upon request. Adjustments to the Water Right Mitigation Plan For Little Careys Creek will be made in concert with recommendations from the Department of Fish and Wildlife and the Skagit Systems Cooperative.

RECOMMENDATION

I recommend approval of the requested changes to Certificate of Ground Water No. G1-24051C: to change the point of withdrawal and to change the place of use.

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, 90.44.450 and WAC 508-64-020 through -040, and WAC 508-12-030. Meter readings shall be recorded at least monthly and made available to the Department of Ecology upon request.

All wells constructed in the State shall meet the construction requirements of Chapter 173-160 WAC entitled "Minimum Standards for the Construction and Maintenance of Wells" and Chapter 18.104 RCW entitled "Water Well Construction, Act (1971)."

A superseding certificate of water right will not be issued until a final investigation is made.

Issuance of this water right may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Under RCW 90.03.005 and 90.54.020(6), conservation and improved water use efficiency must be emphasized in the management of the state's water resources, and must be considered as a potential new source of water. Accordingly, as part of the terms of this water right, the applicant shall prepare and implement a water conservation plan approved by Department of Health. The standards for such a plan may be obtained from either the Department of Health or the Department of Ecology.

CONCLUSION

The Town of Hamilton has perfected the instantaneous quantity of 70 gpm and 65.86 acre-feet per year certified in Ground Water Right G1-24051C. This change in place, and point of withdrawal, will not result in an increase to the certified quantities of 70 gpm and 65.86 acre-feet per year as perfected under the municipal water right G1-24051C

Water is available. The well is designed and capable of a yield of 525 gpm[2]. The quality of the well water is good with the exception of manganese detected in concentrations of 0.07mg/l.

Pumping from the new production well may impact the perched aquifer that feeds the Little Careys Creek. This impact will be mitigated by the above noted stream augmentation requirements.

It is in the public interest to approve these changes, to relocate the Town of Hamilton's well out of the Skagit River floodplain, as requested by the State of Washington Department of Health, and to change the place of use for the Town of Hamilton's service area. No detriment to the public inserest shall occur as a result of this change authorization.

The applicant is advised that a superseding certificate will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology, including metering data and/or water duty analysis.

In accordance with Chapters 90.03 and 90.44 RCW, I conclude that Ground Water Certificate G1-24051C is in good standing and is eligible for change. The requested change will not enlarge the existing water right, impair existing rights or be detrimental to the public interest. Therefore, this change should be approved subject to existing rights and the above-indicated provisions.

REPORT BY: _____ DATE: _____

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE OF WATER RIGHT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 2, 1972	G1-20003A	G1-20003P	G1-20003C

NAME
Town of Hamilton

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 528	Hamilton	Washington	98255

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	36	35.0

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal Supply - continuous

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

1400 feet south and 400 feet east of the northwest corner of Section 12, Township 35N, Range 6E, W.M. in Skagit County.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW1/4 NW1/4	12	35	6E	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

All the land within the Town of Hamilton, located in Sections 11, 12, 13, and 14, in Township 35N, Range 6E., W.M. in Skagit County, Washington.

DESCRIPTION OF PROPOSED WORKS

The proposed change is to move the water source for the Crown Pacific facility to the Town of Hamilton's well. The well is 8"x200', the 35 HP pump is submersible, the storage tank will have a 500,000 gallon capacity, and the distribution system will be completed with the installation of 6,0 feet of 12-inch and 1,730 feet of 10-inch transmission main connecting the new site to the existing distribution system. The Town of Hamilton will incorporate the water rights of G1-20003C into their municipal water supply system, and include Crown Pacific, Inc. facility into the Town of Hamilton's place of use.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	Five years from issuance of change authorization	30 years from issuance of change authorization

REPORT

Applicant:	TOWN OF HAMILTON
Certificate Number:	G1-20003C
Name on Certificate:	Scott Paper Company
Priority Date:	March 2, 1972
Certified Quantities:	36.0 gallons per minute, 35.0 acre-feet per year
Certified Purpose of Use:	Industrial use, dust control, truck washing, domestic use, fire protection as needed

CHANGE REQUEST

Point of Withdrawal:	**Change the point of withdrawal to SW1/4 NW1/4, Section 12, Township 35N, Range 6E.,W.M.**
Purpose of Use:	**Change use to municipal**
Published:	**December 22 and 29, 1999**
Protests:	**None**

BACKGROUND

The Scott Paper Company filed an application for permit to appropriate public ground waters of the State of Washington on March 2, 1972. The application requested 750 gallons per minute and 600 acre feet per year for continuous industrial use. The request was published in the Skagit Valley Herald on May 4 and May 11, 1972. No protests were recorded. The Department of Ecology (Ecology) wrote a report of exam on July 2, 1973. Permit G1-20003, was issued on November 30, 1973. Scott Paper Company sent in the Proof of Appropriation form on January 18, 1974. Ecology issued ground water certificate G1-20003C on February 13, 1974.

G1-20003C issued to the Scott Paper Company for 36 gallons per minute (gpm), and 35.0 acre-feet per year (afy). The source of water was from a well in the NE1/4 NW1/4 of Section 14, Township 35N, Range 6E., W.M. in Skagit County. The well dimensions measured at 6" X [illegible]. The purpose of use was listed as: "Industrial use (continuous use) Truck Wash - 40 trucks, 6,000 g.p.d., 5.0 afy; Oct-May, 2.0 ac-ft per year; truck tank for brakes,- 26 trucks, 5,200 g.p.d., Apr-Nov. 3.0 afy; Domestic 660 g.p.d., 6.0 afy. As these totals are based on a 40-hour week, and additional is added for overtime use 7.0 afy. Total 35 ac-ft per year."

In 1989, Scott Paper Company sold its timberland and facilities, except for the pulp mill, to Crown Pacific Inc. (Crown Pacific), who operates the Old Soundview Pulp Company/Scott Paper Company yard near the Town of Hamilton. The water rights were consolidated into Crown Pacific's ownership.

The Washington State Department of Health rated the Crown Pacific well as "highly susceptible to contamination." Water quality monitoring during 1998 and 1999 indicated that the Crown Pacific well was hydraulically connected with the adjacent creek and treatment would be required.

Crown Pacific transferred the water right (G1-20003C) to the Town of Hamilton, who then agreed to add the Crown Pacific paper mill to their place of use and supply them with their water needs (industrial, truck washing, dust control and domestic uses). The Town of Hamilton submitted the change request for G1-20003C, on November 22, 1999.

On November 8, 1999, the Washington State Department of Health sent Ecology a letter, requesting that Ecology expedite this change application as a health and safety request. The well under G1-20003C is a public health and safety concern because of its location in the Skagit River flood plain, and because the well's location near a creek would lead to developing a treatment system in order to prevent water supply contamination.

Town of Hamilton Well (Existing Right)

Purpose of Use

The proposed use will be to cover the current uses of industrial use, truck washing, dust control, and domestic use, and add this water right to the Town of Hamilton's municipal water system.

INVESTIGATION

In considering this application for change the investigation included, but is not limited to, research and/or review of: (1) State Water Code, (2) the Certificate of Water Right G1-20003C and Certificate of Water Right G1-24051C (the Town of Hamilton's water right), (3) topographic and vicinity maps, (4) well reports (Ecology's and AES's report), (5) hydrogeologic reviews (Ecology's and Wilson Engineering's Project Report), (6) conversation, meetings, e-mail correspondence with applicant and with Crown Pacific personnel, (7) correspondence and conversations with the Washington State Department of Health, and (8) input from the Skagit Cooperative and the Washington State Department of Fish and Wildlife.

State Water Code

Chapter 90.03 RCW and Chapter 90.44 RCW authorize the appropriation of public water for beneficial use and describes the process for obtaining water rights including the process to amend or change existing rights. Changes or amendments to these rights are covered under RCW 90.03.380 and RCW 90.44.100.

WAC 173-152-050 Criteria for priority processing of competing applications.
"(1) An application may be processed prior to a competing application if the application resolves or alleviates a public health or safety emergency caused by a failing public water supply system currently providing potable water to existing users. The application must be filed specifically to correct the actual or anticipated cause(s) of the public water system failure. The department, upon notification by the department of health or local health authority, determines a public water system has failed, or is in danger of failing within one year, to meet state board of health standards for the delivery of portable water to existing users . . ."

Perfection of Water Right Certificate G1-20003C

According to the letter sent to Ecology on October 27, 1999, from Russ Paul, Land and Timber Manager of the Hamilton Division of Crown Pacific, Inc., "The ground water source covered by . . . G1-20003P (Ecology note: should refer to G1-20003C) has been in use since 1972 when another surface source was discontinued. This well has been in constant operation since that time, providing drinking water, some fire protection, truck washing, dust control, and other domestic uses. Use varied by the time of year, but can be characterized by 36 gpm and 35.0 acre feet per year for these varions uses."

The absence of metering records makes the annual quantities evaluation of perfection impossible. In good faith the above statement is accepted as valid and renders G1-20003C perfected to the instantaneous amount of 36.0 gallons per minutes and 35.0 acre-feet per year. The proposed source (the Town of Hamilton well) is metered, therefore prior to issuing a superseding certificate accurate meter readings will be evaluated for perfection of this water right.

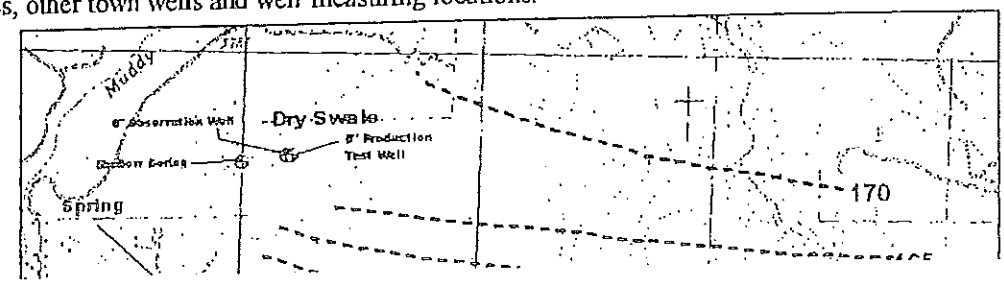
Geologic Setting

The geology in the area of the new wells consists of silty sands, sands, and gravels approximately 100 feet thick overlying a clay layer with interbedded water-bearing sands and silty sands approximately 80 feet thick. The production and observation wells were completed in a confined sand and gravel aquifer beneath the clay layer.

The applicant's consultant (Associated Earth Sciences, Inc. (AES)) concludes that the well sites are located on a delta deposit formed during recession of the Vashon Glaciation. As the glaciers were receding, streams were blocked by ice and deltas were formed in the ice-dammed lakes. As the glaciers melted, the delta deposits slumped and formed the kettle- and kame-type topography present in the area.

Well Location

The well location (labeled 8" Production Test Well) is shown in the figure below. Also shown on the figure are ground water contours, surface water bodies, other town wells and weir measuring locations.



he production well is located approximately 360 feet from a dry swale representing Little Careys Creek. Little Careys Creek is part of ie Careys Lake-Careys Creek-Hamilton Slough drainage system. The drainage provides high-quality spawning and rearing habitat for chum, and sea-run and resident cutthroat trout. In addition, the drainage provides quality habitat for a wide variety of wildlife Chris Detrick, DFW).

Juvenile Salmon observed in Little Careys Creek upstream of weir (August 10, 2000)

spring-fed system drains an area of approximately 4½ square miles between Muddy and Alder Creeks on a portion of the southern e of Mt. Josephine. The drainage is primarily undeveloped.

Indicating Potential Impacts to Little Careys Creek

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6-inch observation well is located approximately 46 feet west of the production well. The shallow boring was drilled approximately feet from the production well adjacent to Little Careys Creek swale (creek was dry at this location when the boring was drilled). The pose of the shallow boring was to construct a well for the purpose of monitoring the perched aquifer during the test. Because no ed water was found at this location the boring was abandoned.

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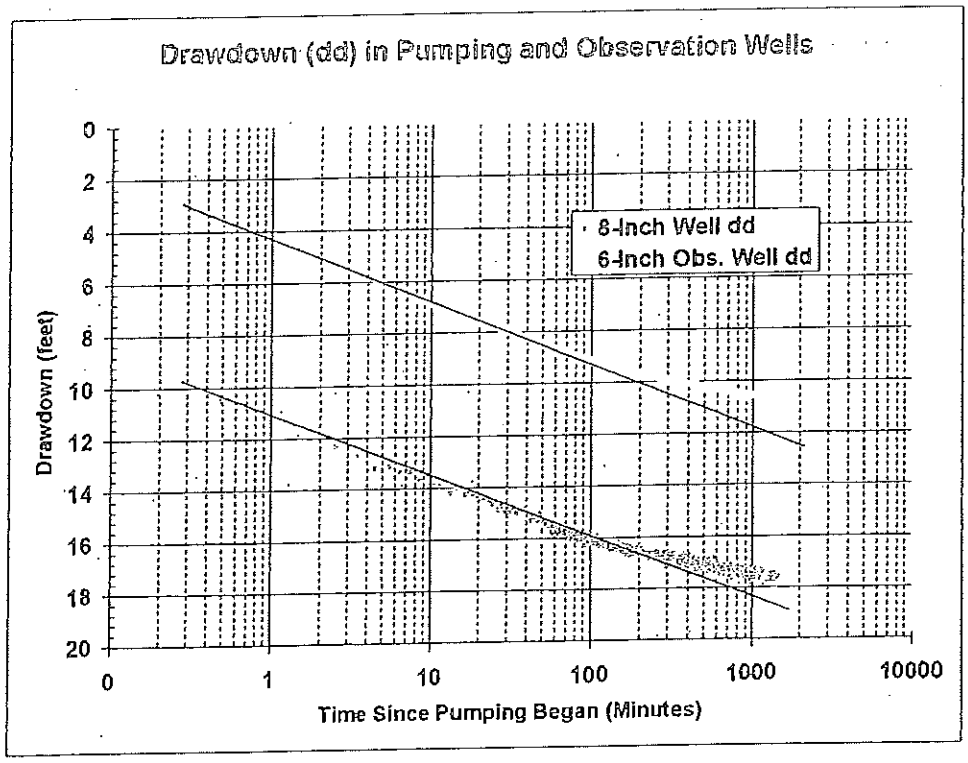

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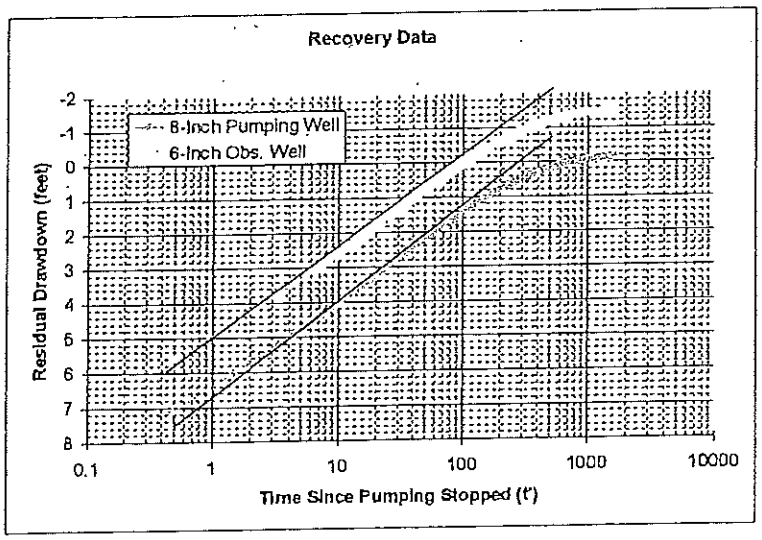

Spring Flow Monitoring

The applicant monitored discharge at six weirs below five springs near Little Careys Lake and a spring feeding Little Careys Creek. Measurements were collected daily before and every four hours during the pumping test.

The springs near Little Careys Lake discharged at a fairly constant rate without much variation during the month of June. This is consistent with earlier data collected by DFW that indicate that discharge at the springs is relatively stable year-round

e[ ]ort Continued

ydrogeologic Conceptual Model and Estimated Impact to Little Careys Creek

ES used aquifer parameters calculated using their pumping test data, existing well logs, and regional geologic information to develop a drogeologic conceptual model. The model was then used to estimate leakage through the confining unit. The amount of leakage ur[ ]gh the confining unit within a 2,500-foot radius of the production well is assumed to be equal to the impact to Little Careys Creek s[ ]ting from pumping the new production well.

he conceptual model includes an unconfined perched aquifer overlying a clay layer that acts as an aquitard and confines the deeper u[ ]er in which the new production well is screened. The perched aquifer is assumed to supply the springs feeding the Careys Creek s[ ]m. Ground water elevations in the confined aquifer indicate a hydraulic gradient of about 0.025 with the confined unit discharging to e Skagit River. Water elevations in the two aquifers are reported to be approximately the same although the well logs indicate a if[ ]rence in hydraulic head between 15 and 22 feet.

r the purposes of evaluating the impacts to Little Careys Creek, AES assumed an aquitard thickness of 80 feet even though the clay unit ncludes at least 19 feet of interbedded sand on the 8-inch production well's log. The well log for the 6-inch observation well includes 25 [ ]of interbedded sand within the clay unit. Because AES assumed an 80-foot thickness of aquitard, their calculations may erestimate the amount of leakage through the confining unit (and the impacts to Little Careys Creek).

[ ] estimated the amount of leakage through the confining unit using the modified Hantush analytical model for non-steady state [ ]itions and Darcy's Law. Their analysis was performed for pumping rates of 70 and 169 gpm for 1 day, 30 days, and 180 days of mping. Their analysis assumes no recharge, which results in an over-estimation of the impacts to the perched aquifer. The total eakage through the confining unit resulting from pumping the well at 70 gpm for 180 days is estimated to be 29 gpm. Within the radius f[ ]500 feet (the area feeding Little Careys Creek) leakage is estimated to be 5 gpm. Pumping the well at 169 gpm for 180 days results in stimated leakage through the confining unit of 70 gpm. Leakage from the area feeding Little Careys Creek is estimated to be 12 gpm.

he estimated impacts to Little Careys Creek (5 and 12 gpm) represent 0.7 and 1.8 percent of the flow measured at the weir on Little [ ]ys Creek during the pumping test. As noted above, the weir is located approximately ½ mile downstream of the spring and the nges in flow at this location is likely heavily influenced by factors other than changes in spring discharge. In other words, if the stimated impacts to Little Careys Creek are accurate, these impacts could not be measured at the present weir location.

[ ]S Recommendations

ES made several recommendations for mitigation to be implemented upon startup of the new production well. These include:

Daily monitoring of precipitation and discharge at the existing weirs.
Augmentation of streamflow in Little Careys Creek at a rate of 10 gpm for the 70 gpm water right change, G1-24051C, and 24 gpm if additional rights (up to 169 gpm) are transferred to the well. As a conservative measure, AES has proposed augmenting the stream at double the calculated impact to Little Careys Creek.
Evaluate the data, as it becomes available to determine if mitigation is required at the springs adjacent to Little Careys Lake.

[ ]cussions

ne estimated impact to Little Careys Creek is based primarily on analytical equations that are based on assumptions that may not be [ ]resentative of actual site conditions. The data collected thus far, along with the analysis and proposed mitigation supports the clusion that Hamilton's water right G1-24051C, G1-28066P (mitigation) and G1-20003C (this application) can be transferred to the production well. Combined, these rights add up to a total instantaneous withdrawal rate of 136 gpm. However, there is a need to [ ]nstruct at least one shallow monitoring well in the perched aquifer. Additional transfers to the new production well may be contingent n additional testing of the monitoring well that includes monitoring of the shallow perched aquifer.

ES proposes a mitigation rate of 10 gpm if the production well is pumped at 70 gpm, and a mitigation rate of 24 gpm if the well is [ ]mped at a rate of 169 gpm. These values imply a mitigation rate of approximately 14% of the withdrawal rate.

ough not specified, it appears that AES has proposed augmenting flows to Little Careys Creek whenever the production well is being mped. This may not be necessary during the wet part of the year and increasing the flows when the stream is flowing at a high rate d possibly be detrimental to the stream. Thus, the Town of Hamilton should continue discussions with Ecology, the Department of eries and other interested parties to determine the appropriate timing and logistics of stream augmentation. The location and specifics mplementing stream augmentation also need to be discussed and agreed upon and the mitigation plan that is developed should be a dition of any water right issued for the new production well.

[ ]ause of the uncertainties associated with the estimated impacts to Little Careys Creek described above, it is strongly recommended t a shallow observation well be constructed in the perched aquifer and that another pumping test be performed before any additional r rights, in excess of 136 gpm, are transferred to the production well.

FINDING

Under state law, for a change to a certificate to be approved, the following criteria must be met:

- Water must be available,
- There must be no detriment or injury to existing rights,
- The water use must be beneficial,
- The water use must be in the public interest, and
- The change will not enhance the original water right.

Water Availability

Water is available. According to the pump tests and monitoring results in this report, the aquifer appears to be sufficient to be used as a municipal source. Wilson Engineering's report that the well is designed and capable of a yield of 525 gpm.[1]

No Detriment to Existing Rights

No other wells appear to be impacted by withdrawals from this system. According to the results of the drawdown test on the production well, a drawdown of about 10 feet, after twenty-four hours, was realized on the observation well while pumping rate of 220 gpm. The total pumping quantities from Changes to G1-20003C, G1-24051C, and the mitigation application G1-28066A, totals 136 gpm. The nearest well is approximately one-half mile away and appears to be completed in the shallower water table aquifer that underlies most of the area south of the subject well.

Beneficial Use

According to 90.54.020 water for municipal purposes is a beneficial use of water.

Public Interest

It is in the public interest to approve this change request to G1-20003C. The Town of Hamilton's well is out of the flood plain and the quality of water is acceptable for domestic use.

Change to a Certificate

This change to G1-20003C will not increase the instantaneous or annual consumptive quantity of water (36 gpm and 35.0afy) perfected under G1-20003C.

SEPA

The Town of Hamilton is not required to go through the State Environmental Policy Act (SEPA) process in regard to this application for water rights. The instantaneous quantity requested is well below the SEPA water right threshold of 2,250 gpm.

RECOMMENDATIONS

I recommend that a change to G1-20003C be approved at the requested rate of up to 36 gallons per minute and 35.0 acre-feet per year for municipal use.

This change authorization shall be issued subject to the following provisions:

Provisions:

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040 (Installation, operation and maintenance requirements attached). Meter reading shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request. In order to protect the resource, static water levels (SWL) shall be measured in each onsite monitoring well at least once each month. Ecology's Water Resources section (NWRO) shall be notified if a below normal seasonal drop is measured in SWL, otherwise this data shall be maintained and be made available to Ecology upon request. The meter reading and static water level data shall be used in the analysis of impacts to Little Careys Creek.

Records of monitoring of Little Careys Creek's weir will be made available to the Department of Ecology, the Department of Fish and Wildlife and/or the Skagit Cooperative upon request.

ONCLUSION

accordance with RCW 90.03 and 90.44, I find there is water available for this beneficial appropriation from the source in question and that ie appropriation, as authorized, will not impair existing rights, will not enlarge the water right under G1-20003C, or be detrimental to the ıb interest. Therefore, this change authorization should be issued, subject to the above-indicated provisions.

ORT BY _____ DATE _____

DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

ITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
ember 30, 1999	G1-28066A		

RESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
n of Hamilton . Box 528	Hamilton	Washington	98255

PUBLIC WATERS TO BE APPROPRIATED

TARY OF (IF SURFACE WATERS)		
XIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 30	MAXIMUM ACRE FEET PER YEAR 36

NTITY, TYPE OF USE, PERIOD OF USE

MITIGATION ONLY - AS NEEDED FOR STREAM AUGMENTATION PURPOSES (NON-CONSUMPTIVE USE) IN ACCORDANCE WITH THE TOWN OF HAMILTON'S WATER RIGHT MITIGATION PLAN FOR LITTLE CAREYS CREEK.

LOCATION OF DIVERSION/WITHDRAWAL

OXIMATE LOCATION OF DIVERSION–WITHDRAWAL
400 feet south and 400 feet east of the northwest corner of Section 12

OCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW1/4NW1/4	12	35N	6 East	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Within the E1/2 of Section 11, and/or the W1/2 of Section 12, Township 35N, Range 6 East, W.M. in Skagit.

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

Table 1

WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – EXISTING STATUS

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	EXISTING WATER RIGHTS		EXISTING CONSUMPTION		CURRENT WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates 1. G1-24051C	Town of Hamilton	3/11/82	Production well	Primary (municipal)	70 gpm	65.86 ac-ft/yr	70 gpm	37.40 ac-ft/yr	0 – fully used	28.46 ac-ft/yr
2.G1-20003C	Town of Hamilton	3/2/72	Production Well	Primary (municipal)	36 gpm	35.0 ac-ft/yr	36 gpm	0	0 – fully used	35.0 ac-ft/yr
3.G1-28066A	Town of Hamilton	12/30/99	Production Well	Supplemental (Fish Mitigation)	30 gpm	36.0 ac-ft/yr	30 gpm	1.8 ac-ft/yr	0-fully used	34.2 ac-ft/yr
4.										
Claims 1.										
2.										
3.										
4.										
TOTAL	**********	********	********	**********	106 gpm	136.86 ac-ft/yr	106 gpm	39.20 ac-ft/yr	0 gpm	97.66 ac-ft/yr

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		EXISTING CONSUMPTION THROUGH INTERTIE		CURRENT INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1.							
2.							
3.							
4.							
TOTAL	**********						

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1.					
2.					
3.					
4.					

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DOH Form 331-371 (Updated 08/10)

To return form, please see reverse side.

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

Table 2

WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – 6 YEAR FORECAST

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	EXISTING WATER RIGHTS		FORECASTED WATER USE FROM SOURCES (6-year Demand)		FORECASTED WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates 1. G1-24051C	Town of Hamilton	3/11/82	Production well	Primary (municipal)	70 gpm	65.86 ac-ft/yr	70 gpm	56.90 ac-ft/yr	0 – fully used	8.96 ac-ft/yr
2.G1-20003C	Town of Hamilton	3/2/72	Production Well	Primary (municipal)	36 gpm	35.0 ac-ft/yr	36 gpm	0	0 – fully used	35.0 ac-ft/yr
3.G1-28066A	Town of Hamilton	12/30/99	Production Well	Supplemental (Fish Mitigation)	30 gpm	36.0 ac-ft/yr	30 gpm	2.6 ac-ft/yr	0-fully used	33.4 ac-ft/yr
4.										
Claims 1.										
2.										
3.										
4.										
TOTAL	**********	*********	*********	**********	106 gpm	136.86 ac-ft/yr	106 gpm	59.50 ac-ft/yr	0 gpm	77.36 ac-ft/yr

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		FORECASTED CONSUMPTION THROUGH INTERTIE		FORECASTED INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1.							
2.							
3.							
4.							
TOTAL	**********						

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1.					
2.					
3.					
4.					

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To return form, please see reverse side.

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

Table 3

WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – 20 YEAR FORECAST

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	EXISTING WATER RIGHTS		FORECASTED WATER USE FROM SOURCES (20-year Demand)		FORECASTED WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates 1. G1-24051C	Town of Hamilton	3/11/82	Production well	Primary (municipal)	70 gpm	65.86 ac-ft/yr	70 gpm	61.40 ac-ft/yr	0 – fully used	4.46 ac-ft/yr
2.G1-20003C	Town of Hamilton	3/2/72	Production Well	Primary (municipal)	36 gpm	35.0 ac-ft/yr	36 gpm	0	0 – fully used	35.0 ac-ft/yr
3.G1-28066A	Town of Hamilton	12/30/99	Production Well	Supplemental (Fish Mitigation)	30 gpm	36.0 ac-ft/yr	30 gpm	2.80 ac-ft/yr	0-fully used	33.2 ac-ft/yr
4.										
Claims 1.										
2.										
3.										
4.										
TOTAL	**********	*********	*********	**********	106 gpm	136.86 ac-ft/yr	106 gpm	64.20 ac-ft/yr	0 gpm	72.66 ac-ft/yr

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		FORECASTED CONSUMPTION THROUGH INTERTIE		FORECASTED INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1.							
2.							
3.							
4.							
TOTAL	**********						

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1.					
2.					
3.					
4.					

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DOH Form 331-373 (Updated 08/10)

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APPENDIX V – CONSISTENCY FORMS

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

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

Local Government Consistency Review Checklist

Water System Name: Town of Hamilton PWS ID: 307000

Planning/Engineering Document Title: Water System Plan Plan Date: May 6, 2013

Local Government with Jurisdiction: Skagit County

WAC 246-290-108 Consistency with local plans and regulations:
Consistency with local plans and regulations applies to planning and engineering documents under WAC 246-290-106, 246-290-107, and 246-290-110(4)(b (ii).

1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has addressed consistency with **local plans and regulations**. This review must include specific elements of local plans and regulations, as they reasonably relate to water service as determined by Department of Health (DOH). Complete the table below and see instructions on back.

Local Government Consistency Statement	Page(s) in Planning Document	Yes – No – Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the applicable service area.		
b) The six-year growth projection used to forecast water demand is consistent with the adopted city/county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.		
c) Applies to cities and towns that provide water service: All water service area policies of the city or town are consistent with the utility service extension ordinances of the city or town.		
d) Service area policies for new service connections are consistent with the adopted local plans and adopted development regulations of all jurisdictions with authority over the service area [City(ies), County(ies)].		
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable; Coordinated Water System plans, Regional Wastewater plans, Reclaimed Water plans, Groundwater Area Management plans, and Capital Facilities Element of Comprehensive plans.		

I certify that the above statements are true to the best of my knowledge and that these specific elements are consistent with adopted local plans and development regulations.

Signature Date

Printed Name, Title, & Jurisdiction

Consistency Review Guidance

For Use by Local Governments and Municipal Water Suppliers

This checklist may be used to meet the requirements of WAC 246-290-108. When using an alternative format, it must describe all of the elements; 1a), b), c), d), and e), when they apply.

For **water system plans (WSP)**, a consistency review is required for the retail service area and any additional areas where a municipal water supplier wants to expand its water right's place of use.

For **small water system management programs**, a consistency review is only required for areas where a municipal water supplier wants to expand its water right's place of use. If no water right place of use expansion is requested, a consistency review is not required.

For **engineering documents**, a consistency review is required for areas where a municipal water supplier wants to expand its water right's place of use (water system plan amendment is required). For non-community water systems, a consistency review is required when requesting a place of use expansion. All engineering documents must be submitted with a service area map per WAC 246-290-110(4)(b)(ii).

A) Documenting Consistency: Municipal water suppliers must document all of the elements in a consistency review per WAC 246-290-108.

1 a) Provide a copy of the adopted **land use/zoning** map corresponding to the service area. The uses provided in the WSP should be consistent with the adopted land use/zoning map. Include any other portions of comprehensive plans or development regulations that are related to water supply planning.

1 b) Include a copy of the **six-year growth projections** that corresponds to the service area. If the local population growth rate projections are not used, provide a detailed explanation on why the chosen projections more accurately describe the expected growth rate. Explain how it is consistent with the adopted land use.

1c) Include water service area policies and show that they are consistent with the **utility service extension ordinances** within the city or town boundaries. This applies to cities and towns only.

1 d) Include all **service area policies** for how new water service will be provided to new customers.

1 e) **Other relevant elements** related to water supply planning as determined by the department (DOH). See Local Government Consistency – Other Relevant Elements, Policy B.07, September 2009.

B) Documenting an Inconsistency: Please document the inconsistency, include the citation from the comprehensive plan or development regulation, and provide direction on how this inconsistency can be resolved.

C) Documenting Lack of Consistency Review by Local Government: Where the local government with jurisdiction did not provide a consistency review, document efforts made and the amount of time provided to the local government for their review. Please include: name of contact, date, and efforts made (letters, phone calls, and e-mails). In order to self-certify, please contact the DOH Planner.

To:
Skagit County Planning and Development Services
Gary Christiansen
1800 Continental Place
Mount Vernon, WA 98273

From:
Joan Cromley, Mayor
Town of Hamilton
584 Maple Street
P. O. Box 528
Hamilton, WA 98255

Regarding: Service Area Request for
Ryan and Sheila Ostrom
34509 Hamilton Cemetery Road
Sedro-Woolley, WA 98284
Parcel# P41080

The Town of Hamilton (Town) water system and Ryan and Sheila Ostrom agree to include the subject property in the Town water system retail service area per the standard agreement for individual residential water service.

At the time of original connection of the above referenced property to the Hamilton Water System in 2002, the Town Council agreed to waive the normal hook-up and connection fees and charges, listed below, in return for easement and construction of the water system transmission line through the above mentioned property. The Town is responsible for maintenance and repair of the water transmission line; and the property owners, together with their heirs and assigns, grant access for such purposes to the Hamilton Water Department.

Ordinance 297

> ***13.04.020 Application for water service.***
> *(a) The owner of any property who desires to connect to the Hamilton Water System shall make application for the connection on the standard form for water service and at that time, the applicant shall pay all connection charges, fees, or assessments required by the Water System Code.*
> *(b) Any owner of any rental property connected, or to be connected, to the water system, shall agree to have their name appear on all billing for that property by the Water Department and such billings shall be mailed to said owner and shall become delinquent if not paid within 30 days of the day indicated on the billing.*
>
> ***13.24.020 Additional connection charge.***
> *In addition to the charges for installing the connection and meter, an owner of property fronting on a main for which the property has neither been assessed nor otherwise paid its pro rata share of the cost of the main shall be required to pay a pro-rata share of the cost of the main to the Town as a condition to the right to connect to the main. The charges may be*

collected either for the benefit of the Town Water System or for private persons who have paid the cost of constructing the main and have entered into a recovery contract with the Town.

Sheila Ostrom — 3-18-13

Sheila Ostrom — Date

Ryan Ostrom — 3/18/13

Ryan Ostrom — Date

Joan Cromley — 2/20/13

Joan Cromley, Mayor
Town of Hamilton — Date

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX VI
LITTLE CAREY'S CREEK WATER RIGHT MITIGATION PLAN

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

Town of Hamilton
Little Carey's Creek Water Right Mitigation Plan

Objective

The objective of this Little Carey's Creek Water Right Mitigation Plan is to meet Department of Ecology requirements to mitigate potential adverse impacts on Little Carey's Creek that may result from pumping from the Town of Hamilton's new municipal water supply well. This mitigation plan outlines:

- Background information and requirements for flow mitigation.
- Mitigation system design parameters.
- Description of the municipal/mitigation system.
- Operation of the mitigation system.
- Water quality and monitoring considerations.

Background

The Town of Hamilton has proposed stream mitigation as part of the development and operation of the Town's new water system. The mitigation system is designed to eliminate potential adverse impacts on Little Carey's Creek that may arise due to groundwater pumping from the Town's new well. The Department of Ecology (Ecology) has approved the following water rights for operation of the new well pending the approval of this mitigation plan by the Washington State Department of Fish and Wildlife:

- Transfer of the 70 gallons per minute (gpm) water right from the old Town well to the new well for municipal water supply (max. allowable instantaneous pumping rate, or Qi, is 70 gpm);
- Transfer of the 36 gpm water right from Scott Paper (Crown Pacific) to the new well for municipal water supply (Qi = 36 gpm); and
- Issuance of a new 30 gpm water right to supply Little Carey's Creek with mitigation water (Qi = 30 gpm).

The September 7, 1999 report, *Project Report Update for Water Production Facilities*, produced by Wilson Engineering, states that during well pump tests, a slight flattening of the drawdown curve was observed. It is theorized that this flattening is the result of leakage from perched groundwater over an aquitard and that it is this perched groundwater that supplies springs feeding Little Carey's Creek. The proposed mitigation plan provides water from the lower aquifer to mitigate for the possible leakage from the aquifer during low precipitation times of the year.

A key component of the mitigation plan is to keep the mitigation system simple and as maintenance-free as possible. This objective has been considered in setting mitigation flow parameters, designing mitigation storage and discharge facilities, and assigning management and monitoring responsibilities.

Design Parameters

The Plan is designed to mitigate potential "negative impacts", defined as reduction or loss of stream source water due to municipal supply pumping. Mitigation is not required to guarantee flow in the stream, only to discharge an estimated volume of water that might be removed from the stream's source during the dry season.

This mitigation plan and the system it describes are designed to provide mitigation water beginning when flow in the creek declines below 0.3 cubic feet per second (cfs) measured at the Washington State Department of Fish and Wildlife (DFW) flow measurement weir. Once mitigation begins, it will be continued until such time that it is determined normal precipitation is sufficient to maintain a flow of at least 0.3 cfs. Annual precipitation patterns will vary, but generally, under this guideline mitigation will be required from approximately May-October each year.

Based on the September 1999 report by Wilson Engineering, the DFW recommended that a mitigation approach be established based on the volume of water pumped from the new well. The flow apportionment recommended by the DFW is approximately 14% of the volume pumped for municipal supply. For example, if the withdrawal rate for municipal supply was established at 100 gpm, then 14 gpm (0.03 cfs) would be supplied to the mitigation system and the actual pump rate would be 114 gpm. Maintaining this relationship between the rates of flow, throughout the mitigation season, will assure that the required volume of water is provided for mitigation.

The mitigation system will be designed with the capacity to discharge the full 30 gpm (0.07 cfs) Qi mitigation water right into the creek. This will allow the system to meet the 14% requirement up to a municipal-supply pumping rate of 214 gpm.

Municipal/Mitigation System Description

The general goal of mitigation is to compensate for a potential decrease in the supply of spring water to the creek during identified low-flow months of the year. Under a continuous pumping operation this could be accomplished by simply diverting a portion of the well water to the creek or spring location. However, municipal water supplies are not operated continuously. Typically, as will be the case with the Hamilton well, pumping will occur for a block of hours, usually in the evening, to refill storage tanks. Providing mitigation water by a simple diversion under these conditions would result in highly variable contributions to the creek. Therefore, the mitigation system has been designed with a storage tank to attenuate and equalize mitigation flow. The result being that the total required mitigation volume pumped from the well during a 6-10 hour period will typically be discharged to the creek over a 24-hour period.

The final municipal/mitigation system will be designed with a large municipal storage tank and a smaller mitigation storage tank. Both tanks will be of concrete construction. The flow of well water will be split at the wellhead. The required flow will be diverted to mitigation storage and the remainder (most of the well water) will be plumbed to municipal storage. A valve will be installed at the diversion to direct all flow to municipal storage if the mitigation tank becomes full. The valving will also allow more rapid filling if the mitigation tank runs dry. Flow rate to the creek will be adjustable by a valve at the tank outlet. The flow out of the mitigation tank will be variable and determined by the valve setting and the hydraulic head in the tank. Operation of the mitigation system is discussed later in this plan. Water will be conveyed from the mitigation storage tank through an underground pipe to a discharge structure. The discharge structure will be designed to dissipate energy and provide for the reduction of dissolved gasses.

Mitigation water will be discharged at a single location in the flow path between the potentially impacted springs and Little Carey's Creek. The discharge location is accessed via a driveway off Hamilton Cemetery Road.

Mitigation System Operation

Town of Hamilton personnel will manage the stream mitigation operations with input from DFW. Annually, on or about May 1st, Hamilton staff will initiate a meeting with DFW to evaluate mitigation season dates based upon the wet season precipitation totals and the stream flow rates recorded by DFW personnel. The mitigation season dates will be adjusted at that time. The Town will provide mitigation water, during the mitigation season, at a volume and rate based on 14% of the water pumped for municipal use.

In order to meet potable water demands, the well pump will typically operate between 6-10 consecutive hours (typically at night) during a 24-hour period. During the mitigation season well operation is expected to be in the upper end of this range. The proposed mitigation system is designed to attenuate the slug-flow effect of intermittent pump operation. This approach tends to equalize the flow rate delivered to Little Carey's Creek. The more uniform rate of supply to the creek is assumed to be desirable for the aquatic environment and better reflect natural spring discharge.

Designing the mitigation system so that each day the allotted water is provided to the creek presents the possibility that the tank will run dry, thus eliminating mitigation water to the stream for a short period. To reduce the possibility of such an occurrence, and provide Hamilton staff with some operational flexibility, the mitigation tank will be oversized and partially filled immediately prior to the start of the mitigation season. The "buffer" storage will reduce the possibility of running the mitigation storage tank dry: a condition that may result from unexpected changes in pumping patterns or personnel schedules.

In the unlikely event that the mitigation tank runs dry, the pump can be activated and the valve to the mitigation tank can be fully opened in order to re-establish buffer storage and re-set the system.

Operating the mitigation system with "buffer" storage presents the other possibility of filling the tank before a given pumping event is complete. To prevent overflow, the mitigation tank will be designed with an altitude shutoff valve. If the shutoff valve is activated, no water will flow from the pump to the mitigation system and the 14% mitigation allowance will not be diverted to the mitigation tank. However, such an event will typically be caused by excess buffer storage and would last for a period less than the pumping cycle. The potential loss of mitigation allowance to the creek will be inconsequential due to addition of buffer water and the short duration of the event. The benefits provided by utilizing buffer storage are expected to outweigh the risks.

Water Quality and Monitoring

Water will be diverted to the mitigation storage tank at the wellhead and prior to any treatment (such as chlorination) associated with the municipal supply.

The discharge structure will be designed to dissipate the erosive energy and excess gases of the water being discharged. The structure will be a simple vault designed with an inlet near the bottom and discharge from the top. The top will be set level so that the tops of the 4 walls of the vault pass water like a rectangular weir. The depth of water as it discharges will be shallow. The concentrations of dissolved gasses will tend toward equilibrium with the atmosphere at and below the "weir" crest. Dissolved nitrogen will be reduced to below the maximum allowable 105% of saturation before reaching the creek.

The concrete construction and the short residence time in the mitigation storage tank (<24 hours) will prevent significant warming of the mitigation water. Temperature monitoring will be conducted regularly at or below the discharge point to verify that the water temperature does not exceed 60 degrees F.

A water quality monitoring plan will be developed by Hamilton staff outlining the schedule, method and reporting procedures for nitrogen gas concentration and temperature monitoring at or below the discharge location. Hamilton personnel will maintain a mitigation logbook documenting mitigation and municipal flows, mitigation start and stop dates, and any significant mitigation storage system events.

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX VII
TYPICAL STREAM MITIGATION DAILY LOG

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

STREAM MITIGATION DAILY LOG
TOWN OF HAMILTON

Month: May Year: 2012 Completed By: Cas Hancock

Date	Previous Daily Total (gallons)	Gallons to Mit. Tank	Mitigation Flow Rate	Temperature At Outlet	Flow at DFW Weir (inches)	Weather Conditions	Comments
5-1-12	26900	open/Set	4 gpm	50	1.8	rain	No further data for May.

STREAM MITIGATION DAILY LOG
TOWN OF HAMILTON

Month: June Year: 2012 Completed By: Cas Hancock

Date	Previous Daily Total (gallons)	Gallons to Mit. Tank	Mitigation Flow Rate	Temperature At Outlet	Flow at DFW Weir (inches)	Weather Conditions	Comments
6-4-12	56800 3days		9gpm	55		Showers	
6-5-12	20000	6100		"		Cloudy	
6-6-	12200	6300		58		"	
6-7	31300	12200		54	2.2	Showers	
6-8	34500	7300		59		Cloudy	
6-11	59600	13400		75		Cloudy	
6-12	800	5600		64		"	
6-13	10800			62		"	
6-14	15200			60		"	
6-15	17300	13500	2gpm	73	2.0	Cloudy	
6-18	37400			58		Showers	
6-19	25000	11400		65		Cloudy	
6-20	18700	2700		75		"	
6-21	23400	4800	3gpm	73		"	
6-22	20300			61		"	
6-25	33800	13000		65		Rainy	
6-26	64200	6700		54	2.0	Showers	
6-27	26800	6600		73		Cloudy	
6-28	8100	6100		77		"	
6-29	26800	0		67		"	
	567300	136500					

STREAM MITIGATION DAILY LOG
TOWN OF HAMILTON

Month: July Year: 2012 Completed By: Cas Hancock

Date	Previous Daily Total (gallons)	Gallons to Mit. Tank	Mitigation Flow Rate	Temperature At Outlet	Flow at DFW Weir (inches)	Weather Conditions	Comments
7-3	57800 3 days	12100	3 gpm	55	2.1	Rain	
7-4	21200	6000		71		Cloudy	
7-5	46500	12700		75		"	
7-6	27100	3200		77		"	
7-9	64500	15500		81	2.0	Clear	
7-10	21600	0		74		"	
7-11	24600	4300		80		"	
7-12	9600	0		79		"	
7-13	36400	11100		72		Cloudy	
7-16	55600	14000		77	2.0	Clear	
7-17	32200	0		81		Partly Cloudy	
7-18	33700	6000		74		"	
7-19	28000	12000		80		"	
7-20	5900	18100		80	1.8	Showers	
7-23	57200	12000		68		Showers	
7-24	30600	6000		73		Clear	
7-25	30600	0		78		"	
7-26	29500	12000		79	1.5	"	
7-27	98200	12500		72		"	
7-30	64200	12800		71		"	
7-31	27200	6000		74		Clear	
	707200	176300					

STREAM MITIGATION DAILY LOG
TOWN OF HAMILTON

Month: Aug Year: 2012 Completed By: Cas Hancock

Date	Previous Daily Total (gallons)	Gallons to Mit. Tank	Mitigation Flow Rate	Temperature At Outlet	Flow at DFW Weir (inches)	Weather Conditions	Comments
8-1	76000	0	3gpm	73	1.2	Clear	
8-2	76000	6000		74		"	
8-3	92500	0		81		"	
8-6	99400	18800		77		"	
8-7	28900	0		71		"	
8-8	36000	6000		74		"	
8-9	32600	6000		75		"	
8-10	30900	0		76	1.1	"	
8-13	98900	12300		82		Clear	
8-14	34600	12800		79		"	
8-15	26300	0		89		"	
8-16	32000	0		91		"	
8-17	33600	6100		91		"	
8-20	74300	12000		77		lite clouds	
8-21	19400	0		72	1.2	Clear	
8-22	32200	6300		72		"	
8-23	35100	6000		69		lite Clouds	
8-24	27500	0		71		"	
8-27	61600	16000		78		lite clouds	
8-28	34700	2000		71		Cloudy	
8-29	32400	6700		69	1.5	Clear	
8-30	27100	0		72		clear	
8-31	8500	6000	↓	72		clear	
	852700	123000					

STREAM MITIGATION DAILY LOG
TOWN OF HAMILTON

Month: Sept Year: 2012 Completed By: Cas Hancock

Date	Previous Daily Total (gallons)	Gallons to Mit. Tank	Mitigation Flow Rate	Temperature At Outlet	Flow at DFW Weir (inches)	Weather Conditions	Comments
9-3	87600	12000	3 gpm	72	1.8	Sunny	
9-4	95000	6100		76			
9-5	28400	5900		75			
9-6	28900	100		82			
9-7	21600	5800		88			
9-10	101500	12300		64	2.1		
9-11	31000	6200		68			
9-12	29700	0		74			
9-13		6000		82			
9-14	33000	6000		81	2.2		
9-17	91200	12100		72			
9-18	25800	6000		81			
9-19	10300	0		77			
9-20	29200	6300		80			
9-21	32100	6000		60	2.1	Cloudy	
9-24	62300	12000		69			
9-25	17900	6100		66			
9-26	11100	0		67			
9-27	33106	6000		74		Sunny	
9-28	39000	6000		77	2.1		
	709,800	120,900					

STREAM MITIGATION DAILY LOG
TOWN OF HAMILTON

Month: Oct Year: 2012 Completed By: Cas Hancock

Date	Previous Daily Total (gallons)	Gallons to Mit. Tank	Mitigation Flow Rate	Temperature At Outlet	Flow at DFW Weir (inches)	Weather Conditions	Comments
10-1	40500	12100	3 gpm	71	2.1	Sunny	
10-2	21700	0	↓	62		"	
10-3	33600	6000		69		"	
10-4	5900	6000	↓	69	1.8	Sunny	
10-5	Turned off	DD					

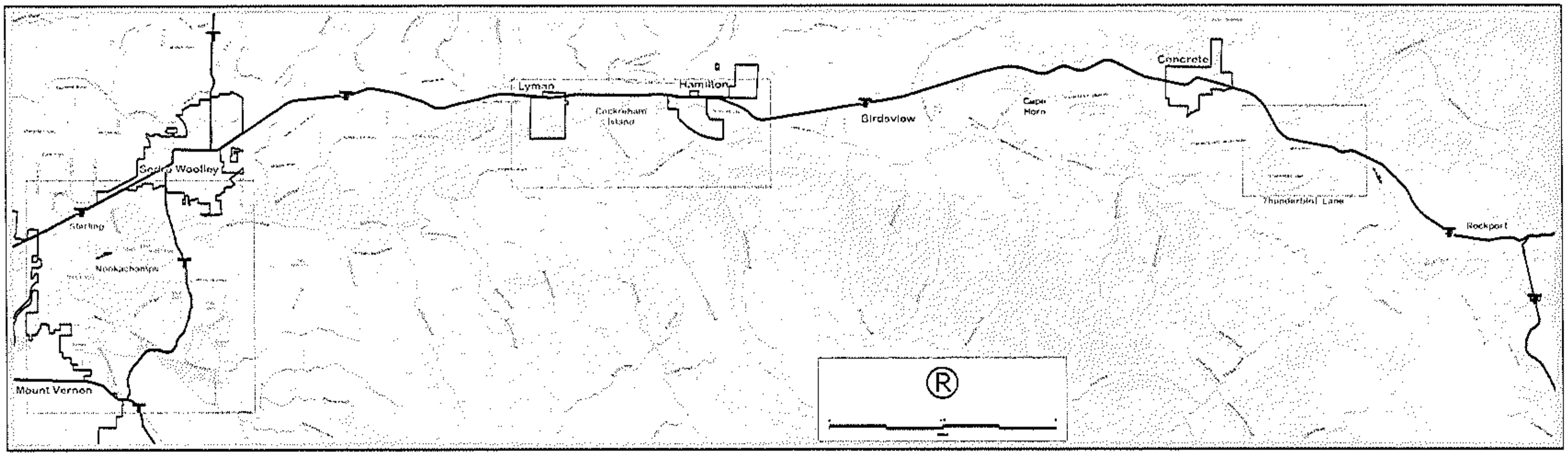
TOWN OF HAMILTON
SKAGIT COUNTY, WA

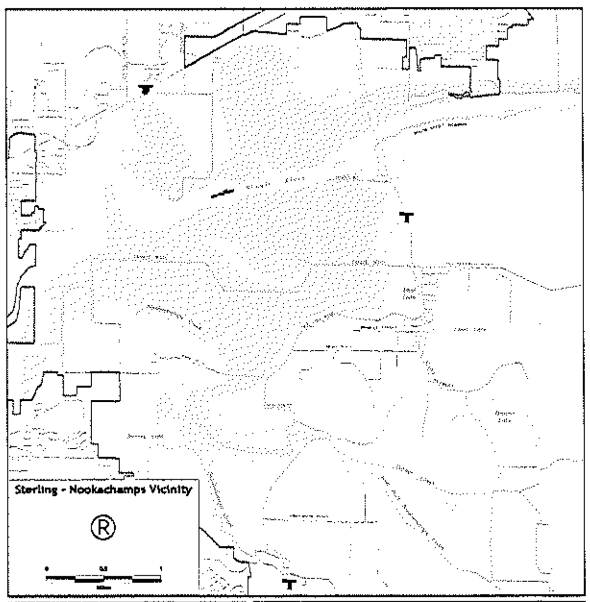
APPENDIX VIII – TOWN OF HAMILTON WATER SERVICE AREA MAPS

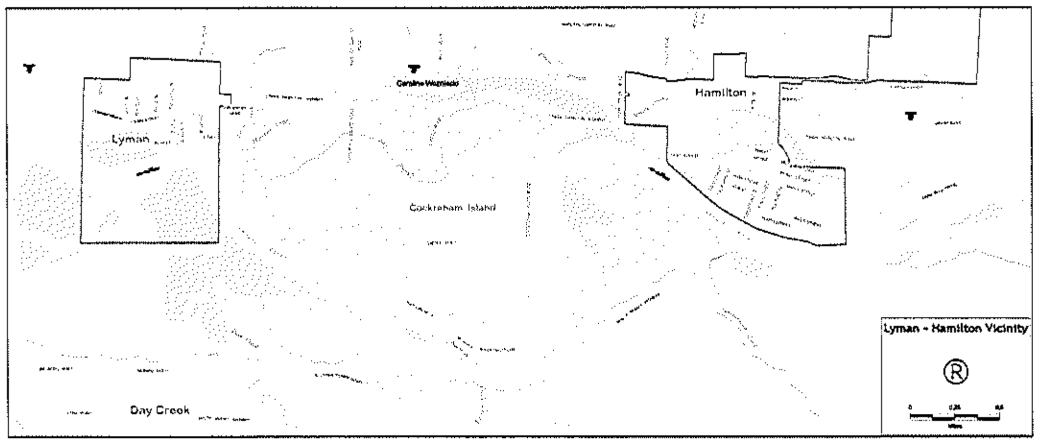
GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

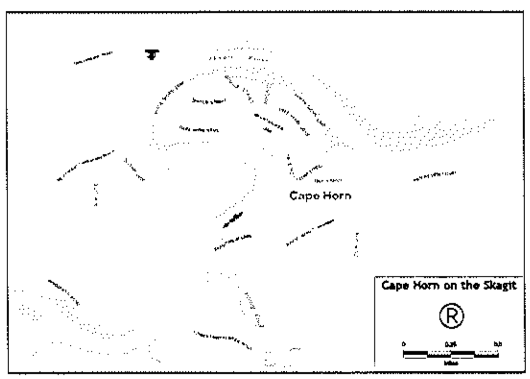
Map i

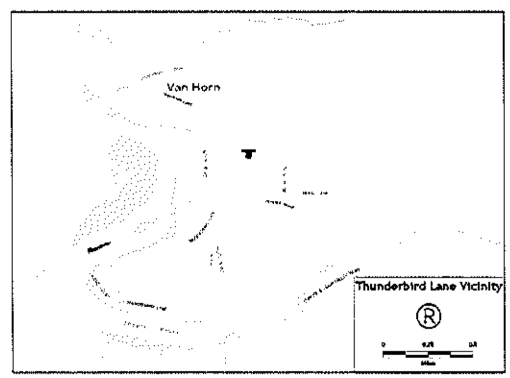
FLOOD WARNING MAP FOR THE SKAGIT RIVER VALLEY FROM NOOKACHAMPS AREA TO ROCKPORT AREA





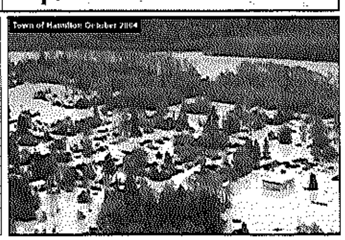






Map Produced By: Skagit County GIS

Other Sources for Flood Information



PHASE DESCRIPTIONS

Phase 1 Flooding:

Phase 1 floods (shown as green on map) inundate low areas near the Skagit River, may cover a few small sections of roads, and occur every few years on the average. These floods generally do not cause significant damage in the Skagit River Valley. A large phase 1 flood occurred in December 1989.

Phase 2 Flooding:

Phase 2 floods (shown as purple on map) inundate a wider area and may cause significant damage. The large phase 2 flood depicted on this map is approximately what occurred in December 1975 which was estimated to be a 10-year event (a flood that would have a 10% chance of occurring on any given year)

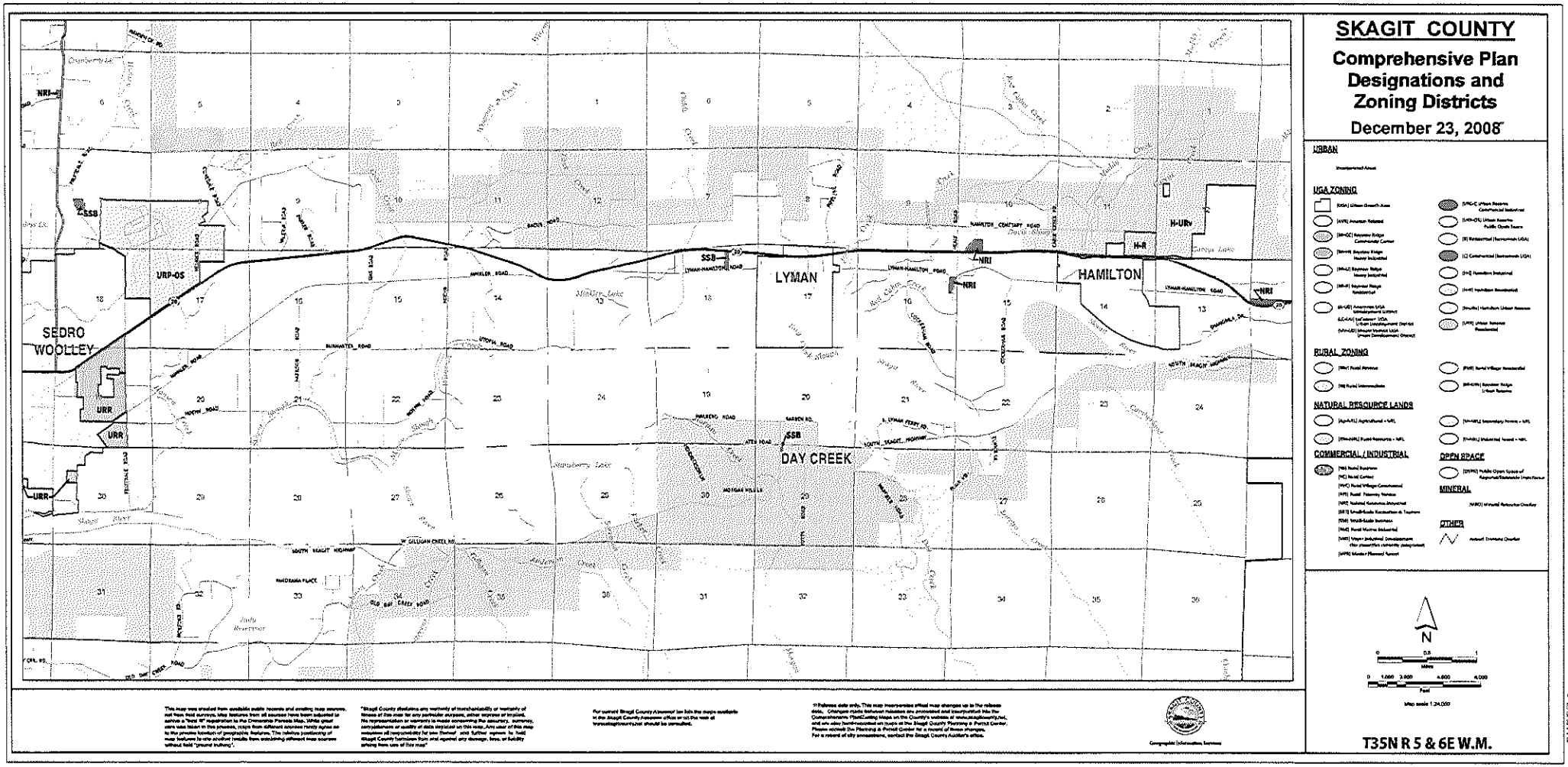
Phase 3 Flooding:

Phase 3 floods (shown as orange on map) can cause catastrophic damage in the valley. The very large phase 3 flood depicted on this map is the FEMA mapped 100-year flood. This flood would have approximately a 1% chance of occurring on any given year. If such a flood were to occur, many hundreds of homes would be flooded, thousands of people may have to be evacuated, and numerous public facilities and businesses would be inundated. In some neighborhoods flood waters would be deep and currents swift. Many roads would become impassable and extremely dangerous to use. The 1990 & 1995 floods were smaller phase3 floods. As a result portions of the phase 3 areas were flooded in 1990 and 1995.

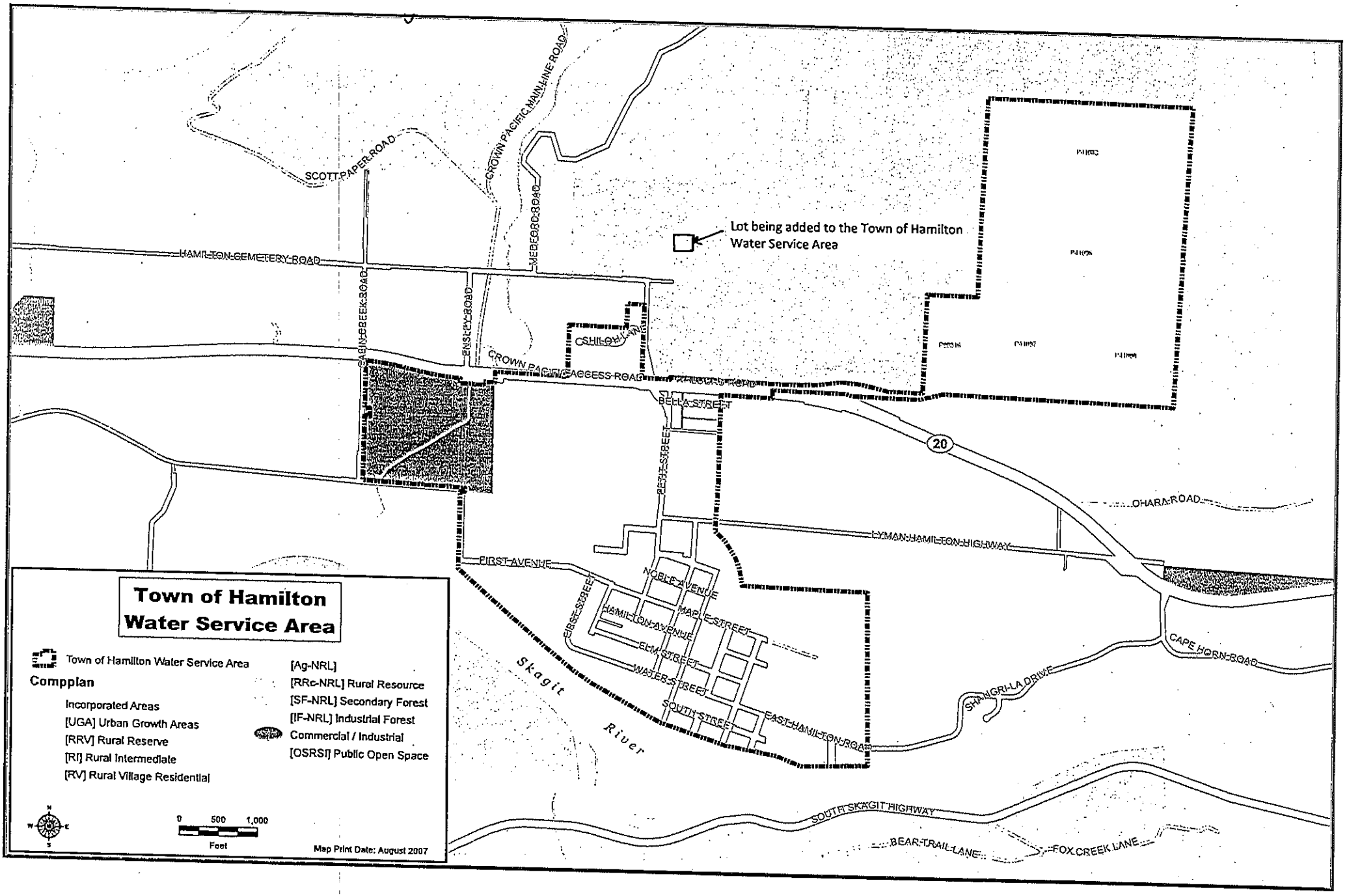
Caution: Under extreme conditions a flood greater than the 100-year flood can occur.

GAUGE HEIGHT AND PHASE

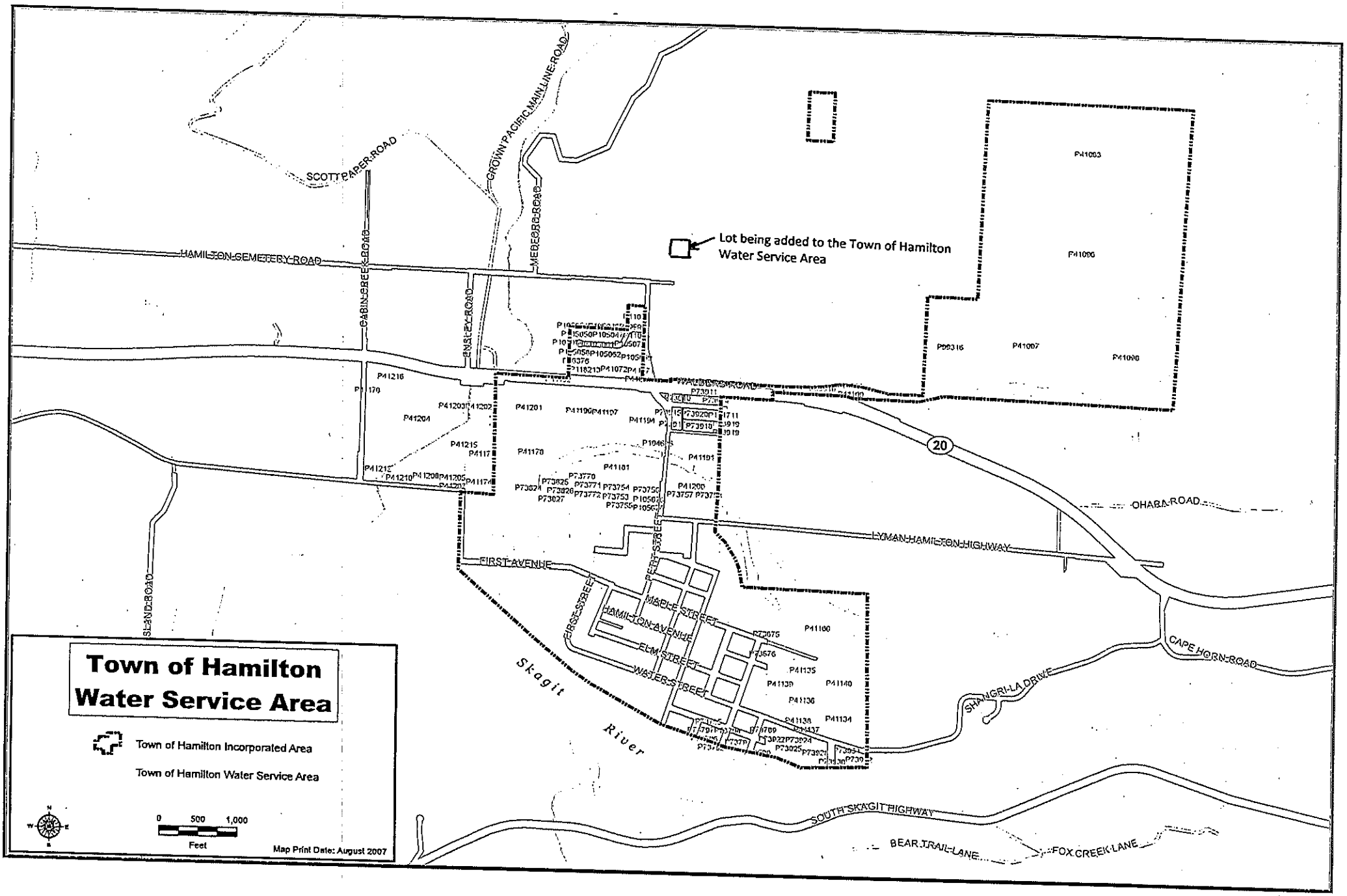
Map 2


SEDRO WOOLLEY
LYMAN
HAMILTON
DAY CREEK
URP-OS
URR
SSB
NRI
H-URv
H-R
SKAGIT COUNTY
Comprehensive Plan Designations and Zoning Districts
December 23, 2008
URBAN
UGA ZONING
RURAL ZONING
NATURAL RESOURCE LANDS
COMMERCIAL / INDUSTRIAL
OPEN SPACE
MINERAL
OTHER
T35N R 5 & 6E W.M.
SHEET 9

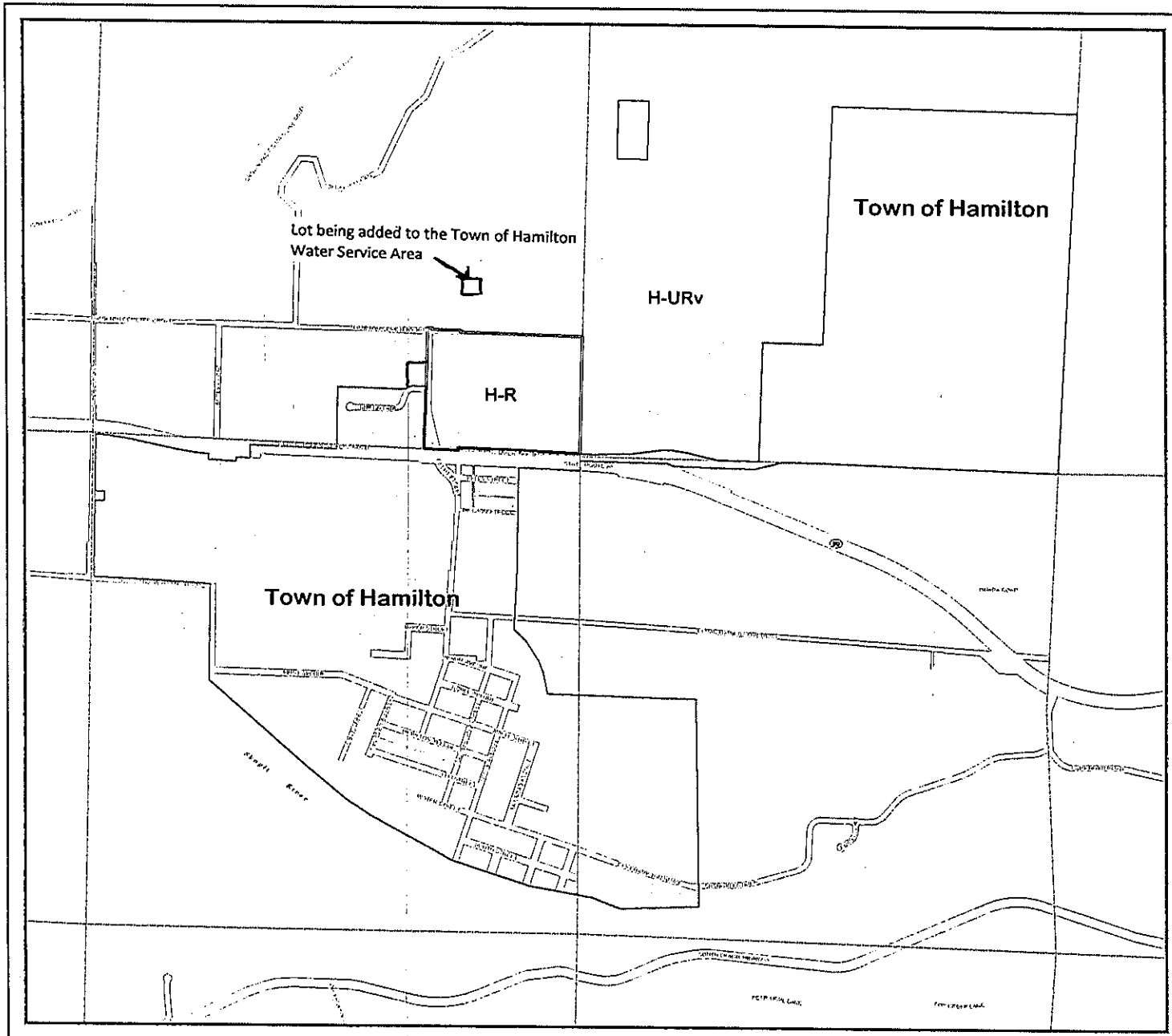
Map 3


Lot being added to the Town of Hamilton Water Service Area
SCOTT PAPER ROAD
CROWN PACIFIC MAINLINE ROAD
WEBFOOT ROAD
HAMILTON CEMETERY ROAD
CABIN CREEK ROAD
ENSLEY ROAD
SHILOH LANE
CROWN PACIFIC ACCESS ROAD
BELLA STREET
26TH STREET
20
OHARA ROAD
LYMAN HAMILTON HIGHWAY
FIRST AVENUE
NOBLE AVENUE
MAPLE STREET
HAMILTON AVENUE
ELM STREET
WATER STREET
SOUTH STREET
EAST HAMILTON ROAD
FIRST STREET
SHANGRI-LA DRIVE
CAPE HORN ROAD
Skagit River
SOUTH SKAGIT HIGHWAY
BEAR TRAIL LANE
FOX CREEK LANE
Town of Hamilton Water Service Area
Compplan
Incorporated Areas
[UGA] Urban Growth Areas
[RRV] Rural Reserve
[RI] Rural Intermediate
[RV] Rural Village Residential
[Ag-NRL]
[RRc-NRL] Rural Resource
[SF-NRL] Secondary Forest
[IF-NRL] Industrial Forest
Commercial / Industrial
[OSRSI] Public Open Space
0 500 1,000
Feet
Map Print Date: August 2007

Map 4


Lot being added to the Town of Hamilton Water Service Area
SCOTT PAPER ROAD
GROWN PACIFIC MAINLINE ROAD
MEEBERG ROAD
HAMILTON CEMETERY ROAD
CABIN CREEK ROAD
ANSLEY ROAD
WALDRON ROAD
20
OHARA ROAD
LYMAN-HAMILTON HIGHWAY
FIRST AVENUE
PEET STREET
FIRST STREET
MAPLE STREET
HAMILTON AVENUE
ELM STREET
WATER STREET
SHANGRI-LA DRIVE
CAPE HORN ROAD
SOUTH SKAGIT HIGHWAY
BEAR TRAIL LANE
FOX CREEK LANE
SLIND ROAD
Skagit River
Town of Hamilton Water Service Area
Town of Hamilton Incorporated Area
Town of Hamilton Water Service Area
0 500 1,000
Feet
Map Print Date: August 2007

Map 5



LEGEND

Town of Hamilton Un-Incorporated UGA Zoning

Urban Growth Area Boundary

[H-R] Hamilton Rural-Residential

[H-URv] Hamilton Urban Reserve

Town of Hamilton Incorporated Area

N
W E
S

February 2009

0 500 1,000 2,000
Feet

0 0.25 0.5
Miles

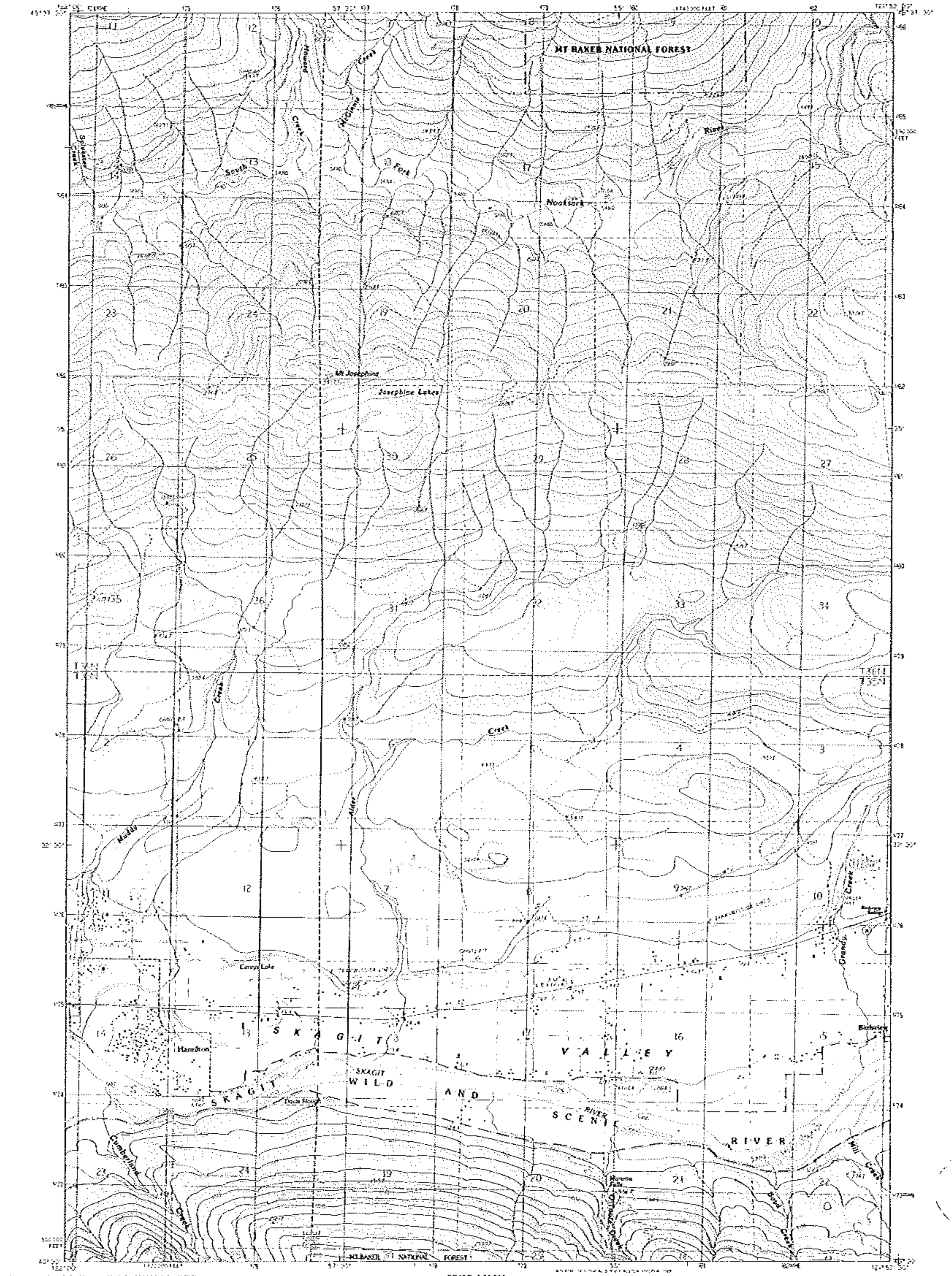
Town of Hamilton

URBAN GROWTH AREA

Map 6

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

HAMILTON QUADRANGLE
WASHINGTON-SKAGIT CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



SCALE 1:24 000

CONTOUR INTERVAL 40 FEET

ROAD LEGEND

Improved Road
Unimproved Road
Trail

Interstate Route   U.S. Route   State Route

To place on the predicted North American Datum of 1983, move the projection lines as shown by dashed corner ticks.

There may be private inholdings within the boundaries of any Federal or State reservations shown on this map.

No distinction made between houses, barns, and other buildings.

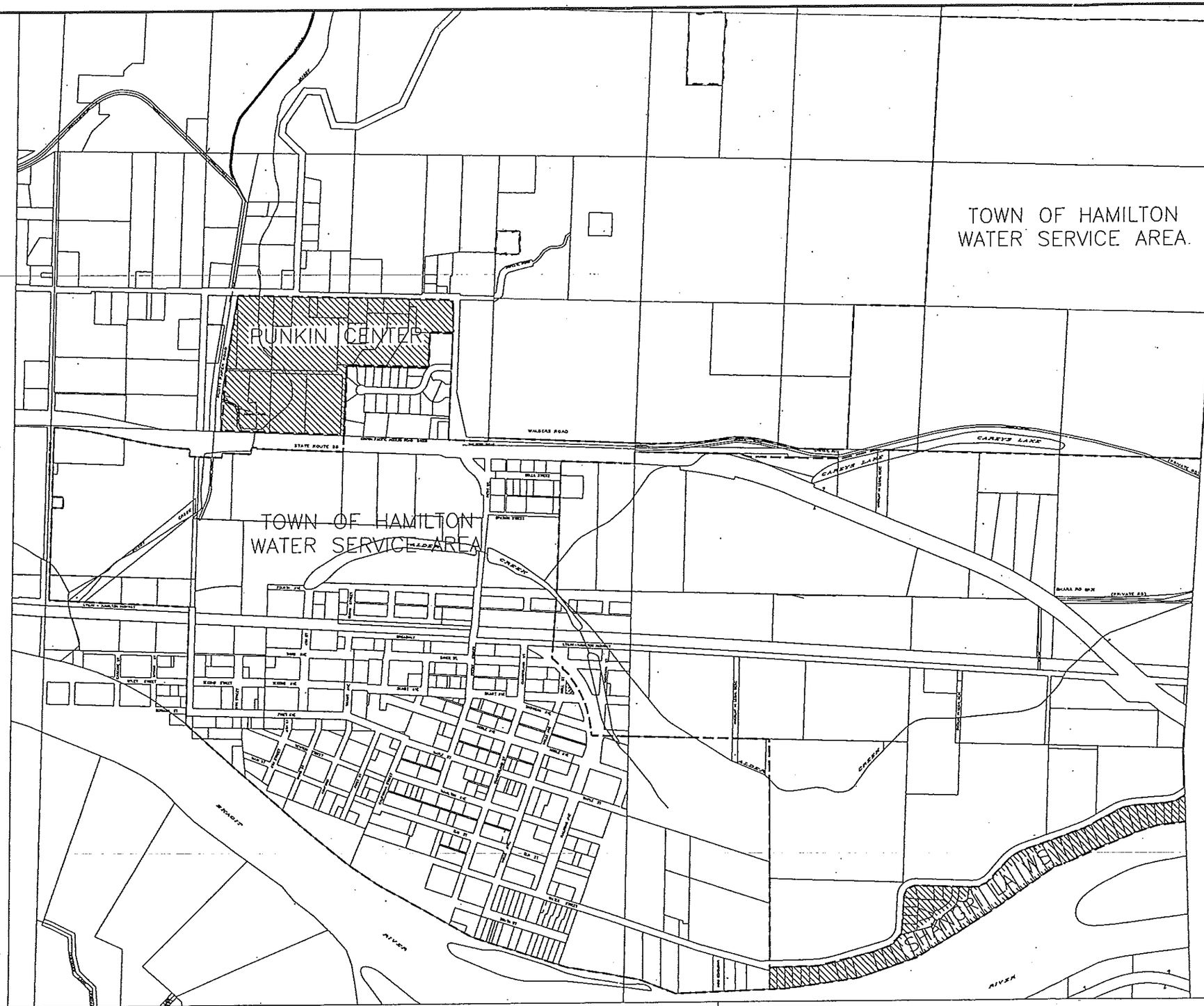
PROVISIONAL MAP
Produced from original manuscript drawings. Information shown as of date of photography.

FOR SALE BY U.S. GEOLOGICAL SURVEY
DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092

HAMILTON, WASHINGTON
PROVISIONAL EDITION 1989

MAP 7

NTS



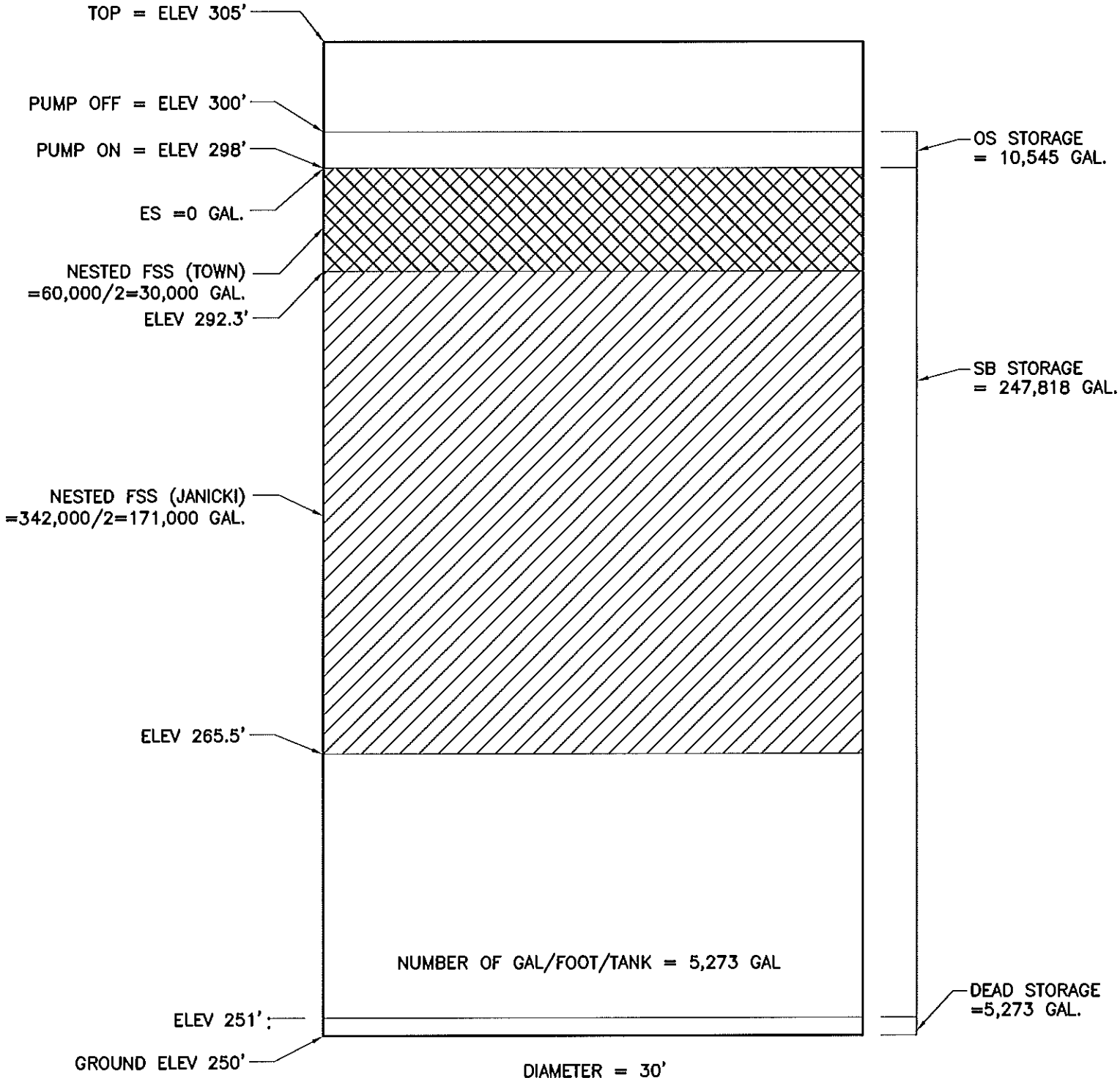
REVISION

TOWN OF HAMILTON
SKAGIT COUNTY, WA

PROPOSED DEVELOPMENT VICINITY MAP

DRAWN/DESIGNED BY: SB/CG	CAD FILE NUMBER:
CHECKED BY: CG	COUNTY: SKAGIT COUNTY
DATE: JANUARY 31, 2013	JOB NUMBER: 12018
SCALE: HORIZONTAL NTS	1 OF 1
VERTICAL N/A	

FIGURE 8

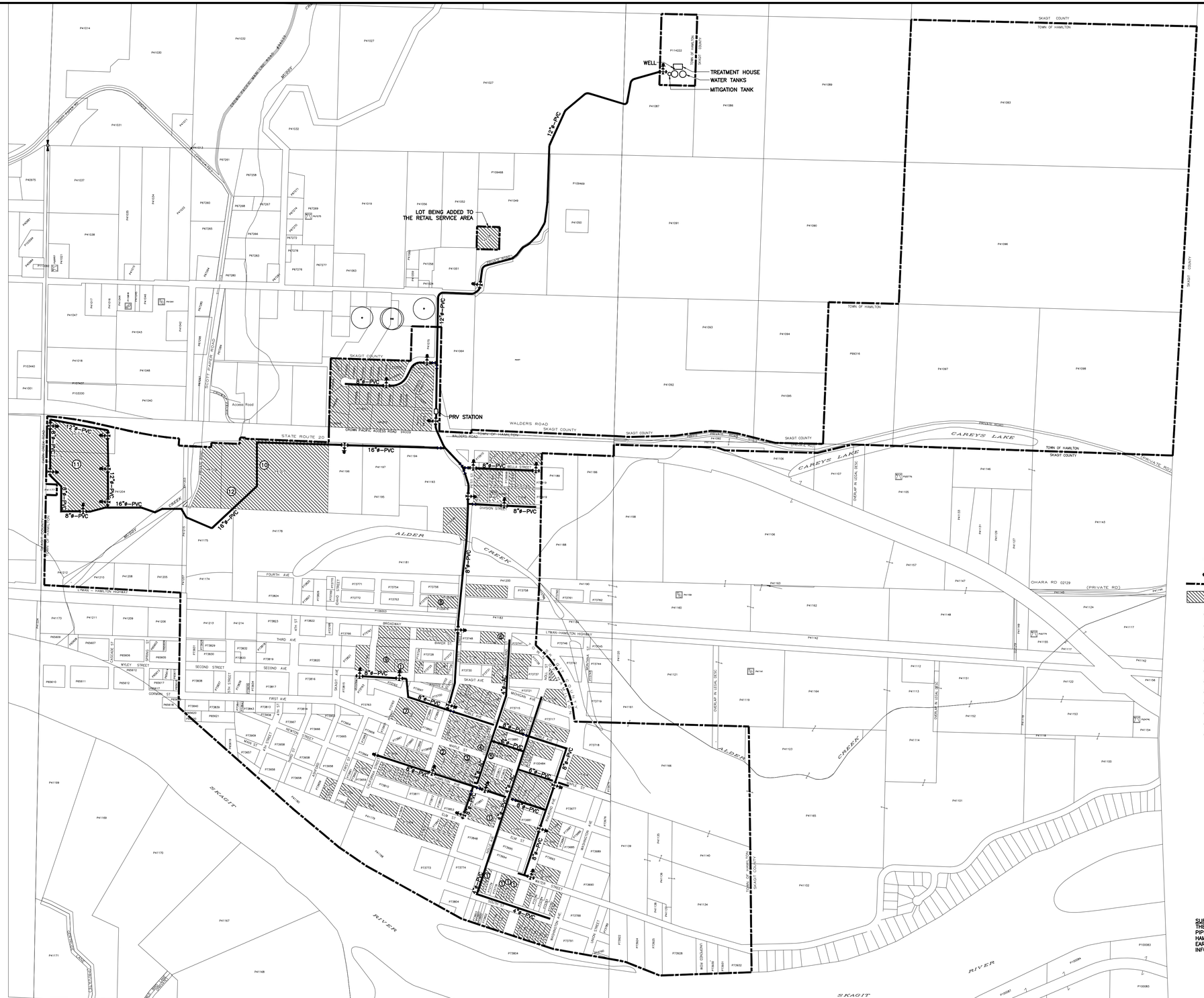


WATER STORAGE ALLOCATION WITH CURRENT
NUMBER OF ERUS (149)
NTS

*ALL ELEVATIONS ARE TYPICAL OF 2 TANKS

HIGHEST HOME BY GRAVITY
SERVICE @ ELEV. 170'
128' (OR 55.5 PSI) BELOW
BOTTOM OF EQUALIZING STORAGE

TOWN OF HAMILTON
STORAGE ELEVATION – EXISTING CONNECTIONS (149 ERUS)



NTS

- VALVES
- FIRE HYDRANTS
- RETAIL SERVICE AREA
- WATER SERVICE (WATER METER)

1. RV PARKS
2. TOWN HALL (¾" METER)
3. POST OFFICE (¾" METER)
4. RESTAURANT/STORE (¾" METER)
5. BANK (¾" METER)
6. FRONTIER BUIDLING (¾" METER)
7. DILL LUMBER (¾" METER)
8. UNIMEN PLANT (¾" METER – CLOSED SINCE MAY 2012)
9. HI-LO RV PARK CLOSED SINCE 2011
10. SKAGIT READY-MIX (1-1/2" METER)
11. JANICKI INDUSTRIES (2" METER)
12. JANICKI LOGGING (1-1/2" METER)

SURVEYING DISCLAIMER:
THE BASE MAP WAS PROVIDED BY THE SKAGIT COUNTY ASSESSOR WEBSITE. PIPELINE AND FIRE HYDRANT LOCATIONS WERE PROVIDED BY THE TOWN OF HAMILTON. GARRISON ENGINEERING HAVE ADDED FEATURES OBTAINED BY GOOGLE EARTH. GARRISON ENGINEERING MAKES NO CLAIM OF THE ACCURACY OF INFORMATION PROVIDED BY OTHERS.

No.	DATE	INIT.	REVISION

APPROVED FOR CONSTRUCTION

REVIEWING ENGINEER DATE

JURISDICTION

APPROVALS

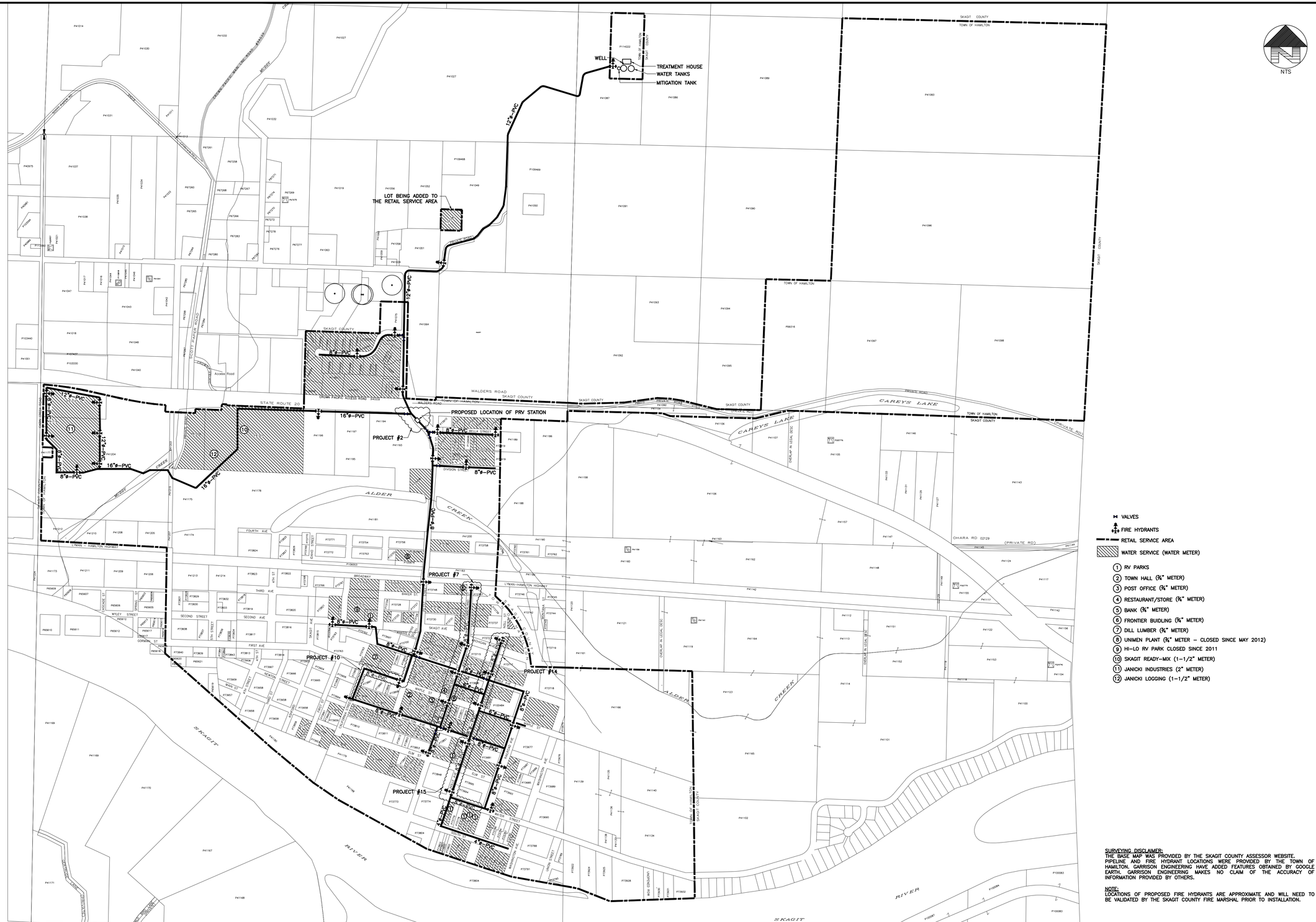
GARRISON ENGINEERING
1997 PARK LANE, BURLINGTON, WA 98233 PHONE (360) 707-5656 FAX (360) 707-5858

CARLTON H. GARRISON — STATE OF WASHINGTON — 31581 — REGISTERED PROFESSIONAL ENGINEER
Date Signed 5/6/13

TOWN OF HAMILTON
SKAGIT COUNTY, WA

WATER SYSTEM MAP
MAP# 9

DRAWN/DESIGNED BY: SB/CG	CAD FILE NUMBER: Hamilton-12018.dwg
CHECKED BY: CG	COUNTY: SKAGIT COUNTY
DATE: May 6, 2013	JOB NUMBER: 12018
SCALE: HORIZONTAL N/A	
VERTICAL N/A	1 OF 1



- VALVES
- FIRE HYDRANTS
- RETAIL SERVICE AREA
- WATER SERVICE (WATER METER)

1. RV PARKS
2. TOWN HALL (¾" METER)
3. POST OFFICE (¾" METER)
4. RESTAURANT/STORE (¾" METER)
5. BANK (¾" METER)
6. FRONTIER BUIDLING (¾" METER)
7. DILL LUMBER (¾" METER)
8. UNIMEN PLANT (¾" METER – CLOSED SINCE MAY 2012)
9. HI-LO RV PARK CLOSED SINCE 2011
10. SKAGIT READY-MIX (1-1/2" METER)
11. JANICKI INDUSTRIES (2" METER)
12. JANICKI LOGGING (1-1/2" METER)

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THE BASE MAP WAS PROVIDED BY THE SKAGIT COUNTY ASSESSOR WEBSITE. PIPELINE AND FIRE HYDRANT LOCATIONS WERE PROVIDED BY THE TOWN OF HAMILTON. GARRISON ENGINEERING HAVE ADDED FEATURES OBTAINED BY GOOGLE EARTH. GARRISON ENGINEERING MAKES NO CLAIM OF THE ACCURACY OF INFORMATION PROVIDED BY OTHERS.

NOTE:
LOCATIONS OF PROPOSED FIRE HYDRANTS ARE APPROXIMATE AND WILL NEED TO BE VALIDATED BY THE SKAGIT COUNTY FIRE MARSHAL PRIOR TO INSTALLATION.

No.	DATE	INIT.	REVISION

APPROVED FOR CONSTRUCTION

REVIEWING ENGINEER DATE

JURISDICTION

APPROVALS

GARRISON ENGINEERING

1997 PARK LANE, BURLINGTON, WA 98233 PHONE (360) 707-5656 FAX (360) 707-5858

CARLTON H. GARRISON — STATE OF WASHINGTON — 31581 — REGISTERED PROFESSIONAL ENGINEER

Date Signed 5/6/13

TOWN OF HAMILTON
SKAGIT COUNTY, WA

WATER SYSTEM MAP
INCLUDING PROPOSED IMPROVEMENTS
MAP #10

DRAWN/DESIGNED BY: SB/CG	CAD FILE NUMBER: Hamilton-12018.dwg
CHECKED BY: CG	COUNTY: SKAGIT COUNTY
DATE: MARCH 6, 2013	JOB NUMBER: 12018
SCALE: HORIZONTAL N/A	
VERTICAL N/A	1 OF 1

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX IX
PAST AND PRESENT WATER USE FIGURES

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

Town of Hamilton
Water usage

	Water pumped from well S02 (gallons)	Total water sold (gallons)	Waters sold to residential customers (gallons)	Water sold to commercial customers (gallons)	Notes
Sep-09	1,613,100	874,203	676,933	197,270	
Oct-09	1,556,300	861,285	592,483	268,801	
Nov-09	1,297,600	711,094	503,127	207,966	
Dec-09	1,500,000	610,084	465,907	144,177	
Jan-10	1,446,300	939,997	743,228	196,769	
Feb-10	1,504,800	613,121	462,376	150,744	
Mar-10	1,687,200	629,595	495,498	134,098	(1)
Apr-10	1,673,600	673,226	573,237	99,989	(1)
May-10	1,707,000	603,225	477,351	125,873	
Jun-10	1,747,700	604,070	462,847	141,222	
Jul-10	2,017,900	697,607	502,918	194,689	
Aug-10	2,137,300	867,740	628,298	239,442	
Total	**19,888,800**	**8,685,245**	**6,584,203**	**2,101,042**	
Sep-10	1,911,700	855,241	584,457	270,783	
Oct-10	1,567,400	650,236	465,421	184,816	
Nov-10	1,477,800	652,301	428,140	224,161	
Dec-10	1,429,700	583,373	462,773	120,600	
Jan-11	3,012,520	772,610	435,538	337,072	(2)
Feb-11	1,376,800	572,654	412,657	159,997	
Mar-11	1,763,200	673,522	485,961	187,561	
Apr-11	1,976,200	547,678	413,569	134,109	
May-11	1,466,400	841,388	700,532	140,856	
Jun-11	1,772,200	553,146	441,058	112,088	
Jul-11	1,700,800	746,422	580,762	165,660	
Aug-11	1,904,500	987,510	700,532	286,978	
Total	**21,359,220**	**8,436,080**	**6,111,399**	**2,324,680**	
Sep-11	1,789,900	611,827	422,530	189,296	
Oct-11	1,624,100	564,702	396,754	167,948	
Nov-11	1,011,800	595,700	446,362	149,338	
Dec-11	1,121,700	517,983	412,515	105,468	
Jan-12	1,009,000	546,085	479,917	66,168	
Feb-12	919,300	435,665	365,278	70,387	
Mar-12	898,100	482,258	401,624	80,634	
Apr-12	577,100	446,855	380,986	65,869	
May-12	921,100	721,865	663,326	58,538	
Jun-12	567,300	510,488	455,667	54,821	
Jul-12	707,200	670,462	549,391	121,071	
Aug-12	852,700	743,654	551,029	192,625	
Total	**11,999,300**	**6,847,543**	**5,525,379**	**1,322,165**	

(1) Commercial water usage readings for March and April 2010 are not available due to a software problem. March 2010 water usage has been estimated by taking the average of water usages for March 2011 & March 2012 April 2010 water usage has been estimated by taking the average of water usages for April 2011 & April 2012

(2) Water usage for commercial customers has been lowered by approximately 800,000 gallons to take into account a large leak located after one of the ¾" commercial meters.

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX X
WATER QUALITY MONITORING PROGRAM

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

WATER QUALITY MONITORING SCHEDULE

PWSID 307000

CONTAMINANTS	YEAR 2010	YEAR 2011	YEAR 2012	YEAR 2013	YEAR 2014	YEAR 2015	YEAR 2016	YEAR 2017	YEAR 2018
LEAD AND COPPER	Done			Due			Due		
ASBESTOS	At DOH direction								
VOLITILE ORGANIC CONTAMINANTS VOCs			Done			Due			Due
HERBICIDES	At DOH direction								
GENERAL PESTICIDES	At DOH direction								
INSECTICIDES	At DOH direction								
EDB AND OTHER FUMIGANTS	Done	At DOH direction							
DIOXIN, ENDOTHALL, DIQUAT, GLYSOPHATE	Waivers								
INORGANIC CONTAMINANTS IOCs	Waivers			Due			Due		
NITRATES (due each year no IOC samples done)	Done	Done	Done		Due	Due		Due	Due
*MANGANESE (normally part of IOC sampling)	At DOH direction			Due					
RADIONUCLIDES	Done				Due				Due
SYNTHETIC ORGANIC CONTAMINANTS SOCs	Statewide Waivers for General SOCs								
DISINFECTION BYPRODUCTS DBPs			Done			Due			Due
OTHER	At DOH direction								

*Managanese levels are tested in the field on a quarterly basis

TOWN OF HAMILTON
COLIFORM MONITORING PLAN

DOH WATER SYSTEM ID# 30700

Prepared By

Mark Spahr, P. E.
Town of Hamilton
Revised September 2007

Updated by
Cas Hancock, Certified Operator
Town of Hamilton
Revised August 2012

TABLE OF CONTENTS

1.0 TOWN OF HAMILTON SYSTEM INFORMATION

Water Sources: The Hamilton System is supplied by a single well. The well is 8-inches in diameter and 200 feet deep; it was drilled in 1999 and it is equipped with a pump that delivers approximately 136 gpm to two adjacent storage reservoirs. The aquifer is recharged in an undeveloped forested area in the vicinity of the well. Water was encountered at a depth of 181 feet below the surface, and the water level rose 100 feet to within 83 feet of the surface, which indicates good natural protection for its water quality. Sodium hypochlorite is added at the pump house and a chlorine residual analyzer continuously analyzes the chlorine residual. The target chlorine residual at the treatment plant is 0.5 to 0.6 mg/l.

Population Served: The number of service connections in Hamilton is 141 (August 2012), hence the total population served is estimated at 550 (assuming 2.5 persons per connection and 200 employees at Janicki Industries). According to WAC 246-290-300, Table 2, *this population requires a minimum of one (1) sample per month.* Refer to the enclosed map of the routine sampling sites, and Section 2.3 for the addresses of these sites. *The population served by the system shall be reviewed annually by the Town's Certified Operator (CO), to insure that the proper number of monthly samples is collected. (Note: one sample per month is required until total monthly population exceeds 1,000 people – or approximately 400 service connections*)

Distribution System: The distribution system includes approximately 7.6 miles of pipe. Maintenance of a target minimum chlorine residual of 0.2 to 0.3 mg/l in all areas of the system is the Town's goal, through the use of circulating flow in reservoirs (top fill, bottom draw), looping of pipelines where feasible and water main flushing (as needed, particularly on "dead end" pipelines).

2.0 ROUTINE SAMPLING INFORMATION

2.1 Number of Monthly Samples:

Until the population exceeds 1,000, Hamilton is required by the Washington State Department of Health (DOH) Group A Regulations [WAC 246-290-300(3)(c)(i)] to collect a minimum of *one sample* per month.

2.2 Sample Collection Schedule:

Sample collection will be conducted *during the first two weeks* of each month, normally during one of the first three business days of the week. Four sites have been identified for routine sample collection. In order to achieve a representative sampling of water served to all of Hamilton's customers, the five sampling sites

will be rotated. For example, Site 1 will be used in January and June; Site 2 in Feb, Jul and Nov; Site 3 in March, Aug and December; Site 4 in April and Sept; and Site 5 in May and Oct.

If holidays or scheduling conflicts occur, samples will be scheduled for collection on an alternate day or week, but within the required collection and reporting period. *Hamilton's CO is responsible for ensuring that any deferred sample collection is rescheduled and that the required sample(s) are collected each month.*

2.3 Sample Site Location:

Five routine coliform monitoring sites are located in various areas served by the Hamilton water system. The sites were selected to be representative and indicative of the system's overall water quality. The sample site locations are shown on the accompanying map; Routine Coliform Sampling Sites.

Site 1: 610 Shiloh Drive

Site 2: 951 Pettit Street

Site 3: 214 South Street

Site 4: 320 California Street

Site 5: 421 Railroad Avenue

Site locations may be revised in response to changes in accessibility, flooding, population growth, "looping" of mains, consolidation with other systems, addition of pressure zones, or extension of water service to new areas. Any time that routine sampling site locations are revised, this plan shall be updated to reflect the revisions (any such revisions shall also be sent to DOH).

To improve efficiency, accessibility, and to avoid inconvenience to customers and avoid "false" unsatisfactory results (from contamination on the exterior of faucets or hose bibs); lockable, above-grade sampling stations have been installed and used to ensure precise and sanitary sample collection.

2.4 Sample Collection Procedures:

To avoid false unsatisfactory results due to contamination from soil, insects, floodwater, animal or groundwater exposure, all sample stations and all customers' hose bibs (if used) shall be disinfected with a thorough spray of liquid sodium hypochlorite (bleach) solution, 6.00% prior to each use.

To insure samples are representative of water quality within the main, all sample sites *shall be flushed for a minimum of two (2) and preferably five (5) minutes prior to sample collection*. This minimum flush time may be increased as needed to address sites with large diameter or lengthy service lines.

2.5 Sampling During Flooding:

A portion of the Town of Hamilton is located within the Skagit River Floodway, hence during flooding events, it may not be feasible to obtain a sample from a designated site. During such events, routine samples will be collected from the closest available routine coliform monitoring site that is not flooded.

2.6 Sample Integrity:

If the CO or the Town Engineer determines that the sample collection process, including conditions during sampling or transport may have compromised the sample integrity and the sample should not be submitted for analysis; the sample and the sample bottle shall be discarded and a replacement sample in a new bottle shall be collected as soon as possible within the same month.

Following collection of the sample, it shall be kept in a cool dark place, and transport shall be as promptly as feasible, with the goal of transporting to the laboratory within 3 hours of the time that the sample is collected. If immediate transport is not feasible, storage of the sample requires refrigeration. In no case shall a sample that is over 20-hours old be turned into the lab.

2.7 Laboratory and Sample Analysis Methods:

Hamilton utilizes the services of state-certified laboratories to perform all analysis of coliform samples. The standard analysis method used for routine testing by these laboratories is the presence/absence (P/A) chromogenic method [SM 9223 B (2b)].

Per WAC 246-290 requirements, the laboratory will analyze all unsatisfactory total coliform samples for *E. coli*.

2.8 Sample Invalidation:

The laboratory will define invalid samples as follows:

- Samples with excess debris
- Multiple tube technique cultures that are turbid without gas production
- P/A technique cultures that are turbid in the absence of acid
- Membrane filtration technique cultures with confluent growth patterns or growth TNTC (too numerous to count) colonies without a surface sheen.

Invalid samples will not be submitted to DOH for compliance. Any invalid sample will be re-sampled at the same location that the invalid sample was collected, preferably within twenty-four (24) hours of receipt of notification from the laboratory that the sample was invalid.

3.0 REPEAT SAMPLING INFORMATION

3.1 Number of Repeat Samples:

When one (1) routine sample is collected per month, a minimum of five (5) repeat samples shall be collected if the routine sample was unsatisfactory. *Repeat samples are required from the following locations*:

- The same tap as the original unsatisfactory routine sample
- An active service within five (5) active connections upstream of where the original unsatisfactory sample was taken
- An active service within five (5) active connections downstream from where the original unsatisfactory sample was taken
- The first individual service connection after storage, which will provide useful information for determining the source of contamination.
- The well SO2 sample tap prior to treatment, which will provide information about the quality of the ground water, the requirements of the Washington State Department of Health (DOH) Group A Regulations [WAC 246-290-320(2) (g)].

3.2 Repeat Sample Sites:

The addresses of the services to be used for upstream and downstream repeat sampling for each routine sample site are listed in this Section. When a routine sample is unsatisfactory, one upstream and one downstream sample shall be collected.

Site	Upstream Address	Downstream Address
Site 1 610 Shiloh Lane	607 Shiloh Lane	615 Shiloh Lane
Site 2 951 Pettit Street	970 Bella Street	700-B Baker Street
Site 3 214 South Street	211 South Street	211-C South Street
Site 4 320 California	650 Hamilton Street	700 Elm Street
Site 5 421 Railroad Ave	490 Railroad Avenue	239 Water Street

3.3 Timing of Repeat Samples:

All repeat samples shall be collected within twenty-four (24) hours of notification from the laboratory of an unsatisfactory result. If logistics prevents collection of repeat samples within twenty-four (24) hours of notification, the Hamilton CO shall prepare a plan to collect samples as soon as possible. The CO shall contact the DOH NW Region Office immediately for consultation, seeking DOH

approval of the plan. *Repeat sampling shall be conducted per the DOH approved plan.* **DOH NW Regional Office Contacts: Carol Stuckey (253) 395-6775, or Nancy Feagin (253) 395-6760.**

All repeat samples shall be collected on the same day.

4.0 FOLLOW-UP SAMPLING AFTER UNSATISFACTORY SAMPLES

If any of the repeat samples are unsatisfactory, the following steps shall be taken; 1) call DOH and discuss the issue, 2) reach an agreement on remediation action(s) to be taken (such as flushing or dosing a reservoir with a higher concentration of chlorine), 3) perform the remediation actions, 4) following remediation, take another set of five (5) follow-up samples *using the same criteria as for repeat samples.*

- From the same tap as the original unsatisfactory result
- From a site within five (5) services upstream of the site that was unsatisfactory
- From a site within five (5) services downstream of the site that was unsatisfactory
- From the first individual service connection after storage
- From the well sample tap

If the unsatisfactory sample is from the first two (2) or last two (2) active services on a main, the DOH Region Office shall be contacted for direction on where and how to collect the repeat samples.

5.0 SAMPLING THE MONTH AFTER UNSATISFACTORY RESULTS

The month after an unsatisfactory result occurs; the following minimum number of monthly samples shall be collected:

Based on WAC 246-290-320(2)(c), Six (6) water samples shall be collected the following month.

It is recommended that the 6 sample site locations be the five routine sampling sites, plus the site specified for the current month.

6.0 REPORTING UNSATISFACTORY RESULTS

6.1 Reporting Responsibility:

When any total coliform or *E. coli* samples are unsatisfactory, the laboratory should notify the CO *as soon as possible on the day the result is obtained.*

The CO is responsible for reporting all unsatisfactory coliform samples to DOH *within 24 hours after the notification is received.*

6.2 Non-acute Maximum Contaminant Level (MCL) violations:

A non-acute coliform MCL violation occurs if more than one sample provides unsatisfactory results for total coliform. For example, if the routine sample was unsatisfactory but the repeat samples were all satisfactory, there is no MCL violation, but if any of the repeat samples are unsatisfactory, an MCL violation occurs, which requires notification of DOH *and customers.*

If a non-acute coliform MCL violation occurs, the DOH NW Region Office shall be contacted within twenty-four (24) hours following notification of the results. *In addition, public notification of the non-acute violation shall be initiated as per WAC 246-290 Part 7 Subpart A.* The notification to customers shall follow DOH Guidelines regarding language and content, and a copy of the notice shall be sent to DOH.

6.3 Fecal Coliform or E. coli Unsatisfactory Samples:

If a sample is unsatisfactory for fecal coliform or *E. coli* bacteria, the CO will be notified by the laboratory and immediately upon such notification the CO shall immediately arrange for repeat sampling as specified in Section 4. Repeat samples shall be collected as soon as is practicable, an in no case beyond twenty-four (24) hours of the notice.

The CO shall also contact the DOH NW Region Office and the Town Engineer on the same day. In the event the DOH NW Regional Office cannot be contacted directly, the CO shall leave a message on the **DOH water system emergency hotline (1-877-481-4901)**. If DOH does not respond to the message on the day it was left, the CO shall attempt to contact DOH again on the following day. Such efforts shall continue until contact has been made.

Note: An unsatisfactory fecal coliform or E. coli result in a routine sample does not represent an MCL violation (unless and until confirmed by repeat samples); however it is a very serious issue that warrants thorough consideration. The CO, in consultation with the Town Engineer shall evaluate the situation to determine if an "advisory" should be distributed to affected customers pending the results of repeat samples.

6.4 Acute MCL Violation:

An acute MCL violation occurs if; 1) a repeat sample is unsatisfactory with fecal coliform or E. coli, or 2) if there is an unsatisfactory total coliform sample in a set of repeat samples collected following an unsatisfactory routine sample with fecal coliform or E. coli.

DOH and the Town Engineer shall be contacted on the same day that the lab notification is received. If it is too late in the day to notify DOH directly, a message shall be left at the DOH water system emergency hotline. If a response from DOH is not received by the next day, the CO shall continue calling until contact has been made.

In addition, upon notification by the reporting laboratory, the process to notify the consuming public of the acute MCL violation shall be implemented immediately, per the requirements of WAC 246-290 Part 7 Subpart A.

7.0 REVISIONS TO COLIFORM MONITORING PLAN

The CMP shall be reviewed by the CO and Town Engineer periodically and revised on an as needed basis. The conditions that may warrant revisions in the future include:

- Changes in regulations
- Population changes
- Loss of sample site availability
- Changes in sample site location
- Service to new areas
- Changes in pressure zones or flow patterns
- Consolidation of systems

TOWN OF HAMILTON
SKAGIT COUNTY, WA

COLIFORM MONITORING PLAN
APPENDICES

COLIFORM MONITORING PLAN – Appendix A

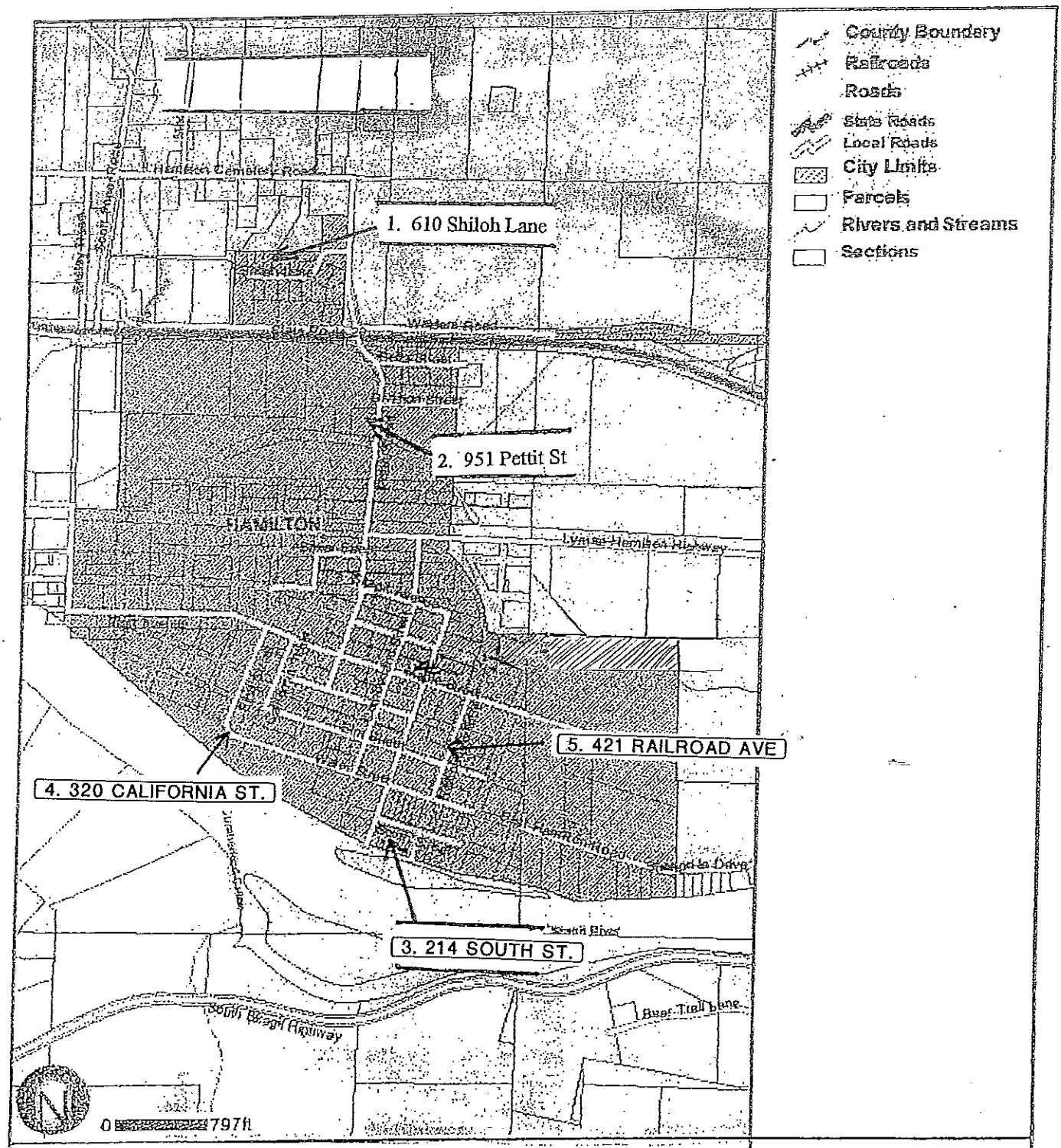
Water System Name: **Town of Hamilton**	ID#: **307000**	County: **Skagit**
Number of service connections: **141**		Peak Population served: **550**
Source Type: **WELL SO2**	Treatment Purpose & Process: **Chlorination to prevent microbial contamination**	Storage Capacity: **581,400 gal**
Completed by: Original **Mark Spahr, P.E.** Revised: **Cas Hancock**	Date: 02/2007 **07/11/07 revised** **11/02/2012 revised**	Position & Daytime Phone#: **OPERATOR** **360-770-4633**

Location/Address for ROUTINE SAMPLE SITES:	Location/Address for REPEAT SAMPLE SITES:	Location/Address for FOLLOWING MONTH ROUTINE SAMPLE SITES:
X1: **Sample Tap @** **610 Shiloh Lane** **Jan., June**	1. 610 Shiloh Lane 2. 607 Shiloh Lane 3. 34509 Ham. Cemetery Rd 4. 615 Shiloh Lane 5. Well Sample Tap	1. 610 Shiloh Lane 2. 607 Shiloh Lane 3. 34509 Ham. Cemetery Rd 4. 615 Shiloh Lane 5. Well Sample Tap 6. 951 Pettit Street
X2: **Sample Tap @** **951 Pettit Street** **Feb., July, Nov**	1. 951 Pettit Street 2. 970 Bella Street 3. 34509 Ham. Cemetery Rd 4. 700-B Baker Street 5. Well Sample Tap	1. 951 Pettit Street 2. 970 Bella Street 3. 34509 Ham. Cemetery Rd 4. 700-B Baker Street 5. Well Sample Tap 6. 214 South Street
X3: **Sample Tap @** **214 South Street** **Mar., Aug., Dec.**	1. 214 South Street 2. 211 South Street 3. 34509 Ham. Cemetery Rd 4. 211-C South Street 5. Well Sample Tap	1. 214 South Street 2. 211 South Street 3. 34509 Ham. Cemetery Rd 211-C South Street 5. Well Sample Tap 6. 320 California Street
X4: **Sample Tap @** **320 California Street** **Apr., Sept.**	1. 320 California Street 2. 650 Hamilton Street 3. 34509 Ham. Cemetery Rd 4. 700 Elm Street 5. Well Sample Tap	1. 320 California Street 2. 650 Hamilton Street 3. 34509 Ham. Cemetery Rd 4. 700 Elm Street 5. Well Sample Tap 6. 421 Railroad Avenue
X5: **Sample Tap @** **421Railroad Ave** **May., Oct.**	1. 421 Railroad Avenue 2. 490 Railroad Avenue 3. 34509 Ham. Cemetery Rd 4. 239 Water Street 5. Well Sample Tap	1. 421 Railroad Avenue 2. 490 Railroad Avenue 3. 34509 Ham. Cemetery Rd 4. 239 Water Street 5. Well Sample Tap 6. 610 Shiloh Lane

Following any ROUTINE unsatisfactory coliform sample result, immediately collect at least 5 REPEAT samples to identify the source of the coliform contamination (do NOT batch or shock chlorinate unless prior authorization is given by DOH staff). If any REPEAT sample results are unsatisfactory, contact our DOH Regional office.

The month following a COLIFORM POSITIVE SAMPLE, 6 ROUTINE SAMPLES, REPRESENTING NORMAL OPERATING CONDITIONS IN THE DISTRIBUTION SYSTEM, AND THE WELL PER GROUNDWATER RULE, MUST BE COLLECTED TO VERIFY THAT THE PROBLEM HAS BEEN SUCCESSFULLY ADDRESSED.

Appendix B

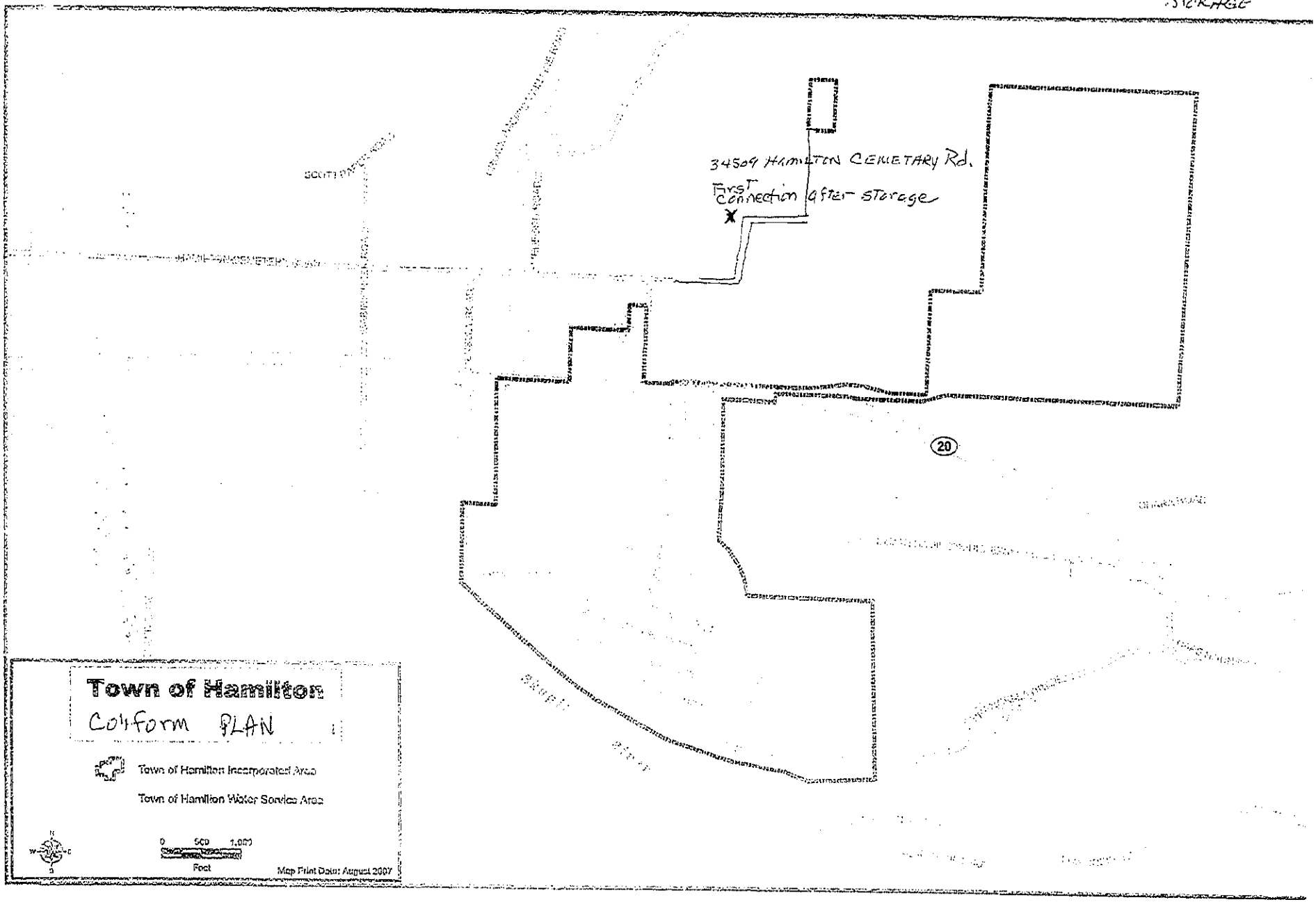


TOWN OF HAMILTON Coliform Monitoring Plan
Routine Monitoring Sites

Map Scale:

1 inch = 1277 Feet
(1 inch = 0.2 Miles)

X = 34509 Hamilton Cemetary Rd - first connection after STORAGE



Coli Form

IMPORTANT NOTICE ABOUT YOUR WATER SYSTEM
Coliform Maximum Contaminant Level (MCL) Exceeded: Non-Acute MCL

The Town of Hamilton water system, ID# 307000 in Skagit County routinely monitors for the presence of total coliform bacteria and in _____ this type of bacteria was detected. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did or are doing to correct the situation.

Coliforms are bacteria which are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or E.coli were present. **None of these bacteria were found.**

You do not need to boil your water. People with severely compromised immune systems, infants, and some elderly may at be an increased risk and may want to contact their health care provider for additional guidance.

What happened? What is the suspected or known source of contamination?

Our routine sample taken _____ contained coliforms & the 4 repeat samples taken June 16 also contained coliforms.

(Explanation of problem.)

At this time:
☐ The problem is resolved. Additional samples collected were found to be free of coliform bacteria.
☐ We anticipate resolving the problem by ____ / ____ / ____.
☒ Other:

For more information, contact Cas Hancock at (360) 770-4633 or at 46451 Baker Loop Rd. Concrete, WA 98237.
(Operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by Town of Hamilton Date Distributed __ /__ /__.

Coliform Non-Acute Public Notice Certification Form
The purpose of this form (below) is to provide documentation to the department that public notice was distributed. Please check the appropriate box and fill in the date that the notice was distributed:

☐ Notice was mailed to all water customers on ___ / ___ / ___.
☒ Notice was hand delivered to all water customers on __ / __ /__.
☐ Notice was posted (*with department approval*) at:

_____ on ___ / ___ /____.

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

_____ Operator __ / __ / __

Signature of owner or operator Position Date

The Department of Health is an equal opportunity agency. For persons with disabilities, this form is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY 1-800-833-6388).

DOH Form #331-263 (Updated 1/06)

DRINKING WATER WARNING

The Town of Hamilton Water System, ID# 307000 located in Skagit County is contaminated with fecal coliform/ *E. coli* bacteria.

Fecal coliform/ *E. coli* bacteria were detected in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

This Boil Water Order applies to all system users.

Bring all water to a rolling boil for one minute. Let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice.* Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We will follow up with further instructions, if needed, from the Department of Health on _____.

We anticipate resolving the problem by_____.

For more information, please contact Cas Hancock at (360)770-4633 or at 46451 Baker Loop Rd., Concrete, WA 98237-9558 (operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distribution copies by hand or mail.

Coliform Acute Public Notice Certification Form

The purpose of this form (below) is to provide documentation to the department that public notice was distributed. Please check the appropriate box and fill in the date that the notice was distributed:

- ☐ Notice was mailed to all water customers on ___ / ___ / ___.
- ☒ Notice was hand delivered to all water customers on __ / __ /__.
- ☐ Notice was posted (*with department approval*) at:

_____ on ___ / ___ /____.

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

_____ Operator __ / __ / __

Signature of owner or operator Position Date

The Department of Health is an equal opportunity agency. For persons with disabilities, this form is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY 1-800-833-6388).

IMPORTANT NOTICE

Town of Hamilton Water System PWSID # 307000

Date: _____

All customers were given the following information via telephone and reader board this morning after confirmation of satisfactory sample results from Edge Analytical:

Samples taken after Acute Coliform Violation this week have good results. It is no longer necessary to boil your water.

Thank you for your patience and cooperation during this process.

As always, if you have any questions about your water, don't hesitate to call.

Cas Hancock 360-770-4633

This notice was called to customers by Town of Hamilton Water System on _____.

CMP

Division of Environmental Health
Office of Drinking Water

View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT	
Collect Date	9/25/2012
Lab Number	164
Lab Name	Edge Analytical Inc - Bellingham
Sample Number	38244
Source	Dist
Analyte Group	MICRO-MICROBIOLOGICAL
Test Panel	COLI_AP-ABSENCE / PRESENCE
Sample Location	779 Hamilton Cemetery Rd
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

Records 1 - 2 of 2

Home Page | Find Water Systems | Find Water Quality | Downloads/Reports

DOH Home | Community and Environment | Drinking Water Home | Drinking Water Contacts
Access Local Health | Privacy Notice | Disclaimer/Copyright Information

Links to external resources are provided as a public service and do not imply endorsement by the Washington State Department of Health

Department of Health, Office of Drinking Water

Street Address:
243 Israel Road S.E. 2nd floor
Tumwater, WA 98501

Mail:
PO BOX 47822
Olympia, WA 98504-7822

Phone: (360) 236-3100

Send inquiries about DOH and its programs to the Health Consumer Assistance Office
Comments or questions regarding this Web site? Send email to Environmental Health Application Testing and Support or call 360-236-3113.

CMP

Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT	
Collect Date	8/21/2012
Lab Number	164
Lab Name	Edge Analytical Inc - Bellingham
Sample Number	32960
Source	Dist
Analyte Group	MICRO-MICROBIOLOGICAL
Test Panel	COLI_AP-ABSENCE / PRESENCE
Sample Location	320 California
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Street Address:
243 Israel Road S.E. 2nd floor
Tumwater, WA 98501

Mail:
PO BOX 47822
Olympia, WA 98504-7822

Phone: (360) 236-3100

Send inquiries about DOH and its programs to the Health Consumer Assistance Office
Comments or questions regarding this Web site? Send email to Environmental Health Application Testing and Support or call 360-236-3113.

CMP

Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT	
Collect Date	7/17/2012
Lab Number	164
Lab Name	Edge Analytical Inc - Bellingham
Sample Number	27603
Source	Dist
Analyte Group	MICRO-MICROBIOLOGICAL
Test Panel	COLI_AP-ABSENCE / PRESENCE
Sample Location	214 South St
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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CMP

Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT	
Collect Date	6/13/2012
Lab Number	164
Lab Name	Edge Analytical Inc - Bellingham
Sample Number	22308
Source	Dist
Analyte Group	MICRO-MICROBIOLOGICAL
Test Panel	COLI_AP-ABSENCE / PRESENCE
Sample Location	951 Petit St
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT	
Collect Date	5/17/2012
Lab Number	164
Lab Name	Edge Analytical Inc - Bellingham
Sample Number	18423
Source	Dist
Analyte Group	MICRO-MICROBIOLOGICAL
Test Panel	COLI_AP-ABSENCE / PRESENCE
Sample Location	779 Hamilton Cemetery Rd
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

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TOWN OF HAMILTON
DISINFECTION BYPRODUCTS
MONITORING PLAN

DOH WATER SYSTEM ID# 30700

Revised September 2012

Prepared By

Kathleen "Cas" Hancock
Certified Operator #7482
Town of Hamilton

TABLE OF CONTENTS

1.0 TOWN OF HAMILTON SYSTEM INFORMATION

Water Sources: The Hamilton System is supplied by a single well. The well is 8-inches in diameter and 200 feet deep; it was drilled in 1999 and it is equipped with a pump that delivers approximately 136 gpm to an adjacent storage reservoir. The aquifer is recharged in an undeveloped forested area in the vicinity of the well. Water was encountered at a depth of 181 feet below the surface, and the water level rose 100 feet to within 83 feet of the surface, which indicates good natural protection for its water quality. Sodium hypochlorite is added at the pump house and a chlorine residual analyzer continuously analyzes the chlorine residual. The target chlorine residual at the treatment plant is 0.5 to 0.6 mg/l. The target Total Trihalomethanes (TTHMs) and Halo Acetic Acid (HAA5s) levels are <0.040 mg/L and <0.030 mg/L, respectively.

Population Served: The number of service connections in Hamilton is 141 (September 2012), hence the total population served is estimated at 550 (assuming 2.5 persons per connection and 200 employees at Janicki Industries). According to WAC 246-290-300 (7)(a)(iv)(C) and in accordance with 40 CFR 141.132 (b)(1)(i)and (ii), *this population and system configuration requires a minimum of one (1) sample for the initial three-year monitoring period.* Refer to the enclosed map of the routine sampling site, and Section 2.3 for the address of this site. The distribution pattern of the system shall be reviewed annually by the Town's Certified Operator (CO), to insure that the proper location of samples collected. *(Note: one (1) sample per three-year monitoring period is required during Phase 1 unless the level for TTHMs exceeds 0.040 mg/L or for HAA5s exceeds 0.030mg/L, at which time monitoring will be required on a quarterly basis or; if the sample result for TTHMs is less than 0.04 mg/L and for HAA5s is less than 0.030 mg/L, monitoring may be reduced. The number of samples required during Phase 2 will be determined by USEPA).*

Distribution System: The distribution system includes approximately 7.6 miles of pipe. Maintenance of a target minimum chlorine residual of 0.2 to 0.3 mg/l in all areas of the system is the Town's goal, through the use of circulating flow in reservoir (top fill, bottom draw), looping of pipelines where feasible and water main flushing (as needed, particularly on "dead end" pipelines). One (1) sample per three-year monitoring period is required during Phase 1 unless the level for TTHMs exceeds 0.040 mg/L or for HAA5s exceeds 0.030mg/L, at which time monitoring will be required on a quarterly basis or; if the sample result for TTHMs is less than 0.04 mg/L and for HAA5s is less than 0.030 mg/L, monitoring may be reduced. The number of samples required during Phase 2 will be determined by USEPA.

2.0 PHASE 1 ROUTINE SAMPLING INFORMATION

2.1 Number of Samples:

Until the population exceeds 10,000, Hamilton is required by the Washington State Department of Health (DOH) Group A Regulations WAC 246-290-300 (7)(a)(iv)(C) in

accordance with 40 CFR141.132((b)(1)(i) and (ii)] to collect a minimum of *one sample* per monitoring period.

2.2 Sample Collection Schedule:

Sample collection will be conducted during the month with the warmest weather. For example, this sample will be taken in mid-August.

2.3 Sample Site Location:

This site was selected to be indicative of the system's longest chlorine residence time. The sample site location is shown on the accompanying map;
Routine Disinfection By-Products Sampling Site.

Site 1: 214 South Street

Site location(s) may be revised in response to changes in regulations, accessibility, flooding, population growth, "looping" of mains, consolidation with other systems, addition of pressure zones, or extension of water service to new areas. Any time that routine sampling site location(s) are revised, this plan shall be updated to reflect the revisions (any such revisions shall also be sent to DOH).

2.4 Sample Collection Procedures:

To insure samples are representative of maximum chlorine residence time within the main and are viable samples, the samples shall be taken according to DOH TTHM Sampling Procedure publication #331-226 and HAA5 Sampling Procedure publication # 331-223.

2.5 Sample Integrity:

Following collection of the sample, it shall be kept in a cool dark place, and transport shall be as promptly as feasible, with the goal of transporting to the laboratory within 3 hours of the time that the sample is collected. If immediate transport is not feasible, storage of the sample requires refrigeration. In no case shall a sample that is over 20-hours old be turned into the lab.

2.6 Laboratory and Sample Analysis Methods:

Hamilton utilizes the services of state-certified laboratories to perform all analysis of water samples. The standard analysis method in accordance with 40 CFR 141.131 for TTHM and HAA5 testing by these laboratories will be used.

3.0 PHASE 2 DISINFECTION BY-PRODUCTS MONITORING PLAN

3.1 Number of Samples:

Until the population exceeds 10,000, Hamilton may be required by the Washington State Department of Health (DOH) Group A Regulations [WAC 246-290-300(3) (c)(i)] to collect more than *one sample* per monitoring period. Phase 2 of the Disinfection By-Products Rule will be administered by the U. S. Environmental Protection Agency (USEPA), which allows for a Very Small System Waiver (VSSW). Based on sample results from the Phase 1 sample collected in July 2004 and December 2006, Hamilton qualified for a VSSW and will adjusted additional numbers of samples or locations as directed by the USEPA.

3.2 Sample Collection Schedule:

Sample collection will be conducted during the month with the warmest weather. For example, this sample will be taken in mid-August.

3.3 Sample Site Location:

Collection site(s) will be selected to be indicative of the system's longest chlorine residence times. The sample site location will be shown on a Phase 2 Routine Disinfection By-Products Sampling Site.

Number and location of sites to be selected as directed by USEPA

Site location(s) may be revised in response to changes in accessibility, flooding, population growth, "looping" of mains, consolidation with other systems, addition of pressure zones, or extension of water service to new areas. Any time that routine sampling site location(s) are revised, this plan shall be updated to reflect the revisions (any such revisions shall also be sent to DOH).

3.4 Sample Collection Procedures:

To insure samples are representative of chlorine residence time within the main, the samples shall be taken according to DOH TTHM Sampling Procedure publication #331-226 and HAA5 Sampling Procedure publication # 331-223.

3.5 Sample Integrity:

Following collection of the sample, it shall be kept in a cool dark place, and transport shall be as promptly as feasible, with the goal of transporting to the laboratory within 3 hours of the time that the sample is collected. If immediate transport is not feasible,

storage of the sample requires refrigeration. In no case shall a sample that is over 20-hours old be turned into the lab.

3.6 Laboratory and Sample Analysis Methods:

Hamilton utilizes the services of state-certified laboratories to perform all analysis of water samples. The standard analysis method in accordance with 40 CFR 141.131 for TTHM and HAA5 testing by these laboratories will be used.

4.0 REPORTING RESULTS

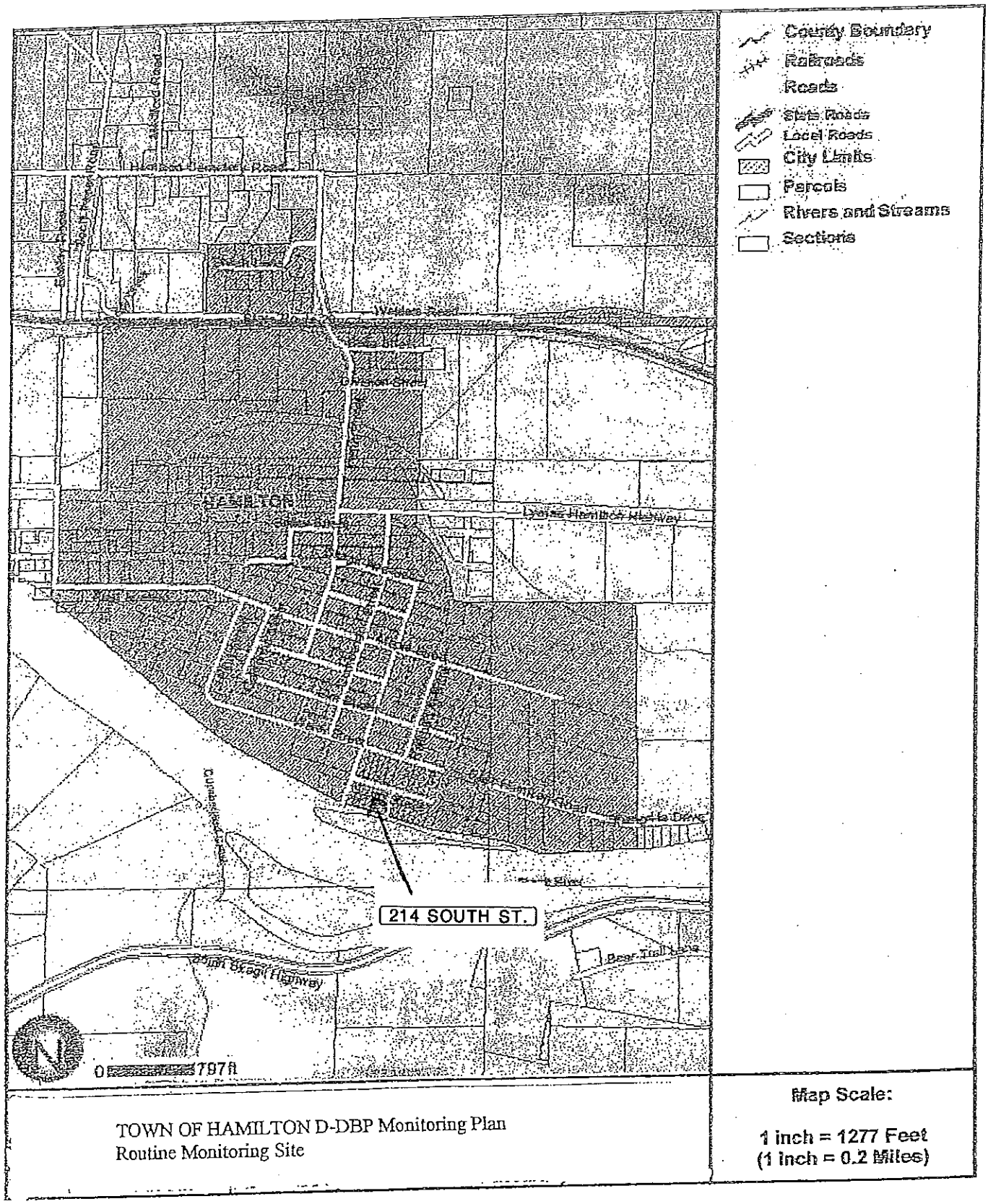
4.1 Reporting Responsibility:

The CO is responsible for reporting all water quality sample results to the customers served and to DOH *with publication of the annual Consumer Confidence Report that is due by July 1 of each calendar year.*

5.0 REVISIONS TO DISINFECTION BY-PRODUCTS MONITORING PLAN

The DBPMP shall be reviewed by the CO and Town Engineer periodically and revised on an as needed basis. The conditions that may warrant revisions in the future include:

- Changes in regulations
- Population changes
- Loss of sample site availability
- Changes in sample site location
- Service to new areas
- Changes in pressure zones or flow patterns
- Consolidation of systems


County Boundary
Railroads
Roads
State Roads
Local Roads
City Limits
Parcels
Rivers and Streams
Sections
214 SOUTH ST.
N
0
797ft
TOWN OF HAMILTON D-DBP Monitoring Plan
Routine Monitoring Site
Map Scale:
1 inch = 1277 Feet
(1 inch = 0.2 Miles)

DBP

Division of Environmental Health
Office of Drinking Water

View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT

Collect Date	8/20/2012
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	32694
Source	Dist
Analyte Group	DBP-DISINFECTION BY PRODUCTS
Test Panel	THM-TOTAL TRIHALOMETHANE
Sample Location	214 s st
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0027	CHLOROFORM	EQ	0.7000		ug/L	0.2500
0028	BROMODICHLOROMETHANE	EQ	0.9000		ug/L	0.5000
0029	DIBROMOCHLOROMETHANE	EQ	0.9000		ug/L	1.5000
0031	TOTAL TRIHALOMETHANE	EQ	2.5000	80.0000	ug/L	
0030	BROMOFORM	LT	0.6000		ug/L	0.6000

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DBP

Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT

Collect Date	8/20/2012
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	32694
Source	Dist
Analyte Group	DBP-DISINFECTION BY PRODUCTS
Test Panel	HAA5-HALO-ACETIC ACIDS
Sample Location	214 south st
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0411	MONOCHLOROACETIC ACID	LT	2.0000		ug/L	2.0000
0412	DICHLOROACETIC ACID	LT	1.0000		ug/L	1.0000
0413	TRICHLOROACETIC ACID	LT	1.0000		ug/L	1.0000
0414	MONOBROMOACETIC ACID	LT	1.0000		ug/L	1.0000
0415	DIBROMOACETIC ACID	LT	1.0000		ug/L	1.0000
0416	HAA(5)	LT	15.0000	60.0000	ug/L	15.0000
0417	BROMOCHLOROACETIC ACID	LT	1.0000		ug/L	1.0000

Records 1 - 7 of 7

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LEAD AND COPPER MONITORING PLAN

A. REQUIREMENT FOR PROGRAM

The US EPA requirement to sample lead and copper levels in drinking water is intended to determine the need for water treatment to provide corrosion control. Most of the lead and copper that occurs in drinking water is the result of corrosive water. The "action levels" to trigger the need for treatment are 0.015 mg/L and 1.3 mg/L for lead and copper, respectively.

The Town currently has 109 active single family connections, supplying water to approximately 530 persons. Under the US EPA "Lead and Copper Monitoring Guidance" criteria, the Town was originally required to collect 10 tap samples, following procedures summarized below:

1. Sampling locations:

    a) Single family structures[1] containing copper pipes with lead solder installed before 1986 (date of lead solder ban in Washington), and before 1983 if possible
    b) Customers with water softeners should not be selected (softened water can be corrosive)

2. Sampling protocol:

    a) Use one-liter sample bottles (supplied by lab)

    b) Sample should be obtained from a cold water kitchen or bathroom tap; first draw of water after water stands at least 6 hours in plumbing system, but no longer that 12 hours; the customer may collect the sample

    c) Obtain clearly written "Chain of Command" paperwork from customers who take their own sample

The complete sample procedure and discussion of the regulatory requirements may be found in the US EPA publication "Lead and Copper Monitoring Guidance for Water Systems Serving 101 to 500 (or <100; 501 to 3,300) Persons".

[1] Only single family residences were chosen. No lead piping could be found within the distribution or plumbing system. The locations meet the "Tier 3" criterion.

B. SAMPLING FREQUENCY AND LIST OF SAMPLE SITES

The utility is required to select samples as described below:

Table 1: Pb and Cu Tap and WQP* Monitoring					
			Number of Pb/Cu Tap Sample Sites	Number of WQP Sampling Sites	
Size Category	System Size	Standard	Reduced	Standard	Reduced
Small	501-3,300	20	10	2	2
Small	101-500	10	5	1	1
Small	<100	5	5	1	1

Table 2: Criteria for reduced Pb/Cu Tap Monitoring	
Monitoring Frequency	System Characteristics
Every 3 Years	1. Serves <50,000 and has <ALs ** for 2 consecutive 6-month monitoring periods; or
	Meets Optimal Water Quality Parameter (OWQP) specifications for 2 consecutive 6-month monitoring periods.

*WQP : Water Quality Parameter
*ALs : Action Levels

The above table assumes that in each sampling period, an action level is not exceeded.

Because repeat samples are required, more sites than the number above meeting the location selection should be identified.

The Town did have AL violations for copper in the first round, therefore requiring two rounds of 6-month consecutive sampling periods with results showing below the action levels before the number of monitoring sample sites could be reduced.

The age of buildings and the age and type of plumbing therein was determined by the Town based on discussion with the property owners, review of Skagit County files, and/or the Town's files.

C. COMPLIANCE WITH STANDARDS

The "action levels" to trigger the need for corrosion treatment are 0.015 mg/L and 1.3 mg/L for lead and copper, respectively. If the 90th Percentile level of lead or copper exceed 00.015 or 1.3 mg/L, the "action level" is considered exceeded.

The following table shows the sample locations and the results of the most recent set of samples. Neither action level was exceeded.

RESULTS FOR LEAD AND COPPER

Sample Date: 12/10/2010
Analysis by: Edge Analytical

Location	LEAD mg/L AL = 0.015 mg/L	COPPER mg/L AL = 1.3 mg/L
521 Noble	0.0010	0.0080
642 Maple	0.0010	0.0480
821 Maple	0.0010	0.0150
700-B Baker	0.0010	0.0050
490 Railroad	0.0010	0.0100

Lead/Copper

Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT	
Collect Date	12/10/2010
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	41813
Source	Dist
Analyte Group	IOC-INORGANIC CONTAMINANTS
Test Panel	LCR-LEAD COPPER
Sample Location	700 b baker st
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0023	COPPER	EQ	0.0050		mg/L	0.0200
0009	LEAD	LT	0.0010		mg/L	0.0010

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Lead / copper

Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT

Collect Date	12/10/2010
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	41814
Source	Dist
Analyte Group	IOC-INORGANIC CONTAMINANTS
Test Panel	LCR-LEAD COPPER
Sample Location	821 maple st
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0023	COPPER	EQ	0.0150		mg/L	0.0200
0009	LEAD	LT	0.0010		mg/L	0.0010

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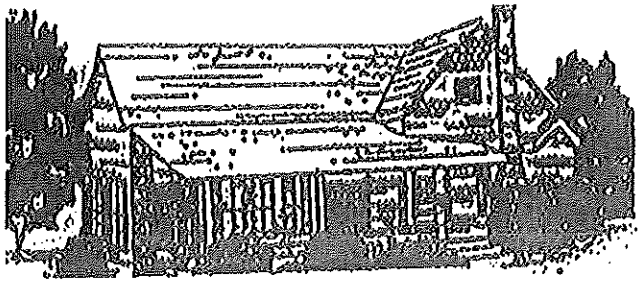
TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XI
TREATMENT DISCONTINUITY DOCUMENTS

- MANGANESE
- DISINFECTION

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

Manganese



since 1891

Town of Hamilton
584 Maple Street
P O. Box 528
Hamilton, WA 98255

October 13, 2010

Nancy Feagin
WA State DOH
Office of Drinking Water-NWRO
20435 72nd Ave S. Suite 200 K17-12
Kent WA 98032-2358

Dear Ms. Feagin,

Since the Town has a choice whether to meet the secondary standard for manganese, we have completed a year's worth of testing the manganese levels in the raw water and the finished water.
We presented the results to the customers, along with an estimate of the cost to operate and maintain the treatment system, on October 12, 2010. The customers chose to discontinue treatment for manganese, as the level of contamination is not over the MCL for the largest portion of the year and the cost of the required operator certification level and the chemical reagents cannot be justified.

Consequently, the Town Council has voted not to renew of the contract for operation with Water & Wastewater Services in Mt. Vernon, who provide the required Water Treatment Plant Operator II, as their services will no longer be needed.

The Town Council also voted to hire Kathleen Hancock, certified contract operator, to manage the system for the Town. We will send two copies of the contract to the DOH Operator Certification Department as is required; and will also make the appropriate changes to the WFI.

Arrangements have been made to properly shut down the treatment system.

Thank you for your guidance throughout the life of this project.

Respectfully,

Timothy G Bates

Tim Bates, Mayor
Town of Hamilton
PWSID# 30700

CC: Judy Carter, WADOH Operator Certification
Lorna Parent, Skagit County Health

Manganese

Domestic Well Water Manganese Content Data			PWSID#	Town of Hamilton
	MCL 0.05 mg/L		307000	
Date	Raw Water	Raw Water	Finished Water	Finished Water
	(mg/L)	pH	(mg/L)	pH
10/26/2009	0.04	8.8	0.02	8.7
11/3/2009	0.07	8.9	0.02	8.9
11/11/2009	0.01	8.9	0.02	8.9
11/25/2009	0.04	8.9	0.02	8.9
11/30/2009	0.04	8.9	0.05	8.8
12/11/2009	0.04	9.1	0.03	9.3
12/18/2009	0.05	8.9	0.02	9.0
12/27/2009	0.07	9.1	0.03	9.1
12/31/2009	0.03	9.1	0.02	9.0
1/14/2010	0	9.0	0	8.9
2/1/2010	0	8.8	0.02	8.9
2/16/2010	0.03	9.2	0.02	9.1
3/1/2010	0.05	9.0	0.03	9.0
3/15/2010	0.03	9.2	0.01	9.1
3/31/2010	0	9.7	0.01	9.2
4/30/2010	0	7.6	0.01	7.0
5/28/2010	0.02	8.1	0	8.7
6/20/2010	0.03	7.0	0.02	7.6
7/30/2010	0.05	7.0	0.03	7.0
8/30/2010	0.02	7.0	0.01	7.5
9/27/2010	0.07	7.0	0.03	7.3

Disinfection

EDGE ANALYTICAL LABORATORIES

Burlington WA — Corporate Office — 1520 S Walnut St - 98233 — 800.755.9295 • 360.757.1400
Bellingham WA — Microbiology — 805 W Orchard Dr Ste 4 - 98225 — 360.671.0688
Portland OR — Microbiology/Chemistry — 9150 SW Pioneer Ct Ste W- 97070 — 503.682.7802

Washington State Department of Health
WATER BACTERIOLOGICAL ANALYSIS

Client Name: Hamilton, Town of
P O Box 528
Hamilton, WA 98255

System Name: HAMILTON WATER DEPT
System ID Number: 307000
DOH Source Number: 00 - Distribution Sample (Bacteria)
Sample Type: D - Drinking Water
Sample Purpose: Investigative or Other
Sample Location: Well Tap
County: Skagit
Sampled By: Tom Selin
Sampler Phone: 360-770-4633

Reference Number: 13-01347
Project: Bacteria

Repeat Sample Number:
Lab Number: 164-03210
Field ID:
Date Collected: 1/24/13 08:20
Date Received: 1/24/13
Date Analyzed: 1/25/13 11:02
Report Date: 1/25/13
Comment:
Peer Review:

DOH#	PARAMETER	RESULT	UNITS	Analyst	METHOD	Batch	COMMENT
1	TOTAL COLIFORM	**Satisfactory, Coliforms Absent**	per 100mL	slm	SM9223 B	m_130124	
3	E. COLI	**Absent**	per 100mL		SM9223 B	m_130124	

If the sample is unsatisfactory you can get information at the following health department websites or phone numbers:

Island Co: http://www.islandcounty.net/health/Envh/DrinkingWater/index.htm
San Juan Co: http://www.sanjuanco.com/health/ehswater.aspx
Skagit Co: http://www.skagitcounty.net/drinkingwater or 360-336-9380
Snohomish Co: 425-339-5250
Whatcom Co: http://www.co.whatcom.wa.us/health/environmental/drinking_water/index.jsp
WSDOH: http://www.doh.wa.gov/ehp/dw/Programs/coliform.htm

NOTES:

If the result is Unsatisfactory a repeat sample is required for Public Water Systems. Private individuals should investigate the cause of the unsatisfactory result and resample.
If E. Coli or Fecal Coliform are present in sample do not drink the water until it is properly treated.

email: waterlady@frontier.com; townofhamilton2

Disinfection

ANALYTICAL LABORATORIES

Burlington WA
Corporate Office
1620 S Walnut St - 98233
800.755.9295 • 360.757.1400

Bellingham WA
Microbiology
805 W Orchard Dr Ste 4 - 98225
360.671.0988

Portland OR
Microbiology/Chemistry
9450 SW Pioneer Ct Ste W- 97070
503.697.7802

Washington State Department of Health
WATER BACTERIOLOGICAL ANALYSIS

Client Name: Hamilton, Town of
P O Box 528
Hamilton, WA 98255

System Name: HAMILTON WATER DEPT
System ID Number: 307000
DOH Source Number: 00 - Distribution Sample (Bacteria)
Sample Type: D - Drinking Water
Sample Purpose: Investigative or Other
Sample Location: Well Sample Tap
County: Skagit
Sampled By: Tom Selin
Sampler Phone: 360-770-4633

Reference Number: 12-22184
Project: Bacteria

Repeat Sample Number:
Lab Number: 164-50954
Field ID: 12005
Date Collected: 12/20/12 08:40
Date Received: 12/20/12
Date Analyzed: 12/21/12 11:17
Report Date: 12/21/12
Comment:
Peer Review:

DOH#	PARAMETER	RESULT	UNITS	Analyst	METHOD	Batch	COMMENT
1	TOTAL COLIFORM	**Satisfactory, Coliforms Absent**	per 100mL	dml	SM9223 B	m_121220	
3	E. COLI	**Absent**	per 100mL		SM9223 B	m_121220	

If the sample is unsatisfactory you can get information at the following health department websites or phone numbers:

Island Co: http://www.islandcounty.net/health/Envh/DrinkingWater/index.htm
San Juan Co: http://www.sanjuanco.com/health/ehswater.aspx
Skagit Co: http://www.skagitcounty.net/drinkingwater or 360-336-9380
Snohomish Co: 425-339-5250
Whatcom Co: http://www.co.whatcom.wa.us/health/environmental/drinking_water/index.jsp
WSDOH: http://www.doh.wa.gov/ehp/dw/Programs/coliform.htm

NOTES:

If the result is Unsatisfactory a repeat sample is required for Public Water Systems. Private individuals should investigate the cause of the unsatisfactory result and resample.
If E. Coli or Fecal Coliform are present in sample do not drink the water until it is properly treated.

email: waterlady@frontier.com; townofhamilton2

Disinfection

EDGE ANALYTICAL LABORATORIES

Burlington WA — Corporate Office — 1620 S Walnut St - 98233 — 800.755.9295 • 360.757.1400
Bellingham WA — Microbiology — 805 W Orchard Dr Ste 4 - 98225 — 360.671.0688
Portland OR — Microbiology/Chemistry — 9150 SW Pioneer Ct Ste W- 97070 — 503.682.7802

Washington State Department of Health
WATER BACTERIOLOGICAL ANALYSIS

Client Name: Hamilton, Town of
P O Box 464
Hamilton, WA 98255

System Name: HAMILTON WATER DEPT
System ID Number: 307000
DOH Source Number: 00 - Distribution Sample (Bacteria)
Sample Type: D - Drinking Water
Sample Purpose: Investigative or Other
Sample Location: Well Sample Tap
County: Skagit
Sampled By: Tom Selin
Sampler Phone: 360-770-4633

Reference Number: 12-20645
Project: Bacteria

Repeat Sample Number:
Lab Number: 164-47289
Field ID:
Date Collected: 11/27/12 08:30
Date Received: 11/27/12
Date Analyzed: 11/28/12 11:00
Report Date: 11/28/12
Comment:
Peer Review:

DOH#	PARAMETER	RESULT	UNITS	Analyst	METHOD	Batch	COMMENT
1	TOTAL COLIFORM	**Satisfactory, Coliforms Absent**	per 100mL	dml	SM9223 B	m_121127	
3	E. COLI	**Absent**	per 100mL		SM9223 B	m_121127	

If the sample is unsatisfactory you can get information at the following health department websites or phone numbers:

Island Co: http://www.islandcounty.net/health/Envh/DrinkingWater/index.htm
San Juan Co: http://www.sanjuanco.com/health/ehswater.aspx
Skagit Co: http://www.skagitcounty.net/drinkingwater or 360-336-9380
Snohomish Co: 425-339-5250
Whatcom Co: http://www.co.whatcom.wa.us/health/environmental/drinking_water/index.jsp
WSDOH: http://www.doh.wa.gov/ehp/dw/Programs/coliform.htm

NOTES:

If the result is Unsatisfactory a repeat sample is required for Public Water Systems. Private individuals should investigate the cause of the unsatisfactory result and resample.
If E. Coli or Fecal Coliform are present in sample do not drink the water until it is properly treated.

FORM: cBact

Disinfection

ANALYTICAL LABORATORIES

Burlington WA — Corporate Office — 1620 S Walnut St - 98233 — 800.755.9295 • 360.757.1400
Bellingham WA — Microbiology — 805 W Orchard Dr Ste 4 - 98225 — 360.671.0699
Portland OR — Microbiology/Chemistry — 9150 SW Pioneer Ct Ste W- 97070 — 503.692.7602

Washington State Department of Health
WATER BACTERIOLOGICAL ANALYSIS

Client Name: Hamilton, Town of
P O Box 528
Hamilton, WA 98255

System Name: HAMILTON WATER DEPT
System ID Number: 307000
DOH Source Number: 00 - Distribution Sample (Bacteria)
Sample Type: D - Drinking Water
Sample Purpose: Investigative or Other
Sample Location: Well Tap (Untreated)
County: Skagit
Sampled By: Cas Hancock
Sampler Phone: 360-770-4633

Reference Number: 12-18936
Project: Bacteria

Repeat Sample Number:
Lab Number: 164-43326
Field ID: 10006
Date Collected: 10/30/12 08:30
Date Received: 10/30/12
Date Analyzed: 10/31/12 11:07
Report Date: 10/31/12
Comment:
Peer Review:

DOH#	PARAMETER	RESULT	UNITS	Analyst	METHOD	Batch	COMMENT
1	TOTAL COLIFORM	**Satisfactory, Coliforms Absent**	per 100mL	slm	SM9223 B	m_121030	
3	E. COLI	**Absent**	per 100mL		SM9223 B	m_121030	

If the sample is unsatisfactory you can get information at the following health department websites or phone numbers:

Island Co: http://www.islandcounty.net/health/Envh/DrinkingWater/index.htm
San Juan Co: http://www.sanjuanco.com/health/ehswater.aspx
Skagit Co: http://www.skagitcounty.net/drinkingwater or 360-336-9380
Snohomish Co: 425-339-5250
Whatcom Co: http://www.co.whatcom.wa.us/health/environmental/drinking_water/index.jsp
WSDOH: http://www.doh.wa.gov/ehp/dw/Programs/coliform.htm

NOTES:

If the result is Unsatisfactory a repeat sample is required for Public Water Systems. Private individuals should investigate the cause of the unsatisfactory result and resample.
If E. Coli or Fecal Coliform are present in sample do not drink the water until it is properly treated.

email: waterlady@frontier.com

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XII
EMERGENCY RESPONSE PLAN

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

Emergency Response Plan For Town of Hamilton Drinking Water System

July 2012

Contents

Introduction: Protecting public health

Safe and reliable drinking water is vital to the Town of Hamilton. Emergency response planning is an essential part of managing a drinking water system.

Hamilton water system has had routine operating emergencies such as pipe breaks, pump malfunctions, coliform contamination, and power outages. These are manageable if the water system has an emergency response plan that can be put into action quickly.

More serious non-routine emergencies may result from intentional acts of sabotage, chemical spills, floods, earthquakes, volcanic eruptions, windstorms, or droughts. These can drastically affect the system and the community that depends on it.

Each emergency has unique effects on different parts of a water system. Floods can cause widespread bacterial contamination, earthquakes can damage sources and distribution systems, and storms can disrupt power supplies. The common element is that each emergency may threaten the system's ability to deliver safe and reliable drinking water.

Emergency response planning is a process by which water system managers and staff explore vulnerabilities, make improvements, and establish procedures to follow in an emergency. It is also a process that encourages people to form partnerships and get to know one another. Preparing a response plan and practicing it can save lives, prevent illness, enhance system security, minimize property damage, and lessen liability.

Section 1.
Emergency Response Mission and Goals

Emergency response mission and goals

Mission statement for emergency response	In an emergency, the mission of the Hamilton water system is to protect the health of our customers by being prepared to respond immediately to a variety of events that may result in contamination of the water or disruption of supplying water.
Goal 1	Be able to quickly identify an emergency and initiate timely and effective response action.
Goal 2	Be able to quickly notify local, state, and federal agencies to assist in the response.
Goal 3	Protect public health by being able to quickly determine if the water is not safe to drink or use and being able to immediately notify customers effectively of the situation and advise them of appropriate protective action.
Goal 4	To be able to quickly respond and repair damages to minimize system down time.

Section 2.
System Information

Keep this basic information readily available for when you need it for emergency responders, repair people, and the news media.

System information

System identification number	307000	
System name and address	Hamilton Water Department P. O. Box 528 Hamilton WA 98255	
Directions to the system	Travel east on E. Hwy. 20 to Hamilton Cemetery Road. Turn left on Medford Road. Turn right at 7339 Medford Road. Well and treatment plant are one mile at the end of the drive.	
Basic description and location of system facilities	System has one active 185' deep well located in the treatment plant on Medford Road.	
Location/Town	Hamilton, WA 98255	
Population served and service connections from Division of Drinking Water records.	301 people	189 connections
System owner (the owner should be listed as a person's name)	Town of Hamilton	
Name, title, and phone number of person responsible for maintaining and implementing the emergency plan.	Cas Hancock 46451 Baker Loop Road Concrete, WA 98237 Tom Selin Concrete, WA 98237	360-770-4633 Cell 360-853-7585 Phone 360-610-3770 Cell

Section 3.
Chain of Command – Lines of Authority

The first response step in any emergency is to inform the person at the top of this list, who is responsible for managing the emergency and making key decisions.

Chain of command – lines of authority

Name and title	Responsibilities during an emergency	Contact numbers
Timothy A Bates, Mayor P. O. Box 26 Hamilton 98255 P. Richard Moore, Mayor Pro-Tem P. O. Box 432 Hamilton 98255	Responsible for overall management and decision making for the water system. The Water System Manager is the lead for managing the emergency, providing information to regulatory agencies, the public and news media. All communications to external parties are to be approved by the water system manager.	Phone: (360) 826-4390 Cell: (360) 391-6253 Work: (360) 826-3027 Phone: 360-929-1015
Tom Selin Public Works Director Concrete 98237	In charge of maintenance and relaying critical information, assessing facilities, and providing recommendations to the water system manager.	Phone: 360-853-7585 Cell: 360-610-3770
Cas Hancock Certified Operator 46451 Baker Lp Rd Concrete 98237	In charge of running system and water treatment plant, performing inspections, maintenance and sampling and relaying critical information, assessing facilities, and providing recommendations to the Public Works Director or water system manager.	Phone: 360-853-7497 Cell: 360-770-4633
Susan West-Mani Clerk/Treasurer 33827 State Rt. 20 Sedro-Woolley, WA 98284	Responsible for administrative functions in the office including receiving phone calls and keeping a log of events. This person will provide a standard carefully pre-scripted message to those who call with general questions. Additional information will be released through the water system manager.	Phone: 360-826-3919 Work: 360-826-3027

Section 4.
Events that Cause Emergencies

The events listed below may cause water system emergencies. They are arranged from highest to lowest probable risk.

Events that cause emergencies

Type of event	Probability or risk (High-Med-Low)	Comments
Earthquake	High	Quake possible area.
High winds	High	System is vulnerable to high wind events. A propane powered generator is located at the treatment plant if power is disrupted.
Flood	Med	Distribution System is located in an area vulnerable to flooding.
Ice storm	Med	Minor damage possible.
Drought	Med	Need to plan for decrease well yield during dry summers.
Construction accident	Med	Construction crews may hit pipes.
Chemical spill	Low	Complete wellhead protection plan.
Equipment Failure	Low	Common equipment failure possible.
Terrorism	Low	Need to be trained on suspicious activity
Volcanic Eruption	Low	Need to plan for complete equipment failure

Section 5.
Severity of Emergencies

Decisions on severity should be collaborative among system personnel, but are ultimately made by the person in charge of the emergency. The information for making such a decision will accumulate over time, and may result in changes in the assessment of severity.

Communicate each assessment of severity immediately to all those dealing with the emergency. Make sure staff has cell phones, pagers, or radios when they are in the field.

Level I – Normal-Routine Emergency

Description: The Hamilton water system considers the following as level I emergencies:

- Distribution line breaks.
- Short power outages.
- Minor mechanical problems in pump-houses.
- Other minor situations where it is not likely that public health will be jeopardized.

The system has specific response activities identified for these types of emergencies, including proper sampling, disinfection, and pressure testing activities. System personnel are advised and are directed to work on the problem and are usually capable of resolving the problem within 24 hours. If it is determined that the problem will take longer than 24 hours to resolve and storage is likely to be drawn down below a safe operating level, the situation will be elevated to level II.

Level II – Minor Emergency

Description: The Hamilton water system considers the following to be level II emergencies:

- Disruption in supply such as a transmission main line break, pump failure with a potential for backflow, and loss of pressure.
- Storage is not adequate to handle disruption in supply.
- An initial positive coliform or E. coli sample.
- An initial primary chemical contaminant sample.
- A disruption in chlorine/chemical feed from the groundwater sources.
- A minor act of vandalism.
- Drought, with a noticeable and continuing decline of water level in the well.

Level III – Emergency

Description: The Hamilton water system considers the following as level III or actual emergencies:

- A verified acute confirmed coliform MCL or E. coli/fecal positive sample requiring immediate consideration of a health advisory notice to customers.
- A confirmed sample of another primary contaminant requiring immediate consideration of a health advisory notice to customers.
- A loss or complete malfunction of the water treatment facilities for the ground water source, including chlorination.
- A major line break or other system failure resulting in a water shortage or requiring system shutdown.
- An act of vandalism or terrorist threat such as intrusion or damage to a primary facility.
- An immediate threat to public health of the customers and an advisory is required.
- Severe drought significantly affecting well yield.

Level IV – Catastrophic Disaster/Major Emergency

Description: The Hamilton water system considers the following events to be level IV or major emergencies:

- Earthquake that shuts down the system or impacts sources, lines, etc.
- Act of terrorism possibly contaminating the water system with biological or chemical agents.
- Flood that infiltrates system facilities and sources.
- Chemical spill within 2000 feet of the system's sources.
- Storm that significantly damages power grid and system facilities.
- Volcano eruption that shuts down all system facilities that are vulnerable to ash.
- Mudslide or other earth shift that causes failure of transmission or loss of water in well.

Section 6.
Emergency Notification

Notification call-up lists

Use these lists to notifying important parties during of an emergency.

Local notification list

Local Law Enforcement day – 911	Local Law Enforcement night – 911
Fire Dept. day – Nick Bates 360-391-6253	Fire Dept. night – Nick Bates 360-391-6253
Ambulance service day – 911	Ambulance service night – 911
Local Health Jurisdiction day- Skagit County 360-336-9380	Local Health Jurisdiction after hours-Skagit County- 911
Water System Operator day 360-770-4633	Water System Operator night 360-770-4633
Public Works Director day 360-610-3770	Public Works Director night 360-853-7585
Hamilton Water System, Mayor Bates, day 360-391-6253	Hamilton Water System, Mayor Bates, night 360-826-4390
News Media Contact	KIRO 206-726-5476, KBRC 360-424-1430 and KAPS 360-424-0660 Radio Stations

State notification list

State Patrol day 360-757-1175 Emergency only 800-283-7807	State Patrol night 360-757-1175 Emergency only 800-283-7807
Division of Drinking Water Regional Office day 253-395-6765- Nancy Feagin, Reg. Engineer	Division of Drinking Water after hours 1-877-481-4901

Service/repair notification list

Electrician day- G & S Electric, Bob Gaddis 360-826-4560	Electrician night- G & S Electric, Bob Gaddis 360-826-4560
Electric Utility day – PSE 888-225-5773	Electric Utility night- PSE 888-225-5773
Plumber day- Excavation West 360-707-0675 Bill Swartz 360-661-6160 cell	Plumber night- Excavation West 360-707-0675 Bill Swartz 360-661-6160 cell
Pump Specialist day- Dahlman Pump 360-757-6666	Pump Specialist night- Dahlman Pump 360-757-6666
Soil Excavator day- Buchanan Construction Dave Buchanan 360-708-7663 OR Bum Equipment Doug Bumgarner 360-826-3435 OR Excavation West 360-707-0675 Bill Swartz 360-661-6160 cell	Soil Excavator night- Buchanan Construction Dave Buchanan 360-708-7663 OR Bum Equipment Doug Bumgarner 360-826-3435 OR Excavation West 360-707-0675 Bill Swartz 360-661-6160 cell
Equipment Rental day – Van's Equipment Rental 360-755-0399	Equipment Rental night – Van's Equipment Rental 360-755-0399

Notification procedures

Notifying water system customers

Who is Responsible:	The water system manager is ultimately responsible for making the decision to notify customers regarding a potential water shortage and the need for water use restrictions. The water system manager should consult with field staff to make the decision. Once the decision is made procedures for notification will be initiated.
Procedures:	• Water system manager confers with key staff to verify problems. • Water system manager organizes staff to develop the message to be delivered to the customers. • Water system operator consults with state drinking water staff regarding the problem. • Water system manager, with assistance from staff, prepares door hangers, signs and radio message. • Water system operator continues to investigate problem and make repairs as necessary. • The water shortage notification will be distributed by: ✓ Field staff placing "water shortage notices" on doors and along travel routes. ✓ Staff will place signs on main travel routes into the community. ✓ Water system manager contacts KIRO, KBRC and KAPS am radio and requests issuance of the water shortage notice and request to curtail water use. ✓ Administrative support person will provide a pre-scripted message to phone callers and log in each phone call. • Water system operator continuously updates the water system manager on water shortage. • Once water shortage is resolved, re-notify customers.

Alerting local law enforcement, state drinking water officials, and local health

Who is Responsible:	The water system manager is ultimately responsible for making the decision to notify local law enforcement, state and local drinking water officials regarding a potential water shortage and the need for water use restrictions. The water system manager should consult with field staff to make the decision. Once the decision is made procedures for notification will be initiated.
Procedures:	• Water system manager confers with key staff to verify problems. • Water system manager organizes staff to develop the message to be delivered to law enforcement and drinking water officials. • Water system operator consults with state drinking water staff regarding the problem. • Water system manager, with assistance from staff, prepares door hangers, signs and radio message. • Water system operator continues to investigate problem and make repairs as necessary. • Water system manager contacts local law enforcement with water emergency information. • Water system operator continuously updates the water system manager on water emergency. • Once water emergency is resolved, re-notify customers.

Contacting service and repair contractors

Who is Responsible:	The water system manager is ultimately responsible for making the decision to notify customers regarding a potential water shortage and the need for water use restrictions. The water system manager should consult with field staff to make the decision. Once the decision is made procedures for notification will be initiated.
Procedures:	• Water system manager confers with key staff to verify problems. • Water system manager organizes staff to contact the appropriate contractors. • Water system operator continuously updates the water system manager on repair progress.

Contact neighboring water systems, if necessary

Who is Responsible:	The water system manager is ultimately responsible for making the decision to contact neighboring water systems regarding a potential water emergency and the need for possible assistance. The water system manager should consult with field staff to make the decision. Once the decision is made procedures for notification will be initiated.
Procedures:	• Water system manager confers with key staff to verify problems. • Water system manager organizes staff to develop the message to be delivered to neighboring system and what staff is to deliver the message. • Water system operator consults with state drinking water staff regarding the problem. • Water system operator continues to investigate problem and make repairs as necessary. • Water system operator continuously updates the water system manager on water emergency.

Procedures for issuing a health advisory

Who is Responsible:	The water system manager is ultimately responsible for making the decision to notify customers regarding a potential health advisory and the need for water use restrictions. The water system manager should consult with field staff to make the decision. Once the decision is made procedures for notification will be initiated.
Procedures:	• Water system manager confers with key staff to verify problems. • Water system manager organizes staff to develop the message to be delivered to the customers. • Water system operator consults with state drinking water staff regarding the problem. • Water system manager, with assistance from staff, prepares door hangers, signs and radio message. • Water system operator continues to investigate problem and make repairs as necessary. • The water shortage notification will be distributed by: ✓ Field staff placing "health advisory notices" on doors and along travel routes. ✓ Staff will place signs on main travel routes into the community. ✓ Water system manager contacts KIRO, KBRC and KAPS am radio and requests issuance of the health advisory notice and request to boil water. ✓ Administrative support person will provide a pre-scripted message to phone callers and log in each phone call. • Water system operator continuously updates the water system manager on health advisory. • Once health issue is resolved, re-notify customers.

Other procedures, as necessary

Who is Responsible:	The water system manager is ultimately responsible for making the decision to notify customers regarding a potential water shortage and the need for water use restrictions. The water system manager should consult with field staff to make the decision. Once the decision is made procedures for notification will be initiated.
Procedures:	• Water system manager confers with key staff to verify problems. • Water system manager organizes staff to develop the message to be delivered to the customers. • Water system manager consults with state drinking water staff regarding the problem. • Water system manager with assistance from staff prepares door hangers, signs and radio message. • Water system operator continues to investigate problem and make repairs as necessary. • The water shortage notification will be distributed by: ✓ Field staff placing "water shortage notices" on doors and along travel routes. ✓ Staff will place signs on main travel routes into the community. ✓ Water system manager contacts KIRO, KBRC and KAPS am radio and requests issuance of the water shortage notice and request to curtail water use. ✓ Administrative support person will provide a pre-scripted message to phone callers and log in each phone call. • Water system operator continuously updates the water system manager on water shortage. • Once water shortage is resolved, re-notify customers.

Section 7.
Water Quality Sampling

If contamination is suspected, notify and work with the local health jurisdiction and State DOH, Office of Drinking Water (ODW) regional office to help identify what testing should be done. This may help prevent illness or even death.

Water quality sampling

Sampling parameter	Do we have procedures? Yes/No	Basic steps to conduct sampling (sites, frequency, procedures, lab requirements, lab locations, contacts, etc.)
Coliform Bacteria	Yes	All system locations available, Edge Analytical, Burlington, WA
Heterotrophic Plate Count (HPC)	Yes	All system locations available, Edge Analytical, Burlington, WA
Chlorine Residual	Yes	All system locations available, staff
Chlorine Demand	No	
Nitrate/Nitrite	Yes	Well, Edge Analytical, Burlington, WA
Total Organic Carbon (TOC)	No	
Total Halogenated Organic Carbon (TOX)	No	
Cyanide	No	

Section 8.
Effective Communication

Communication with customers, the news media, and the general public is a critical part of emergency response.

Designated public spokesperson

Designate a spokesperson (and alternates) for delivering messages to the news media and the public (see Section 6 for news media contacts in local notification list).

Designate a spokesperson and alternates

Spokesperson	Alternate 1	Alternate 2
Mayor Timothy A Bates	Mayor Pro Tem T. Richard Moore	Clerk/Treasurer Susan West-Mani

Key messages

Possible message (update as the emergency develops):

- We are taking this incident seriously and doing everything we can to resolve it.
- Our primary concern is protecting our customers' health.
- Another important concern is keeping the system operational and preventing damage.
- What we know right now is _____
- The information we have is incomplete. We will keep you informed as soon as we know more.
- We have contacted state and local officials to help us respond effectively.
- If you think you may be ill or need medical advice, contact a physician.
- Please curtail water usage until we inform you otherwise.
- We are sampling the water and doing tests to determine whether there is contamination.

  Etc.

- If you are concerned about water quality before we receive sample results, you may purchase bottled water for human consumption. DO NOT BOIL your water. We will inform you if contamination exists and whether or not to boil your water. Some contaminates worsen with boiling.

Health advisories

During events when water quality and human health are in question, it may be necessary to issue a health advisory that gives advice or recommendations to water system customers on how to protect their health when drinking water is considered unsafe. These advisories are issued when the health risks to the consumers are sufficient, in the estimation of the water system or state or local health officials, to warrant such advice.

Health advisories usually take the form of a drinking water warning or boil water advisory. Communication during these times is critical. Health advisories should always be well thought out and provide very clear messages.

Section 9.
The Vulnerability Assessment

Facility vulnerability assessment and improvements identification

System component	Description and condition	Vulnerability	Improvements or mitigating actions	Security improvements
Source	One 185' deep groundwater well. It is located outside the Town limits off Medford Road. The source is in excellent condition.	The well is most vulnerable to contamination from above ground activities because it is located in an uninhabited area. The well house is highly secure so it should not be vulnerable to acts of vandalism.	Implement wellhead protection program.	Upgrade Auto Dialer for SCADA/ Security Systems.
Storage	Storage reservoirs are in sound condition. Reservoir hatches are not easily accessed, but locks could be broken.	Vandals could access reservoir hatches. Also, the reservoirs could be prone to shaking and settling resulting from an earthquake.	Provide earthquake strapping to secure reservoir to the foundation.	Install signage to protect against unauthorized entry and access to reservoir hatches.
Treatment	There is a dual chlorine injection system in well/pump-house. Both systems are in sound operating condition.	These systems are not subject to power outages because there is an emergency generator on-site. The common solution tank is not secured and may tip over during an earthquake.	Secure tank with earthquake straps.	Install signage to protect against unauthorized entry.
Pump-house and pumping facilities	Pump-house and pumping facilities are in good condition.	Pump-house is subject to vandalism. It is also vulnerable to equipment failure during earthquake.	Inspect equipment regularly for any changes in "normal" conditions.	Install signage to protect against unauthorized entry.

System component	Description and condition	Vulnerability	Improvements or mitigating actions	Security improvements
Computer and telemetry system	Computer and telemetry systems are located in pump-house. All systems are in good operating condition.	Computers are currently well protected against cyber attack or hacking, however, telemetry is vulnerable to "no alarm condition" if it fails.	Correct deficiencies of the alarm system. Replace Auto Dialer for SCADA/security system.	Contract consultant to correct Auto Dialer for telemetry wiring and alarms.
Volcanic Eruption	All system components are vulnerable to lava or ash in case of volcano eruption	System components are currently protected against everything except airborne particulates.	Investigate possible solutions to airborne lava/ash particles	Contact DOH/DOE for advice regarding volcanic eruptions

Section 10.
Response Actions for Specific Events

In any event there are a series of general steps to take:

1. Confirm and analyze the type and severity of the emergency.
2. Take immediate actions to save lives.
3. Take action to reduce injuries and system damage.
4. Make repairs based on priority demand.
5. Return the system to normal operation.

The following tables identify the assessment, set forth immediate response actions, define what notifications need to be made, and describe important follow-up actions.

A. Power outage

Assessment	The Hamilton water system is vulnerable to power outages, experiencing an average of three outages per year that last several hours. The system does have a back-up generator. If the generator fails, storage is able to supply the system for 48 to 72 hours until power is restored.
Immediate actions	• Assess whether the generator outage is likely to last more than 24 hours. If no, be on alert for changing conditions and monitor storage tank. If yes, complete the following steps: • Call on availability of back-up generator at Van's Equipment Rental. • Obtain generator if available. • Connect generator to system and resume operations. • Implement water shortage response actions to inform customers to cut back on water usage until power is restored.
Notifications	• Power Company – Let them know that a public water system is experiencing an outage and the generator will be turned on until power is restored. • Van's Equipment Rentals – Obtain emergency generator if ours fails. • Customers – cut back on water usage until power is restored.
Follow-up actions	• Turn off back-up generator; (disconnect if rented one is used) • Return system to general power supply • Inspect reservoirs and pumping facilities to ensure proper operation. • Return generator to Van's Equipment Rental if one was rented.

B. Distribution line break

Assessment	The Hamilton water system is vulnerable to distribution main breaks. The system does not always have the equipment to repair main breaks. Licensed contractors must be available for repairs if the Town cannot do so.
Immediate actions	• Assess whether the break is able to be isolated by closing specific valves. If no, notify all customers of break, water is to be turned off and anticipated time of repair and restoration of water service. If yes, complete the following steps: ✓ Notify select customers (those between valves that need to be closed) of water shortage. ✓ Call on availability of repairman at Buchanan Construction, Bum Equipment or Excavation West. ✓ Obtain repair materials. ✓ Repair and disinfect break, and resume operations. • Implement possible coliform contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	• DOH – Let them know that Hamilton water system is experiencing a major line break and loss of pressure to system will remain until repairs are affected. • Fire Service - Hydrants on certain streets are not available; no hydrants are available. • Customers (all or selected) – No water available until break is repaired; boil water until satisfactory results received from lab.
Follow-up actions	• Open valves used to isolate break • Return system to general water supply • Inspect reservoirs and pumping facilities to ensure proper operation. • Notify Fire Service that hydrants are back in service. • Take required coliform samples and submit to lab. • Notify customers of satisfactory test results and lift boil water notice.

C. Transmission line break

Assessment	The Hamilton water system is vulnerable to transmission line breaks. The system does not always have the equipment to repair transmission line breaks. Licensed contractors must be available for repairs if needed.
Immediate actions	• Assess whether the break is able to be isolated by closing specific valves. If no, notify all customers of break, water is to be turned off and anticipated time of repair and restoration of water service. If yes, complete the following steps: ✓ Close appropriate valves to stop water flow at leak. ✓ Notify all customers of water shortage. ✓ Call on availability of repairman at Buchanan Construction, Bum Equipment or Excavation West. ✓ Obtain repair materials. ✓ Repair and disinfect break, and resume operations. • Implement possible coliform contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	• Fire Service - No hydrants are available until repairs are effected.
Follow-up actions	• Open valves used to isolate break • Return system to general water supply • Inspect reservoirs and pumping facilities to ensure proper operation. • Notify Fire Service that hydrants are back in service. • Take required coliform samples and submit to lab. • Notify customers of satisfactory test results and lift boil water notice.

D. Chlorine treatment equipment failure

Assessment	The Hamilton water system is vulnerable to chlorine treatment equipment failure. The system does not have the staff or equipment to effect major repairs; however with a dual-injection system, one injection point may be operable if the other is not. It is not likely that both will fail at the same time. Licensed contractors may be needed for repairs.
Immediate actions	• Assess whether the failure is able to be repaired by staff within 24 to 48 hours. If yes, it is not necessary to notify customers. If no, complete the following steps: ✓ Notify system manager of equipment failure. ✓ Obtain repair materials. ✓ Repair equipment and resume operations. • Implement possible coliform contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	• DOH – It is not necessary to contact DOH if the repair can be made in a timely manner & no non-chlorinated water is sent to the reservoir or the distribution system. If there is a possibility that non-chlorinated water will be delivered to customers, let DOH know that Hamilton water system is experiencing a major equipment failure and will remain on line until repairs are affected, and will implement boil water notice. • Fire Service –If water is turned off, no hydrants are available. • Customers –Water is available until equipment is repaired; boil water until satisfactory results received from lab.
Follow-up actions	• Return chlorination system to general water supply • Take coliform samples and submit to lab if necessary. • Notify Fire Service that hydrants are back in service. • Notify customers of satisfactory test results and lift boil water notice, if necessary.

E. Manganese Treatment equipment

Assessment	The Hamilton water system is vulnerable to green-sand filter equipment failure only if the filtration system is put back in service. Should the filters be in operation, the following is applicable. The system does not have the equipment to make major equipment repairs. Licensed contractors may need to be available for repairs.
Immediate actions	• Assess whether the equipment is able to be repaired by system staff. If yes, action necessary: ✓ Repair equipment ✓ Resume operations. If no, complete the following steps: ✓ Call on availability of repairman at Dahlman Pump. ✓ Obtain repair materials. ✓ Repair equipment and resume operations.
Notifications	• DOH – It is not necessary to inform DOH unless untreated water is allowed to enter the reservoir or the distribution system. • Fire Service - Hydrants on certain streets are not available; no hydrants are available. • Customers (all or selected) – No water available until break is repaired; boil water until satisfactory results received from lab.
Follow-up actions	• Notify system manger that equipment repair has been affected. • Notify Fire Service that hydrants are back in service. • Notify customers of satisfactory test results and lift boil water notice, if necessary.

F. Source pump failure

Assessment	The Hamilton water system is vulnerable to source pump failure. The system does not have the equipment to repair pumps. Licensed contractors must be available for repairs.
Immediate actions	• Assess whether the failure requires replacement of pump. If no, notify system manager of failure and anticipated time of repair. If yes, complete the following steps: ✓ Notify all customers of water use restrictions during repairs. ✓ Call on availability of repairman at Dahlman Pump. ✓ Obtain repair materials. ✓ Repair and disinfect pump & casing, and resume normal operations.
Notifications	• System manager -
Follow-up actions	• Return water pump to system operation. • Notify customers that any water use restrictions are no longer needed.

G. Microbial (coliform, E. coli) contamination

Assessment	The Hamilton water system is vulnerable to coliform contamination. The system has some of the equipment and expertise to track down contamination. Licensed contractors may need to be available for repairs.
Immediate actions	• Assess whether the contamination is able to be isolated by system staff. If no, notify all customers of contamination and anticipated time of repair and restoration of normal water service. If yes, complete the following steps: ✓ Notify customers of water contamination. ✓ Call on availability of assistance from DOH. ✓ Obtain samples and submit to lab. ✓ Eliminate contamination and resume operations. • Implement possible coliform contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	• DOH – Let them know that Hamilton water system is experiencing a contamination problem and the system will remain on line until contamination is eliminated. • Customers –Water available until contamination is eliminated but they must boil water until satisfactory results received from lab.
Follow-up actions	• Return system to general water supply • Inspect reservoirs and pumping facilities to ensure proper operation. • Take required coliform samples and submit to lab. • Notify customers of satisfactory test results and lift boil water notice.

H. Chemical contamination

Assessment	The Hamilton water system is vulnerable to Chemical contamination. The system does not have the equipment to test for chemical contamination. Samples must be collected and taken to the lab.
Immediate actions	• Assess whether the chemical contamination is able to be isolated by closing specific valves. If no, notify all customers of break, water is to be turned off and anticipated time of repair and restoration of water service. If yes, complete the following steps: ✓ Notify select customers (those between valves that need to be closed) of contamination. ✓ Call on availability of assistance from DOH. ✓ Obtain isolation or neutralization materials. ✓ Isolate or deactivate the chemical and resume operations. • Implement possible chemical contamination response actions to inform customers of lack of water until contamination is isolated or neutralized.
Notifications	• DOH – Let them know that Hamilton water system is experiencing a chemical contamination in the system and we <u>were</u> / <u>were not</u> able to isolate the contamination. We have interrupted service until problem is solved and system flushed/cleaned. • Fire Service - No hydrants are available. • Customers (all or selected) – No water available until contamination is eliminated or neutralized.
Follow-up actions	• Open valves used to isolate break. • Flush system. • Return system to general water supply. • Inspect reservoirs and pumping facilities to ensure proper operation. • Notify Fire Service that hydrants are back in service. • Take required samples and submit to lab. • Notify customers of satisfactory test results and resume water service.

I. Vandalism or terrorist attack

Assessment	The Hamilton water system is vulnerable to vandalism or terrorist attack. The system does not have the equipment or expertise to address all acts of vandalism or terrorism. Licensed contractors must be available for assessment and correction.
Immediate actions	• Assess whether the vandalism/terrorism is able to be isolated by closing specific valves. If no, notify all customers of incident, water is to be turned off and anticipated time of correction and restoration of water service. If yes, complete the following steps: ✓ Notify select customers (those between valves that need to be closed) of no water. ✓ Call on availability of assistance from DOH or County Health. ✓ Obtain repair materials. ✓ Repair or neutralize and resume operations. • Implement possible coliform contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	• DOH – Let them know that Hamilton water system is experiencing an act of vandalism/terrorism and loss of pressure to system will remain until repairs are affected. • Fire Service - Hydrants on certain streets are not available; or no hydrants are available. • Customers (all or selected) – No water available until vandalism is repaired.
Follow-up actions	• Open valves used to isolate vandalism. • Return system to general water supply. • Inspect reservoirs and pumping facilities to ensure proper operation. • Take required coliform samples and submit to lab. • Notify Fire Service that hydrants are back in service. • Notify customers of satisfactory test results and resume water service.

J. Reduction or loss of water in the well

Assessment	The Hamilton water system may be vulnerable to reduction or loss of water in the well. The system does not have the expertise to effect resolution of this problem. Licensed contractors must be available for assistance.
Immediate actions	• Notify all customers of loss, that water is to be turned off and anticipated time of correction and restoration of water service. Complete the following steps: ✓ Notify system manager of water shortage. ✓ Switch electrical system off and disable the alarms. ✓ Call on availability of assistance from DOH, DOE or County Health. ✓ Obtain assistance and necessary materials. ✓ Resolve loss and resume operations. • Implement curtailment actions to inform customers to curtail water use until the reduction/loss is corrected. • Implement possible coliform contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	• DOH – Let them know that Hamilton water system is loss of water in the well and loss of pressure to system and will remain off line until restoration is effected. • Fire Service -No hydrants are available. • Customers – No water available until loss is corrected; after service is restored, to boil water until satisfactory results received from lab.
Follow-up actions	• Open valves used to isolate break • Return system to general water supply • Inspect reservoirs and pumping facilities to ensure proper operation. • Take required coliform samples and submit to lab. • Notify Fire Service that hydrants are back in service. • Notify customers of satisfactory test results and lift boil water notice.

K. Drought

Assessment	The Hamilton water system is vulnerable to drought. The system does not have the expertise to alleviate drought.
Immediate actions	• Assess whether the drought is expected to be prolonged. If no, notify all customers of loss, water is to be turned off and anticipated time of restoration of water service. If yes, complete the following steps: ✓ Notify customers of water shortage. ✓ Obtain alternate water for customers. ✓ Disinfect system and flush lines when operations resume. • When service is resumed, implement possible coliform contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	• DOH – Let them know that Hamilton water system is experiencing a drought and loss of pressure to system and will remain off line until water supply is restored. • Fire Service -No hydrants are available. • Customers– No water available until supply is restored; directions to receive alternate water supply; directions when water supply resumes.
Follow-up actions	• Return system to general water supply • Inspect reservoirs and pumping facilities to ensure proper operation. • Take required coliform samples and submit to lab. • Notify Fire Service that hydrants are back in service. • Notify customers of satisfactory test results and lift boil water notice.

L. Flood

Assessment	The Hamilton water system is vulnerable to flood. Licensed contractors may be needed for repairs, depending upon flood damage.
Immediate actions	• Assess whether the flood poses difficulty. If no, notify all customers of continuation of service. If yes, complete the following steps: ✓ Close any valves that can isolate the break. ✓ Notify select customers of water shortage. ✓ Call on availability of repairman at Buchanan Construction, Bum Equipment or Excavation West, Dahlman Pump and G & S Electric. ✓ Obtain repair materials. ✓ Make repairs, disinfect any breaks, and resume operations. • Implement possible coliform contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	• DOH – Let them know if Hamilton water system is experiencing a flood with a major line break or loss of pressure to system. • Fire Service - Hydrants on certain streets are not available; no hydrants are available. • Customers (all or selected) – No water available until break is repaired; boil water until satisfactory results received from lab.
Follow-up actions	• Open valves used to isolate break. • Return system to general water supply. • Inspect reservoirs and pumping facilities to ensure proper operation. • Take required coliform samples and submit to lab. • Notify Fire Service that hydrants are back in service. • Notify customers of satisfactory test results and lift boil water notice.

M. Earthquake

Assessment	The Hamilton water system is vulnerable to earthquakes. The system does not have the equipment to repair major breaks. Licensed contractors must be available for repairs.
Immediate actions	• Assess whether any breaks are able to be isolated by closing specific valves. If no, notify all customers of breaks, water is to be turned off and anticipated time of repair and restoration of water service. If yes, complete the following steps: ✓ Notify select customers (those between valves that need to be closed) of water shortage. ✓ Call on availability of repairman at Buchanan Construction, Bum Equipment or Excavation West, Dahlman Pump and G& S Electric. ✓ Obtain repair materials. ✓ Repair and disinfect breaks, and resume operations. • Implement possible coliform contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	DOH – Let them know that Hamilton water system is experiencing a major line break and loss of pressure to system and will remain off line until repairs are affected. • Fire Service - Hydrants on certain streets are not available; no hydrants are available. • Customers (all or selected) – No water available until break is repaired; boil water until satisfactory results received from lab.
Follow-up actions	• Open valves used to isolate break • Return system to general water supply • Inspect reservoirs and pumping facilities to ensure proper operation. • Take required coliform samples and submit to lab. • Notify Fire Service that hydrants are back in service. • Notify customers of satisfactory test results and lift boil water notice.

N. Hazardous materials spill in vicinity of sources or system lines

Assessment	The Hamilton water system is vulnerable to hazardous materials spills. The system does not have the equipment to contain or clean up hazardous materials. Licensed contractors must be available for cleanup.
Immediate actions	• Assess whether the spill is able to be isolated. If no, notify all customers of spill, water is to be turned off and anticipated time of containment/cleanup and restoration of water service. If yes, complete the following steps: ✓ Notify customers of water shortage. ✓ Call on availability of licensed hazardous materials workmen. ✓ Obtain repair materials. ✓ Contain and clean up spill, and resume operations. • Implement possible contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	• DOH, DOE, County Health – Let them know that Hamilton water system is experiencing a major hazardous materials spill and will remain off line until repairs are effected. • Fire Service -No hydrants are available. • Customers– No water available until spill is cleaned up; boil water until satisfactory results received from lab.
Follow-up actions	• Return system to general water supply • Disinfect and flush entire system. • Inspect reservoirs and pumping facilities to ensure proper operation. • Take required coliform samples and submit to lab. • Notify Fire Service that hydrants are back in service. • Notify customers of satisfactory test results and lift boil water notice.

O. Electronic equipment failure

Assessment	The Hamilton water system is vulnerable to electronic equipment failure. The system does not have the equipment to repair electronics. Licensed contractors must be available for repairs.
Immediate actions	• Assess whether the failure will disrupt supply or treatment process. If no, notify all customers of failure, water use is to be curtailed and anticipated time of repair and restoration of normal water service. If yes, complete the following steps: ✓ Notify select customers of water use curtailment. ✓ Call on availability of repairman at TSI. ✓ Obtain repair materials. ✓ Correct failure and resume operations.
Notifications	• Fire Service -No hydrants are available.
Follow-up actions	• Return system to regular water usage • Inspect reservoirs and pumping facilities to ensure proper operation. • Notify Fire Service that hydrants are back in service. • Notify customers of repair and return to normal service.

P. Cyber attack

Assessment	The Hamilton water system is not very vulnerable to cyber attack. The system does not have the equipment to repair computer failure. Licensed contractors must be available for repairs.
Immediate actions	• Assess if attack affects water supply/distribution. If no, it is not necessary to notify customers. If yes, complete the following steps: ✓ Notify customers of computer attack and no water service. ✓ Call on availability of repairman at TSI. ✓ Obtain repair materials. ✓ Repair computer and resume operations. • Implement possible coliform contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	• DOH – Let them know that Hamilton water system is experiencing a cyber attack and will remain off line until repairs are effected. • Fire Service –If service is interrupted and no hydrants are available. • Customers – No water available until computer is repaired; boil water until satisfactory results received from lab.
Follow-up actions	• Open valves used to isolate break • Return system to general water supply • Inspect reservoirs and pumping facilities to ensure proper operation. • Take required coliform samples and submit to lab. • Notify Fire Service that hydrants are back in service. • Notify customers of satisfactory test results and lift boil water notice.

Q. Volcano eruption

Assessment	The Hamilton water system is vulnerable to volcanic eruption. The system does not have the equipment to repair major breaks or electronic equipment. Licensed contractors must be available for repairs.
Immediate actions	• Assess whether any breaks or equipment failures are able to be isolated by closing specific valves. If no, notify all customers of breaks/failures, water is to be turned off and anticipated time of repair and restoration of water service. If yes, complete the following steps: ✓ Notify select customers (those between valves that need to be closed) of water shortage. ✓ Call on availability of repairman at Buchanan Construction, Bum Equipment or Excavation West, Dahlman Pump, G&S Electric and TSI. ✓ Obtain repair materials. ✓ Repair and disinfect breaks, and resume operations. • Implement possible coliform contamination response actions to inform customers to boil water until satisfactory sample results are obtained from lab.
Notifications	DOH – Let them know that Hamilton water system is experiencing fallout from a volcano and a major line break and loss of pressure to system and will remain off line until repairs are affected. • Fire Service - Hydrants on certain streets are not available; no hydrants are available. • Customers (all or selected) – No water available until break is repaired; boil water until satisfactory results received from lab.
Follow-up actions	• Open valves used to isolate break • Return system to general water supply • Inspect reservoirs and pumping facilities to ensure proper operation. • Take required coliform samples and submit to lab. • Notify Fire Service that hydrants are back in service. • Notify customers of satisfactory test results and lift boil water notice.

Section 11.
Alternative Water Sources

Intertie to adjacent water supply system

Water systems within one-quarter mile of our system	Feasibility of connecting
There is no water system located within one-quarter mile of the Hamilton water system that has the capacity to serve the Town.	Connecting to a neighboring system is not an alternative.

Alternate source(s) of water

Alternative sources	Names	Phone	Availability	Is the water safe for drinking?
Bottled water suppliers	Hamilton Market	(360) 826-3309	Up to 1000 gallons in 1 gallon jugs within 24 hours	Yes
Tanker trucks in the area available to deliver bulk water	None		Not Available	

Section 12.
Curtailing Water Usage

Curtailing water use

Water curtailment measures	Actions
Restrict outside water usage including watering lawns, washing cars, etc. Request curtailment of inside usage.	• Upon making the decision that curtailment is needed: • Draft door hanger with curtailment messages. • Post on customer doors. • Contact KIRO, KBRC and KAPS AM news to announce curtailment message. • Monitor system usage and spot check meter usage if time is available. • Continue message as long as curtailment is warranted. • Draft door hanger with "return to normal usage" advisory.

Section 13.
Returning to Normal Operation

Returning to normal operations

Action	Description and actions
Inspect, flush, and disinfect the system	Water system operator and support staff inspect all system facilities, ensure all water quality tests have been done and the system has been flushed and disinfected if necessary. Water system operator makes a report to the water system manager. Water system manager makes decision on current condition of system.
Verification of water quality	Water system manager verifies water quality sampling results.
Coordinate with DOH	Water system operator coordinates with DOH on system condition and water quality results.
Notify customers	Water system manager meets with water system operator and communications lead to write notice to customers. Water system manager directs communications lead to distribute public notice.
Notify Fire Service	Notify Fire Service that hydrants are back in service.

Section 14.
Training and Rehearsals

Training

Identify staff position training needs and expectations.

Position	Training needs and expectations
Water System Manager	Emergency response communications, emergency response planning, issuing health advisories
Water System Operator	Emergency response communications, emergency response planning, suspicious activity training
Public Works Director/ Field support	Emergency response communications, suspicious activity training
Administrative Support	Emergency response communications, emergency response planning, Issuing health advisories

Emergency rehearsals

Schedule for drills, tabletop exercises, and other ways to practice emergency response:

Event	Description	People and organizations involved	Date
Rehearsal	Conduct actual emergency drill	Water system staff	Unannounced
On-site training drills	Conduct specific drills, i.e., communications, water line breaks, sampling with a professional trainer	Water system staff and professional trainer	Pending

Section 15.
Plan Approval

Plan approval

This plan is officially in effect when reviewed, approved, and signed by the following people:

Name/Title	Signature	Date
Timothy A. Bates, Mayor		July 10, 2012
P. Richard Moore, Mayor Pro Tem Councilmember #5		July 10, 2012
Tom Selin, Dir. Public Works		July 10, 2012
Cas Hancock, Certified Operator		July 10, 2012
Dale Bonner, Councilmember #1		July 10, 2012
Jennifer Benjamin, Councilmember #2		July 10, 2012
Joan Cromley, Councilmember #3		July 10, 2012
Andy Jensen, Councilmember #4		July 10, 2012
Susan West-Mani, Clerk/Treasurer		July 10, 2012

Appendix A.
Sample News Releases
Sample Public Notices
DOH Guidelines

Town of Hamilton
Water Department

News Release

For Immediate Release: <DATE>
Contact: Hamilton Water Department/Mayor Timothy Bates and 360-826-3027

Hamilton Water Department announces boil water advisory for all customers on Hamilton Water System

CITY NAME — The Hamilton Water Department is advising all water customers to boil their drinking water after recent samples showed the presence of <fecal coliform, E. coli, total coliform>. The Washington State Department of Health (DOH) has been notified and Hamilton Water Department is working closely with the Office of Drinking Water to find the source of contamination and fix the problem, which may include disinfecting the system. The boil water advisory will remain in effect until further notice.

Mayor Bates (e.g. "We are doing all we can to eliminate the bacteria from the water system. Safe and reliable drinking water is critical to good health and responding to this kind of emergency is our highest priority," said system spokesperson.)

<NUMBER or NO> illnesses related to the community's drinking water have been reported.

To correct the problem <WHAT IS BEING DONE> (e.g. Chlorine concentration in the entire system was increased on DATE.)

The boil water advisory includes several precautionary steps that customers should take. These include using purchased treated bottled water or boiled water for any water that might be consumed: drinking, brushing teeth, dishwashing, preparing food and making ice. Water should be boiled for 1 minute, and then allowed to cool before using.

The advisory will remain in effect until Hamilton Water Department and DOH are confident there is no longer a threat of illness to their customers. Once satisfactory results are reported, customers will be notified that the advisory has been lifted.

If you have any questions, please call us at 360-826-3027.

WARNING:

Do not drink tap water without boiling it first!

☐ **Fecal coliform**
☐ **E. coli bacteria**
☐ **Other:** _____

were detected in the water supply on:
(date)_____.

Boiling kills bacteria and other organisms in the water:

- **Bring water to a boil**
- **Continue boiling for 1 minute**
- **Let water cool before using**

To avoid possible illness: use boiled or purchased bottled water for drinking, making ice, brushing teeth, washing dishes, and food preparation until further notice.

Contact your doctor, if you experience one or more of these symptoms: nausea, cramps, diarrhea, jaundice, headache and/or fatigue. People with chronic illnesses, infants and the elderly may be at higher risk and should seek medical advice.

Water System:	**Hamilton Water Department**
I.D.:	**307000**
County:	**Skagit**
Contact:	**Cas Hancock, Certified Operator**
Telephone:	**360-770-4633**

Date notice distributed: _____

See reverse side for more information

What is fecal coliform and E. coli?

Fecal coliform and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these waters can cause short-term effects, such as diarrhea, cramps, nausea, headaches or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely comprised immune systems.

How long will this warning be in effect?

We will consult with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water.

DRINKING WATER WARNING

The Town of Hamilton Water System, ID# 307000, located in Skagit County is contaminated with fecal coliform/ *E. coli* bacteria.

Fecal coliform/ *E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil 1 minute, and let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice*. Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. *The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.*

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact Cas Hancock at (360)770-4633
(operator) (phone number)
or at 46451 Baker Loop Road, Concrete WA 98237-9558
(address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by Town of Hamilton Water System on ___/___/____

Truck Transportation Guidelines

Emergency Water Supply For Public Use

Introduction

These guidelines are for water system utilities, companies or associations that need to deliver potable water to the public during emergencies. Although the Washington State Department of Health (DOH) does not encourage this method of supplying water, trucked water may be the only viable alternative in some situations. When trucking water, there are important considerations for protection of public health.

DOH recommends that someone with water treatment expertise be responsible for the operation and management of trucked potable water. Usually this expertise is found in municipal water utilities.

A water system that plans to use trucked water in response to an emergency should first contact the appropriate regional office of the DOH Office of Drinking Water (DOH-ODW) or local health department to discuss current requirements and approve the proposed operation. [See WAC 246-290-415(2) (d) and 246-290-451(4)].

Guidelines

Truck Container

The truck container must be contaminant-free and capable of being maintained so that water contamination is prevented. Appropriate trucks include milk trucks, military-style water trucks, or others approved by DOH, the state Emergency Management Office, or local health departments. All container interiors must be visually inspected, flushed with disinfected water (see "Initial Truck Disinfection" guidelines), filled with water to be transported, and then tested for coliform organisms. Initial testing must show absence of coliform organisms before the truck is used for routine water hauling. Once the routine hauling operation has begun and precautions are in place to prevent contamination, testing does not need to be repeated during the course of the emergency response.

If a truck container has been previously used only for potable water and has been protected from possible contamination, it may be used without disinfection and testing for bacteria. The DOH-ODW regional office or the local health jurisdiction must approve use of these truck containers, unless the state or local Emergency Management division has pre-approved their use in emergencies.

Truck containers that cannot pass the initial testing criteria after disinfection (i.e. absence of coliforms) shall not be used. Trucks previously used for substances other than potable water will be evaluated on an individual basis. Consult with DOH-ODW before using trucks that may have previously carried toxic or other non-potable liquids.

All truck containers must be filled or emptied through an air gap or approved double-check valve assembly, in accordance with WAC 246-290-490. All containers must be completely enclosed and tightly sealed, with lockable lids or hatches. Containers that are open to the atmosphere during hauling are not acceptable for use.

Initial Truck Disinfection

To insure that water-hauling equipment is adequately disinfected before using, all rust and sediment must be rinsed or flushed from the tank. The tank should then be completely filled with water containing at least 50-60 parts per million (ppm) of chlorine. This chlorine solution should be held in the tank for at least 24 hours. All hoses, pumps, and other equipment used in handling water, should be disinfected in the same manner.

About one gallon of liquid bleach is required in every 1,000 gallons of water to produce 50-60 ppm. Bleach should be 5.25-6 percent hypochlorite with no additives, such as scent or cleaning enhancers. To insure adequate mixing, the bleach should be added in proportion to the water as the tank is being filled. For example: add approximately one-half gallon of bleach with each 500 gallons of water.

The chlorine solution must be flushed from the tank after 24 hours. It should not be discharged directly into a stream because it can kill fish and plants. In some cases, the chlorinated water may be treated with citric acid or thiosulfate to remove the chlorine before discharging it. Once the tank is emptied, refill it with the water to be transported, and test for coliform bacteria. If coliforms are present, repeat the process. If the tank cannot be disinfected to eliminate coliforms, it must not be used.

Source of Water

The source for emergency trucked water must come from an approved public water supply. Another source of water can be used only with a formal written agreement between DOH or the local health department and the receiving purveyor. The unapproved source must be shown to be safe to use when treated to the minimal levels described in the "Handling" guidelines.

Every precaution should be taken to ensure that the water remains potable once it is collected

and transported. The receiving water system should check that the truck hauler is familiar with proper handling procedures at the source and during transport.

Handling

All hoses and other handling equipment used in the operation must be stored off the ground at all times. They must be thoroughly flushed, disinfected, and then flushed again with the source water prior to use. Hoses should be capped at each end when they are not in use. The disinfection solution should be the same as that used for disinfecting the truck container.

All equipment surfaces that contact the potable water, including fill-point equipment, containers, caps, valves, filters, fittings, and other plumbing attachments should be regularly inspected and either disinfected or replaced as needed.

All equipment associated with the collection, transport, and delivery should be designed for potable water and must be able to be disinfected.

Water to be transported by tank trucks should contain a free chlorine residual of about one part per million (1 pip or mg/l) at the beginning of the haul. This is done by adding 5-6 tablespoons (2.5 – 3 ounces) of common household bleach to each 1,000 gallons. The bleach should be 5.25-6 percent strength, unscented and without additives. It should be added in proportion to the quantity of water during filling to insure uniform distribution.

Receiving Tank

The water system's receiving tanks must be inspected to assure that water quality issues will not occur during filling and later distribution to consumers. Receiving tanks must be cleaned and disinfected using the same procedures identified for the truck containers (see "Initial Truck Disinfection" guidelines). The receiving tanks must be kept secure and protected from contamination throughout the emergency response. Comments regarding receiving tanks should be documented in written records.

The customer's receiving tank must be filled through an air gap or an approved double-check valve assembly in accordance with WAC 246-290-490.

Documentation And Record-Keeping

The receiving water system is responsible for documenting and keeping proper records of the emergency trucked water operation. This includes:

- written records of the names and contact numbers of the hauler(s),
- the quantity delivered per trip,
- the approved water source(s) used,
- dates and times of delivery, free chlorine residual at point of delivery,
- assurance by the hauler (or a representative of the receiving system at the fill site) that proper disinfection was performed for each trip,

- the chlorine dose at the fill point and the free chlorine residual, if taken, after filling,
- Any notes regarding the receiving tank.

These records should be retained for at least six months for review upon request by health agencies, haulers, or the supplying water system.

For more information

For more information on this issue, please call the regional office nearest you:

Northwest Regional Office (Kent) – 253/395-6750
Southwest Regional Office (Olympia) – 360/236-3030
Eastern Regional Office (Spokane) – 509/456-3115
You may also call toll free: 1-800-521-0323, or email: dwinfo@doh.wa.gov

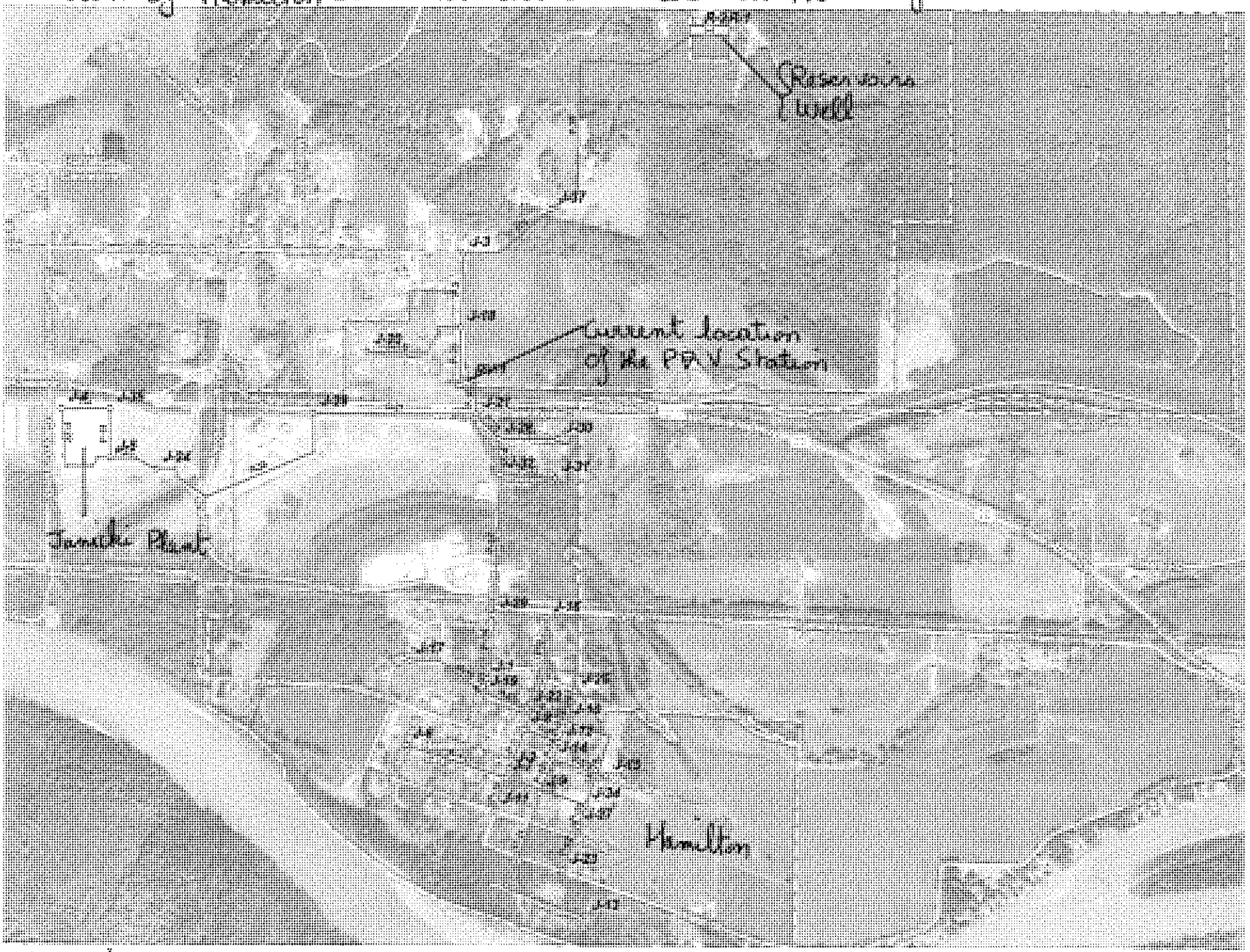
DOH Pub#: 331-063

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XIII
HYDRAULIC ANALYSIS

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

Town of Hamilton - PRV at current location north of SR 20



Scenario #1

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* * * * * * * * * * *  K Y P I P E 5  * * * * * * * * * * *
*                                                          *
*              Pipe Network Modeling Software              *
*                                                          *
*                Copyrighted by KYPIPE LLC                 *
*                Version 5 - February 2010                 *
*                                                          *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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Date & Time: Thu Mar 07 14:52:36 2013

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SUMMARY OF ORIGINAL DATA

UNITS SPECIFIED

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

REGULATING VALVE DATA

VALVE LABEL	VALVE TYPE	VALVE SETTING (ft or gpm)
RV-1	PRV-1	253.46

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	R-1	R-2	20.73	8.00	139.4518	0.00
P-2	J-3	J-18	650.00	12.00	150.0000	0.00
P-3	J-3	J-37	980.00	12.00	150.0000	0.75
P-4	J-4	J-35	410.00	12.00	150.0000	0.00
P-5	J-8	J-2	415.00	4.00	124.4518	0.00
P-6	J-8	J-16	960.00	4.00	124.4518	0.00
P-7	J-8	J-12	310.00	6.00	150.0000	0.00
P-8	J-7	J-34	725.00	8.00	150.0000	0.00
P-9	J-12	J-10	160.00	4.00	124.4518	0.00
P-10	J-12	J-14	170.00	4.00	124.4518	0.00
P-11	J-13	J-9	1650.00	4.00	150.0000	0.75
P-12	J-23	J-27	470.00	8.00	150.0000	0.00
P-13	J-10	J-22	375.00	8.00	150.0000	0.00
P-14	J-7	J-6	900.00	8.00	150.0000	0.00

P-15	J-7	J-11	280.00	4.00	150.0000	0.00
P-16	J-17	J-19	730.00	8.00	150.0000	0.00
P-17	J-9	J-14	288.00	4.00	124.4518	0.00
P-18	J-21	O-RV-1	230.00	12.00	139.4518	0.00
P-19	J-18	J-20	950.00	8.00	150.0000	1.50
P-20	J-21	J-26	240.00	8.00	150.0000	0.00
P-21	J-21	J-28	1390.00	16.00	150.0000	0.00
P-22	J-5	J-4	950.00	8.00	150.0000	0.00
P-23	J-5	J-24	450.00	16.00	150.0000	0.00
P-24	J-10	J-34	980.00	8.00	150.0000	0.75
P-25	J-14	J-15	450.00	4.00	150.0000	0.00
P-26	J-22	J-19	425.00	8.00	150.0000	0.00
P-27	I-RV-1	J-18	500.00	12.00	139.4518	0.00
P-29	J-26	J-32	360.00	8.00	150.0000	0.00
P-30	J-19	J-1	130.00	8.00	150.0000	0.00
P-31	J-26	J-30	51.42	8.00	150.0000	0.00
P-32	J-32	J-29	1210.00	8.00	150.0000	0.00
P-33	J-32	J-31	48.63	8.00	150.0000	0.00
P-34	J-1	J-29	600.00	8.00	150.0000	0.00
P-35	J-28	J-24	2000.00	16.00	150.0000	2.25
P-36	J-10	J-25	390.00	4.00	124.4518	0.00
P-38	J-37	R-2	2680.00	12.00	150.0000	2.25
P-39	J-34	J-27	200.00	8.00	150.0000	0.00
P-41	J-35	J-5	440.00	12.00	150.0000	0.00

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
J-1		0.00	98.00	
J-2		4.55	99.00	
J-3		0.00	128.00	
J-4		2850.00	115.00	
J-5		9.80	115.00	
J-6		6.48	96.00	
J-7		2.61	99.00	
J-8		1.26	99.00	
J-9		1.26	100.00	
J-10		2.61	100.00	
J-11		3.87	100.00	
J-12		0.00	101.00	
J-13		8.13	100.00	
J-14		3.20	101.00	
J-15		0.68	100.00	
J-16		4.26	98.00	
J-17		4.84	96.00	
J-18		0.00	123.00	
J-19		10.06	99.00	
J-20		15.58	130.00	
J-21		0.00	111.00	
J-22		3.29	100.00	
J-23		1.26	96.00	
J-24		0.00	111.00	
J-25		0.68	100.00	
J-26		0.00	108.00	
J-27		1.26	101.00	
J-28		9.10	117.00	

J-29	1.26	98.00	
J-30	1.94	108.00	
J-31	0.68	104.00	
J-32	0.68	102.00	
J-34	0.00	101.00	
J-35	0.00	116.00	
J-37	0.68	170.00	
R-1	----	250.00	265.50
R-2	----	250.00	265.50
O-RV-1	----	115.00	253.46
I-RV-1	0.00	115.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
MAXIMUM AND MINIMUM PRESSURES = 5
MAXIMUM AND MINIMUM VELOCITIES = 5
MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 38
NUMBER OF END NODES .....(j) = 36
NUMBER OF PRIMARY LOOPS .....(l) = 1
NUMBER OF SUPPLY NODES .....(f) = 2
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 9 TRIALS: ACCURACY = 0.00006

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/ 1000 (ft/ft)	HL/ 1000 (ft/ft)
P-1	R-1	R-2	0.58	0.00	0.00	0.00	0.00	0.00
P-2	J-3	J-18	2949.31	9.37	0.00	8.37	14.42	14.42
P-3	J-37	J-3	2949.31	14.13	0.82	8.37	15.25	14.42
P-4	J-35	J-4	2152.17	3.30	0.00	6.10	8.04	8.04
P-5	J-8	J-2	4.55	0.01	0.00	0.12	0.03	0.03
P-6	J-8	J-16	4.26	0.02	0.00	0.11	0.02	0.02
P-7	J-12	J-8	10.06	0.00	0.00	0.11	0.01	0.01
P-8	J-34	J-7	12.96	0.00	0.00	0.08	0.00	0.00
P-9	J-10	J-12	23.32	0.09	0.00	0.60	0.55	0.55

P-10	J-12	J-14	13.26	0.03	0.00	0.34	0.19	0.19
P-11	J-9	J-13	8.13	0.09	0.00	0.21	0.06	0.06
P-12	J-27	J-23	1.26	0.00	0.00	0.01	0.00	0.00
P-13	J-22	J-10	42.09	0.01	0.00	0.27	0.04	0.04
P-14	J-7	J-6	6.48	0.00	0.00	0.04	0.00	0.00
P-15	J-7	J-11	3.87	0.00	0.00	0.10	0.01	0.01
P-16	J-19	J-17	4.84	0.00	0.00	0.03	0.00	0.00
P-17	J-14	J-9	9.39	0.03	0.00	0.24	0.10	0.10
P-18	O-RV-1	J-21	2933.73	3.76	0.00	8.32	16.34	16.34
P-19	J-18	J-20	15.58	0.01	0.00	0.10	0.01	0.01
P-20	J-21	J-26	64.83	0.02	0.00	0.41	0.09	0.09
P-21	J-21	J-28	2868.90	4.69	0.00	4.58	3.37	3.37
P-22	J-5	J-4	697.83	6.84	0.00	4.45	7.20	7.20
P-23	J-24	J-5	2859.80	1.51	0.00	4.56	3.36	3.36
P-24	J-10	J-34	15.48	0.01	0.00	0.10	0.01	0.01
P-25	J-14	J-15	0.68	0.00	0.00	0.02	0.00	0.00
P-26	J-19	J-22	45.38	0.02	0.00	0.29	0.05	0.05
P-27	J-18	I-RV-1	2933.73	8.17	0.00	8.32	16.34	16.34
P-29	J-26	J-32	62.90	0.03	0.00	0.40	0.08	0.08
P-30	J-1	J-19	60.28	0.01	0.00	0.38	0.08	0.08
P-31	J-26	J-30	1.94	0.00	0.00	0.01	0.00	0.00
P-32	J-32	J-29	61.54	0.10	0.00	0.39	0.08	0.08
P-33	J-32	J-31	0.68	0.00	0.00	0.00	0.00	0.00
P-34	J-29	J-1	60.28	0.05	0.00	0.38	0.08	0.08
P-35	J-28	J-24	2859.80	6.71	0.73	4.56	3.72	3.36
P-36	J-10	J-25	0.68	0.00	0.00	0.02	0.00	0.00
P-38	R-2	J-37	2949.99	38.66	2.45	8.37	15.34	14.43
P-39	J-34	J-27	2.52	0.00	0.00	0.02	0.00	0.00
P-41	J-5	J-35	2152.17	3.54	0.00	6.10	8.04	8.04

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
J-1		0.00	157.69	98.00	59.69	25.87
J-2		4.55	157.54	99.00	58.54	25.37
J-3		0.00	209.45	128.00	81.45	35.29
J-4		2850.00	137.41	115.00	22.41	9.71
J-5		9.80	144.24	115.00	29.24	12.67
J-6		6.48	157.63	96.00	61.63	26.71
J-7		2.61	157.64	99.00	58.64	25.41
J-8		1.26	157.55	99.00	58.55	25.37
J-9		1.26	157.49	100.00	57.49	24.91
J-10		2.61	157.64	100.00	57.64	24.98
J-11		3.87	157.63	100.00	57.63	24.97
J-12		0.00	157.56	101.00	56.56	24.51
J-13		8.13	157.40	100.00	57.40	24.87
J-14		3.20	157.52	101.00	56.52	24.49
J-15		0.68	157.52	100.00	57.52	24.93
J-16		4.26	157.53	98.00	59.53	25.80
J-17		4.84	157.68	96.00	61.68	26.73
J-18		0.00	200.07	123.00	77.07	33.40
J-19		10.06	157.68	99.00	58.68	25.43
J-20		15.58	200.07	130.00	70.07	30.36
J-21		0.00	157.88	111.00	46.88	20.32
J-22		3.29	157.66	100.00	57.66	24.99
J-23		1.26	157.64	96.00	61.64	26.71
J-24		0.00	145.75	111.00	34.75	15.06

J-25	0.68	157.64	100.00	57.64	24.98
J-26	0.00	157.86	108.00	49.86	21.61
J-27	1.26	157.64	101.00	56.64	24.54
J-28	9.10	153.19	117.00	36.19	15.68
J-29	1.26	157.74	98.00	59.74	25.89
J-30	1.94	157.86	108.00	49.86	21.61
J-31	0.68	157.83	104.00	53.83	23.33
J-32	0.68	157.83	102.00	55.83	24.19
J-34	0.00	157.64	101.00	56.64	24.54
J-35	0.00	140.70	116.00	24.70	10.71
J-37	0.68	224.39	170.00	54.39	23.57
R-1	----	265.50	250.00	15.50	6.72
R-2	----	265.50	250.00	15.50	6.72
O-RV-1	----	161.64	115.00	46.64	20.21
I-RV-1	0.00	191.90	115.00	76.90	33.32

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-3	35.29	R-1	6.72
J-18	33.40	R-2	6.72
I-RV-1	33.32	J-4	9.71
J-20	30.36	J-35	10.71
J-17	26.73	J-5	12.67

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-38	8.37	P-1	0.00
P-2	8.37	P-33	0.00
P-3	8.37	P-12	0.01
P-27	8.32	P-31	0.01
P-18	8.32	P-39	0.02

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-27	16.34	P-1	0.00
P-18	16.34	P-33	0.00
P-38	15.34	P-12	0.00
P-3	15.25	P-31	0.00
P-2	14.42	P-39	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)

P-27	16.34	P-1	0.00
P-18	16.34	P-33	0.00
P-38	14.43	P-12	0.00
P-2	14.42	P-31	0.00
P-3	14.42	P-39	0.00

R E G U L A T I N G V A L V E R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING (psi or gpm)	VALVE STATUS	UPSTREAM PRESSURE (psi)	DOWNSTREAM PRESSURE (psi)	THROUGH FLOW (gpm)
RV-1	PRV-1	60.00	WIDE OPEN	33.32	20.21	2933.73

Pressure drop in PRV

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

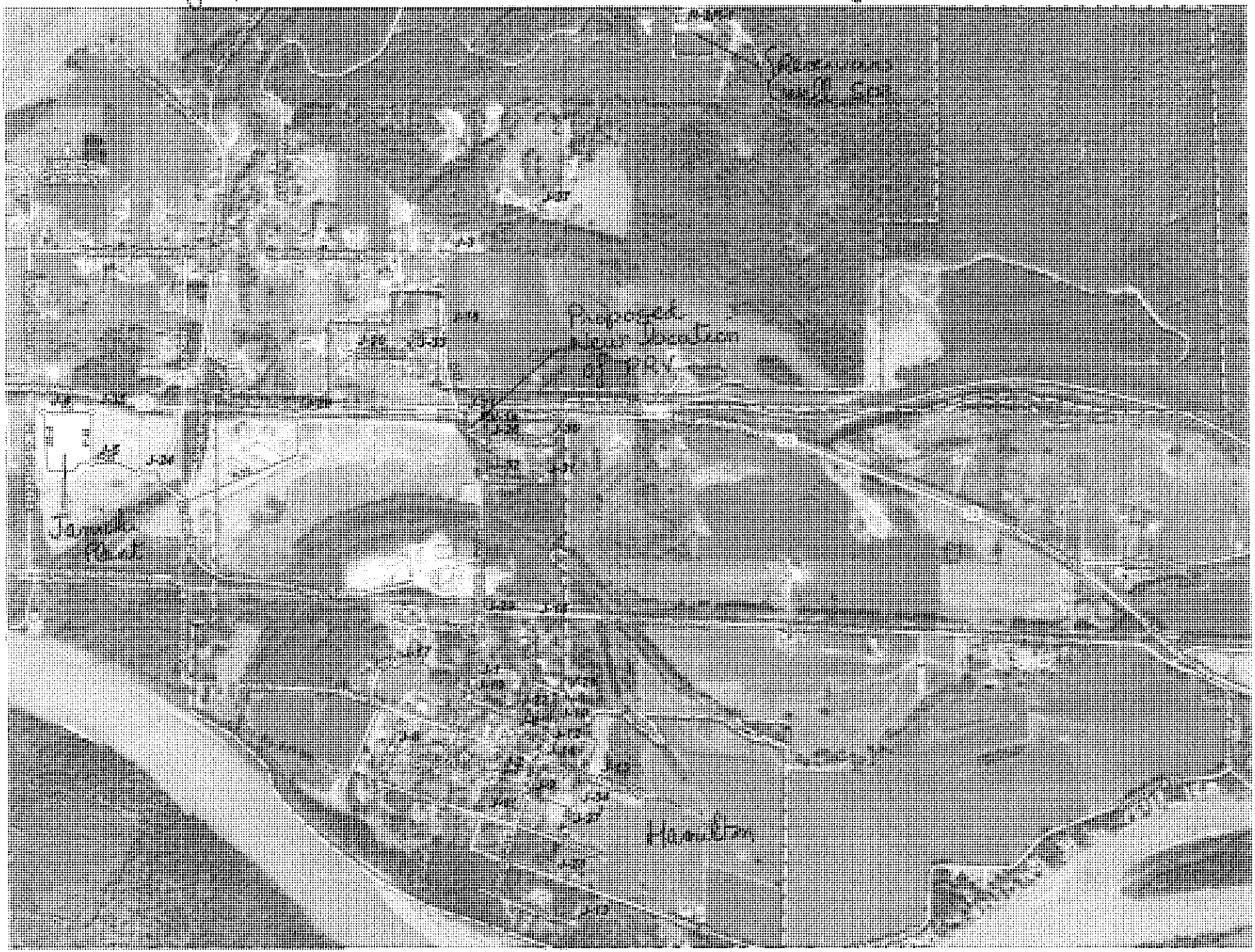
(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	0.58	
R-2	2949.41	

NET SYSTEM INFLOW = 2949.99
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 2949.99

***** HYDRAULIC ANALYSIS COMPLETED *****

Town of Hamilton - PRV relocated South of SR20



Scenario #2, 3, & 4

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* * * * * * * * * *   K Y P I P E 5   * * * * * * * * * *
*                                                       *
*              Pipe Network Modeling Software           *
*                                                       *
*                Copyrighted by KYPIPE LLC              *
*                Version 5 - February 2010              *
*                                                       *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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Date & Time: Thu Mar 07 15:18:28 2013

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SUMMARY OF ORIGINAL DATA

UNITS SPECIFIED

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

REGULATING VALVE DATA

VALVE LABEL	VALVE TYPE	VALVE SETTING (ft or gpm)
RV-1a	PRV-1	248.46

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	R-1	R-2	20.73	8.00	139.4518	0.00
P-2	J-3	J-18	650.00	12.00	150.0000	0.00
P-3	J-3	J-37	980.00	12.00	150.0000	0.75
P-4	J-4	J-35	410.00	12.00	150.0000	0.00
P-5	J-8	J-2	415.00	4.00	124.4518	0.00
P-6	J-8	J-16	960.00	4.00	124.4518	0.00
P-7	J-8	J-12	310.00	6.00	150.0000	0.00
P-8	J-7	J-34	725.00	8.00	150.0000	0.00
P-9	J-12	J-10	160.00	4.00	124.4518	0.00
P-10	J-12	J-14	170.00	4.00	124.4518	0.00
P-11	J-13	J-9	1650.00	4.00	150.0000	0.75
P-12	J-23	J-27	470.00	8.00	150.0000	0.00
P-13	J-10	J-22	375.00	8.00	150.0000	0.00
P-14	J-7	J-6	900.00	8.00	150.0000	0.00

P-15	J-7	J-11	280.00	4.00	150.0000	0.00
P-16	J-17	J-19	730.00	8.00	150.0000	0.00
P-17	J-9	J-14	288.00	4.00	124.4518	0.00
P-18	J-33	J-20	522.03	8.00	150.0000	0.00
P-19	J-18	J-33	427.97	8.00	150.0000	1.50
P-20	J-21	I-RV-1a	100.00	8.00	150.0000	0.00
P-21	J-21	J-28	1390.00	16.00	150.0000	0.00
P-22	J-5	J-4	950.00	8.00	150.0000	0.00
P-23	J-5	J-24	450.00	16.00	150.0000	0.00
P-24	J-10	J-34	980.00	8.00	150.0000	0.75
P-25	J-14	J-15	450.00	4.00	150.0000	0.00
P-26	J-22	J-19	425.00	8.00	150.0000	0.00
P-27	J-21	J-18	730.00	12.00	139.4518	0.00
P-28	O-RV-1a	J-26	140.00	8.00	150.0000	0.00
P-29	J-26	J-32	360.00	8.00	150.0000	0.00
P-30	J-19	J-1	130.00	8.00	150.0000	0.00
P-31	J-26	J-30	52.35	8.00	150.0000	0.00
P-32	J-32	J-29	1210.00	8.00	150.0000	0.00
P-33	J-32	J-31	48.63	8.00	150.0000	0.00
P-34	J-1	J-29	600.00	8.00	150.0000	0.00
P-35	J-28	J-24	2000.00	16.00	150.0000	2.25
P-36	J-10	J-25	390.00	4.00	124.4518	0.00
P-38	J-37	R-2	2680.00	12.00	150.0000	2.25
P-39	J-34	J-27	200.00	8.00	150.0000	0.00
P-41	J-35	J-5	440.00	12.00	150.0000	0.00

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
J-1		0.00	98.00	
J-2		4.55	99.00	
J-3		0.00	128.00	
J-4		0.00	115.00	
J-5		9.80	115.00	
J-6		6.50	96.00	
J-7		2.61	99.00	
J-8		1.26	99.00	
J-9		1.26	100.00	
J-10		2.61	100.00	
J-11		3.87	100.00	
J-12		0.00	101.00	
J-13		8.13	100.00	
J-14		3.20	101.00	
J-15		0.68	100.00	
J-16		4.26	98.00	
J-17		4.84	96.00	
J-18		0.00	123.00	
J-19		10.06	99.00	
J-20		15.58	130.00	
J-21		0.00	111.00	
J-22		3.29	100.00	
J-23		1.26	96.00	
J-24		0.00	111.00	
J-25		0.68	100.00	
J-26		0.00	108.00	
J-27		1.26	101.00	

J-28	9.10	117.00		
J-29	1.26	98.00		
J-30	1.94	108.00		
J-31	0.68	104.00		
J-32	0.68	102.00		
J-33	0.00	124.00		
J-34	0.00	101.00		
J-35	0.00	116.00		
J-37	0.68	170.00		
R-1	----	250.00	300.00	
R-2	----	250.00	300.00	
O-RV-1a	----	110.00	248.46	
I-RV-1a	0.00	110.00		

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
MAXIMUM AND MINIMUM PRESSURES = 5
MAXIMUM AND MINIMUM VELOCITIES = 5
MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 39
NUMBER OF END NODES .....(j) = 37
NUMBER OF PRIMARY LOOPS .....(l) = 1
NUMBER OF SUPPLY NODES .....(f) = 2
NUMBER OF SUPPLY ZONES .....(z) = 1

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Case: 0

RESULTS OBTAINED AFTER 17 TRIALS: ACCURACY = 0.00001

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/ 1000 (ft/ft)	HL/ 1000 (ft/ft)
P-1	R-1	R-2	0.00	0.00	0.00	0.00	0.00	0.00
P-2	J-3	J-18	99.33	0.02	0.00	0.28	0.03	0.03
P-3	J-37	J-3	99.33	0.03	0.00	0.28	0.03	0.03
P-4	J-4	J-35	0.00	0.00	0.00	0.00	0.00	0.00
P-5	J-8	J-2	4.55	0.01	0.00	0.12	0.03	0.03
P-6	J-8	J-16	4.26	0.02	0.00	0.11	0.02	0.02
P-7	J-12	J-8	10.06	0.00	0.00	0.11	0.01	0.01

P-8	J-34	J-7	12.98	0.00	0.00	0.08	0.00	0.00
P-9	J-10	J-12	23.32	0.09	0.00	0.60	0.55	0.55
P-10	J-12	J-14	13.26	0.03	0.00	0.34	0.19	0.19
P-11	J-9	J-13	8.13	0.09	0.00	0.21	0.06	0.06
P-12	J-27	J-23	1.26	0.00	0.00	0.01	0.00	0.00
P-13	J-22	J-10	42.11	0.01	0.00	0.27	0.04	0.04
P-14	J-7	J-6	6.50	0.00	0.00	0.04	0.00	0.00
P-15	J-7	J-11	3.87	0.00	0.00	0.10	0.01	0.01
P-16	J-19	J-17	4.84	0.00	0.00	0.03	0.00	0.00
P-17	J-14	J-9	9.39	0.03	0.00	0.24	0.10	0.10
P-18	J-33	J-20	15.58	0.00	0.00	0.10	0.01	0.01
P-19	J-18	J-33	15.58	0.00	0.00	0.10	0.01	0.01
P-20	J-21	I-RV-1a	64.85	0.01	0.00	0.41	0.09	0.09
P-21	J-21	J-28	18.90	0.00	0.00	0.03	0.00	0.00
P-22	J-5	J-4	0.00	0.00	0.00	0.00	0.00	0.00
P-23	J-24	J-5	9.80	0.00	0.00	0.02	0.00	0.00
P-24	J-10	J-34	15.50	0.01	0.00	0.10	0.01	0.01
P-25	J-14	J-15	0.68	0.00	0.00	0.02	0.00	0.00
P-26	J-19	J-22	45.40	0.02	0.00	0.29	0.05	0.05
P-27	J-18	J-21	83.75	0.02	0.00	0.24	0.02	0.02
P-28	O-RV-1a	J-26	64.85	0.01	0.00	0.41	0.09	0.09
P-29	J-26	J-32	62.91	0.03	0.00	0.40	0.08	0.08
P-30	J-1	J-19	60.30	0.01	0.00	0.38	0.08	0.08
P-31	J-26	J-30	1.94	0.00	0.00	0.01	0.00	0.00
P-32	J-32	J-29	61.56	0.10	0.00	0.39	0.08	0.08
P-33	J-32	J-31	0.68	0.00	0.00	0.00	0.00	0.00
P-34	J-29	J-1	60.30	0.05	0.00	0.38	0.08	0.08
P-35	J-28	J-24	9.80	0.00	0.00	0.02	0.00	0.00
P-36	J-10	J-25	0.68	0.00	0.00	0.02	0.00	0.00
P-38	R-2	J-37	100.00	0.07	0.00	0.28	0.03	0.03
P-39	J-34	J-27	2.52	0.00	0.00	0.02	0.00	0.00
P-41	J-35	J-5	0.00	0.00	0.00	0.00	0.00	0.00

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
J-1		0.00	248.26	98.00	150.26	65.11
J-2		4.55	248.11	99.00	149.11	64.62
J-3		0.00	299.90	128.00	171.90	74.49
J-4		0.00	299.86	115.00	184.86	80.11
J-5		9.80	299.86	115.00	184.86	80.11
J-6		6.50	248.21	96.00	152.21	65.96
J-7		2.61	248.21	99.00	149.21	64.66
J-8		1.26	248.13	99.00	149.13	64.62
J-9		1.26	248.07	100.00	148.07	64.16
J-10		2.61	248.22	100.00	148.22	64.23
J-11		3.87	248.20	100.00	148.20	64.22
J-12		0.00	248.13	101.00	147.13	63.76
J-13		8.13	247.97	100.00	147.97	64.12
J-14		3.20	248.10	101.00	147.10	63.74
J-15		0.68	248.10	100.00	148.10	64.17
J-16		4.26	248.10	98.00	150.10	65.04
J-17		4.84	248.25	96.00	152.25	65.98
J-18		0.00	299.88	123.00	176.88	76.65
J-19		10.06	248.25	99.00	149.25	64.68
J-20		15.58	299.87	130.00	169.87	73.61
J-21		0.00	299.86	111.00	188.86	81.84

J-22	3.29	248.23	100.00	148.23	64.23
J-23	1.26	248.21	96.00	152.21	65.96
J-24	0.00	299.86	111.00	188.86	81.84
J-25	0.68	248.22	100.00	148.22	64.23
J-26	0.00	248.43	108.00	140.43	60.85
J-27	1.26	248.21	101.00	147.21	63.79
J-28	9.10	299.86	117.00	182.86	79.24
J-29	1.26	248.31	98.00	150.31	65.13
J-30	1.94	248.43	108.00	140.43	60.85
J-31	0.68	248.40	104.00	144.40	62.58
J-32	0.68	248.40	102.00	146.40	63.44
J-33	0.00	299.88	124.00	175.88	76.21
J-34	0.00	248.21	101.00	147.21	63.79
J-35	0.00	299.86	116.00	183.86	79.67
J-37	0.68	299.92	170.00	129.92	56.30
R-1	----	300.00	250.00	50.00	21.67
R-2	----	300.00	250.00	50.00	21.67
O-RV-1a	----	248.45	110.00	138.45	59.99
I-RV-1a	0.00	299.85	110.00	189.85	82.27

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
I-RV-1a	82.27	R-1	21.67
J-21	81.84	R-2	21.67
J-24	81.84	J-37	56.30
J-4	80.11	O-RV-1a	59.99
J-5	80.11	J-26	60.85

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-9	0.60	P-4	0.00
P-20	0.41	P-41	0.00
P-28	0.41	P-1	0.00
P-29	0.40	P-22	0.00
P-32	0.39	P-33	0.00

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-9	0.55	P-4	0.00
P-10	0.19	P-41	0.00
P-17	0.10	P-1	0.00
P-20	0.09	P-22	0.00
P-28	0.09	P-33	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-9	0.55	P-4	0.00
P-10	0.19	P-41	0.00
P-17	0.10	P-1	0.00
P-20	0.09	P-22	0.00
P-28	0.09	P-33	0.00

REGULATING VALVE REPORT

VALVE LABEL	VALVE TYPE	VALVE SETTING (psi or gpm)	VALVE STATUS	UPSTREAM PRESSURE (psi)	DOWNSTREAM PRESSURE (psi)	THROUGH FLOW (gpm)
RV-1a	PRV-1	60.00	ACTIVATED	82.27	59.99	64.85

SUMMARY OF INFLOWS AND OUTFLOWS

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	0.00	
R-2	100.00	

NET SYSTEM INFLOW = 100.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 100.00

***** HYDRAULIC ANALYSIS COMPLETED *****

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          * * * * * * * * * *   K Y P I P E 5   * * * * * * * * * *
          *                                                         *
          *              Pipe Network Modeling Software             *
          *                                                         *
          *                Copyrighted by KYPIPE LLC                *
          *                Version 5 - February 2010                *
          *                                                         *
          * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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S U M M A R Y O F O R I G I N A L D A T A

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

R E G U L A T I N G V A L V E D A T A

VALVE LABEL	VALVE TYPE	VALVE SETTING (ft or gpm)
RV-1a	PRV-1	248.46

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	R-1	R-2	20.73	8.00	139.4518	0.00
P-2	J-3	J-18	650.00	12.00	150.0000	0.00
P-3	J-3	J-37	980.00	12.00	150.0000	0.75
P-4	J-4	J-35	410.00	12.00	150.0000	0.00
P-5	J-8	J-2	415.00	4.00	124.4518	0.00
P-6	J-8	J-16	960.00	4.00	124.4518	0.00
P-7	J-8	J-12	310.00	6.00	150.0000	0.00
P-8	J-7	J-34	725.00	8.00	150.0000	0.00
P-9	J-12	J-10	160.00	4.00	124.4518	0.00
P-10	J-12	J-14	170.00	4.00	124.4518	0.00
P-11	J-13	J-9	1650.00	4.00	150.0000	0.75
P-12	J-23	J-27	470.00	8.00	150.0000	0.00
P-13	J-10	J-22	375.00	8.00	150.0000	0.00
P-14	J-7	J-6	900.00	8.00	150.0000	0.00

P-15	J-7	J-11	280.00	4.00	150.0000	0.00
P-16	J-17	J-19	730.00	8.00	150.0000	0.00
P-17	J-9	J-14	288.00	4.00	124.4518	0.00
P-18	J-33	J-20	522.03	8.00	150.0000	0.00
P-19	J-18	J-33	427.97	8.00	150.0000	1.50
P-20	J-21	I-RV-1a	100.00	8.00	150.0000	0.00
P-21	J-21	J-28	1390.00	16.00	150.0000	0.00
P-22	J-5	J-4	950.00	8.00	150.0000	0.00
P-23	J-5	J-24	450.00	16.00	150.0000	0.00
P-24	J-10	J-34	980.00	8.00	150.0000	0.75
P-25	J-14	J-15	450.00	4.00	150.0000	0.00
P-26	J-22	J-19	425.00	8.00	150.0000	0.00
P-27	J-21	J-18	730.00	12.00	139.4518	0.00
P-28	O-RV-1a	J-26	140.00	8.00	150.0000	0.00
P-29	J-26	J-32	360.00	8.00	150.0000	0.00
P-30	J-19	J-1	130.00	8.00	150.0000	0.00
P-31	J-26	J-30	52.35	8.00	150.0000	0.00
P-32	J-32	J-29	1210.00	8.00	150.0000	0.00
P-33	J-32	J-31	48.63	8.00	150.0000	0.00
P-34	J-1	J-29	600.00	8.00	150.0000	0.00
P-35	J-28	J-24	2000.00	16.00	150.0000	2.25
P-36	J-10	J-25	390.00	4.00	124.4518	0.00
P-38	J-37	R-2	2680.00	12.00	150.0000	2.25
P-39	J-34	J-27	200.00	8.00	150.0000	0.00
P-41	J-35	J-5	440.00	12.00	150.0000	0.00

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
J-1		0.00	98.00	
J-2		4.55	99.00	
J-3		0.00	128.00	
J-4		2850.00	115.00	
J-5		9.80	115.00	
J-6		6.48	96.00	
J-7		2.61	99.00	
J-8		1.26	99.00	
J-9		1.26	100.00	
J-10		2.61	100.00	
J-11		3.87	100.00	
J-12		0.00	101.00	
J-13		8.13	100.00	
J-14		3.20	101.00	
J-15		0.68	100.00	
J-16		4.26	98.00	
J-17		4.84	96.00	
J-18		0.00	123.00	
J-19		10.06	99.00	
J-20		15.58	130.00	
J-21		0.00	111.00	
J-22		3.29	100.00	
J-23		1.26	96.00	
J-24		0.00	111.00	
J-25		0.68	100.00	
J-26		0.00	108.00	
J-27		1.26	101.00	

J-28	9.10	117.00	
J-29	1.26	98.00	
J-30	1.94	108.00	
J-31	0.68	104.00	
J-32	0.68	102.00	
J-33	0.00	124.00	
J-34	0.00	101.00	
J-35	0.00	116.00	
J-37	0.68	170.00	
R-1	----	250.00	265.50
R-2	----	250.00	265.50
O-RV-1a	----	110.00	248.46
I-RV-1a	0.00	110.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
MAXIMUM AND MINIMUM PRESSURES = 5
MAXIMUM AND MINIMUM VELOCITIES = 5
MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 39
NUMBER OF END NODES .....(j) = 37
NUMBER OF PRIMARY LOOPS .....(l) = 1
NUMBER OF SUPPLY NODES .....(f) = 2
NUMBER OF SUPPLY ZONES .....(z) = 1

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Case: 0

RESULTS OBTAINED AFTER 9 TRIALS: ACCURACY = 0.00007

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/ 1000 (ft/ft)	HL/ 1000 (ft/ft)
P-1	R-1	R-2	0.58	0.00	0.00	0.00	0.00	0.00
P-2	J-3	J-18	2949.31	9.37	0.00	8.37	14.42	14.42
P-3	J-37	J-3	2949.31	14.13	0.82	8.37	15.25	14.42
P-4	J-35	J-4	2152.17	3.30	0.00	6.10	8.04	8.04
P-5	J-8	J-2	4.55	0.01	0.00	0.12	0.03	0.03
P-6	J-8	J-16	4.26	0.02	0.00	0.11	0.02	0.02
P-7	J-12	J-8	10.06	0.00	0.00	0.11	0.01	0.01

P-8	J-34	J-7	12.96	0.00	0.00	0.08	0.00	0.00
P-9	J-10	J-12	23.32	0.09	0.00	0.60	0.55	0.55
P-10	J-12	J-14	13.26	0.03	0.00	0.34	0.19	0.19
P-11	J-9	J-13	8.13	0.09	0.00	0.21	0.06	0.06
P-12	J-27	J-23	1.26	0.00	0.00	0.01	0.00	0.00
P-13	J-22	J-10	42.09	0.01	0.00	0.27	0.04	0.04
P-14	J-7	J-6	6.48	0.00	0.00	0.04	0.00	0.00
P-15	J-7	J-11	3.87	0.00	0.00	0.10	0.01	0.01
P-16	J-19	J-17	4.84	0.00	0.00	0.03	0.00	0.00
P-17	J-14	J-9	9.39	0.03	0.00	0.24	0.10	0.10
P-18	J-33	J-20	15.58	0.00	0.00	0.10	0.01	0.01
P-19	J-18	J-33	15.58	0.00	0.00	0.10	0.01	0.01
P-20	J-21	I-RV-1a	64.83	0.01	0.00	0.41	0.09	0.09
P-21	J-21	J-28	2868.90	4.69	0.00	4.58	3.37	3.37
P-22	J-5	J-4	697.83	6.84	0.00	4.45	7.20	7.20
P-23	J-24	J-5	2859.80	1.51	0.00	4.56	3.36	3.36
P-24	J-10	J-34	15.48	0.01	0.00	0.10	0.01	0.01
P-25	J-14	J-15	0.68	0.00	0.00	0.02	0.00	0.00
P-26	J-19	J-22	45.38	0.02	0.00	0.29	0.05	0.05
P-27	J-18	J-21	2933.73	11.93	0.00	8.32	16.34	16.34
P-28	O-RV-1a	J-26	64.83	0.01	0.00	0.41	0.09	0.09
P-29	J-26	J-32	62.90	0.03	0.00	0.40	0.08	0.08
P-30	J-1	J-19	60.28	0.01	0.00	0.38	0.08	0.08
P-31	J-26	J-30	1.94	0.00	0.00	0.01	0.00	0.00
P-32	J-32	J-29	61.54	0.10	0.00	0.39	0.08	0.08
P-33	J-32	J-31	0.68	0.00	0.00	0.00	0.00	0.00
P-34	J-29	J-1	60.28	0.05	0.00	0.38	0.08	0.08
P-35	J-28	J-24	2859.80	6.71	0.73	4.56	3.72	3.36
P-36	J-10	J-25	0.68	0.00	0.00	0.02	0.00	0.00
P-38	R-2	J-37	2949.99	38.66	2.45	8.37	15.34	14.43
P-39	J-34	J-27	2.52	0.00	0.00	0.02	0.00	0.00
P-41	J-5	J-35	2152.17	3.54	0.00	6.10	8.04	8.04

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
J-1		0.00	187.93	98.00	89.93	38.97
J-2		4.55	187.79	99.00	88.79	38.47
J-3		0.00	209.45	128.00	81.45	35.29
J-4	– FH @ Janicki	2850.00	167.67	115.00	52.67	22.82
J-5		9.80	174.50	115.00	59.50	25.79
J-6		6.48	187.88	96.00	91.88	39.81
J-7		2.61	187.88	99.00	88.88	38.51
J-8		1.26	187.80	99.00	88.80	38.48
J-9		1.26	187.74	100.00	87.74	38.02
J-10		2.61	187.89	100.00	87.89	38.09
J-11		3.87	187.88	100.00	87.88	38.08
J-12		0.00	187.80	101.00	86.80	37.61
J-13		8.13	187.65	100.00	87.65	37.98
J-14		3.20	187.77	101.00	86.77	37.60
J-15		0.68	187.77	100.00	87.77	38.03
J-16		4.26	187.78	98.00	89.78	38.90
J-17		4.84	187.92	96.00	91.92	39.83
J-18		0.00	200.07	123.00	77.07	33.40
J-19		10.06	187.92	99.00	88.92	38.53
J-20		15.58	200.07	130.00	70.07	30.36
J-21		0.00	188.14	111.00	77.14	33.43

J-22	3.29	187.90	100.00	87.90	38.09
J-23	1.26	187.88	96.00	91.88	39.82
J-24	0.00	176.01	111.00	65.01	28.17
J-25	0.68	187.89	100.00	87.89	38.09
J-26	0.00	188.11	108.00	80.11	34.71
J-27	1.26	187.88	101.00	86.88	37.65
J-28	9.10	183.45	117.00	66.45	28.80
J-29	1.26	187.98	98.00	89.98	38.99
J-30	1.94	188.11	108.00	80.11	34.71
J-31	0.68	188.08	104.00	84.08	36.43
J-32	0.68	188.08	102.00	86.08	37.30
J-33	0.00	200.07	124.00	76.07	32.96
J-34	0.00	187.88	101.00	86.88	37.65
J-35	0.00	170.96	116.00	54.96	23.82
J-37	0.68	224.39	170.00	54.39	23.57
R-1	----	265.50	250.00	15.50	6.72
R-2	----	265.50	250.00	15.50	6.72
O-RV-1a	----	188.12	110.00	78.12	33.85
I-RV-1a	0.00	188.13	110.00	78.13	33.86

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-17	39.83	R-1	6.72
J-23	39.82	R-2	6.72
J-6	39.81	J-4	22.82
J-29	38.99	J-37	23.57
J-1	38.97	J-35	23.82

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-38	8.37	P-1	0.00
P-2	8.37	P-33	0.00
P-3	8.37	P-12	0.01
P-27	8.32	P-31	0.01
P-4	6.10	P-39	0.02

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-27	16.34	P-1	0.00
P-38	15.34	P-33	0.00
P-3	15.25	P-12	0.00
P-2	14.42	P-31	0.00
P-4	8.04	P-39	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-27	16.34	P-1	0.00
P-38	14.43	P-33	0.00
P-2	14.42	P-12	0.00
P-3	14.42	P-31	0.00
P-4	8.04	P-39	0.00

R E G U L A T I N G V A L V E R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING (psi or gpm)	VALVE STATUS	UPSTREAM PRESSURE (psi)	DOWNSTREAM PRESSURE (psi)	THROUGH FLOW (gpm)
RV-1a	PRV-1	60.00	WIDE OPEN	33.86	33.85	64.83

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	0.58	
R-2	2949.41	

NET SYSTEM INFLOW = 2949.99
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 2949.99

***** HYDRAULIC ANALYSIS COMPLETED *****

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* * * * * * * * * * *  K Y P I P E 5  * * * * * * * * * * *
*                                                           *
*              Pipe Network Modeling Software               *
*                                                           *
*                Copyrighted by KYPIPE LLC                  *
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*                                                           *
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SUMMARY OF ORIGINAL DATA

UNITS SPECIFIED

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

REGULATING VALVE DATA

VALVE LABEL	VALVE TYPE	VALVE SETTING (ft or gpm)
RV-1a	PRV-1	248.46

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	R-1	R-2	20.73	8.00	139.4518	0.00
P-2	J-3	J-18	650.00	12.00	150.0000	0.00
P-3	J-3	J-37	980.00	12.00	150.0000	0.75
P-4	J-4	J-35	410.00	12.00	150.0000	0.00
P-5	J-8	J-2	415.00	4.00	124.4518	0.00
P-6	J-8	J-16	960.00	4.00	124.4518	0.00
P-7	J-8	J-12	310.00	6.00	150.0000	0.00
P-8	J-7	J-34	725.00	8.00	150.0000	0.00
P-9	J-12	J-10	160.00	4.00	124.4518	0.00
P-10	J-12	J-14	170.00	4.00	124.4518	0.00
P-11	J-13	J-9	1650.00	4.00	150.0000	0.75
P-12	J-23	J-27	470.00	8.00	150.0000	0.00
P-13	J-10	J-22	375.00	8.00	150.0000	0.00
P-14	J-7	J-6	900.00	8.00	150.0000	0.00

P-15	J-7	J-11	280.00	4.00	150.0000	0.00
P-16	J-17	J-19	730.00	8.00	150.0000	0.00
P-17	J-9	J-14	288.00	4.00	124.4518	0.00
P-18	J-33	J-20	522.03	8.00	150.0000	0.00
P-19	J-18	J-33	427.97	8.00	150.0000	1.50
P-20	J-21	I-RV-1a	100.00	8.00	150.0000	0.00
P-21	J-21	J-28	1390.00	16.00	150.0000	0.00
P-22	J-5	J-4	950.00	8.00	150.0000	0.00
P-23	J-5	J-24	450.00	16.00	150.0000	0.00
P-24	J-10	J-34	980.00	8.00	150.0000	0.75
P-25	J-14	J-15	450.00	4.00	150.0000	0.00
P-26	J-22	J-19	425.00	8.00	150.0000	0.00
P-27	J-21	J-18	730.00	12.00	139.4518	0.00
P-28	O-RV-1a	J-26	140.00	8.00	150.0000	0.00
P-29	J-26	J-32	360.00	8.00	150.0000	0.00
P-30	J-19	J-1	130.00	8.00	150.0000	0.00
P-31	J-26	J-30	52.35	8.00	150.0000	0.00
P-32	J-32	J-29	1210.00	8.00	150.0000	0.00
P-33	J-32	J-31	48.63	8.00	150.0000	0.00
P-34	J-1	J-29	600.00	8.00	150.0000	0.00
P-35	J-28	J-24	2000.00	16.00	150.0000	2.25
P-36	J-10	J-25	390.00	4.00	124.4518	0.00
P-38	J-37	R-2	2680.00	12.00	150.0000	2.25
P-39	J-34	J-27	200.00	8.00	150.0000	0.00
P-41	J-35	J-5	440.00	12.00	150.0000	0.00

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
J-1		0.00	98.00	
J-2		4.55	99.00	
J-3		0.00	128.00	
J-4		0.00	115.00	
J-5		9.80	115.00	
J-6 — FH		1006.50	96.00	
J-7		2.61	99.00	
J-8		1.26	99.00	
J-9		1.26	100.00	
J-10		2.61	100.00	
J-11		3.87	100.00	
J-12		0.00	101.00	
J-13		8.13	100.00	
J-14		3.20	101.00	
J-15		0.68	100.00	
J-16		4.26	98.00	
J-17		4.84	96.00	
J-18		0.00	123.00	
J-19		10.06	99.00	
J-20		15.58	130.00	
J-21		0.00	111.00	
J-22		3.29	100.00	
J-23		1.26	96.00	
J-24		0.00	111.00	
J-25		0.68	100.00	
J-26		0.00	108.00	
J-27		1.26	101.00	

J-28	9.10	117.00	
J-29	1.26	98.00	
J-30	1.94	108.00	
J-31	0.68	104.00	
J-32	0.68	102.00	
J-33	0.00	124.00	
J-34	0.00	101.00	
J-35	0.00	116.00	
J-37	0.68	170.00	
R-1	----	250.00	292.30
R-2	----	250.00	292.30
O-RV-1a	----	110.00	248.46
I-RV-1a	0.00	110.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
MAXIMUM AND MINIMUM PRESSURES = 5
MAXIMUM AND MINIMUM VELOCITIES = 5
MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 39
NUMBER OF END NODES .....(j) = 37
NUMBER OF PRIMARY LOOPS .....(l) = 1
NUMBER OF SUPPLY NODES .....(f) = 2
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 14 TRIALS: ACCURACY = 0.00001

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/ 1000 (ft/ft)	HL/ 1000 (ft/ft)
P-1	R-1	R-2	0.01	0.00	0.00	0.00	0.00	0.00
P-2	J-3	J-18	1099.33	1.51	0.00	3.12	2.32	2.32
P-3	J-37	J-3	1099.33	2.27	0.11	3.12	2.43	2.32
P-4	J-4	J-35	0.01	0.00	0.00	0.00	0.00	0.00
P-5	J-8	J-2	4.55	0.01	0.00	0.12	0.03	0.03
P-6	J-8	J-16	4.26	0.02	0.00	0.11	0.02	0.02
P-7	J-12	J-8	10.06	0.00	0.00	0.11	0.01	0.01

P-8	J-34	J-7	1012.98	10.41	0.00	6.47	14.35	14.35
P-9	J-10	J-12	23.32	0.09	0.00	0.60	0.55	0.55
P-10	J-12	J-14	13.26	0.03	0.00	0.34	0.19	0.19
P-11	J-9	J-13	8.13	0.09	0.00	0.21	0.06	0.06
P-12	J-27	J-23	1.26	0.00	0.00	0.01	0.00	0.00
P-13	J-22	J-10	1042.11	5.67	0.00	6.65	15.13	15.13
P-14	J-7	J-6	1006.50	12.77	0.00	6.42	14.18	14.18
P-15	J-7	J-11	3.87	0.00	0.00	0.10	0.01	0.01
P-16	J-19	J-17	4.84	0.00	0.00	0.03	0.00	0.00
P-17	J-14	J-9	9.39	0.03	0.00	0.24	0.10	0.10
P-18	J-33	J-20	15.58	0.00	0.00	0.10	0.01	0.01
P-19	J-18	J-33	15.58	0.00	0.00	0.10	0.01	0.01
P-20	J-21	I-RV-1a	1064.85	1.57	0.00	6.80	15.74	15.74
P-21	J-21	J-28	18.90	0.00	0.00	0.03	0.00	0.00
P-22	J-5	J-4	0.01	0.00	0.00	0.00	0.00	0.00
P-23	J-24	J-5	9.80	0.00	0.00	0.02	0.00	0.00
P-24	J-10	J-34	1015.50	14.13	0.49	6.48	14.92	14.42
P-25	J-14	J-15	0.68	0.00	0.00	0.02	0.00	0.00
P-26	J-19	J-22	1045.40	6.47	0.00	6.67	15.22	15.22
P-27	J-18	J-21	1083.75	1.89	0.00	3.07	2.58	2.58
P-28	O-RV-1a	J-26	1064.85	2.20	0.00	6.80	15.74	15.74
P-29	J-26	J-32	1062.91	5.65	0.00	6.78	15.69	15.69
P-30	J-1	J-19	1060.30	2.03	0.00	6.77	15.62	15.62
P-31	J-26	J-30	1.94	0.00	0.00	0.01	0.00	0.00
P-32	J-32	J-29	1061.56	18.94	0.00	6.78	15.65	15.65
P-33	J-32	J-31	0.68	0.00	0.00	0.00	0.00	0.00
P-34	J-29	J-1	1060.30	9.37	0.00	6.77	15.62	15.62
P-35	J-28	J-24	9.80	0.00	0.00	0.02	0.00	0.00
P-36	J-10	J-25	0.68	0.00	0.00	0.02	0.00	0.00
P-38	R-2	J-37	1100.00	6.22	0.34	3.12	2.45	2.32
P-39	J-34	J-27	2.52	0.00	0.00	0.02	0.00	0.00
P-41	J-35	J-5	0.01	0.00	0.00	0.00	0.00	0.00

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
J-1		0.00	208.31	98.00	110.31	47.80
J-2		4.55	194.03	99.00	95.03	41.18
J-3		0.00	283.35	128.00	155.35	67.32
J-4		0.00	279.96	115.00	164.96	71.48
J-5		9.80	279.96	115.00	164.96	71.48
J-6		1006.50	156.34	96.00	60.34	26.15
J-7		2.61	169.11	99.00	70.11	30.38
J-8		1.26	194.05	99.00	95.05	41.19
J-9		1.26	193.99	100.00	93.99	40.73
J-10		2.61	194.14	100.00	94.14	40.79
J-11		3.87	169.11	100.00	69.11	29.95
J-12		0.00	194.05	101.00	93.05	40.32
J-13		8.13	193.90	100.00	93.90	40.69
J-14		3.20	194.02	101.00	93.02	40.31
J-15		0.68	194.02	100.00	94.02	40.74
J-16		4.26	194.02	98.00	96.02	41.61
J-17		4.84	206.28	96.00	110.28	47.79
J-18		0.00	281.85	123.00	158.85	68.83
J-19		10.06	206.28	99.00	107.28	46.49
J-20		15.58	281.84	130.00	151.84	65.80
J-21		0.00	279.96	111.00	168.96	73.22

J-22	3.29	199.81	100.00	99.81	43.25
J-23	1.26	179.52	96.00	83.52	36.19
J-24	0.00	279.96	111.00	168.96	73.22
J-25	0.68	194.14	100.00	94.14	40.79
J-26	0.00	242.27	108.00	134.27	58.18
J-27	1.26	179.52	101.00	78.52	34.02
J-28	9.10	279.96	117.00	162.96	70.62
J-29	1.26	217.68	98.00	119.68	51.86
J-30	1.94	242.27	108.00	134.27	58.18
J-31	0.68	236.62	104.00	132.62	57.47
J-32	0.68	236.62	102.00	134.62	58.34
J-33	0.00	281.84	124.00	157.84	68.40
J-34	0.00	179.52	101.00	78.52	34.02
J-35	0.00	279.96	116.00	163.96	71.05
J-37	0.68	285.74	170.00	115.74	50.15
R-1	----	292.30	250.00	42.30	18.33
R-2	----	292.30	250.00	42.30	18.33
O-RV-1a	----	244.47	110.00	134.47	58.27
I-RV-1a	0.00	278.39	110.00	168.39	72.97

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)
J-21	73.22
J-24	73.22
I-RV-1a	72.97
J-4	71.48
J-5	71.48

JUNCTION NUMBER	MINIMUM PRESSURES (psi)
R-1	18.33
R-2	18.33
J-6	26.15
J-11	29.95
J-7	30.38

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)
P-20	6.80
P-28	6.80
P-29	6.78
P-32	6.78
P-30	6.77

PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-4	0.00
P-41	0.00
P-1	0.00
P-22	0.00
P-33	0.00

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)
P-28	15.74
P-20	15.74
P-29	15.69
P-32	15.65
P-30	15.62

PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-4	0.00
P-41	0.00
P-1	0.00
P-22	0.00
P-33	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-28	15.74	P-4	0.00
P-20	15.74	P-41	0.00
P-29	15.69	P-1	0.00
P-32	15.65	P-22	0.00
P-30	15.62	P-33	0.00

R E G U L A T I N G V A L V E R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING (psi or gpm)	VALVE STATUS	UPSTREAM PRESSURE (psi)	DOWNSTREAM PRESSURE (psi)	THROUGH FLOW (gpm)
RV-1a	PRV-1	60.00	ACTIVATED	72.97	58.27	1064.85

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
R-1	0.01	
R-2	1099.99	

NET SYSTEM INFLOW = 1100.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 1100.00

***** HYDRAULIC ANALYSIS COMPLETED *****

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XIV
WELLHEAD PROTECTION PLAN

GARRISON ENGINEERING
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TOWN OF HAMILTON NEW WELL

WELLHEAD PROTECTION PLAN

PARTS I, II and III

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EXECUTIVE SUMMARY

Our overall impression of the Town of Hamilton's New Well and its wellhead protection area is that the well is in an excellent location and the likelihood of its being impacted in a negative way in the future appears extremely remote. Based on our review of past work and the work conducted for this report the following conclusions have been reached.

1. The aquifer in which the Town of Hamilton's New Well is completed is confined and under significantly high pressure. The balance of the wells studied in the local area are completed in the shallower water table aquifer.

2. Based on the area well logs, the ground water in the unconfined aquifer is moving in a south to southwest direction toward the Skagit River where it likely discharges. We believe the ground water in the confined aquifer is also moving in the same direction.

3. Recharge to the confined aquifer probably occurs at higher elevations north to northeast of the wellhead. Based on the driller's log the aquifer is composed of coarse gravel. The well appears to be a big producer based on a test pumping rate of 264 g.p.m. and a long-term specific capacity of 10.35.

4. Analysis of the ground water from samples taken following the 24-hour pumping test demonstrate the water supply is of high quality. The iron and manganese concentrations are above current Washington State Health Department standards but proposed treatment should resolve this problem.

5. We believe, based on our research, that the Town of Hamilton's New Well is situated in an ideal location. It is isolated from subdivision development, access is highly controlled, the well is completed in a confined aquifer, and its wellhead capture zones are in undeveloped forested lands. We believe that its rural and isolated setting will help to ensure the integrity of its water supply and to protect the aquifer quality.

TOWN OF HAMILTON WELLHEAD PROTECTION PLAN

INTRODUCTION

Wellhead Protection Requirements

The 1986 amendments under Section 1428 of the Federal Safe Drinking Water Act require that all states establish a Wellhead Protection Program (WHP). As of February 1997, 43 states and two territories have approved wellhead protection programs, leaving seven states out of compliance. Approved state plans differ in minor respects from each other, being tailored to each individual state's unique situations. All state plans are basically similar in nature and scope.

The WHP program established the first nationwide wellhead protection requirements for the purpose of protecting the ground water resources used for public water supplies from all potential anthropogenic threats. While previous federal programs tended to focus on individual contaminant sources, this program approaches the assessment and management of ground water quality from a more comprehensive perspective.

The WDOH program was officially adopted in July of 1994. In Washington State the Governor designated the Washington Department of Health (WDOH) as the lead agency for the WHP program.

Under the Washington state program all Group A public water systems in the state using wells or springs for their water source (excluding systems using purchased sources) are required to develop a Wellhead Protection Program. A Group A public water system meets the federal definition of a public water supply when it serves 15 or more residential connections, or serves 25 or more people per day during any two or more months of the year. The goal of Wellhead Protection is to prevent contamination of ground water used as a drinking water source. The strategy involves three main components, which this report addresses in turn:

- Part I: Delineation of Wellhead Protection Areas
- Part II: Inventory of Potential Contaminant Sources
- Part III: Management of Wellhead Protection Areas to Prevent Contamination

PURPOSE AND SCOPE

The purpose of the Washington State Wellhead Protection Program (WHP), as described before, is to identify potential contamination sources and prevent them from affecting the ground water used by Group A public water systems. A complete definition of a public water system is found in WAC 246-290-020.

Washington State Wellhead Protection Program

In the simplest terms, the basic goal of any WHP program is to prevent contamination of the ground water used by all Group A public water systems. The lead agency, the Washington State Department of Health, has as its goal protection of the ground water supply through the establishment of State Wellhead Protection programs (WHP) and local WHP committees and boards.

Under Washington State law the WHP program shall, at a minimum, include the following elements:

PART I:

- Prepare ground water contamination susceptibility assessment survey forms for each well.
- Determine the regional ground water movement direction for the aquifer utilized by the wellfield. Delineate the wellhead protection area for the wellfield or spring.

PART II:

- Conduct an inventory within the wellhead protection area of all potential sources of ground water contamination.
- Prepare a management plan to reduce the likelihood that potential contaminant sources will pollute or cause loss of the drinking water supply.

PART III:

- Prepare contingency plans for providing alternate sources of drinking water in the event that contamination or loss of the wellfield does occur.

METHODS OF INVESTIGATION

To delineate the Town of Hamilton's Wellhead Protection Area around its new well, a study was made of the regional area aquifers to evaluate general characteristics and determine ground water movement direction. The steps followed for this procedure are outlined as follows:

Scope of Activities

- Determine the geology and hydrogeology of the subject site and surrounding areas.
- Prepare base maps of the study area by assembling U.S. Geological Survey (USGS) 7.5 minute topographic base maps (see Figure No. 2). Acquire and plot the location of all wells available on file with the Washington Department of Ecology (WDOE) in Bellevue, Washington.
- The regional area for the study of the aquifer system used in this investigation covers approximately two square miles. The investigation was conducted in order to determine the nature of the local aquifer systems and in particular the aquifer supplying the Town of Hamilton's New Well site and the Wellhead Protection Area.
- Study and comment on previous studies directly related to the WHP site.
- Determine the geology for the local and regional area.
- Determine the general direction of the ground water movement.
- Using both the fixed radius and the analytical methods, determine the capture zones for the six-month, one-, five-, and ten-year times of ground water travel (capture zones) to the Town of Hamilton's new well.
- Findings and conclusions, along with appropriate maps and drawings, are presented in this Wellhead Protection Report.

BACKGROUND AND SETTING

Local Physical Setting for the Town of Hamilton's New Well

The Town of Hamilton's New Well is located approximately 1.5 miles north-northeast of the town of Hamilton in a remote and wooded area owned by Crown Pacific, with a headquarters office located at the western edge of Hamilton(see Figure No. 1). The Town of Hamilton's New Well was drilled between June 21 and 23, 1999 and is a replacement well involving a change in water rights. Documents related to the water rights is included in the Appendix of this report. A new ground water contamination susceptibility assessment survey form was completed and is found in the Appendix of this report. The original form was sent to the Washington Department of Health in Olympia.

The new well has a diameter of eight inches and was drilled to a total depth of 200.5 feet. The well was constructed with an eight-inch stainless steel, 60-slot, well screen. Details of the well construction will be discussed in more detail later in this report.

Local Land Use in the Surrounding Area

The Town of Hamilton's New Well is located in a rural, forested area controlled by Crown Pacific, a large wood products company. The town of Hamilton, the largest community in the area, lying on the north side of the Skagit River. Lyman, another small community, lies approximately 2.5 miles directly west of the town of Hamilton. State Route 20 parallels the Skagit River. To the north and within approximately 0.5 miles of the highway the area is subdivided into building lots (see Figure No. 1).

GEOLOGY AND HYDROGEOLOGY

General Geology of the Regional Area

The geology in the regional area around the wellhead protection site is the result of uplift over an extensive period of time from the mountain-building forces which have created the Cascade Range of Mountains stretching from Mt. Garibaldi in British Columbia down to Mt. Lawson in northern California. These geologic processes shaping the local landscape include volcanic activity all along the Cascade Range and recent events of the last Ice Age. The mountain valleys and lowlands of this region, including all of the Skagit River valley, were once covered by thick tongues of ice, in places a mile in thickness, originating from the Cascade range of mountains further east. As these ice sheets advanced, thick deposits of poorly sorted but well graded sediments called till were laid.

The thick ice sheets which filled the valleys began to melt and withdraw toward the Cascade Range about 10,000 years ago. As the ice melted, thick sediments were deposited in the present river valleys and particularly in the lowland areas. These glacial melt deposits, called glacial outwash, consisted primarily of unconsolidated gravels, sand and, to a lesser extent, silt and clay.

General Regional Hydrogeology

As a result of the sorting action and redeposition of the glacial sediments by the meltwater, pathways were created for the movement of ground water. Fair to excellent water-producing aquifers are found in the porous and permeable sands and gravels in the outwash deposits. Poorer producing aquifers may be found in the more silty, fine grained outwash deposits. Poor to only fair producing aquifers occur within the till-like deposits, which are usually hard and less permeable, and are often described as being similar in structure and composition to concrete.

Lying adjacent to these washed channel sediments are finer materials composed of silts or clays. These materials act as confining or semi-confining layers between aquifers, as impermeable layers producing perched aquifers, and as the lateral limits to aquifers called boundary conditions which can greatly affect an aquifer's capacity to store and transmit water.

Surface Streams

The Town of Hamilton's New Well is located upgradient of the Skagit River which lies approximately two miles south of the wellhead. The Skagit River drains a portion of the Cascade Range to the east flowing westward where it discharges into the Skagit Bay southwest of Mount Vernon (see Figure No. 1). Draining an area to the north of the site is Muddy Creek, which originates on the south slope of Mt. Josephine. Muddy Creek lies approximately 1,100 feet west of the Town of Hamilton's New Well and flows south-southwest, emptying into the Skagit River approximately 0.5 miles west of the Town of Hamilton. An unnamed creek some 800 feet east of the wellhead also flows to the south and empties into the Skagit River.

Regional Aquifer Types

The three types of aquifers in the regional area are outlined in the following paragraphs, and discussed in more detail later under the heading Discussion of Aquifers in the Regional and Local Areas.

1. Perched aquifers

Perched aquifers may be distributed over large areas in glacial terrains and may or may not be interconnected. Perched aquifers are shallow and are generally recharged by direct precipitation; they are more subject to static water level fluctuations and may go dry during periods of low moisture.

2. Water Table Aquifers

The water table aquifer in the Hamilton area appears to be widespread and consistent in occurrence. The water table aquifer is at atmospheric pressure and does not rise in the sealed casing of a well.

3. Confined Aquifers

Because of the geology of the region, this type of aquifer is common. Generally confined aquifers lie deep and are under greater than atmospheric pressure. These aquifers may or may not be in direct hydraulic continuity with the Skagit River. Confined aquifers are much less likely to be influenced by surface activities and contamination which may impact shallower water table or perched aquifers.

Site Specific Hydrogeology

As described before, the Town of Hamilton's New Well is completed in a confined aquifer lying approximately 90 feet below the water table aquifer. Directly above the confined aquifer is according to the driller's well log a mixture of clay and gravel. Aquifer testing has shown this layer allows leakage across it. The full thickness of the confined aquifer is unknown, as the driller completed the well within the aquifer at a depth of 200.5 feet. At a minimum, the thickness of the confined aquifer under the Town of Hamilton's New Well site is approximately 19.5 feet.

Regional Water Wells and Determination of Ground Water Movement Directions

All available water well logs of wells located within a two-square mile area of the Town of Hamilton's New Well were obtained from the Washington Department of Ecology. From these well logs, those having sufficient data such as accurate locations and well information were utilized for this study. Each water well was plotted on the USGS 7.5-minute topographic base map from the Township, Range and Quarter-Quarter Section coordinates listed on the individual well logs. Based on the plotted location of the well on

the topographic base map, a surface elevation for each well was estimated and a static water elevation was determined. A contour map was created to establish the direction of ground water movement. This information is plotted topographic maps and are found the Appendix of this report. It can be seen by inspection that the ground water in the aquifer formation is moving toward the Skagit River in a southwest to south direction.

General Hydrogeology

Fair to excellent water-producing aquifers are found in the porous and permeable sands and gravels of the glacial outwash deposits. Poorer producing aquifers may be found in the more silty, fine-grained outwash deposits. The fine sand, silt and clay deposits often serve as the confining to semi-confining layers separating the various aquifers. Poor to only fair producing aquifers occur within the till-like deposits, which are usually less permeable and hard.

Recharge of the upper aquifers, including any perched aquifers and the water table aquifer, is accomplished by direct infiltration of precipitation into the sediments and then vertical migration downward to the water table. The ground water generally moves downslope into the valley, eventually discharging into the Skagit River.

Local Aquifers

A search was made in the files of the Washington Department of Ecology for all available well logs in Township 35N, Range 6E, Section 12 (where the Town of Hamilton's New Well was drilled). Also checked were sections 11 (where 20 reports were found), Sections 12 and 06 had no water well logs reported.

Based on the data from these well logs and hydrogeololgic reports done in the local area which includes the Town of Hamilton's New Well, there are three types of aquifers in the regional area: 1) perched aquifers which overlie the regional water table aquifer; 2) the water table aquifer, which is at atmospheric pressure; and 3) the deeper confined aquifers which are usually under high hydrostatic pressure.

Based on information in the driller's water well log for the new well, the primary component of the confined aquifer is gravel and coarse sand. According to the log the deep aquifer was first encountered at a depth of 181 feet and is at least 19.5 feet thick. The final static water level was measured in the well at a depth of 83.3 feet, indicating the aquifer is confined and under significant hydrostatic pressure. The nature of the aquifer will be discussed in more detail later in this report. Data from the available water well logs is presented in Table No. 2, and copies of the logs are presented in the Appendix of this report.

Discussion of Aquifers in the Regional and Local Areas

Based on the data abstracted from 18 area water well logs collected from the Washington Department of Ecology, three general categories of aquifers were identified: perched aquifers in two wells), unconfined or water table aquifer (18 wells) and one well that penetrated a deeper confined aquifer the Town of Hamilton's New Well. Several of these wells, penetrated more than one type of aquifer. The different types of aquifers are discussed as follows:

1. Perched Aquifers

These shallow aquifers are commonly found in glacial-type sediments, particularly in outwash conditions where the strong sorting action of the meltwater sized or graded the sediments in layers according to particle size. Stronger currents deposited sands and gravels, while weaker, less energetic currents left finer sands or silts. Layers of fine materials such as clay and silt between the coarser materials act as barriers to the vertical or horizontal movement of ground water. Layers of fine sediment above the water table can result in the ground water becoming perched. Perched aquifers may be distributed over large areas in glacial terrains and may or may not be interconnected. Perched aquifers are shallow and are generally recharged by direct precipitation in the local area. They are more subject to static water level fluctuation and are prone to drying up during periods of low moisture.

2. Water Table Aquifer

The water table aquifer is a regional aquifer and appears to be widespread and consistent in occurrence. Water in the wells where it occurs is at atmospheric pressure, so the water level does not rise inside the well casing. The water table aquifer is recharged by moisture from the local and surrounding area. Elevation measurements taken on the top of the water table aquifer from 18 area well logs indicate that the general direction of ground water movement is toward the Skagit River. The wells completed in the water table aquifer tend to be of lower yield but provide sufficient quantities for individual households.

3. Confined Aquifers

Below the water table aquifer formation are found other deeper, confined aquifers. This is the type of aquifer in which the Town of Hamilton's New Well is completed. These confined aquifers are generally under significant hydrostatic pressure, causing the water levels inside the well casing to rise to an elevation equal to the hydrostatic pressure of the

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aquifer. These aquifers may or may not be in direct hydraulic continuity with the Skagit River. Confined aquifers are usually characterized by one or more unique features:

A) Confined aquifers are overlain by an impermeable to semi-impermeable layer of geological sediments generally composed of clay, silt, very fine sand, or a combination of such materials.

B) The recharge areas for confined aquifers are generally located at higher elevations outside the local area.

C) Ground water in confined aquifers is generally older than that in shallower aquifers and therefore may be in contact with local water-bearing formations for a longer period of time. This interaction may result in higher concentrations of dissolved compounds than that in the water table and perched aquifers.

D) Confined aquifers are much less likely to be influenced by the surface activities and contamination which may impact shallower water table or perched aquifers. Dilution and attenuation also provide a certain amount of buffering.

Comparison of the characteristics of unconfined aquifers and confined aquifers is presented in Table No. 1 following.

Table No. 1 CHARACTERISTICS OF MAJOR AQUIFER TYPES

AQUIFER CHARACTERISTICS	UNCONFINED AQUIFERS (WATER TABLE AND PERCHED)	CONFINED AQUIFERS
AQUIFER PRESSURIZATION	Atmospheric	Higher than Atmospheric
AQUIFER RECHARGE	Locally and Regionally	Outside Local Region at Higher Elevations
AGE OF GROUND WATER RESOURCE	Tends to Be Younger	Tends to Be Older
DISSOLVED MINERALS IN THE GROUND WATER	Less Time for Mineralization to Occur	Greater Time for Mineralization to Occur

AQUIFER CHARACTERISTICS	UNCONFINED AQUIFERS (WATER TABLE AND PERCHED)	CONFINED AQUIFERS
SUSCEPTIBILITY TO LOCAL SURFACE CONTAMINATION	More Susceptible	Less Susceptible

PREPARATION OF LOCAL DATA BASE

Local Water Wells

As mentioned before, 18 well logs were collected from the Washington Department of Ecology. The well logs utilized for this study are summarized in table form and copies of all well logs are included in the Appendix of this report. Results of the search show that the existing domestic wells have all been completed in the shallower water table aquifer which underlies most of the area south of subject site. The summarized well information is presented in Table No. 2.

Table No. 2. WATER WELLS IN THE AREA
(ALL VALUES PRESENTED IN FEET)

NAME on WELL LOG (Date Drilled)	Total Depth of Well	Static Water Level	Screened Interval	Well Tested (gpm)	Aquifer Depths	Comments
TOWN OF HAMILTON'S NEW WELL (June 1999)	*200.5*	*83.3*	*185.5-200.5*	*220*	*68-90 ▢ 135-152 ▼ 168-170 ◆ 181-200.5 ◆*	*12-1*
D. Guffie (May 1993)	51	34	None	30	40-51 ▼	11-1
D. Ammons (Feb 1982)	100.5	57	None	20	94-100.5 ▼	11-2
C. Adams (Oct 1976)	90	60	None	10	67-69 ▼	11-3
B. Melton (June 1992)	60	46	None	30	51-60 ▼	11-4

NAME on WELL LOG (Date Drilled)	Total Depth of Well	Static Water Level	Screened Interval	Well Tested (gpm)	Aquifer Depths	Comments
D. Moody (March 1981)	86	74	None	15	81-86 ▼	11-5
K. Michaels (Feb 1994)	54	27	None	10	46-54 ▼	11-6
Baptist Church (April 1975)	49	37	None	20	42-48 ▼	11-7
G. Puhrow (July 1974)	88	67	82.5-87.5	10	70-88 ▼	11-8
W. Self (June 1979)	80	64	None	10	70-80 ▼	11-9
H. Hayes (March 1980)	89	71	84-89	20	84-89 ▼	11-10
L. Hornbeck (May 1991)	62	42	None	30	42-62 ▼	11-11
B. Kinney (Oct 1979)	80	60	None	20	74-80 ▼	11-12
Fire District 8 (Feb 1993)	37.6	22.6	32.6-37.6	30	20.6-37.6 ▼	11-13
V. Schryer (Nov 1990)	80	57	None	20	75-80 ▼	11-14
C. N. Self (Feb 1979)	60	36	None	20	52-60 ▼	11-15
D. Woody (June 1979)	72	44	67-72	16	58-72 ▼	11-16
R. Blanton (Jan 1973)	65	63	None	15	43-44 ❑ 56-63 ▼	11-17

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NOTES: ❑= Perched Aquifer ◆= Confined Aquifer ▼= Upper Aquifer.

Ground Water Movement Direction

The general direction of ground water movement for the water table aquifer (upper aquifer) was obtained by estimating the surface and static water elevations in each of the water well

logs. The elevation data was read directly from the topographic base map after the wells were plotted. From this information a contour map of the water elevations was constructed. Based on this information it is shown that the ground water moves in a general direction toward the Skagit River (see Drawing No. 2 in the Appendix).

In the confined aquifer where the Town of Hamilton's New Well is completed there is only one known well. Since it requires a minimum of three wells to establish ground water movement direction, the actual ground water movement direction can only be estimated. We believe this confined aquifer is moving in approximately the same direction as the water table aquifer. Further these two aquifers may merge further down gradient.

Physical Setting for the Town of Hamilton's New Well

The Town of Hamilton's New Well is sited in a rural area north of Hamilton. Access to the wellhead is via a dirt road whose entrance is controlled by a very sturdy steel barrier and locked gate. Recent logging activity has been conducted around the area and in particular south of the new well. The pumping and observation wells lie along the north side of the dirt road at the southwest corner of a five-acre lot. Future plans for the water system include the construction of a 250,000 gallon and a 500,000 gallon reservoir. In addition there will be a chlorination system, a manganese treatment system and a backup power supply for the wellhead.

Water from the reservoirs will be piped 2,600 feet south to the town of Hamilton via a 12-inch PVC pipe. The current well serves the community of homes and business within the town of Hamilton. Future development will include the Hamilton town area, with 195 connections, plus the Centennial Annexation with 133 connections for a total of 328 connections at 800 gallons per day g.p.d.). The Crown Pacific demand of 78 g.p.m. brings the total required pumping rate for the new well up to 260 g.p.m. Water right documents from the Department of Ecology are included in the appendix of this report.

Description of the new Town of Hamilton Well Source

The Town of Hamilton's New Well was drilled in June 1999 by Dahlman Pump and Well Drilling of Bow, Washington. The well was constructed of 8-inch diameter steel casing and was drilled to a total depth of 200.5 feet, with a 60-slot well screen set for a length of 15 feet, from 185.5 to 200.5 feet. According to the driller's well log a surface seal was installed from 0 down to 18 feet. The static water level recorded at 83.3 feet. Well information is summarized in Table No. 3.

Table No. 3. TOWN OF HAMILTON'S NEW WELL

DATE DRILLED	SCREENED INTERVAL (feet)	SLOT SIZE	TOTAL DEPTH (feet)	ELEVATION AT TOP OF CASING (feet)	MINIMUM AQUIFER THICKNESS	STATIC W.L. 08-23-1999 FROM TOC
1999	185.5-200.5	60	200.5	255.23	19.5	83.3

Explanation:

W.L. = Water Level in the well
19.5 = Lengths in Feet
ELEV.= Elevation as measured from TOC
TOC = Top Of Casing

TESTING OF THE NEW WELL

Background

The new well was tested by Associated Earth Sciences, Inc. Testing consisted of a series of four step-drawdown tests on June 29, 1999 followed by a 24-hour pumping test and ending with a recovery test lasting approximately 13 hours. Each test will be discussed briefly in the following paragraphs.

Step-Drawdown Tests

The new well was pumped at four increasing pumping rates of 109, 175, 233, and 321 feet. Based on the measured drawdowns in the pumping well it was determined that the Specific Capacities of the four steps were 18.8, 15.9, 14.5 and 13.3 (gallons per minute per foot of drawdown: g.p.m./ft). It was further determined by Associated Earth Sciences, Inc. that the well had a six-month Specific Capacity of 10.35 g.p.m./ft. Draft copies of the drawdown plots are included in the appendix of this report.

24-Hour Pumping Test

At approximately 2:44 pm on the same day (June 29, 1999) a 24-hour pumping test was begun on the new well. The well was pumped at a constant rate of 220 g.p.m. Barometric pressure monitoring data shows a high at approximately 800 minutes into the test. Water level readings were collected using a pressure transducer and data logger and plots of the data were made on log-log and semi-log graph scales.

Recovery Test

The 24-hour pumping test was followed by a 13-hour recovery test in which the water level in the well was allowed to recover to its original static water level. The aquifer coefficients are shown in Table No. 4 which follows.

Table No. 4. AQUIFER COEFFICIENTS

Type of Test	Pumping Rates	Drawdowns	Coefficients	
Step-Drawdown	1) 109 g.p.m. 2) 175 g.p.m. 3) 233 g.p.m. 4) 321 g.p.m.	1) 5.81 feet 2) 11.04 feet 3) 14.5 feet 4) 13.3 feet	1) 18.8 g.p.m./ft 2) 15.9 g.p.m./ft 3) 14.5 g.p.m./ft 4) 13.3 g.p.m./ft	
24-Hour Test: 1) Semi-Log Plot 2) Log-Log Plot	1) 264 g.p.m. 2) 264 g.p.m.	Δs = 2.3 feet	T = 2.30 ft^2/min T = 2.13 ft^2/min	S = 2.5 x 10^{-5} S = 4.4 x 10^{-5}
13-Hour Recovery	---		T = 2.0 ft^2/min	

Explanation: T = Transmissivity S = Storativity

Conclusions Based on the Well Tests

The new well has an average storativity value of 3.4 x 10^{-5} as determined by Associated Earth Sciences, Inc. From this information it is clear that the aquifer from which the new well is drawing is confined and under significantly high hydrostatic pressure. The well is also clearly capable of meeting the current and projected future needs of the Hamilton Community.

WATER QUALITY FOR THE TOWN OF HAMILTON'S NEW WELL

Water samples collected following the 24-hour pumping test were analyzed by Edge Analytical for primary and secondary inorganics, organic compounds and bacteria testing.

The results of these tests are presented in the reports from the lab in the appendix of this report and summarized in Table No. 5. The table presents the MCLs (the Maximum

Contaminant Level allowed). MCL values followed by a small (p) indicate this is a primary drinking water standard. Those values listed without the (p) indicate a secondary drinking water standard.

Table No. 5. INORGANIC WATER QUALITY ANALYSIS

ANALYTE	MCL	RESULTS (7-20-1999)
Antimony (p)	0.006 mg/L	ND
Arsenic (p)	0.05 mg/L	ND
Barium (p)	2 mg/L	ND
Beryllium	0.004	ND
Cadmium (p)	0.005 mg/L	ND
Chromium (p)	0.1 mg/L	ND
Cyanide (p)	0.2 mg/L	ND
Fluoride (p)	4 mg/L	ND
Iron	0.3 mg/L	0.05 mg/L
Lead (p)	0.015 mg/L	ND
Manganese (S)	0.05 mg/L	0.077 mg/L
Mercury (p)	0.002 mg/L	ND
Nickel	0.1 mg/L	ND
Selenium (p)	0.05 mg/L	ND
Silver	0.05 mg/L	ND
Sodium	20 mg/L	ND
Thallium	0.002 mg/L	ND
Hardness	mg CaCo3/L	95.1 mg/L
Conductivity	700 uMicromhos/cm @ 25°C	187 Micromhos/cm @ 25° C
Turbidity (p)	1.0 NTU	ND
Color	15.0 Color Units	ND
Nitrate-N (p)	10 mg/L	ND
Nitrite-N (p)	1.0 mg/L	ND
Chloride (S)	250 mg/L	ND
Sulfate (S)	250 mg/L	ND
Copper	1.3 mg/L	ND

ANALYTE	[illegible]	RESULT (mg/L)
[illegible]	[illegible]	ND

ND = Indicates the compound was not detected above the specified reporting limit

Discussion of Results of Inorganic Compounds Testing

Results of the Inorganic Testing showed only two analytes, iron and manganese, above the EPA Regulated (Secondary) standards. The presence of high iron and manganese levels are not untypical for groundwater in the Pacific northwest area due to the prevalence of these elements in the volcanic rocks of this region. Of the State Regulated and State Unregulated analytes only hardness was above the standard.

Organic Compounds Testing

Water samples were also collected and tested for 23 Regulated Compounds, 31 Unregulated Compounds and four Trihalomethanes. Results of these water sample tests showed no organic compounds detected (ND = Not Detected) above the specified reporting limit. The data sheets are included in the Appendix of this report.

PART I

CAPTURE ZONE DELINEATION

Actual vs Theoretical Demand

As described earlier in this report, the Town of Hamilton's New Well currently provides water to the Hamilton Community. Future needs will include the Crown Pacific site and a new development called the Centennial Annexation. The present well serving the community is located in the flood plain of the Skagit River near the Hamilton Slough. An application for change in *point of withdrawal* of this water right has a priority date of February 29, 1996. The Town of Hamilton has a certificate of water right for their existing well of 70 g.p.m. instantaneous withdrawal and an annual quantity of 65.86 acre-feet with a priority date of March 11, 1982. A transfer of the existing 70-g.p.m. water right for the town well to the new production well has been requested. Additional transfers and/or new water rights will also be requested for a maximum instantaneous yield of 260 g.p.m. and an annual discharge of 273 acre-feet (169 g.p.m.) to support future growth and economic development. For these capture zone delineation calculations a pumping rate of 169 g.p.m. was used.

WELLHEAD PROTECTION AREA CAPTURE ZONES
(6-MONTH, 1-, 5-, AND 10-YEAR TIMES OF GROUND WATER TRAVEL)

Determination of the Half-, One-, Five- and Ten-Year Times of Travel for Capture Zones for the Town of Hamilton's New Well

Four methods are recognized by the WDOH for delineating the capture zones around a well or wellfield. These replace the earlier method which used an arbitrary fixed radius such as 100-foot setbacks from a property line, roadway, etc. These methods differ in complexity and degree of sophistication and therefore in costs, as well as in terms of the amount and quality of basic geologic and hydrogeologic information required for use. The four methods are listed below in order of increasing technical sophistication and expense, and each method will be discussed briefly:

1) Calculated Fixed Radius
2) Analytical Models

3) Hydrogeological Mapping
4) Numerical Flow/Transport Models

1) The Calculated Fixed Radius Method is the least sophisticated and requires the least amount of hydrogeologic information to utilize. The method draws a circular protection area around the wellfield for a specified time of travel or capture zone: i.e., 6-month, 1-, 5-, and 10-year times of ground water travel. With this method a simple volumetric flow equation is used to calculate the radius of the generalized capture area around the well.

The fixed radius circles may also be determined using tables found in the Wellhead Protection Program Guidance Document (DOH Publication # 331-018). In either case the calculations yield the area of an undifferentiated fixed radius around the wellfield.

2) The Analytical Method involves more complex mathematical calculations and graphical methods to delineate the WHP zones. The contribution of each capture zone area is derived based on computerized ground water flow models which take into account the actual aquifer materials and hydrogeology of the specific site.

3) Hydrogeologic Mapping Method is loosely defined by the EPA and often required to characterize aquifer properties, determine ground water movement directions and to locate aquifer boundaries. This method is frequently used when the aquifer recharge area is vulnerable and when it might be desirable to control activities in this specific area. Hydrogeologic mapping is usually a prelude to constructing the more complex numerical model method described next.

4) Numerical Model Method is used when larger and more complex water associations may require delineation of their ground water supply using a computer model that numerically approximates ground water movement and/or solute transport equations. These models are generally recognized as the technically superior means to delineate wellhead zones of contribution, if sufficient data can be assembled. Numerical flow models generally are expensive to develop and test and are used only for large municipal systems.

Methods Used for This Report

Two methods were used for this Town of Hamilton's Wellhead Protection plan. The first method, the Calculated Fixed Radius Method, though rapid and easy to verify, is not as definitive as the more technical and accurate computer-aided Analytical Method. Both methods were used in this report and are presented together as a comparison in Figure No. 5.

The Calculated Fixed Radius Method

This method is simple and direct. For this method the areas were determined by utilizing the simple Department of Health equation. A state-supplied set of tables could also have been used. The formula, presented below, states that the radius of the individual capture zones are equal to the square root of the yearly pumped quantity of ground water multiplied by the time in years divided by π times the porosity of the aquifer, multiplied by the length of the well screen. The values required for the formula are described in more detail below:

Explanation

$$r = \sqrt{\frac{Qt}{\pi nH}}$$

r is the radius or distance of the concentric circles around the well which represent the given travel time to the well. For this report the radii were calculated for the 6-month, 1-, 5- and 10-year times of travel.

Q is the total yearly pumping volume of the new well based on a yearly total of 88,970,700 gallons was used.

t is the travel time of the ground water to the well, calculated for 6 months, 1, 5, and 10 years.

n is the porosity of the aquifer. The Health Department uses an average value of 22 percent for all aquifers. A value of 25 percent is considered conservative for a gravelly aquifer. The actual porosity for this aquifer may even be higher.

H is the open interval or length of the well screen. As reported on the driller's well log, the well screen length is 10 feet long for well.

The calculated values are based on the following assumptions:

1) The production wellfield consists of one well.

2) For this wellhead protection study the well productivity was calculated for a demand based on a pumping rate of projected full buildout, including the new subdivision and the needs of Crown Pacific, for a daily demand of 243,360 gallons. This is equivalent to 32,537 cubic feet per day, or 88,826,400 gallons per year, or 11,876,005 ft³ per year.

Utilizing the Department of Health's calculated fixed radius formula the Town of Hamilton's wellhead protection area circles (times of travel zones) were drawn around the single well and are presented in Figure No. 3. Table No. 6 presents the actual values obtained.

Table No. 6
GROUND WATER TRAVEL TIMES BASED ON THE FIXED RADIUS EQUATION

AVERAGE YEARLY PUMPING VOLUME	AVERAGE CUBIC FEET PER YEAR	TIMES OF TRAVEL TO WELLHEAD (Radius in Feet for Each Circle)			
		6 MONTHS	1 YEAR	5 YEARS	10 YEARS
88,826,400 gallons per year	11,876,005 ft^3 per year	869'	1,229'	2,749'	3,888'

Drawing Showing Location of Circular Travel Times to Wellhead

A drawing has been prepared showing the concentric wellhead protection circles around the Town of Hamilton's New Well. These circles are based on the formula and give only a rough approximation of the area actually being affected by the pumping of the well (see Figure No. 3). The concentric circles have been shown with the more accurate analytical method shown in Figure No. 5.

2) The Analytical Method

In order to use the analytical method certain basic geologic and hydrogeologic properties must be known about the aquifer: The sources for this data is briefly summarized below:

1. Determining the general direction of ground water movement in the aquifer. This was accomplished by plotting the area well logs, estimating surface elevations and converting the static water levels to elevations. Constructing a subsurface structure map drawn on the top of the static water level of the aquifer.

2. Estimating the aquifer coefficients such as aquifer thickness, hydraulic gradient, aquifer porosity and angle of ambient flow.

3. Conducting field tests (pumping tests) to determine the transmissivity, storativity and specific capacity of the new well.

For this report a computer program was utilized for determining the WHP capture zones for the 6-month, 1 year, 5-year and 10-year times of travel to the wellhead. The program is named *the modular semi-analytical model Version 2.0* was developed for the United

States Environmental Protection Agency (USEPA) and distributed by the International Ground Water Modeling Center in Golden, Colorado. The coefficients used for the computer program are presented in the following table.

Table No. 7. AQUIFER PARAMETERS BASED ON 24-HOUR PUMPING TESTS AT A CONSTANT PUMPING RATE OF 169 G.P.M.

For the analytical model calculations for determining the computer-derived capture zones the following data was input into the data base:

PARAMETER	VALUE
Well Discharge Rate	8,247 Ft^3/day
Calculated Transmissivity	3,189 ft^2/day
Hydraulic Gradient	0.02
Angle of Ambient Flow	180°
Estimated Aquifer Porosity	0.25
Estimated Aquifer Thickness	19.5 feet

These capture zones have been plotted on a USGS 7.5-minute topographic base map (see Figure No. 4). The capture zone areas determined using the analytical method extend north-northeastward upgradient of the Town of Hamilton's wellfield. Ground water movement was estimated based on the general direction of ground water movement in the upper or water table aquifer. The analytical method presents a mathematical approximation of actual conditions. This model assumes uniform geology and aquifer conditions with no discontinuity or hydraulic boundary conditions. The actual situation can be highly variable due to boundary conditions and nonconformities of the actual aquifer materials encountered at the site. The analytical method, however, produces a useful approximation based on actual direction of ground water movement and the pumping rate of the aquifer, and is an important tool for wellhead protection decisions. For convenience and comparison, the calculated fixed radius model circles drawn around the wellhead, using the Department of Health fixed radius formula discussed earlier, have been superimposed on the same base maps at the appropriate scales (see Figure No. 5 for comparison).

PART II INVENTORY

POTENTIAL CONTAMINATION SOURCES WITHIN THE WELLHEAD PROTECTION AREAS

Ground Water as a Source of Supply

Ground water is the drinking water source for an estimated 65 percent of citizens in the State of Washington. In many of the rural areas that value is much higher, approaching 100 percent in places such as the Town of Hamilton. Common wisdom in the past held that soils and their biological communities provided an adequate natural filtration system for removing contaminants before they reached the aquifer. This is probably a gross oversimplification of actual conditions. Natural filtration capabilities of soils may not be adequate to cope with complex, present-day chemical compounds. Ground water can also become contaminated as it passes through soils. Removal of contamination by natural processes is time consuming, can be affected by surface activities and events, and can require years or centuries to accomplish, particularly in the case of man-made chemicals and substances.

Natural contamination of ground water can occur when factors such as pH combine with the length of contact with the surrounding aquifer materials to leach out ions from natural sediments. This natural leaching action accounts for the often high levels of certain dissolved metals such as manganese and iron in our ground water.

Ground water contamination can also occur from man-made (anthropogenic) sources such as household chemicals, improper application or disposal of fertilizers, herbicides, other poisons, and animal and human waste. This can be an acute problem in rural agricultural and farming areas. Unexpected contamination from some poor practices involving chemical handling have the potential of occurring quickly and with quite devastating consequences to an aquifer and the water wells it serves.

Unexpected events which have at least the potential for impact on the Town of Hamilton's New Well could include such unrelated situations as a chemical or fuel spill upgradient of the well or the application or misapplication of chemicals in areas that lie within the capture zones of the wellhead protection area.

Because the Town of Hamilton's New Well is located in a very rural area with no septic systems nearby, the risk of bacteria or elevated nitrates and/or chlorides is remote. Chemical analysis of the water samples submitted following the 24-hour pumping test show that currently there is no nitrate or chloride problem, and none is reasonably expected.

Area Land Use

The area near the well and in particular the capture zones for the Town of Hamilton's New Well is decidedly rural in nature. The area where the well capture zones lie consists of woodlands composed of second- or third-growth stands of timber. Development is very sparse in this zone. Upgradient of the Town of Hamilton's New Well there is no industrialization or farming activities. The only significant activity is logging on the lands controlled by Crown Pacific.

GENERAL DISCUSSION OF THE CAPTURE ZONES

The Washington Department of Health has outlined protection zones based on established times of ground water travel to the wellhead. Each management zone in the wellhead protection area corresponds to an established time of travel of ground water in a given aquifer to the pumping well. Within any given aquifer the degree and amount of moisture infiltration, either by direct precipitation or by infiltration from a more distant collection point as is the case with this confined aquifer, is variable. Other factors that may contribute are the topography, slope of the land surface, local drainage, location and size of creeks, rivers, lakes and ponds, soil types, geology and the nature of the land surface activities. Generally it is very difficult to estimate and predict the influence of infiltration, particularly in a confined aquifer such as that which serves the Town of Hamilton's New Well.

Control Zones Around the Well

The Department of Health has set up several control zones around public water supply wells. Normally the first zone is often referred to as the Sanitary Control Area a protective area required by WAC 246-290-135. This area consisting of about a 100 foot radius circle around the wellhead is tightly controlled by the public water supply to minimize any direct contamination to the wellhead. The Sanitary Control Area is generally controlled by the erection of a lockable wellhouse to prevent unauthorized access to the well. The area around the wellhouse and water silos is often fenced with access limited via a locked gate. This helps protect wells from vandalism or any other direct introduction of contaminants.

Under the wellhead protection law three zones have been set up which further define the rationale and levels of control. As discussed in the last section of this report, the boundaries of the circles or capture zones can be determined by a drawing a series of concentric circles on a base map usually for the 6-month, 1-, 5- and 10-year times of travel drawn around the wellhead. These concentric circles are derived using simple tables or from a formula which was also discussed earlier in this report. The more accurate and

more meaningful method is by calculating the capture zones using a computer program designed to determine these values taking take into account such factors as actual ground water movement direction, aquifer materials, and aquifer properties The rationale behind the capture zones will be discussed in the following paragraphs.

ZONE 1 (Six-Month and One-Year Capture Zones)

The critical area of greatest susceptibility for wellhead protection occurs within the half- and one-year times of travel into the wellhead. Again, this zone is defined by the surface area overlying the portion of the aquifer which contributes ground water to the well within a one-year period. Within this Zone 1, microbial or viral organisms may live long enough to contaminate the ground water and the well water. Any source of these contaminates must be carefully managed or eliminated in this critical Zone 1.

Also, chemicals within Zone 1 may have a short time for cleanup and may have insufficient time to become attenuated or diluted. Within Zone 1 chemicals capable of contaminating ground water should be stored and used only with sufficient precautions to protect the ground water resource.

The potential concerns for contamination within Zone 1 are summarized as follows:

1) Bacterial (microbial) and viral contaminants may live in the soils and travel down to the ground water zone for up to a year.

2) The time line for physically cleaning up contaminants in proximity to the wellhead would be very brief or insufficient to prevent contamination from moving into the well screen.

3) Because of the brief travel time to the wellhead, the risks in the six-month and one-year time-of-travel zone can include such factors as direct chemical contamination.

4) Once a contaminant reaches the aquifer, there may be insufficient time for it to become diluted by contact with water in the aquifer or to react to elements in the soils, or for elements in the aquifer to render it harmless.

ZONE 2 (5-Year Time of Travel)

The area within the 5-year time of travel should be actively managed for control of potential chemical contaminants. Chemical contaminants traveling within the five-year zone may undergo so much alteration, attenuation and dilution before reaching the wellhead that they would be thereby rendered harmless. In any case the time period for cleaning up contaminants within the five-year capture zones may be sufficient to mitigate the effects

of any spill or other contamination event. Generally speaking, the further away from the well a contamination event occurs, the more time there is to react and remediate the problem.

ZONE 3 (10-Year Time of Travel)

Within this area there is sufficient time to meditate or remediate potential contaminant sources. Sources should be inventoried. Any high risk operations and facilities should be identified and steps taken to reduce contaminant loading. A primary purpose of Zone 3 is to encourage decision makers and planners to recognize the long-term source of the drinking water supplying community water systems.

WINDSHIELD SURVEY

A windshield survey was conducted of the Town of Hamilton's New Well site and surrounding areas, encompassing approximately two square miles, on September 3, 1999 by Northwest HydroGeo Consultants. The windshield survey consisted of driving all the roadways in the area within the Town of Hamilton's New Well WHP zone and contiguous surrounding areas (see Figures No. 1 and 2).

Observations

Then new water well for the Town of Hamilton is located off Medford Road east on an unnamed gravel and dirt access road guarded by a large red barrier gate (see Photo No. 1 following the text of this report). We obtained the key to the padlock from the main office of Crown Pacific just outside the Town of Hamilton prior to our site visit. The locking device is set up so a number of various padlocks may be installed and the gate opened by any authorized person.

Leaving the residential area, we noted the last houses, numbered 7596 and 7611, at the curve where Medford Road begins its ascent. Medford Road leads upward in elevation to the wellsite access road, which forks off Medford Road. At the fork the gravel and dirt wellsite access road is marked with a sign reading: "Primitive Road: No Warning Signs."

The wellsite itself is perhaps a quarter of a mile from the fork of Medford Road and the access road. There are two wells at this location: an observation well, which is labeled TBM 105B on top and TBM 105C on the 6-inch PVC casing; and the production well itself, measured at exactly 47 feet to the east, which is labeled TBM 105A on the 8-inch PVC

casing. Elevations of the wells are not noted on the casings but are reported by Wilson Engineering to be: 256.94 feet for the 6-inch observation well and 255.23 feet for the 8-inch production well. The well casings protrude from the surface of the ground about 18 inches. Currently, the well casings have no protective wellhouse, fences or barriers to prevent logging traffic from running into them. The Town of Hamilton plans in the near future to construct both a wellhouse and a locked fence as protection for the wellhead.

The production well, as noted, has 8-inch casing installed. A 1-inch trimmie pipe leads down to the water level. The pump is installed in place in a temporary setting. A discharge pipe with a valve is set up for samples only. There is also a regular discharge pipe which is blocked off at this time. The well tag for the production well reads AEN 137. Exactly 47 feet to the west of the production well is the observation well, with a 6-inch casing and a well tag reading AEN 136.

Both wells are located on the north side of the graveled area. On the south side of the graveled area there has been substantial logging activity in the past couple of months: a sizeable area has been cleared and there are large slash piles and stacked log debris. Surrounding the site are mostly deciduous trees which appear to be mature second and third growth.

Leaving the wellsite, we turned north onto the road which has now become an oil-and-gravel logging road. Along this road are young trees, mostly evergreens. This is part of the Crown Pacific tree farm. We came to Medford Road, which leads to an area marked "State of Washington Department of Natural Resources: Harry Osborne State Forest." The sign further states: "This forest was originally logged in the 1920s and 1920s. With intensive management today it is providing wildlife and fisheries habitat, recreation opportunities and second growth timber management in a multiple use setting. Revenues generated from the timber sales benefit Skagit County and the K-12 school construction fund." There is a small camping trailer here and a picnic area with shelter.

We continued down this very wide graveled road and came to a fork in the park, near the old gravel pit. Taking the left fork, we drove down a more narrow road. At the bottom of the elevation gradient we came to an unnamed creek crossed by a concrete bridge built in 1982. Traveling up the other side of the road, we began to gain in elevation. Past the intersection where the dirt road leads back to the wellsite, the entrance road going south dips steeply to the south. To the left the road is a pretty good dip off to the east.

Back on Medford Road, we headed out of the forested area and back towards the town: Some of the trailers, which are permanently mounted, have above-ground tanks for fuel

oil heating. These homes are powered with electricity. Most of these residential areas appear built on plots of less than 5 acres. In addition to the mounted trailers there are also single-story homes, most of which are wood frame. These homes are all served by individual water wells. Many have well houses; others have only the bare casing sticking up out of the ground.

Medford Road crosses Muddy Creek approximately 300 feet from the intersection of Hamilton Cemetery Road (the paved road leading into Hamilton). The houses here are typical residential wood frame, mostly single-story and some converted mobile homes. We crossed over what looks like a fairly extensive little lake, which is in fact the old slough.

Study of Aerial Photographs

Two aerial photographs were studied for this report. Both were supplied by Crown Pacific and both were flown on July 23, 1998. The well site has been mark on southern photo. By inspection it can be seen the area is very remote and unpopulated. Copies of these aerial photographs are included in the appendix of this report.

OTHER POTENTIAL HAZARDS WITHIN THE HAMILTON WELLHEAD PROTECTION AREA

Manmade Hazards

There are no major potential manmade hazards to the Town of Hamilton's New Well. Some of the potential manmade hazards, although small, are:

A) Vandalism in which unauthorized access is gained to the wellhead and harm done to the aquifer by introducing a foreign substance, chemicals or explosive materials down the well casing, resulting in damage to the pump and distribution system as well as potentially to the aquifer itself. The Town of Hamilton's New Well is located in a remote, wooded area known by very few people. Access to the site is only through a locked steel gate. But a determined vandal could access the site and cause mischief and surface damage to the presently unprotected well casings. In the future the wellhead will be enclosed by a pumphouse and the area including the water storage silos will be fenced off and locked separately. The threat due to vandalism after these improvements are made to the Town of Hamilton's New Well is considered quite remote but not impossible.

B) Vehicular Accidents: Release of hazardous materials from a vehicular accident near the wellhead is possible. Vehicular traffic in the area of the wellhead is very limited and even more so now that logging operations have been completed. Until the new pumphouse is built and the protective fence installed around the perimeter, however, the possibility of a vehicular accident exists. A direct impact to the wellhead could possibly destroy the surface casing while having almost no direct impact or effect upon the aquifer itself.

Geologic Hazards

Geologic hazards can be categorized into two broad types: Hazards from geologic materials and hazards from geological processes. Each category will be discussed briefly.

A) Hazards from Geologic Materials: These might include reactive minerals such as swelling soils, reactive aggregates in concrete, and acid drainage. Asbestos is a naturally-occurring mineral associated with metamorphic rocks, which do not occur in this area. Commercially, in the past asbestos materials were often used in the building industry for applications such as heading ducts, grout and insulation on water pipes, in ceiling tiles and in roofing and siding materials. Because asbestos is non-flammable it was used for its fireproofing characteristics on floors, walls, ceilings and trim. The presence of asbestos is not considered a likely problem for the Town of Hamilton's New Well. Any new structures built in the area would not contain asbestos materials.

Another potential hazard is radon, an invisible, odorless, radioactive gas which may be present from both manmade and natural sources. Manmade sources may be associated with diagnostic medical materials and X-rays, as well as the color televisions, computer screens and smoke detectors found in nearly every home these days. Natural sources include releases from local soils and rocks which may contain radioactive minerals. Potassium-40, a common geological radiation source, occurs in high levels in potassium-rich rocks such as granites, gneisses, slates, and some schists such as are common in the Cascade range of mountains in eastern Skagit County.

Hazardous Gases may include methane, carbon monoxide, carbon dioxide and hydrogen sulfide. Release of these hazardous gases may result from gas or sewer main ruptures and earthquakes. None of these are considered major potential threats here at the Town of Hamilton's New Well site.

B) Hazards from Geological Processes

Three types of geological processes could possibly affect the Town of Hamilton's New Well: a) Earthquakes, b) Volcanoes, and c) Landslides. Each of these will be discussed in more detail below:

a) Earthquakes All of western Washington lies within an area prone to earthquakes. Earthquakes result from a sudden rupture of rock deep in the earth. These sutures or breakages are caused by the buildup of forces due to movement along geological crustal plate boundaries. Such a major boundary, known as a *subduction plate boundary*, lies just off the western coast of Washington and Vancouver Island in the Pacific Ocean. The eastern-moving Juan De Fuca plate is diving below the western-moving North American plate. This resulting collision of plates has created and continues to elevate the Cascade Range of mountains. Abrupt slippage along these plate boundaries can produce earthquakes and the volcanic activity that occurs along the area stretching from northern California into British Columbia.

Earthquakes may produce damage in several ways. 1. Ground shaking, which is the most severe direct cause of damage. 2. Surface rupture, resulting in horizontal or vertical displacements. 3. Ground failure, which can result in landslides, mudflows and liquefaction, can be a major problem along coastal areas where structures may collapse or sink. Many major prehistoric landslides in the have been documented in northwest Washington.

Earthquakes are common in this area of Washington, and small earthquakes are frequent along the west coast. Earthquakes are classified in terms of the energy released and the damage observed. The most common and widely accepted reporting system is the Richter Scale, devised in 1934. The Richter is based on a logarithmic scale, with each incremental whole number representing ten times the magnitude of the previous number. An earthquake of Richter magnitude 3 may be just barely noticeable, but a magnitude 9 could result in total destruction of all standing structures. Geologists are predicting, based on evidence in the fossil record, that an earthquake of magnitude 7, which could result in major destruction, will occur somewhere in western Washington. Seattle had a magnitude 7.1 quake in 1949 which killed eight people. The Alaskan quake of 1964 was magnitude 9.2.

An earthquake of magnitude 7 in the Town of Hamilton's New Well area could result in some home damage and some breakage of water mains and septic lines. Often landslides are associated with earthquakes, which act as a trigger. A landslide of this type in the

Town of Hamilton's New Well or its service area is not considered a likely occurrence or to constitute a matter of concern. The potential for earthquake damage to the underground structures such as piping systems, utilities and infrastructure is also considered very slight. A major earthquake could affect the local confined aquifers in unpredictable ways, but would not expected to have any major effects.

b) Volcanoes Major eruptions are not frequent but may produce great devastation near the volcano. Western Skagit County is probably not in any direct danger from destructive events usually associated with volcanoes, such as volcanic explosions, lava flows, pyroclastic flows, avalanche, mud and debris flows. The active volcano nearest to the Town of Hamilton's New Well is Mount Baker in eastern Whatcom County. Mount Baker last experienced a major eruption in 1870. More recently, Mount Baker produced a significant steam venting episode in 1975. Historically, Mount Baker erupts about once per century. Depending on the wind direction, Western Skagit County could receive some ash deposits and perhaps the effects of a gas cloud from an eruption. Geologists predict that, if the mountain follows past eruption patterns, any explosion or flows from Mount Baker would occur primarily in an easterly direction toward Baker Lake. Discharges could send a large volume of pyroclastic debris flowing down the Skagit River with catastrophic results if the Baker Lake Dam should be breached or fail.

Major eruptions are not frequent, but great devastation may be produced near the volcano. The Town of Hamilton's New Well is probably not in any direct danger from the destructive events that could be expected from an eruption of Mount Baker, though there could be some pyroclastic flows, ash clouds, avalanches, mud and debris flows from the higher elevations to the north of the wellhead.

c) Landslides As mentioned earlier, landslides can occur as a result of seismic activity or as a result of slope failure. Landslides result from earth materials moving downslope by gravitational force. Landslides are caused by the constant stress of gravity and the gradual weakening of earth materials caused by physical weathering. The two basic types of landslides are: the *rotational slide* in soil, often referred to as a *slump*, which may be caused by a buildup of soil moisture. *Planar slides* occur in bedrock, which is less common due to the thick accumulations of overlying glacial material in this area. A planar slide from the surrounding upland areas could be triggered by a climatological (prolonged moisture and saturation) or seismic event but, again, this is not seen to pose a major risk to the community.

FINDINGS AND CONCLUSIONS

On-Site Contamination Sources

Our activities for this report included our windshield reconnaissance inspection, observations of aerial photographs of the area, and evaluation of the current land use in the local and regional area. There are currently no public roads or buildings onsite and contamination sources are considered to be very minimal or non-existent and to represent no immediate threat to the Town of Hamilton's New Well or to the deep confined aquifer from which the wellhead draws its water.

We therefore conclude that within the Town of Hamilton's New Well WHP area the potential for aquifer contamination from sources of hazardous materials and hazardous wastes is extremely low.

Off-Site Contamination Sources

Based on observations from our windshield reconnaissance inspection, observations of current land use of the surrounding areas, and interviews with knowledgeable people, there does not appear to be any major source of hazardous waste or hazardous materials upgradient of the Town of Hamilton's New Well.

PART III

MANAGEMENT OF WELLHEAD PROTECTION AREAS

Establishment of a Wellhead Protection Committee

It is strongly recommended that a Wellhead Protection Committee be established to oversee the Town of Hamilton's New Well WHP plan and make further recommendations to safeguard and protect the wellhead protection area.

Many wellhead protection areas in Washington State lie outside the jurisdiction of the ground water purveyor. Land use in these areas may be controlled by other communities, counties, or even by other states or countries. For example, the Abbotsford-Sumas Aquifer is shared by both the State of Washington and the Province of British Columbia. The two jurisdictions have formed an alliance to solve some very difficult problems involving aquifer contamination and remediation.

The Town of Hamilton's New Well is fortunate in that much of its wellhead protection areas lie almost entirely within an undeveloped area. Since most of the wellhead protection areas lies outside the direct control of the Town of Hamilton's New Well property, it becomes even more imperative that these areas be monitored and steps be taken to avoid unwanted activities in these areas which right now are rural in nature.

In our local situation the Town of Hamilton's New Well WHP area lies within a relatively large area of access highly restricted from jurisdiction outside the Town of Hamilton's New Well site. To help manage and resolve multi-jurisdictional issues the state of Washington's (WDOH) promotes and encourages the establishment of local wellhead protection committees. These committees should include jurisdictions with land use controls over the wellhead protection area; local planning agencies; regulatory agencies; homeowners in the WHP areas; development interests; and local citizen action groups. In some locations, an existing group such as a ground water advisory committee may serve as the core membership of the local wellhead protection committee. Lacking these, the wellhead protection committee should be formed by the Town of Hamilton.

Coordinating the efforts of the Town of Hamilton's New Well WHP area, jurisdictions, and affected parties as the local program evolves, a consensus can develop as to what constitutes an appropriate management program. Coordinating efforts may also provide significant cost savings when delineating and inventorying. Spill response plans and contingency plans also benefit from coordinated, integrated planning efforts.

A lead agency should be selected by the Town of Hamilton's New Well WHP Committee to coordinate local wellhead protection activities. In many instances, an appropriate lead agency may be the county Health Department or local planning agency.

As part of the wellhead protection program an inventory will be conducted of potential contaminant sources within the wellhead protection area. The Town of Hamilton's New Well WHP Committee or its appointed representative should notify any potential sources of risk, such as other interests working on adjacent lands, that their operations are near or within a wellhead protection area. Potential contaminant sources or activities for which no lead agency can be determined should be identified to both the local jurisdiction and the DOH.

Protection of the aquifer is everyone's responsibility. We believe that communication with and education of the owners/operators of potential contaminant sources or activities, and voluntary adoption of Best Management Practices by them, are important first steps in implementing protective measures for the wellhead protection areas. Following is a list of 12 appropriate tools that can be used by the local WHP committee to safeguard its wellhead protection area. Many of these practices are already being accomplished by the Town of Hamilton's New Well:

1. Zoning Ordinances: These are typically comprehensive land-use requirements designed to direct the present and future development of an area. Zoning offers a very good method for restricting or regulating certain land uses within wellhead protection areas, particularly as growth occurs.

2. Subdivision Ordinances: These are applied to land that is to be subdivided into two or more subunits for resale or development. Unregulated development could lead to contamination of the aquifer; responsible regulated development can protect this valuable resource.

3. Site Plan Review: These are regulations requiring developers to submit for approval development plans within a given area.

4. Design Standards: Regulations that apply to the design and construction of buildings or structures. These regulations can be used to ensure that the design of new buildings within a WHP area does not pose a threat to the water supply.

5. Operating Standards: Regulations that apply to land-use activities: i.e., application of agricultural pesticides, or the storage and use of hazardous substances, and the proper care and maintenance of onsite septic systems in and around the area.

6. **Source Prohibitions:** Regulations that prohibit the presence or use of chemicals or hazardous activities within a given area.

7. **Purchase of Property or Development Rights:** This is a tool used by some localities to ensure complete control of land uses in or surrounding a WHP area. This may be the preferred method if other land use or regulatory restrictions are politically unfeasible and land purchase is affordable.

8. **Public Education:** This may consist of public meetings and seminars as well as designing, printing and distributing brochures and informational pamphlets. This tool promotes voluntary protection efforts and builds public awareness and support.

9. **Ground Water Monitoring:** Designed to detect any pollutants upgradient of the wellhead. Detecting a contaminant plume before it affects the ground water supply gives the Town of Hamilton time to plan and react to such a potential emergency.

10. **Household Hazardous Waste Collection:** Designed to eliminate improper disposal of household hazardous waste.

11. **Water Conservation:** This can encourage individual users to limit their water use and help protect the resource.

12. **Other Methods:** Many communities and water associations have developed their own innovative methods that combine elements of the other eleven management tools or create specific new ones of their own.

Two of the technical assistance guidance documents (TADs) prepared by the DOH and EPA to assist local water providers are:

1. DOH *Wellhead Protection Program Guidance Document (1995)*
2. EPA *Wellhead Protection: Tools for Local Governments (1989)*

SPILL RESPONSE PLAN

Worst Case Scenarios

As discussed in Part II of this report, the worst-case scenarios for the Town of Hamilton's New Well wellhead could result from manmade or natural hazards, from vehicular accident, or by intent, as in the case of vandalism. If at all possible the best way to prepare for a manmade or natural hazard is to prevent it from happening in the first place.

Potential Risk Sources

1. Vehicular Accident: As discussed in the previous section, there is some risk from a vehicular accident in which a vehicle crashes directly into the wellhead or a crash releases contamination product down the well casing from a ruptured fuel tank. Steps will be taken in the future to alleviate both of these problems. The 8-inch production well will be enclosed with in a pumphouse and the entire pumphouse and future storage tanks will be protected behind fencing. However, until these structures are completed the construction activities themselves could pose a certain amount of risk in this category.

2. Deliberate Sabotage or Vandalism: At some public well sites and public reservoirs, individuals have introduced drugs, explosive materials or other foreign substances into ponds, reservoirs, wellheads, water storage tanks, and distribution piping. Sometimes the perpetrators are unaware of the seriousness of the consequences of their actions. Serious physical damage to the well can result from explosive devices or by the introduction of hazardous chemical substances directly into the wellhead. Either of these scenarios could mean long-term or permanent loss of the well. While a vandalism scenario may seem unlikely in this mostly rural and isolated setting, the threat for opportunistic random or deliberate destructive mischief must be considered.

3. Improper use and disposal of household chemicals or hazardous wastes: This is an unlikely occurrence, considering the very low population of the area. Most of the local population is concentrated in the valley south of the Town of Hamilton's New Well.

SPILL RESPONSE PLAN

This spill response plan is divided into 1) prevention of a spill or release of a potentially harmful chemical or wastes; and 2) response and cleanup of a potentially harmful release or spill within the wellhead protection area.

1) Prevention

The Town of Hamilton's New Well WHP area is very fortunate in that it has no problems at the current time and the land included in the one-, five- and ten- year capture zones is controlled by timber companies. The Town of Hamilton's New Well controls five acres, of which the wellhead is located in the extreme southern end while the capture zones extend upgradient into the northern area. Since it is always less expensive to prevent the

release of hazardous materials than it is to clean it up, *prevention* should be the main goal of every wellhead protection plan.

Some of these initiatives were discussed earlier under the heading of identification of potential risks.

- The long-term goal for the Town of Hamilton's New Well is to build a pumphouse protected by a fence with locking access gate that will include the storage silos.

- All future land owners, especially those who build homes within the wellfield capture zones, should be notified of the wellhead protection area. They should be aware that their actions have the potential to directly impact the community's water supply.

- Any chemical spills within the Town of Hamilton's New Well wellhead protection area should be reported immediately and cleaned up promptly to avoid harming the aquifer. Dialing 911 will alert the Cental Dispatch in Mount Vernon who will alert Crown Pacific, the Town of Hamilton, and the Emergency Management Office.

- There should be no unauthorized access to the well, pumphouse or water storage silos. No chemicals, liquid fuels or hazardous materials should ever be stored in the building itself or in any nearby area.

2) Response

a. The emergency spill response notification flow chart presented on the following page should be posted in the meeting area for members of the water board. The purpose of a spill response plan is to prevent further spread of contamination, to limit hazardous exposure to the community, and to maintain the integrity of the well system in case of such a spill. After a spill event the material, whether liquid or solid, should be isolated and cleaned up quickly before contamination has time to infiltrate downward to the aquifer.

b. For a spill response plan to be effective, the Town of Hamilton must coordinate its spill response plan with local first responders such as Crown Pacific management, the Skagit County Emergency Management office, the Department of Health and the Washington State Departments of Ecology and Health.

EMERGENCY RESPONSE CONTACTS

CALL 911

EMERGENCY MANAGEMENT OFFICE

CALL 911

CENTRAL DISPATCH

FIRE DEPARTMENT

CALL 911

OFFICE 826-3027

CITY HALL AND RURAL FIRE DISTRICT 8

CROWN PACIFIC FACILITY

OFFICE: 826-3951

AFTER HOURS: GUARD SHACK 826-3002

SKAGIT COUNTY SHERIFF

EMERGENCY

911

OFFICE 360-336-9450

SKAGIT COUNTY HEALTH DEPT.

DRINKING WATER

(360) 336-9380

STATE SPILL RESPONSE

24-HOUR

EMERGENCY LINE

(425) 649-7000

Notification of First Responders

The following interested parties were notified about the Town of Hamilton's New Well Wellhead Protection Plan. Each responder was sent a fact sheet which briefly describes the Town of Hamilton's New Well WHP program, along with a map of the location and capture zones for the 6-month, 1-, 5- and 10-year times of ground water travel to the wellhead. A copy of this data sheet is included in the Appendix of this report.

Mr. Nick Bates, Fire Marshall
TOWN OF HAMILTON
PO Box 528
Hamilton, WA 98255
Phone 360-856-5147

Mr. Russ Paul, Land & Timber Manager
CROWN PACIFIC
PO Box 28
Hamilton, WA 98255
Phone 360-826-3951

Mr. Mark Watkinson, Coordinator
EMERGENCY MANAGEMENT OFFICE
2911 East College Way
Mt. Vernon, WA 98273
Phone 360-428-3250

CONTINGENCY PLANS AND POTENTIAL FUTURE SOURCES OF DRINKING WATER

The risk of the Town of Hamilton's New Well experiencing a major disaster that would mean the loss of its well and drinking water supply due to natural causes or man-made activities is deemed very remote but not negligible. To reiterate: Potential natural threats could result from earthquakes, landslides and potential local flooding. Man-made activities which might affect the aquifer include surface spills, vehicular accidents, deliberate damage to the well system by vandalism, and the misapplication or misuse of commercial fertilizers, pesticides and herbicides.

RECOMMENDATIONS

Based on our research and the information collected for this report the following recommendations are made for the Town of Hamilton's New Well.

Long Term Recommendations*

- Protection of Wellhead: We recommend that a pumphouse be built to provide physical protection to the well. Further, we recommend that the entire site including the water storage tanks be protected by a perimeter fence accessible via a locked gate. Keys or other access devices for this facility should not be kept hidden at the site. We also believe that the strong and lockable gate at the entrance road is a good idea and should be maintained.

- Any agents of future development upgradient of the well, particularly if near the 5- to 10-year wellhead protection zones, must be made aware of the fact that they are locating in a wellhead protection area and be made aware that their activities can have an effect on the water quality of the aquifer. Such homeowners should be made aware of the importance of having their septic systems inspected and properly maintained on a regular basis. Regular inspection should assure the holding tanks and associated drainfields are functioning correctly. Homeowners should be advised of proper procedures for disposing of hazardous liquids and wastes.

CONCLUSIONS BASED ON INVESTIGATION

Our overall impression of the Town of Hamilton's New Well and its wellhead protection area is that the well is in an excellent location and the likelihood of its being impacted in a negative way in the future appears extremely remote. Based on our review of past work and the work conducted for this report the following conclusions have been reached.

- The aquifer in which the Town of Hamilton's New Well is completed is confined and under significantly high pressure. The balance of the wells studied in the local area are completed in the shallower water table aquifer.

- Based on the area well logs the ground water in the unconfined aquifer is moving in a south to southwest direction toward the Skagit River where it likely discharges. We believe the ground water in the confined aquifer is also moving in the same direction.

- Recharge to the confined aquifer probably occurs at higher elevations north to northeast of the wellhead. Based on the driller's log the aquifer is composed of coarse gravel. The well appears to be a big producer based on a test pumping rate of 264 gpm and a long-term specific capacity of 10.35.

- Analysis of the ground water from samples taken following the 24-hour pumping test demonstrate the water supply is of high quality. The iron and manganese concentrations are above current Washington State Health Department standards but proposed treatment should resolve this problem.

- We believe, based on our research, that the Town of Hamilton's New Well is situated in an ideal location. It is isolated from subdivision development, access is highly controlled and its wellhead capture zones are in undeveloped forested lands. We believe that its rural and isolated setting will help to ensure the integrity of its water supply and to protect the aquifer quality.

This concludes our Wellhead Protection Plan for the Town of Hamilton's New Well. Any questions are welcome and should be referred to Doug Dillenberger, Principal of Northwest HydroGeo Consultants.

Sincerely,

Doug Dillenberger, P.G.
Professional Geologist ▼ Principal
Northwest HydroGeo Consultants

INDEMNIFICATION AND LIMITATIONS

This project was conducted and this report prepared in accordance with generally accepted professional practices for the nature and conditions of the work completed in this area at the time the work was performed. This report and its conclusions and recommendations are intended for the exclusive use of the Town of Hamilton for specific application to the referenced project site and the wellhead protection plan for this location.

This report is not meant to represent a legal opinion. No other warranty, express or implied, is given. Our services are provided in accordance with the terms presented in our General Conditions. Interpretation of data, conclusions, and recommendations based thereon are built on the information collected at the time this investigation was conducted and should not be interpreted as long-term hydrogeological conditions or trends.

As a condition of our services, it is understood that, to the fullest extent permitted by law, our clients agree to defend, indemnify and hold harmless Northwest HydroGeo Consultants, its owners, employees, subcontractors and agents, from any past, present, or future claims or damages at the site, including potential claims from third parties that may name Northwest HydroGeo Consultants as a claimant.

Any questions regarding our work and this report, the presentation of the information, and interpretation of the data are welcome and should be referred to The Principal of Northwest HydroGeo Consultants.

REFERENCES

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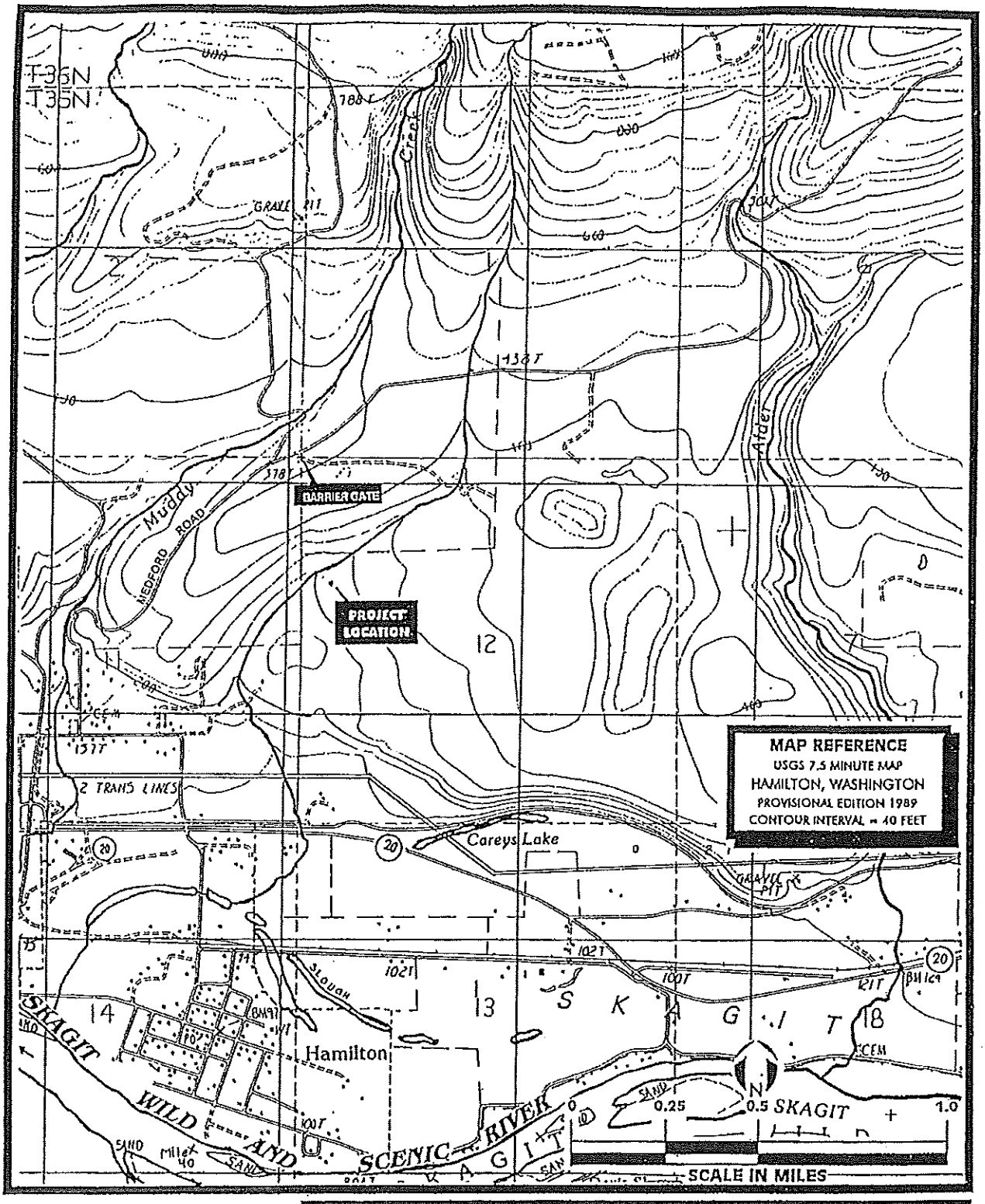


REGIONAL SETTING AND PROJECT LOCATION

NORTHWEST HYDROGEO CONSULTANTS © 1999

WELLHEAD PROTECTION STUDY

TOWN OF HAMILTON
HAMILTON, WASHINGTON

PN 99020 SEPTEMBER 1999

FIGURE 1

LEGEND

- Moody Well* Well owner on well log. Star (*) indicates well elevation surveyed.
- 91 Approximate static water level elevation. All wells field located except well 1381. Location of this well from Rongey, 1998.
- DH-1 Concrete Northwest monitoring well. Location from Rongey, 1998
- —100— Generalized ground water elevation contour.

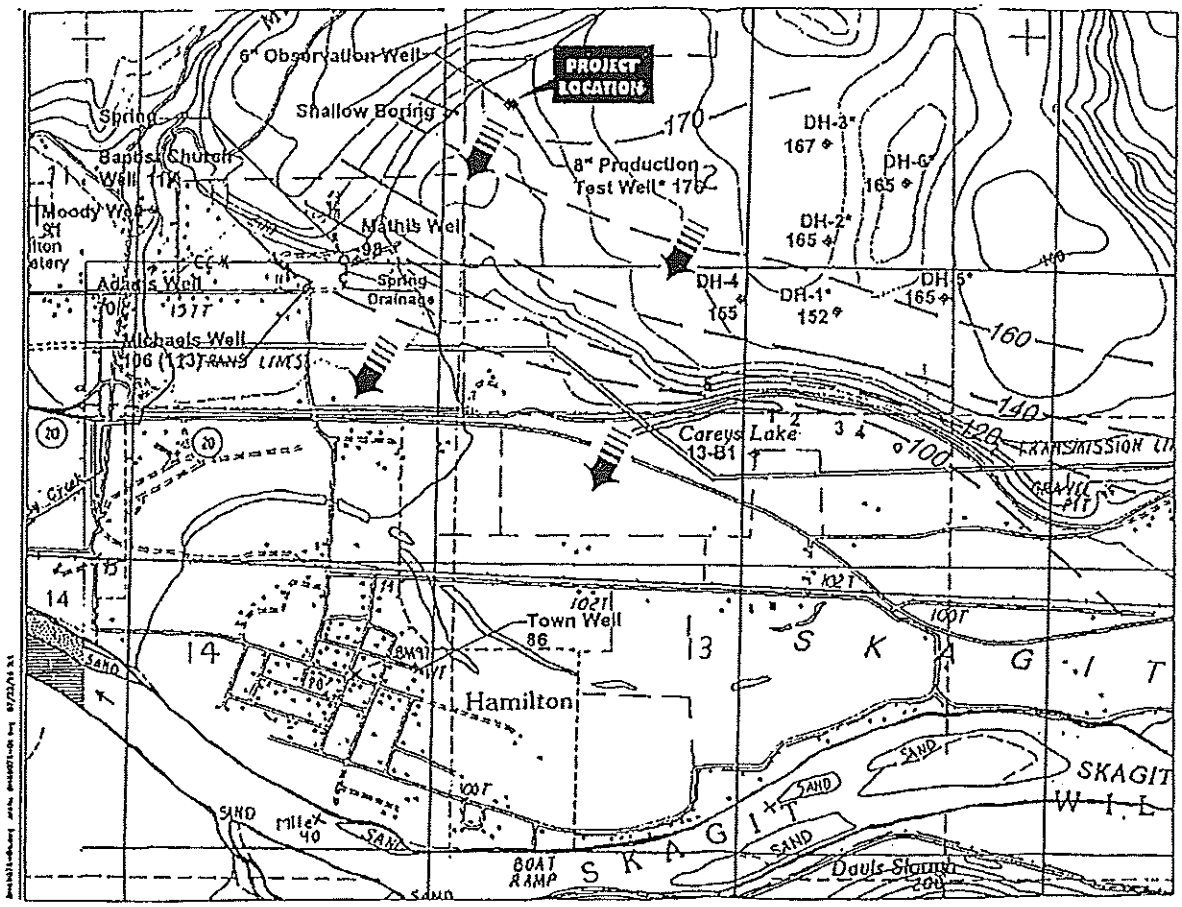
NOTES

1. Static water levels were compiled from well log and Rongey, 1998.
2. Dates of static water levels vary.
3. Base map reference, USGS

DRAFT

Ground Water Elevation Contour Map
Wilson Engineering
Hamilton, Washington

Figure 4



GENERAL DIRECTION OF GROUND WATER MOVEMENT

MAP REFERENCE

MAPS PROVIDED FOR PROJECT
BY WILSON ENGINEERING
SOURCES AS SHOWN
USGS 7.5 MINUTE BASE MAP
HAMILTON, WASHINGTON
PROVISIONAL EDITION 1989 CONTOUR INTERVAL = 40 FEET

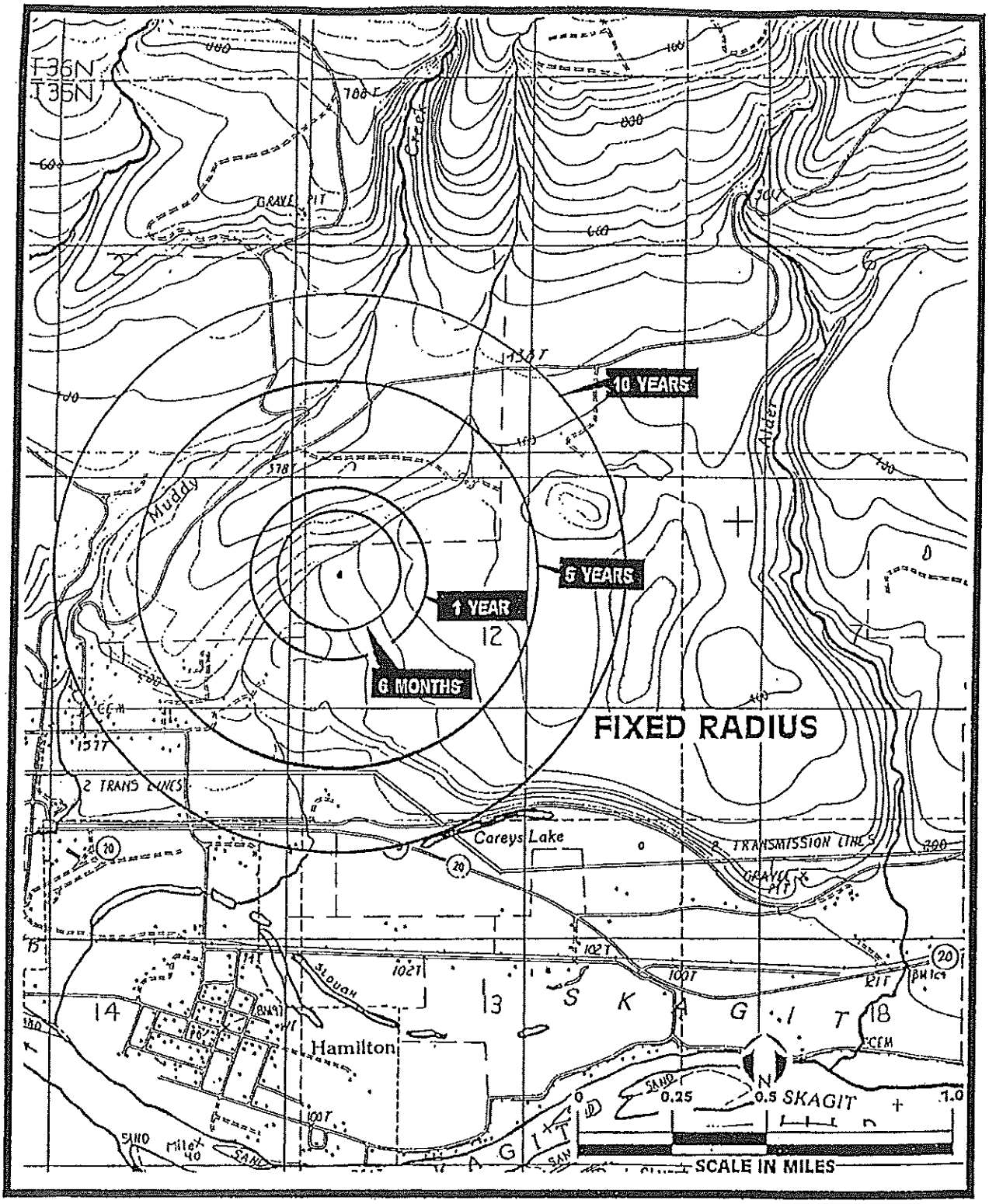
GENERAL DIRECTION OF GROUND WATER MOVEMENT

NORTHWEST HYDROGEO CONSULTANTS

TOWN OF HAMILTON
HAMILTON, WASHINGTON

PN 99020 SEPTEMBER 1999

FIGURE 2



WELLHEAD CAPTURE ZONES

CALCULATED FIXED RADIUS METHOD

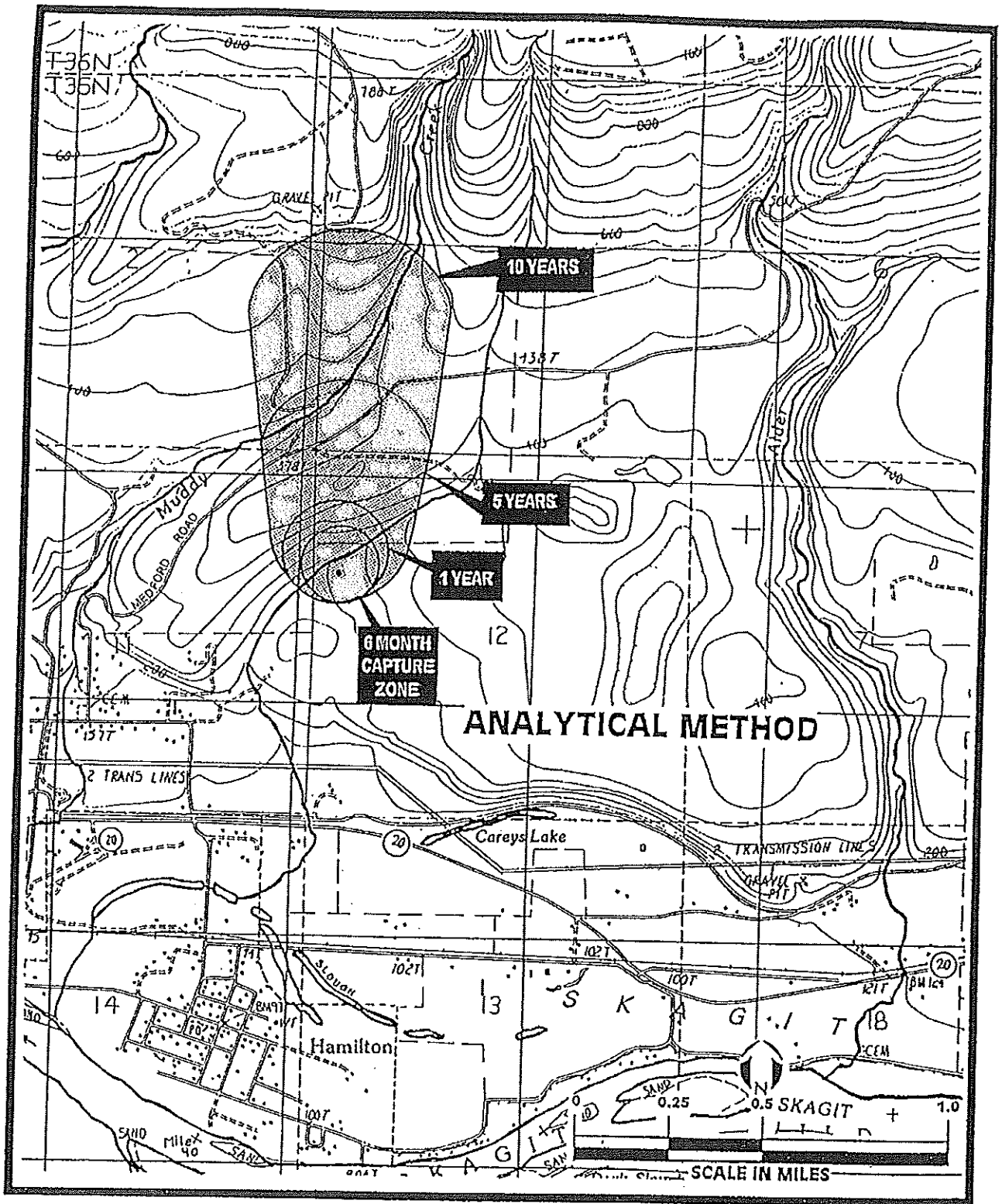
NORTHWEST HYDROGEO CONSULTANTS © 1999

WELLHEAD PROTECTION STUDY

TOWN OF HAMILTON
HAMILTON, WASHINGTON

PN 99020 SEPTEMBER 1999

FIGURE 3



WELLHEAD CAPTURE ZONES

ANALYTICAL METHOD

NORTHWEST HYDROGEO CONSULTANTS © 1999

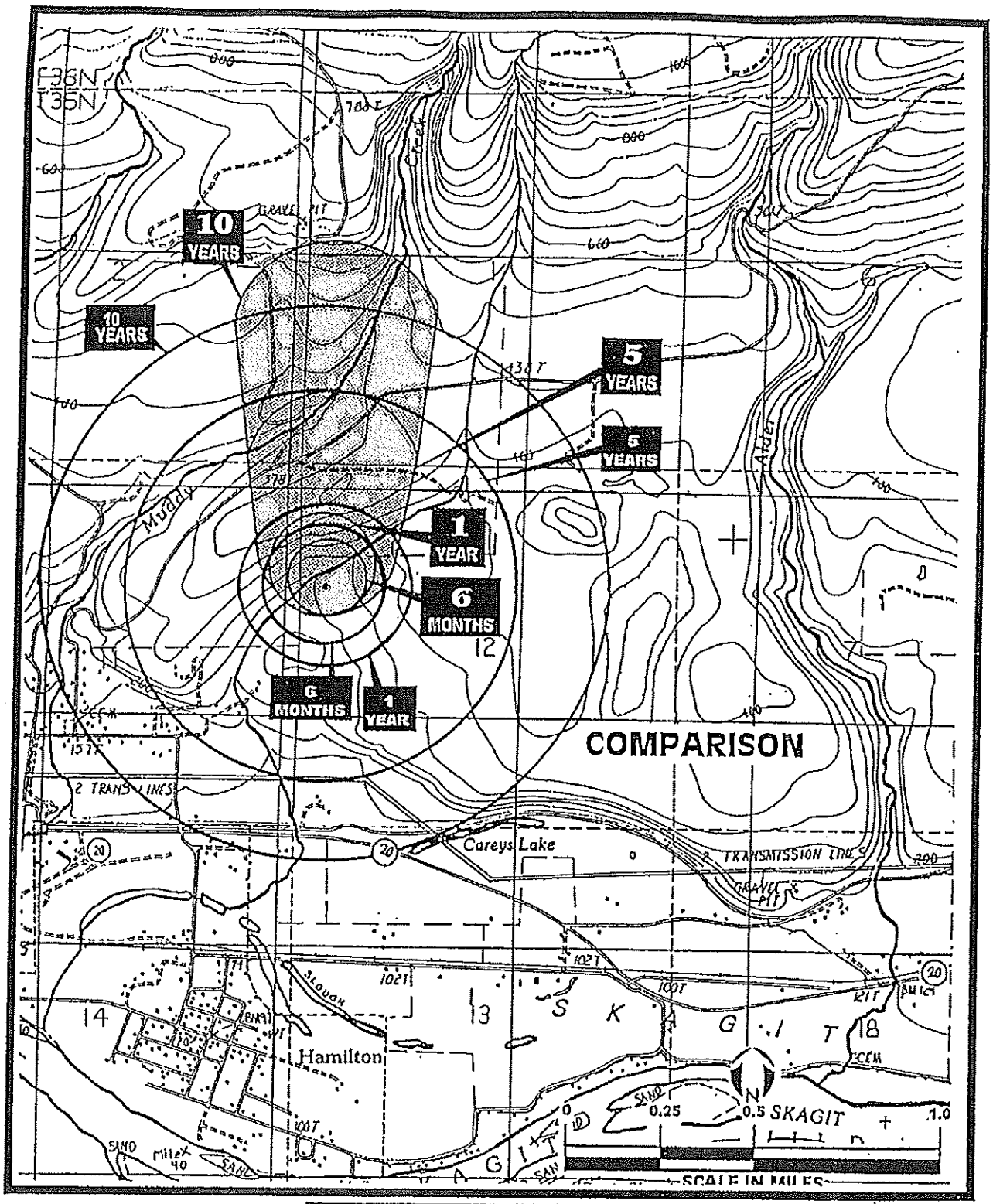
WELLHEAD PROTECTION STUDY

TOWN OF HAMILTON

HAMILTON, WASHINGTON

PN 99020 **SEPTEMBER 1999**

FIGURE 4



WELLHEAD CAPTURE ZONES
METHOD COMPARISON

NORTHWEST HYDROGEO CONSULTANTS © 1999

WELLHEAD PROTECTION STUDY

TOWN OF HAMILTON

HAMILTON, WASHINGTON

PN 99020 SEPTEMBER 1999

FIGURE 5

SITE PHOTOS

TOWN OF HAMILTON
NEW WELL

— SKAGIT COUNTY —

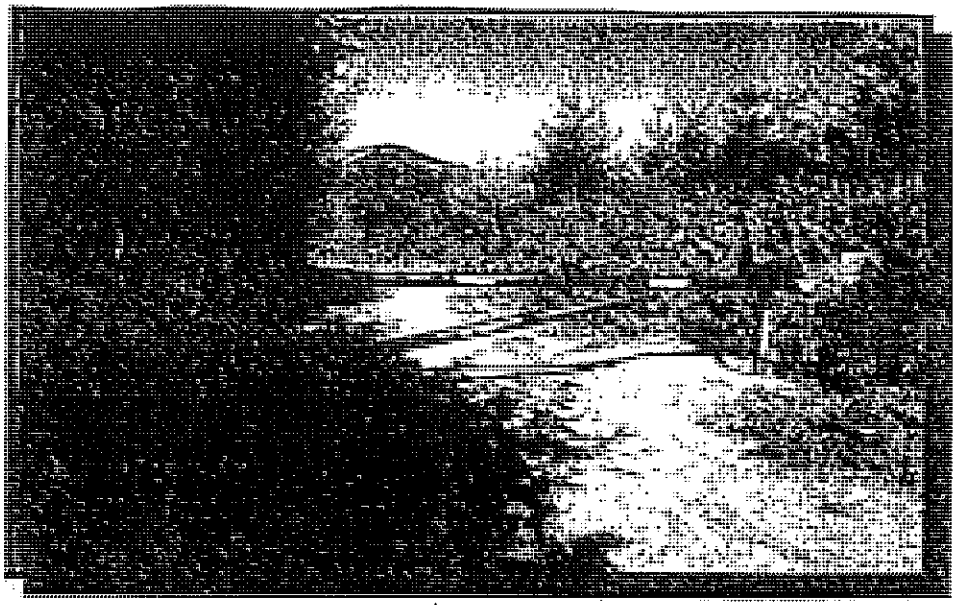
SEPTEMBER 3, 1999

PN 99020

1

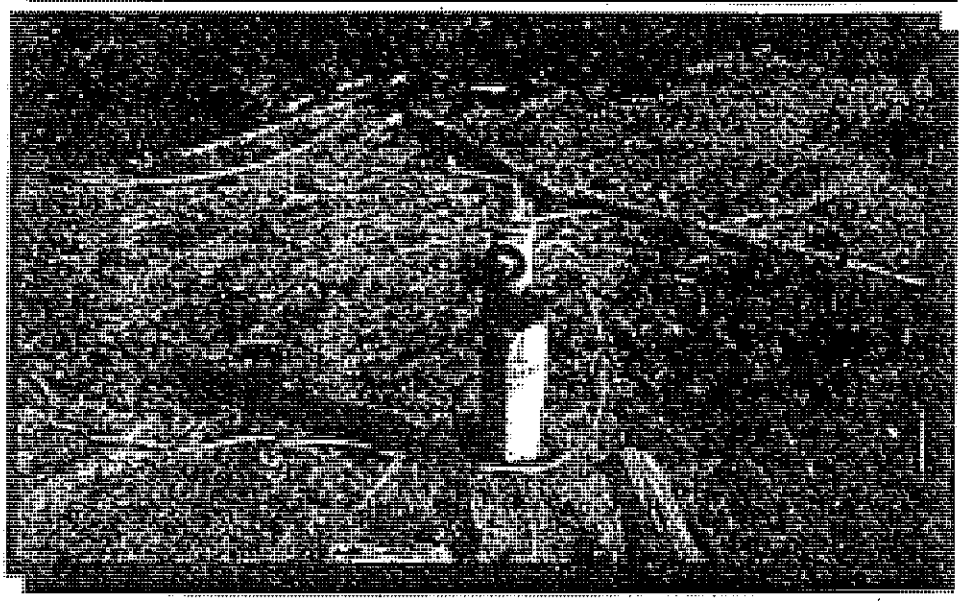
DIRT AND GRAVEL ROAD LEADING EAST OFF MEDFORD ROAD TO THE WELLHEAD SITE.

VIEW OF STURDY LOCKED GATE BLOCKING UNAUTHORIZED ACCESS TO THE WELLSITE.



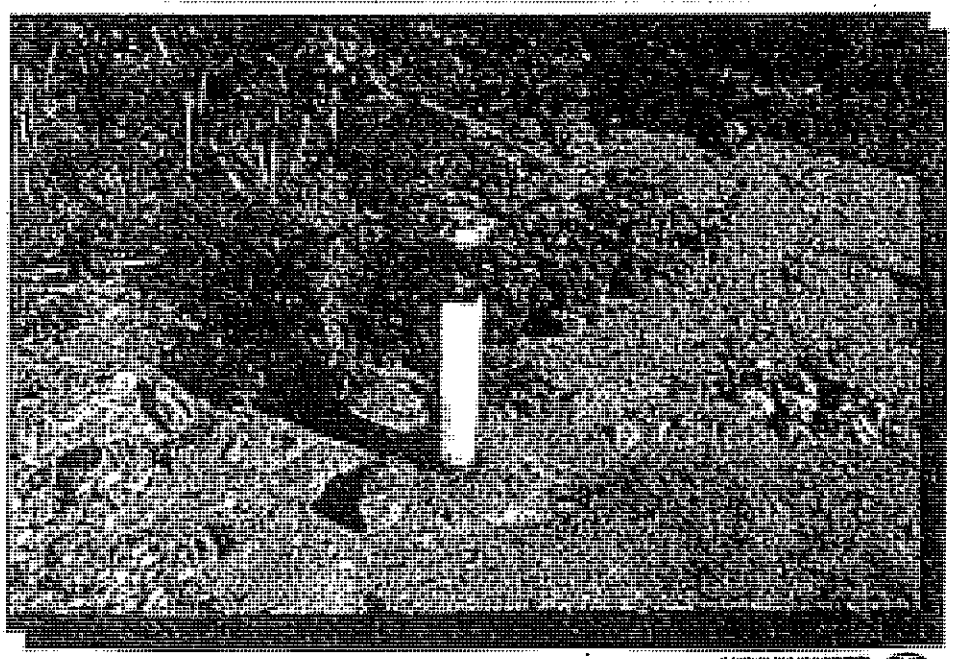
2

EIGHT-INCH CASING PRODUCTION WELL FOR THE TOWN OF HAMILTON LOCATED SOME QUARTER OF A MILE OFF THE MEDFORD ROAD INTERSECTION, AND ON THE NORTH SIDE OF THE DIRT ACCESS ROAD.



3

SIX-INCH CASING OBSERVATION WELL LOCATED 47 FEET EAST OF THE PRODUCTION WELL.



NORTHWEST HydroGeo CONSULTANTS

WHP APPENDIX

1 Application for Water Right & Certificate of Water Right

2 Ground Water Contamination Susceptibility Assessment Survey Form Version 2.2

3 EDGE Analytical Laboratory Results
- VOC
- IOC
- Bacteria

4 Drawings
- Ground Water Elevation Contour Map on Water Table Aquifer
- Cross Section Locations
- Cross Sections A-A' and B-B'
- Transmission Main
- Water Production Facilities

6 Graphs from Aquifer Pumping Test

7 Well Logs from Section 11 and 12, T35N, R6E

8 Aerial Photographs (2ea)

DEPARTMENT OF ECOLOGY

[redacted]70001 CERTIFICATE OF WATER RIGHT

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 11, 1982	G1-24051	G1-24051P	G1-24051C

NAME
TOWN OF HAMILTON

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P. O. Box 403	Hamilton	Washington	98255

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
Well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	70	65.86

QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
300 feet west and 300 feet south of the E¼ corner Sec. 14.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NW¼SE¼	14	35	6 E	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
15	2	Townsite 1st Addition to Hamilton

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The Town of Hamilton as recorded in the following plats: Sec. 14, T. 35N., R. 6 E. 1st of Plats: Hamilton Original Addition #4111, Hamilton Township Co. 1st Addition #4112, Hamilton Township Co. 2nd Addition #4113, Hamilton Township Co. 3rd Addition #4114, Hamilton Township Co. 4th Addition #4115, Hamilton Central Addition #4116, West Central Addition #4117, Cumberland Addition #4118, McMillins Addition #4119, Moody's Addition #4120, Shea's Addition #4121, as recorded in the Book of Plats, in Skagit County, Washington.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Accepted By ______
Date ______
Is Field Exam. Required? ☐ YES ☐ NO
Determined By ______

APPLICATION FOR CHANGE OF WATER RIGHT

☐ PURPOSE ☒ DIVERSION OR WITHDRAWAL
☒ PLACE ☐ ADDITIONAL POINT OR POINTS

NAME
Town of Hamilton
c/o Mr. James E. Wilson
Wilson Engineering

Bus. Tel. (360)733-6100
Home Tel. N.A.
Other Tel. N.A.

ADDRESS	(CITY)	(STATE)	(ZIP CODE)
805 Dupont Street #7	Bellingham	WA	98225

APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
G1-20051	G1-20051P	G1-20051C

DECREED RIGHT (TITLE OF CASE)
N.A.

APPROPRIATIONS MADE (GIVE DATE IF PRIOR TO JUNE 7, 1917 IF SURFACE WATER, OR JUNE 7, 1945 IF GROUND WATER)

IS THE WATER RIGHT RECORDED IN YOUR NAME? ☐ YES ☒ NO
IF NO, GIVE NAME RECORDED UNDER: Town of Hamilton

1. RIGHT CONSISTS OF

WATERS USED FROM (STREAM, LAKE, WELL, OR TRENCH, ETC.): Well
GALLONS PER MINUTE OR CUBIC FEET PER SECOND: 70
WATER CURRENTLY USED FOR: Municipal Supply
TIME OF USE: Continuous

2. LOCATION OF PRESENT POINT OF DIVERSION OR WITHDRAWAL

ENTER BELOW THE DISTANCES FROM THE NEAREST SECTION OR PROPERTY CORNER TO THE DIVERSION OR WITHDRAWAL
500 feet west and 300 feet south of E 1/4 corner Section 14

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	COUNTY
NE 1/4 SE 1/4	14	35	6E	Skagit

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, COMPLETE THIS SECTION

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
15	2	Townsite First Addition to Hamilton

3. LEGAL DESCRIPTION OF LANDS WATER IS USED ON

All of the land within the Town of Hamilton, Section 11, 12, 13 and 14, T35N, R6E, Skagit County, Washington.

SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	COUNTY
11 12 13 and 14	35	6E	Skagit

(ATTACH SEPARATE SHEET IF NECESSARY)

ARE YOU THE LEGAL OWNER OF THE ABOVE DESCRIBED LANDS? ☐ YES ☒ NO
IF NO, EXPLAIN YOUR INTEREST: Town Engineer

REASONS FOR THE PROPOSED CHANGE
Relocate facilities out of Skagit River floodway and provide adequate supply to conform with Department of Health requirements (WAC 246-290).

A MINIMUM FEE OF $10.00 MUST ACCOMPANY THIS APPLICATION

CONTINUE ON REVERSE SIDE

ECY 040-1-14
Rev. 1/84 OF 4-207

CHANGE

4. CHANGE REQUESTED

CHANGE WATER USE TO	TIME OF USE	GALLONS PER MINUTE OR CUBIC FEET PER SECOND
		200

5. LOCATION OF PROPOSED POINT OF DIVERSION OR WITHDRAWAL

ON ACCOMPANYING SECTION MAPS, ACCURATELY MARK AND IDENTIFY EACH POINT OF DIVERSION, SHOW NORTH-SOUTH AND EAST-WEST DISTANCES FROM NEAREST SECTION CORNER OR PROPERTY CORNER.

ALSO, ENTER BELOW THE DISTANCES FROM THE NEAREST SECTION OR PROPERTY CORNER TO THE DIVERSION OR WITHDRAWAL.

1400 feet south and 100 feet west of the NE corner of Section 11

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE E. OR W.) W.M.	COUNTY
NE 1/4 SE 1/4 NE 1/4	11	35N	6E	Skagit

6. IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, COMPLETE THIS SECTION

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

ARE YOU THE OWNER OF THE LAND ON WHICH THE PROPOSED POINT OF DIVERSION OR WITHDRAWAL IS TO BE LOCATED

☐ YES ☑ NO

LEGAL DESCRIPTION OF LANDS WATER IS TO BE USED ON

All of the land within the Town of Hamilton, Sections 11, 12, 13 and 14, T35N, R6E, Skagit County, Washington

SECTION	TOWNSHIP N.	RANGE, E. OR W.) W.M.	COUNTY
11, 12, 13, and 14	35	6E	Skagit

(ATTACH SEPARATE SHEET IF NECESSARY)

ARE YOU THE LEGAL OWNER OF THE ABOVE DESCRIBED LANDS	IF NO, EXPLAIN YOUR INTEREST
☐ YES ☒ NO	Town Engineer

* PLEASE NOTE LEGAL LAND OWNER SIGNATURE AND APPLICANT SIGNATURE ARE BOTH REQUIRED. IF THE LEGAL LAND OWNER AND APPLICANT ARE THE SAME, PLEASE SIGN IN BOTH PLACES. THANK YOU.

Mayor Tim Bates
Town of Hamilton
LEGAL LANDOWNER (PLEASE PRINT)

APPLICANT'S SIGNATURE

LEGAL LANDOWNER SIGNATURE (OWNER OF PROPERTY DESCRIBED IN ITEM NUMBER 3)

LEGAL LANDOWNER'S ADDRESS

Town of Hamilton
P.O. Box 528
Hamilton, WA 98255

Ground Water Contamination
Susceptibility Assessment Survey Form
Version 2.2

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : TOWN OF HAMILTON / HAMILTON, WA 98255

Water system name : TOWN OF HAMILTON

County: SKAGIT

Water system number: 307000 Source number: 2 CHANGE IN POINT OF WITHDRAWAL

Well depth: 200.5 (ft.) (From WFI form)

Source name: TOWN OF HAMILTON NEW WATER WELL

WA well identification tag number: T B M - 1 0 5 A

_____ well not tagged

Number of connections: 195 at present / 328 future Population served: ≈500

Township: 35 N Range: 6 E

Section: 12 1/4 1/4 Section: SW 1/4 NW 1/4

Latitude/longitude (if available): _____ / _____

How was lat./long. determined? n/a

_____ global positioning device _____ survey _____ topographic map
_____ other: _____

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 06/23/99 month/day/year – NEW WELL –

last reconstruction: __/__/__ month/day/year

_____ information unavailable

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

__ < 20 ft __ 20—50 ft __ 50—100 ft ✓ 100—200 ft (185.5) __ >200 ft

__ information unavailable ('<' means less than; '>' means greater than)

2) Depth to ground water (static water level):

__ < 20 ft __ 20—50 ft ✓ 50—100 ft (83.3) __ >100 ft

__ flowing well/spring (artesian)

How was water level determined?

__ well log ✓ other: M-scope measurement

__ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

n/a psi (pounds per square inch)

or

n/a feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: __ YES ✓ NO

5) Wellhead elevation (height above mean sea level): 2552.23 (ft) from top of casing

How was elevation determined? __ topographic map __ Drilling/Well Log __ altimeter

✓ other: SURVEY; WILSON ENGINEERING

__ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

✓ evidence of a confining layer in well log

_____ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the bottom of the lowest confining layer? ✓ YES __ NO

_____ information unavailable

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: ✓ (gallons) 88 MILLION

88,826,400 gpy

How was this determined?

ENGINEERING PROJECTIONS & DESIGN CRITERIA

__ meter

✓ estimated: ✓ pumping rate (220 gpm)

__ pump capacity ( )

__ other:

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6 month ground water travel time : 869 (ft)

1 year ground water travel time : 1229 (ft)

5 year ground water travel time: 2749 (ft)

10 year ground water travel time: 3888 (ft)

Information available on length of screened/open interval?

✓ YES __ NO

Length of screened/open interval: 15 (ft) 60-SLOT SCREEN

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? ✓ YES __ NO (mark and identify on map). UNNAMED STREAM – SEE MAP

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? __ YES ✓ NO (mark and identify on map).

Comments: NO DEVELOPMENT IN CAPTURE ZONE AREA AT PRESENT

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions: (Unless listed on assessment, MCLs are listed in assistance package.)

A. Nitrate: (Nitrate MCL = 10 mg/l)	YES
Results greater than MCL	
< 2 mg/liter nitrate	✓
2—5 mg/liter nitrate	
> 5 mg/liter nitrate	
Nitrate sampling records unavailable	

B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)	YES
Results greater than MCL or SAL	
VOCs detected at least once	
VOCs never detected	✓
VOC sampling records unavailable	

C. EDB/DBCP:	YES
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)	
EDB/DBCP detected below MCL at least once	NOT TESTED
EDB/DBCP detected above MCL at least once	
EDB/DBCP never detected	
EDB/DBCP tests required but not yet completed	
EDB/DBCP tests not required	

D. Other SOCs (Pesticides):	YES
Other SOCs detected	
(pesticides and other synthetic organic chemicals)	NOT DETECTED
Other SOC tests performed but none detected	
(list test methods in comments)	
Other SOC tests not performed	

If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: n/a

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

___ YES ✓ NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
< 6 month travel time	___	✓	___
6 month—1 year travel time	___	✓	___
1—5 year travel time	___	✓	___
5—10 year travel time	___	✓	___

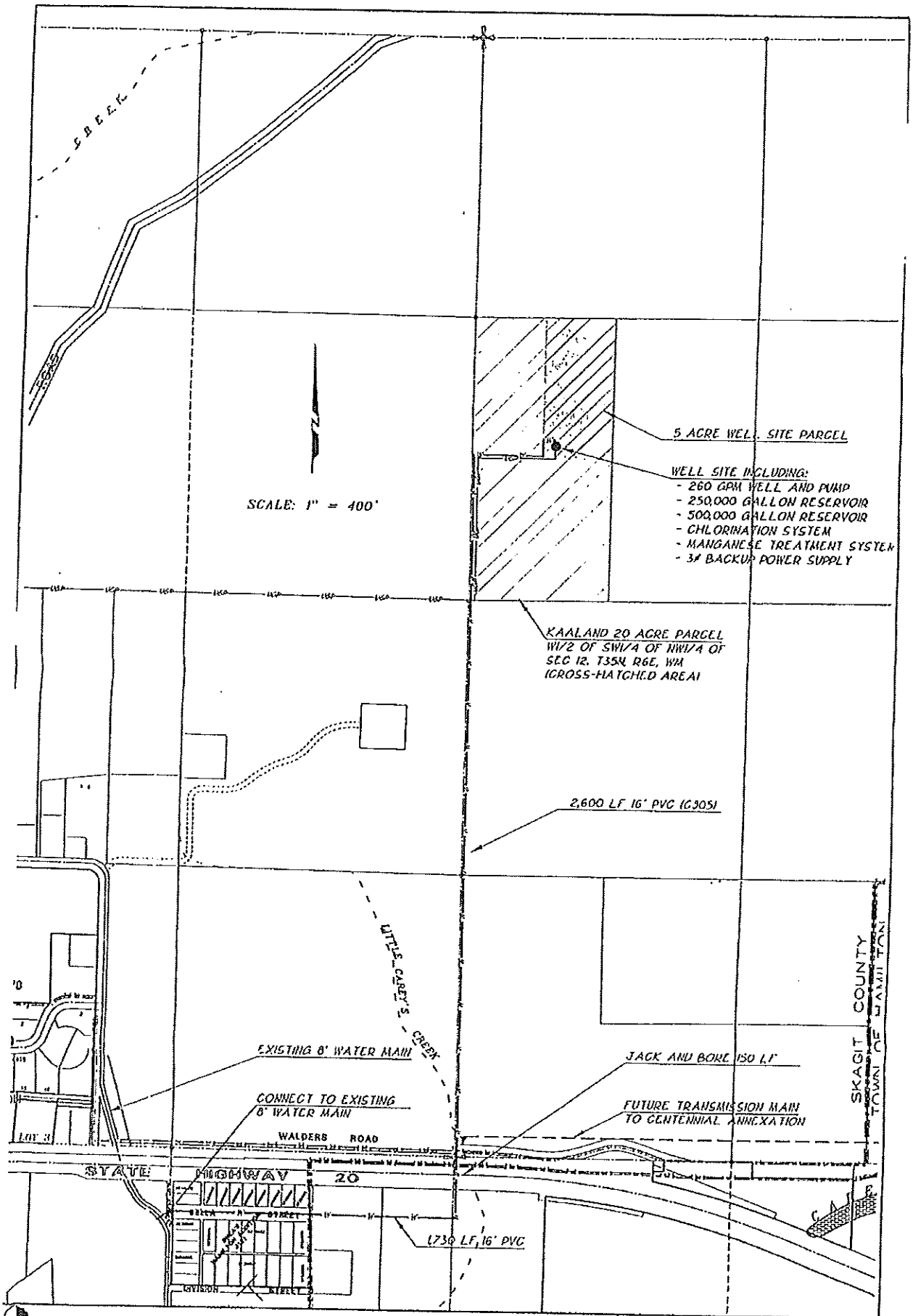
b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
< 1 year travel time	___	✓	___
1—5 year travel time	___	✓	___
5—10 year travel time	___	✓	___

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

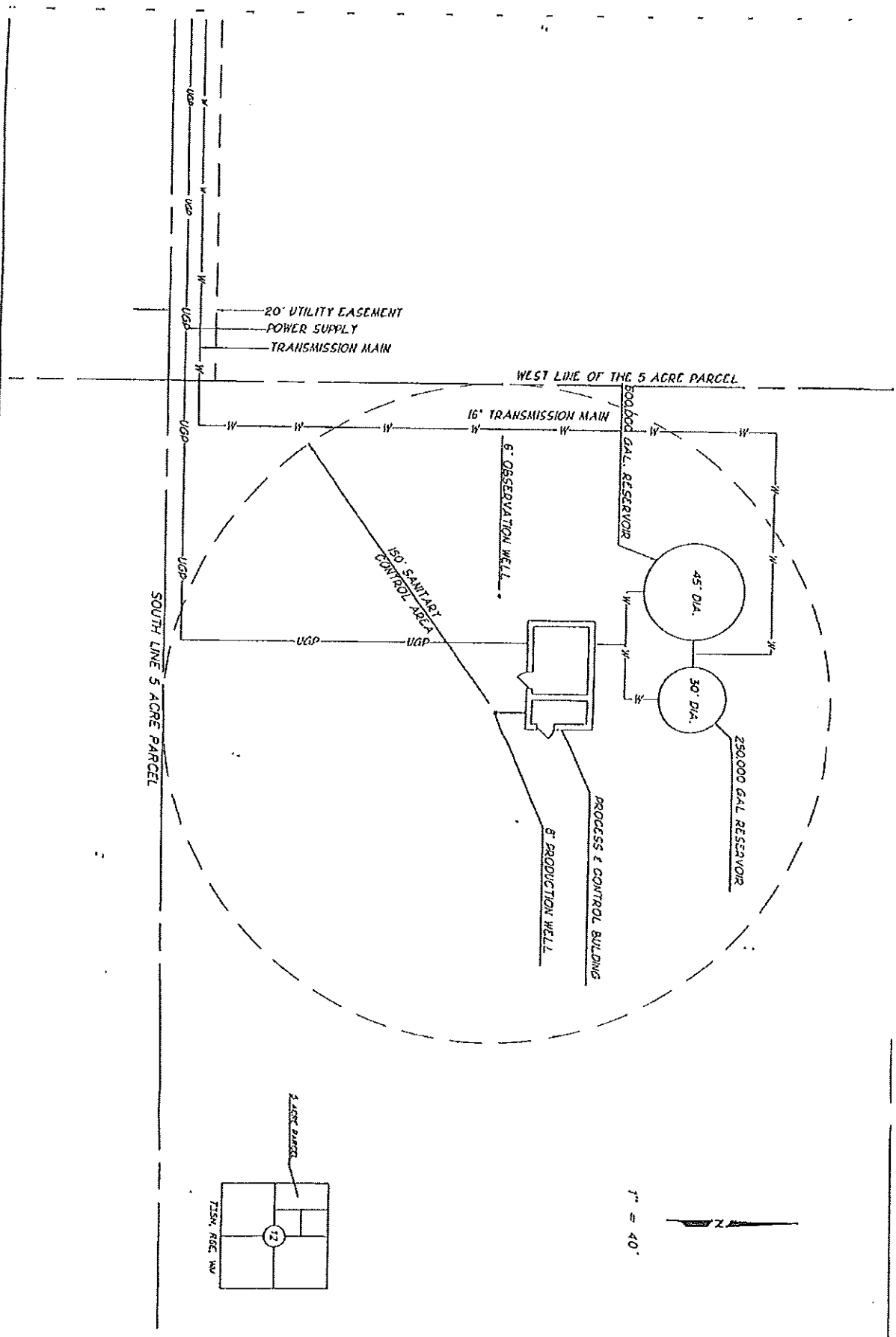
WELL IS COMPLETED IN A CONFINED AQUIFER WHICH IS RECHARGED OUTSIDE THE LOCAL AREA AT HIGHER ELEVATIONS. REFER TO WELLHEAD PROTECTION REPORT FOR DETAILS.

FIGURES



Wilson Engineering
CONSULTING ENGINEERS & SURVEYORS
805 DUPONT STREET
BELLINGHAM, WA 98225
(360) 733-6100

FIGURE 1
TRANSMISSION MAIN



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(360) 647-9061

FIGURE 2
WATER PRODUCTION FACILITIES

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XV
WATER QUALITY DOCUMENTS

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

WATER QUALITY MONITORING SCHEDULE

PWSID 307000

CONTAMINANTS	YEAR 2010	YEAR 2011	YEAR 2012	YEAR 2013	YEAR 2014	YEAR 2015	YEAR 2016	YEAR 2017	YEAR 2018
LEAD AND COPPER	Done			Due			Due		
ASBESTOS	At DOH direction								
VOLITILE ORGANIC CONTAMINANTS VOCs			Done			Due			Due
HERBICIDES	At DOH direction								
GENERAL PESTICIDES	At DOH direction								
INSECTICIDES	At DOH direction								
EDB AND OTHER FUMIGANTS	Done	At DOH direction							
DIOXIN, ENDOTHALL, DIQUAT, GLYSOPHATE	Waivers								
INORGANIC CONTAMINANTS IOCs	Waivers			Due			Due		
NITRATES (due each year no IOC samples done)	Done	Done	Done		Due	Due		Due	Due
*MANGANESE (normally part of IOC sampling)	At DOH direction			Due					
RADIONUCLIDES	Done				Due				Due
SYNTHETIC ORGANIC CONTAMINANTS SOCs	Statewide Waivers for General SOCs								
DISINFECTION BYPRODUCTS DBPs			Done			Due			Due
OTHER	At DOH direction								

*Managanese levels are tested in the field on a quarterly basis

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RAD

View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT

Collect Date	9/9/2010
Lab Number	156
Lab Name	Pace Analytical Srvs - Pittsburgh
Sample Number	30117
Source	02
Analyte Group	RAD-RADIONUCLIDES
Test Panel	RAD-RADIONUCLIDES
Sample Location	s/t
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0166	RADIUM 228	EQ	0.9490	5.0000	pCi/L	1.0000
0042	GROSS BETA	LT	4.0000	50.0000	pCi/L	4.0000
0165	GROSS ALPHA	LT	3.0000		pCi/L	3.0000

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VOC

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View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT

Collect Date	9/25/2012
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	38122
Source	02
Analyte Group	VOC-VOLATILE ORGANIC CONTAMINANTS
Test Panel	VOC1-VOLATILE ORGANIC
Sample Location	wh tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0027	CHLOROFORM	LT	0.5000		ug/L	0.5000
0028	BROMODICHLOROMETHANE	LT	0.5000		ug/L	0.5000
0029	DIBROMOCHLOROMETHANE	LT	0.5000		ug/L	0.5000
0030	BROMOFORM	LT	0.5000		ug/L	0.5000
0045	VINYL CHLORIDE	LT	0.5000	2.0000	ug/L	0.5000
0046	1,1 DICHLOROETHYLENE	LT	0.5000	7.0000	ug/L	0.5000
0047	1,1,1 TRICHLOROETHANE	LT	0.5000	200.0000	ug/L	0.5000
0048	CARBON TETRACHLORIDE	LT	0.5000	5.0000	ug/L	0.5000
0049	BENZENE	LT	0.5000	5.0000	ug/L	0.5000
0050	1,2 DICHLOROETHANE	LT	0.5000	5.0000	ug/L	0.5000
0051	TRICHLOROETHYLENE	LT	0.5000	5.0000	ug/L	0.5000
0052	1,4 DICHLOROBENZENE	LT	0.5000	75.0000	ug/L	0.5000
0053	CHLOROMETHANE	LT	0.5000		ug/L	0.5000
0054	BROMOMETHANE	LT	0.5000		ug/L	0.5000
0055	CHLOROETHANE	LT	0.5000		ug/L	0.5000
0056	METHYLENE CHLORIDE (DICHLOROMETHANE)	LT	0.5000	5.0000	ug/L	0.5000
0057	TRANS- 1,2 DICHLOROETHYLENE	LT	0.5000	100.0000	ug/L	0.5000
0058	1,1 DICHLOROETHANE	LT	0.5000		ug/L	0.5000
0059	2,2 DICHLOROPROPANE	LT	0.5000		ug/L	0.5000
0060	CIS- 1,2 DICHLOROETHYLENE	LT	0.5000	70.0000	ug/L	0.5000
0062	1,1 DICHLOROPROPENE	LT	0.5000		ug/L	0.5000
0063	1,2 DICHLOROPROPANE	LT	0.5000	5.0000	ug/L	0.5000
0064	DIBROMOMETHANE	LT	0.5000		ug/L	0.5000
0065	CIS- 1,3 DICHLOROPROPENE	LT	0.5000		ug/L	0.5000
0066	TOLUENE	LT	0.5000	1000.0000	ug/L	0.5000

|◀ ◀ ▶ ▶|
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EDB

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View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT

Collect Date	9/9/2010
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	30117
Source	02
Analyte Group	SOC-SYNTHETIC ORGANIC CONTAMINANTS
Test Panel	FUMIGANT-SOIL FUMIGANTS
Sample Location	s/t
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0079	1,2,3 TRICHLOROPROPANE	LT	0.5000		ug/L	0.5000
0102	EDB (ETHYLENE DIBROMIDE)	LT	0.0200	0.0500	ug/L	0.0200
0103	DBCP	LT	0.0400	0.2000	ug/L	0.0400

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View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT

Collect Date	10/10/2005
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	26751
Source	02
Analyte Group	SOC-SYNTHETIC ORGANIC CONTAMINANTS
Test Panel	HERB1-CHLOROPHENOXY HERBICIDES
Sample Location	potable sample tap treatment bldg
Sample Type	Post-Treatment / Finished

HERB.

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0037	2,4 - D	LT	0.2000	70.0000	ug/L	0.5000
0038	2,4,5 TP (SILVEX)	LT	0.4000	50.0000	ug/L	1.0000
0134	PENTACHLOROPHENOL	LT	0.0800	1.0000	ug/L	0.2000
0135	2,4 DB	LT	1.0000		ug/L	1.0000
0136	2,4,5 T	LT	0.4000		ug/L	0.4000
0137	DALAPON	LT	2.0000	200.0000	ug/L	5.0000
0138	DICAMBA	LT	0.2000		ug/L	0.2000
0139	DINOSEB	LT	0.4000	7.0000	ug/L	1.0000
0140	PICLORAM	LT	0.2000	500.0000	ug/L	0.5000
0220	BENTAZON	LT	0.5000		ug/L	0.5000
0221	DICHLORPROP	LT	0.5000		ug/L	0.5000
0223	ACIFLUORFEN	LT	2.0000		ug/L	2.0000
0225	DCPA ACID METABOLITES	LT	0.1000		ug/L	0.1000
0226	3,5 DICHLORBENZOIC ACID	LT	0.5000		ug/L	0.5000

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View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT

Collect Date	10/10/2005
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	26751
Source	02
Analyte Group	SOC-SYNTHETIC ORGANIC CONTAMINANTS
Test Panel	INSECT1-CARBAMATE INSECTICIDES
Sample Location	potable sample tap treatment bldg
Sample Type	Post-Treatment / Finished

INSECT.

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0141	3- HYDROXYCARBOFURAN	LT	2.0000		ug/L	2.0000
0142	ALDICARB	LT	1.0000		ug/L	1.0000
0143	ALDICARB SULFONE	LT	0.7000		ug/L	0.7000
0144	ALDICARB SULFOXIDE	LT	1.8000		ug/L	1.8000
0145	CARBARYL	LT	2.0000		ug/L	2.0000
0146	CARBOFURAN	LT	2.0000	40.0000	ug/L	2.0000
0147	METHOMYL	LT	1.0000		ug/L	4.0000
0148	OXAMYL	LT	4.0000	200.0000	ug/L	10.0000
0326	BAYGON	LT	1.0000		ug/L	1.0000
0327	METHIOCARB	LT	4.0000		ug/L	4.0000

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Collect Date	10/10/2005
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	26751
Source	02
Analyte Group	SOC-SYNTHETIC ORGANIC CONTAMINANTS
Test Panel	PEST1-GENERAL PESTICIDE SUITE
Sample Location	potable sample tap treatment bldg
Sample Type	Post-Treatment / Finished

PEST.

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0033	ENDRIN	LT	0.0200	2.0000	ug/L	0.0500
0034	LINDANE (BHC - GAMMA)	LT	0.0400	0.2000	ug/L	0.0400
0035	METHOXYCHLOR	LT	0.2000	40.0000	ug/L	10.0000
0036	TOXAPHENE	LT	2.0000	3.0000	ug/L	2.0000
0117	Alachlor	LT	0.4000	2.0000	ug/L	0.4000
0118	ALDRIN	LT	0.1000		ug/L	0.1000
0119	ATRAZINE	LT	0.2000	3.0000	ug/L	0.5000
0120	BENZO (A) PYRENE	LT	0.0400	0.2000	ug/L	0.0400
0121	BUTACHLOR	LT	0.4000		ug/L	0.4000
0122	CHLORDANE (TOTAL)	LT	0.4000	2.0000	ug/L	0.4000
0123	DIELDRIN	LT	0.1000		ug/L	0.1000
0124	DI (ETHYLHEXYL) ADIPATE	LT	1.3000	400.0000	ug/L	1.3000
0125	DI (ETHYLHEXYL) PHTHALATE	LT	1.3000	6.0000	ug/L	1.3000
0126	HEPTACHLOR	LT	0.0800	0.4000	ug/L	0.0900
0127	HEPTACHLOR EPOXIDE	LT	0.0400	0.2000	ug/L	0.1000
0128	HEXACHLOROBENZENE	LT	0.2000	1.0000	ug/L	0.5000
0129	HEXACHLOROCYCLO PENTADIENE	LT	0.2000	50.0000	ug/L	0.5000
0130	METOLACHLOR	LT	1.0000		ug/L	1.0000
0131	METRIBUZIN	LT	0.2000		ug/L	0.2000
0132	PROPACHLOR	LT	0.1000		ug/L	0.1000
0133	SIMAZINE	LT	0.1500	4.0000	ug/L	0.1500
0134	PENTACHLOROPHENOL	LT	0.0800	1.0000	ug/L	0.2000
0153	PCB (AS TOTAL AROCHLORS)	LT	0.2000	0.5000	ug/L	0.5000
0173	AROCHLOR 1221	LT	0.5000		ug/L	100.0000
0174	AROCHLOR 1232	LT	0.1000		ug/L	2.5000

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Asbestos

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View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT	
Collect Date	8/18/2009
Lab Number	119
Lab Name	Lab/Cor, Inc
Sample Number	26623
Source	Dist
Analyte Group	IOC-INORGANIC CONTAMINANTS
Test Panel	ASB-ASBESTOS
Sample Location	
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0115	ASBESTOS	LT	1.4000	7.0000	MFL	1.4000

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IOC

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View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT

Collect Date	9/5/2007
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	26675
Source	02
Analyte Group	IOC-INORGANIC CONTAMINANTS
Test Panel	IOC-COMPLETE INORGANIC ANALYSIS
Sample Location	ph after treatment
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0004	ARSENIC	EQ	0.0030	0.0104	mg/L	0.0030
0009	LEAD	EQ	0.0020		mg/L	0.0010
0015	HARDNESS	EQ	100.0000		mg/L	10.0000
0016	CONDUCTIVITY	EQ	221.0000	700.0000	Umhos/cm	70.0000
0017	TURBIDITY	EQ	0.3800		NTU	0.1000
0005	BARIUM	LT	0.4000	2.0000	mg/L	0.4000
0006	CADMIUM	LT	0.0020	0.0050	mg/L	0.0020
0007	CHROMIUM	LT	0.0200	0.1000	mg/L	0.0200
0008	IRON	LT	0.1000	0.3000	mg/L	0.1000
0010	MANGANESE	LT	0.0100	0.0500	mg/L	0.0100
0011	MERCURY	LT	0.0004	0.0020	mg/L	0.0004
0012	SELENIUM	LT	0.0100	0.0500	mg/L	0.0100
0013	SILVER	LT	0.1000	0.1000	mg/L	0.1000
0014	SODIUM	LT	5.0000		mg/L	5.0000
0018	COLOR	LT	15.0000	15.0000	CU	15.0000
0019	FLUORIDE	LT	0.5000	4.0000	mg/L	0.5000
0020	NITRATE-N	LT	0.2000	10.0000	mg/L	0.2000
0021	CHLORIDE	LT	20.0000	250.0000	mg/L	20.0000
0022	SULFATE	LT	50.0000	250.0000	mg/L	50.0000
0023	COPPER	LT	0.0200		mg/L	0.0200
0024	ZINC	LT	0.2000	5.0000	mg/L	0.2000
0110	BERYLLIUM	LT	0.0008	0.0040	mg/L	0.0008
0111	NICKEL	LT	0.1000	0.1000	mg/L	0.1000
0112	ANTIMONY	LT	0.0060	0.0060	mg/L	0.0060
0113	THALLIUM	LT	0.0020	0.0020	mg/L	0.0020

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Nitrate

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View Sample Detail - WSID 307000 - HAMILTON WATER DEPARTMENT	
Collect Date	9/25/2012
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	38122
Source	02
Analyte Group	IOC-INORGANIC CONTAMINANTS
Test Panel	NIT-NITRATE SUITE
Sample Location	wh tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0020	NITRATE-N	EQ	0.1400	10.0000	mg/L	0.2000

Records 1 - 1 of 1

Home Page | Find Water Systems | Find Water Quality | Downloads/Reports

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Department of Health, Office of Drinking Water

Street Address:
243 Israel Road S.E. 2nd floor
Tumwater, WA 98501

Mail:
PO BOX 47822
Olympia, WA 98504-7822

Phone: (360) 236-3100

Send inquiries about DOH and its programs to the Health Consumer Assistance Office
Comments or questions regarding this Web site? Send email to Environmental Health Application Testing and Support or call 360-236-3113.

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XVI
DOH GROUND WATER TREATMENT PLAN REPORTS

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

DOH GROUND WATER TREATMENT PLANT REPORT

Hamilton Water Department		Month/Year: August 2012
Skagit County	**ID No. 307000**	Report submitted by: Cas Hancock
Well #2	**Source No. 02**	Operator Certification #: 7482
DOH Water Quality Parameter Requirements:		Signature: *Cas Hancock*
Mn - __≤0.05__ mg/L Cl_2 Residual - __≥0.2__ mg/L		Telephone #: 360-770-4633

Day	Water Production (Gallons)		Chemicals Used (gal 12.5 %)		Water Quality		Distribution System Water Quality	
	Meter Reading 18143	Total Water to System	NaOCl	Sol 4.0	Mn mg/L	Cl_2 Residual at entry	Cl_2 mg/L Residual Distribution	Location/ Initials of Sampler
1	18203	6000	4	12.5		0.21	0.22	541 Petit / TS
2	18466	26300		12		0.21	0.22	541 Petit / TS
3	18941	47500		11		0.24	0.24	541 Petit / TS
4								
5								
6	19935	99400		10		0.27	0.22	320 California/TS
7	20224	28900		9.25		0.28	0.26	320 California/TS
8	20260	3600		9		0.25	0.22	320 California/TS
9	20586	32600		8.825		0.27	0.21	320 California/TS
10	20895	30900		8.25		0.28	0.26	320 California/TS
11								
12								
13	21874	98900		7		0.29	0.30	214 South St/TS
14	22220	34600		6.25		0.30	0.29	214 South St/TS
15	22483	26300		6		0.30	0.34	214 South St/TS
16	22793	31000		5.5		0.30	0.31	214 South St/TS
17	23129	33600		5		0.30	0.31	214 South St/TS
18								
19								
20	23872	74300	4	12.25		0.29	0.33	610 Shilo/TS
21	24066	19400		12		0.28	0.29	610 Shilo/TS
22	24388	32200		11.5		0.29	0.32	610 Shilo/TS
23	24739	35100		11		0.31	0.35	610 Shilo/TS
24	25014	27500		10.5		0.33	0.32	610 Shilo/TS
25								
26								
27	25630	61600		9.5		0.30	0.31	320 California/TS
28	25977	34700		9		0.34	0.29	320 California/TS
29	26311	32400		8.5		0.34	0.27	320 California/TS
30	26582	27100		8		0.34	0.36	320 California/TS
31	26670	8800		7.825		0.34	0.35	320 California/TS
Tot		852700	8	5				
Ave		27506	0.26	0.81		0.29	0.22	

Mail completed form by the 10th of the following month to:

Washington State Department of Health
NW Drinking Water Operations
20435 72nd Ave S, Suite 200, K17-12
Kent WA 98032

DOH GROUND WATER TREATMENT PLANT REPORT

Hamilton Water Department		Month/Year: July 2012
Skagit County	**ID No. 307000**	Report submitted by: Cas Hancock
Well #2	**Source No. 02**	Operator Certification #: 7482
DOH Water Quality Parameter Requirements:		Signature: *Cas Hancock*
Mn - __≤0.05__ mg/L Cl_2 Residual - __≥0.2__ mg/L		Telephone #: 360-770-4633

Day	Water Production (Gallons)		Chemicals Used (gal 12.5 %)		Water Quality		Distribution System Water Quality	
	Meter Reading 11027	Total Water to System	NaOCl	Sol	Mn mg/L	Cl_2 Residual at entry	Cl_2 mg/L Residual Distribution	Location/ Initials of Sampler
1								
2								
3	11649	57800		12		.25	.28	541 Petit / TS
4	11861	21200		11.5		.26	.23	541 Petit / TS
5	12266	46500		11		.27	.25	541 Petit / TS
6	12537	27100		10.75		.28	.26	541 Petit / TS
7								
8								
9	13182	64500		10.50		.24	.29	320 California/TS
10	13208	2600		10.25		.17	.28	320 California/TS
11	13454	24600		10		.21	.22	320 California/TS
12	13550	9600		10		.22	.22	320 California/TS
13	13914	36400		9.625		.20	.27	320 California/TS
14								
15								
16	14470	55600		9		.20	.24	210 South St/TS
17	14792	32200		8.5		.21	.27	210 South St/TS
18	15129	33700		8		.23	.22	210 South St/TS
19	15409	28000		7.5		.25	.26	210 South St/TS
20	15968	5900		7		.23	.24	210 South St/TS
21								
22								
23	16040	57200		6.5		.24	.24	610 Shilo/TS
24	16346	30600		6.25		.25	.20	610 Shilo/TS
25	16652	30600		6		.25	.26	610 Shilo/TS
26	16947	29500		5.5		.24	.29	610 Shilo/TS
27	17229	28200		5		.24	.26	610 Shilo/TS
28								
29								
30	17871	64200		4		.21	.21	541 Petit / TS
31	18143	27200		4		.20	.20	541 Petit / TS
Tot		707200	0	8.125				
Ave		22800		.26		0.23	0.25	

Mail completed form by the 10th of the following month to:

Washington State Department of Health
NW Drinking Water Operations
20435 72nd Ave S, Suite 200, K17-12
Kent WA 98032

DOH GROUND WATER TREATMENT PLANT REPORT

Hamilton Water Department		Month/Year: June 2012
Skagit County	**ID No. 307000**	Report submitted by: Cas Hancock
Well #2	**Source No. 02**	Operator Certification #: 7482
DOH Water Quality Parameter Requirements:		Signature: *Cas Hancock*
Mn - ≤0.05 mg/L Cl_2 Residual - ≥0.2 mg/L		Telephone #: 360-770-4633

Day	Water Production (Gallons)		Chemicals Used (gal 12.5 %)		Water Quality		Distribution System Water Quality	
	Meter Reading +00 5428	Total Water to System	NaOCl	Sol 13.25	Mn mg/L	Cl_2 Residual at entry	Cl_2 mg/L Residual Distribution	Location/ Initials of Sampler
1	5649	22100		13		0.22	0.30	210 South St/TS
2								
3								
4	6209	56000		12.5		0.24	0.23	610 Shilo/TS
5	6409	20000		12		0.44	0.30	610 Shilo/TS
6	6531	12200		12		0.24	0.34	610 Shilo/TS
7	6844	31300		11.75		0.20	0.32	610 Shilo/TS
8	7189	34500				0.20	0.23	610 Shilo/TS
9								
10								
11	7785	59600	4	11/16		0.31	0.27	541 Petit / TS
12	7793	800		15.75		0.26	0.20	541 Petit / TS
13	7901	10800				0.14	0.19	541 Petit / TS
14	8053	15200				0.27	0.17	541 Petit / TS
15	8226	17300				0.29		
16								
17								
18	8600	37400		15		0.25	0.19	210 South St/TS
19	8850	25000				0.27	0.17	210 South St/TS
20	9037	18700		14.75		0.16	0.16	210 South St/TS
21	9271	23400				0.25	0.25	210 South St/TS
22	9474	20300		14.5			0.20	210 South St/TS
23								
24								
25	9812	33800		14		0.20	0.20	320 California/TS
26	10459	64200		13.5		0.20	0.20	320 California/TS
27	10722	26800		13		0.27	0.19	320 California/TS
28	10803	8100				0.43	0.20	320 California/TS
29	11071	26800		12.5		0.22	0.22	320 California/TS
30								
31								
Tot		567300		5.25				
Ave		27014		0.175		0.241	0.235	

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Washington State Department of Health
NW Drinking Water Operations
20435 72nd Ave S, Suite 200, K17-12
Kent WA 98032

DOH GROUND WATER TREATMENT PLANT REPORT

Hamilton Water Department		Month/Year: May 2012
Skagit County	**ID No. 307000**	Report submitted by: Cas Hancock
Well #2	**Source No. 02**	Operator Certification #: 7482
DOH Water Quality Parameter Requirements:		Signature: *Cas Hancock*
Mn - ≤0.05 mg/L Cl_2 Residual - ≥0.2 mg/L		Telephone #: 360-770-4633

Day	Water Production (Gallons)		Chemicals Used (gal 12.5 %)		Water Quality		Distribution System Water Quality	
	Meter Reading Last 35206	Total Water to System	NaO Cl	Sol last 6.5	Mn mg/L	Cl_2 Residual at entry	Cl_2 mg/L Residual Distribution	Location/ Initials of Sampler
1	3552600	32000		6.25		0.32	0.38	210 South St/TS
2	3573200	20600		6		0.33	0.39	210 South St/TS
3	3585200	12000		5.75		0.32	0.38	210 South St/TS
4	3612600	27400		5.5		0.30	0.36	210 South St/TS
5								
6								
7	3673800	61200	4g	4.5/14.5		0.28	0.26	610 Shilo/TS
8	3680300	6500		14.25		0.28	0.28	610 Shilo/TS
9	3750200	22900		14		0.24	0.26	610 Shilo/TS
10	3735100	31900		13.75		0.24	0.25	610 Shilo/TS
11	3760400	25300		13.5		0.25	0.26	610 Shilo/TS
12	3769000	8600		13.25				
13								
14	3828600	59600		12.5		0.27	0.31	541 Petit / TS
15	30000011	71400		12.25		0.30	0.30	541 Petit / TS
16	62400	61300		11.5		0.32	0.33	541 Petit / TS
17	107300	44900		11		0.32	0.35	541 Petit / TS
18	169900	62600		10		0.34	0.36	541 Petit / TS
19	223200	53300		9.75				
20								
21	324600	101400		9.5		0.21	0.36	320 California/TS
22	387200	62600		8.75		0.24	0.36	320 California/TS
23	413800	26600		8		0.25	0.28	320 California/TS
24	413800	000		8		0.25	0.24	320 California/TS
25	444000	30200		7.75		0.26	0.25	320 California/TS
26								
27								
28	505200	61200		7.25		0.24		
29	505200	000		7.25		0.24	0.29	210 South St/TS
30	532700	27500		7		0.23	0.27	210 South St/TS
31	542800	10100	3g	6.75/13.2		0.24	0.27	210 South St/TS
Tot		921,100		9.75				
Ave		29700	0.2	0.31		0.29	0.31	

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Washington State Department of Health
NW Drinking Water Operations
20435 72nd Ave S, Suite 200, K17-12
Kent WA 98032

DOH GROUND WATER TREATMENT PLANT REPORT

Hamilton Water Department		Month/Year: April 2012
Skagit County	**ID No. 307000**	Report submitted by: Cas Hancock
Well #2	**Source No. 02**	Operator Certification #: 7482
DOH Water Quality Parameter Requirements:		Signature: *Cas Hancock*
Mn - ≤0.05 mg/L Cl_2 Residual - ≥0.2 mg/L		Telephone #: 360-770-4633

Day	Water Production (Gallons)		Chemicals Used (gal 12.5 %)		Water Quality		Distribution System Water Quality	
	Meter Reading + 00 29435	Total Water to System	NaOCl	Sol 9.25	Mn mg/L	Cl_2 Residual at entry	Cl_2 mg/L Residual Distribution	Location/ Initials of Sampler
1								
2	29781	346		9		0.35	0.40	210 South St/TS
3	30073	292		8.5		0.34	0.39	210 South St/TS
4	30356	283		8		0.34	0.37	210 South St/TS
5	30356			8		0.35	0.39	210 South St/TS
6	30678	322		7.5		0.34	0.38	210 South St/TS
7	30971	293				0.34		
8							0.37	610 Shilo/TS
9	31276	305	2	6.5/15		0.33	0.33	610 Shilo/TS
10	31586	310		14.5		0.33	0.33	610 Shilo/TS
11	31683	97		14		0.33	0.37	610 Shilo/TS
12	31912	229		13		0.33	0.39	610 Shilo/TS
13	32184	212		12.5		0.34	0.37	610 Shilo/TS
14								
15								
16	32813	629		10.75		0.34	0.33	541 Petit / TS
17	32813			10.75		0.33	0.40	541 Petit / TS
18	33117	304		10.25		0.31	0.41	541 Petit / TS
19	33375	258		10		0.34	0.38	541 Petit / TS
20	33375			10		0.34	0.29	541 Petit / TS
21	33711	336		9		0.34		
22								
23	34032	321		8		0.34	0.38	320 California/TS
24	34311	279		7.5		0.31	0.35	320 California/TS
25	34311					0.33	0.32	320 California/TS
26	34636	325		7.25		0.33	0.35	320 California/TS
27	34888	252		7		0.34	0.32	320 California/TS
28	34937	49						
29								
30	35206	269		6.5		0.32	0.38	210 South St/TS
31								
Tot		577,100	2	11.25				
Ave		19,237	0.06g	.375g		0.32	0.33	

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Washington State Department of Health
NW Drinking Water Operations
20435 72nd Ave S, Suite 200, K17-12
Kent WA 98032

DOH GROUND WATER TREATMENT PLANT REPORT

Hamilton Water Department		Month/Year: March 2012
Skagit County	**ID No. 307000**	Report submitted by: Cas Hancock
Well #2	**Source No. 02**	Operator Certification #: 7482
DOH Water Quality Parameter Requirements:		Signature: *Cas Hancock*
Mn - ≤0.05 mg/L	Cl_2 Residual - ≥0.2 mg/L	Telephone #: 360-770-4633

Day	Water Production (Gallons)		Chemicals Used (gal 12.5 %)		Water Quality		Distribution System Water Quality	
	Meter Reading	Total Water to System	NaOCl	Sol	Mn mg/L	Cl_2 Residual at entry	Cl_2 mg/L Residual Distribution	Location/ Initials of Sampler
1	20245	18600		14.5	0.04	.36	.34	320 California/TS
2	20668	24300		13.75		.35	.38	320 California/TS
3								
4								
5	21003	33500		12.25		.34	.46	210 South St/TS
6				12		.38	.40	210 South St/TS
7	22470	140700		10		.37	.49	210 South St/TS
8	22765	29500		9		.36	.50	210 South St/TS
9	22768	45000	4	8/16.5		.40	.45	210 South St/TS
10	23218	85000		16		.45	.45	210 South St/TS
11								
12	23915	69700		15		.37	.39	610 Shilo/TS
13	24236	32100		14.5		.33	.40	610 Shilo/TS
14	24545	30900		14		.42	.43	610 Shilo/TS
15	24859	31400		13		.44	.55	610 Shilo/TS
16	25166	30700		12.5		.37	.50	610 Shilo/TS
17	25379	21300		12		.43	.39	610 Shilo/TS
18	25380	100		11		.34	.38	610 Shilo/TS
19	25518	13800		9		.35	.39	541 Petit / TS
20	26550	103200		8.75		.35	.38	541 Petit / TS
21								
22	27208	65800		8.5		.35	.41	541 Petit / TS
23	27586	37800		7.25		.35	.36	541 Petit / TS
24	27914	32800		6.5		.35	.31	541 Petit / TS
25								
26	28520	60600	4	6/14		.33	.39	541 Petit / TS
27	28546	2600		12.5		.36	.34	541 Petit / TS
28	28861	31500		12		.35	.41	320 California/TS
29	28969	10800		11.25		.36	.35	320 California/TS
30	29141	17200		11		.36	.37	320 California/TS
31	29435	29400		10		.35	.35	320 California/TS
Tot		1,004,300	8gal	297.75				
Ave		32,400	.26gal	9.6	.04	.37	.38	

Mail completed form by tbe 10th of the following month to:

Washington State Department of Health
NW Drinking Water Operations
20435 72nd Ave S, Suite 200, K17-12
Kent WA 98032

DOH GROUND WATER TREATMENT PLANT REPORT

Hamilton Water Department		Month/Year: Feb 2012
Skagit County	**ID No. 307000**	Report submitted by: Cas Hancock
Well #2	**Source No. 02**	Operator Certification #: 7482
DOH Water Quality Parameter Requirements:		Signature: *Cas Hancock*
Mn - ≤0.05 mg/L	Cl_2 Residual - ≥0.2 mg/L	Telephone #: 360-770-4633

Day	Water Production (Gallons)		Chemicals Used (gal 12.5 %)		Water Quality		Distribution System Water Quality	
	Meter Reading 11350	Total Water to System	NaOCl 15.5	Sol	Mn mg/L	Cl_2 Residual at entry	Cl_2 mg/L Residual Distribution	Location/ Initials of Sampler
1	11675	32500	15	.5		.37	.41	320 California/TS
2	11973	29800	14	1		.41	.36	320 California/TS
3	12289	31600	13	1		.41	.41	320 California/TS
4								
5								
6	13234	94500	11	1		.41	.43	210 South St/TS
7	13526	29200	10	1		.41	.39	210 South St/TS
8	13847	32100	9.5	.5		.38	.41	210 South St/TS
9	15165	31800	8.5	1		.40	.41	210 South St/TS
10	15401	33600	7.5/15	1		.37	.41	210 South St/TS
11								
12								
13	15398	89700	14	1		.42	.39	610 Shilo/TS
14	15714	31600	13	1		.41	.39	610 Shilo/TS
15	16054	34000	12.5	.5		.36	.31	610 Shilo/TS
16	16392	33800	11.25	0.25		.37	.30	610 Shilo/TS
17	16703	31100	11	.75		.35	.38	610 Shilo/TS
18								
19								
20	17321	61800	10.5	.5		.35	.38	541 Petit / TS
21	17729	40800	10	.5		.34	.42	541 Petit / TS
22	18069	39000	9	1		.34	.42	541 Petit / TS
23	18434	36900	8.5	.5		.35	.40	541 Petit / TS
24	18772	33800	8	.5		.34	.42	541 Petit / TS
25								
26								
27	19678	90600	7.5	.5		.40	.40	320 California/TS
28	20015	33700	7	.5		.37	.35	320 California/TS
29	20239	22400	6/15.5	1		.44	.40	320 California/TS
30								
31								
Tot		919300		20.5				
Ave		31700		.71		0.38	0.38	

Mail completed form by the 10th of the following month to:

Washington State Department of Health
NW Drinking Water Operations
20435 72nd Ave S, Suite 200, K17-12
Kent WA 98032

DOH GROUND WATER TREATMENT PLANT REPORT

Hamilton Water Department		Month/Year: January 2012
Skagit County	**ID No. 307000**	Report submitted by: Cas Hancock
Well #2	**Source No. 02**	Operator Certification #: 7482
DOH Water Quality Parameter Requirements:		Signature: *Cas Hancock*
Mn - ≤0.05 mg/L	Cl_2 Residual - ≥0.2 mg/L	Telephone #: 360-770-4633

Day	Water Production (Gallons)		Chemicals Used (gal 12.5 %)		Water Quality		Distribution System Water Quality	
	Meter Reading 1326	Total Water to System	NaOCl	Sol 13	Mn mg/L	Cl_2 Residual at entry	Cl_2 mg/L Residual Distribution	Location/ Initials of Sampler
1								
2	2038	71200		11		0.36	0.37	320 California/TS
3	2367	32900		10.5		0.35	0.31	320 California/TS
4	2724	35700		9.75		0.36	0.31	320 California/TS
5	3070	34600		9.25		0.36	0.34	320 California/TS
6	3458	38800		8.75		0.36	0.41	320 California/TS
7								
8								
9	4519	106100		7.5		0.36	0.37	210 South St/TS
10	4889	37000		7		0.34	0.31	210 South St/TS
11	5291	40200	4	6.5/15		0.34	0.32	210 South St/TS
12	5618	39900		14		0.34	0.36	210 South St/TS
13	5927	30900		13		0.36	0.41	210 South St/TS
14								
15								
16	6911	98400		10		0.35	0.34	610 Shilo/TS
17								
18	2508	59700		8.5		0.35	0.36	610 Shilo/TS
19								
20	8115	60700	4	7/16.5		0.35	0.38	610 Shilo/TS
21								
22								
23	9031	91600		14		0.36	0.41	541 Petit / TS
24	9236	20500		13		0.37	0.43	541 Petit / TS
25	9373	13700		12.5		0.36	0.41	541 Petit / TS
26	9718	34500		11		0.36	0.43	541 Petit / TS
27	10050	33200		10.5		0.35	0.42	541 Petit / TS
28								
29								
30	11007	95700		8		0.37	0.41	420 California/TS
31	11350	34300	4	7/15		0.37	0.41	420 California/TS
Tot		1009000	12	20.25				
Ave		32500	0.387	0.65		0.36	0.375	

Mail completed form by the 10th of the following month to:

Washington State Department of Health
NW Drinking Water Operations
20435 72nd Ave S, Suite 200, K17-12
Kent WA 98032

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XVII
WELL LOGS

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

ENTERED Production Well AEN137

WELL REPORT

STATE OF WASHINGTON

Start Card No. W 116463
Unique Well I.D. # AEN137
Water Right Permit No. G1-24501C

(1) OWNER: Name TOWN OF HAMILTON Address 584 MAPLE STREET HAMILTON, WA 98255-

(2) LOCATION OF WELL: County SKAGIT - SW 1/4 NW 1/4 Sec 12 T 35 N., R 6E WM

(2a) STREET ADDRESS OF WELL (or nearest address) 35-6E-12E

(3) PROPOSED USE: MUNICIPAL

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 8 inches
Drilled 200.5 ft. Depth of completed well 200.5 ft.

(6) CONSTRUCTION DETAILS:
Casing Installed: 8 " Dia. from +2.5 ft. to 184.5 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: NO
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: YES
Manufacturer's Name JOHNSON
Type STAINLESS STEEL Model No. TELESCOPING
Diam. 8 slot size 60 from 185.5 ft. to 200.5 ft.
Diam. slot size 0 from 183 ft. to 185.5 ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 83.3 ft. below top of well Date 06/23/99
Artesian Pressure lbs. per square inch Date
Artesian water controlled by

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 4004 gal/min. w/ stem set at 180 ft. for 2 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made?

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
BROWN CLAY	0	8
GRAVEL & BRN SILTY SAND	8	68
SAND GRAVEL & WATER	68	90
BRN SILTY SAND & GRAVEL	90	102
GRAY CLAY & SOME GRAVEL	102	115
GRAVEL & GRAY CLAY	115	126
BROWN CLAY & SAND	126	135
BROWN SAND & WATER	135	152
GRAY CLAY & GRAVEL	152	156
BROWN SANDY CLAY	156	168
FINE GREY SAND & WATER	168	170
GRAY CLAY BROWN CLAY & SAND	170	181
WATER GRAVEL COARSE SAND	181	

Well Located According To Skagit County Ordinance # 12.48

RECEIVED
JUL 6 1999
DEPT OF ECOLOGY

Work started 06/21/99 Completed 06/23/99

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME DAHLMAN PUMP & WELL DRILL
(Person, firm, or corporation) (Type or print)

ADDRESS PO BOX 422

[SIGNED] License No. 2043

Contractor's Registration No. DAHLMPH123LC Date 06/25/99

ENTERED

Monitoring Well

AEN136

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. R 11640
Unique Well I.D. # AEN136
Water Right Permit No. G1-24501C

(1) OWNER: Name TOWN OF HAMILTON Address 584 MAPLE STREET HAMILTON, WA 98255-

(2) LOCATION OF WELL: County SKAGIT - SW 1/4 NW 1/4 Sec 12 T 35 N., R 6E WM
(2a) STREET ADDRESS OF WELL (or nearest address) , 35-6E-12E

(3) PROPOSED USE: MONITORING

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 199 ft. Depth of completed well 199 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from +2.5 ft. to 183 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: NO
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: YES
Manufacturer's Name JOHNSON
Type STAINLESS STEEL Model No. TELESCOPING
Diam. 6 slot size 60 from 199 ft. to 184 ft.
Diam. slot size 0 from 184 ft. to 179 ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 82 ft. below top of well Date 06/17/99
Artesian Pressure lbs. per square inch Date
Artesian water controlled by

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 300+ gal/min. w/ stem set at 180 ft. for 2 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
CRUSHED ROCK & TOPSOIL	0	1
BROWN CLAY	1	6
GRAVEL COBBLES BRN SILTY SAND	6	45
BROWN SAND & GRAVEL	45	60
SAND GRAVEL & WATER	60	82
BRN SILTY SAND & SOME GRAVEL	82	101
GRAY CLAY & SOME GRAVEL	101	120
GRAVEL & GRAY CLAY	120	127
BROWN CLAY & SAND	127	131
GRAY CLAY & SAND	131	137
BROWN SAND & WATER	137	150
GRAY CLAY BROWN CLAY FINE SAND	150	153
WATER BROWN SAND & GRAVEL	153	160
WATER & GRAVEL	160	162
BROWN CLAY	162	165
FINE GRAY SAND & WATER	165	168
GRAY CLAY & FINE GREY SAND	168	180
WATER GRAVEL COARSE SAND	180	

RECEIVED
JUL 6 1999
DEPT OF ECOLOGY

Work started 06/16/99 Completed 06/17/99

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME DAHLMAN PUMP & WELL DRILL
(Person, firm, or corporation) (Type or print)

ADDRESS PO BOX 422

[SIGNED] Ralph W. Dahlman License No. 2043

Contractor's Registration No. DAHLMPW123LC Date 06/29/99

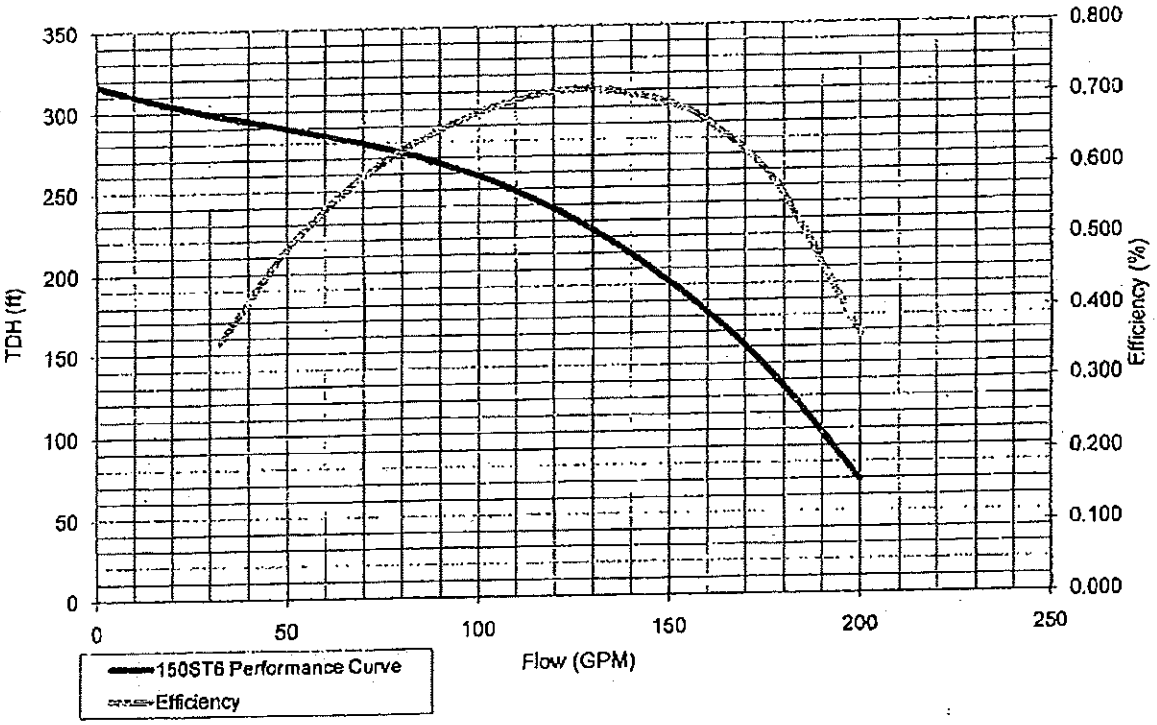
TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XVIII
WELL PUMP CURVE

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

Franklin Electric
Bluffton, Indiana 46714 • www.franklin-electric.com

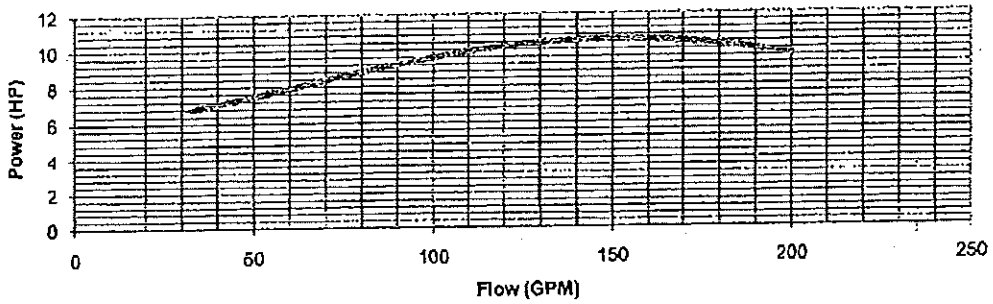
15 GPM Pump Performance



0 A trim
5 B trim
0 C trim

Max Power on Curve: **10.5** HP

Power Required



TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XIX
WATER USE EFFICIENCY PROGRAM DOCUMENTS

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

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

Date Submitted: 6/18/2012

Water Use Efficiency
Annual Performance Report - 2011

WS Name: HAMILTON WATER DEPARTMENT Water System ID# : 30700 WS County: SKAGIT

Report submitted by: *Cas Hancock*

Meter Installation Information:

Estimate the percentage of metered connections: *100%*

If not fully metered - Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period: *01/01/2011* To *12/31/2011*

Incomplete or missing data for the year? *No*

If yes, explain:

Distribution System Leakage Summary:

Total Water Produced and Purchased (TP) – Annual Volume	*20,520,200* gallons
Authorized Consumption (AC) – Annual Volume	*8,612,490* gallons
Distribution System Leakage – Annual Volume TP – AC	*11,907,710* gallons
Distribution System Leakage – Percent DSL = [(TP – AC) / TP] x 100	*58.0 %*
3-year annual average	*65.9 %*

Goal-Setting Information:

Date of Most Recent Public Forum: *07/13/2010* Has goal been changed since last performance report? *No*

Note: Customer goal must be re-established every 6 years through a public process

WUE Goals:

Customer Goal (Demand Side):

Reduce the GPD water consumption per household by 10% by the year 2013.

Describe Progress in Reaching Goals:

Customer (Demand Side) Goal Progress:

We have continued to track down household leaks and get them repaired. We believe that portion of the leak detection program is well in hand.

Additional Information Regarding Supply and Demand Side WUE Efforts

Include any other information that describes how you and your customers use water efficiently:

The Town continues an aggressive distribution system leak detection program. We had a professional leak detection service survey the entire system in December 2011. After discovery and repair of 2 large leaks, our water loss has been reduced significantly. Our April DSL was down to 11% but in May 2012 it was up to 21%. In June of 2012 we replaced 1600 feet of old AC pipe and are anticipating an even greater and steadier improvement in water savings. Although we have achieved our original goal, the Town is committed to improving our DSL percentage.

Do not mail, fax, or email this report to DOH

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

Date Submitted: 6/26/2011

Water Use Efficiency
Annual Performance Report - 2010

WS Name: HAMILTON WATER DEPARTMENT Water System ID# : 30700 WS County: SKAGIT

Report submitted by: *Cas Hancock*

Meter Installation Information:

Is your water system fully metered? *Yes*

If not fully metered - Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period: *01/01/2010* To *12/31/2010*

Incomplete or missing data for the year? *Yes*

If yes, explain:

We were still experiencing difficulty with the digital source meter for the year. After change of Operator in January 2011, and installation of an analogue meter on the upstream side of the digital meter, all source water pumped has been recorded from the analogue source meter and we anticipate more accurate reporting for the 2011 reporting period.

Distribution System Leakage Summary:

Total Water Produced and Purchased (TP) – Annual Volume	*20,310,440* gallons
Authorized Consumption (AC) – Annual Volume	*1,227,746* gallons
Distribution System Leakage – Annual Volume TP – AC	*19,082,694* gallons
Distribution System Leakage – Percent DSL = [(TP – AC) / TP] x 100	*94.0 %*
3-year annual average	*52.4 %*

Goal-Setting Information:

Date of Most Recent Public Forum: *07/13/2010* Has goal been changed since last performance report? *No*

Note: Customer goal must be re-established every 6 years through a public process

WUE Goals:

Customer Goal (Demand Side):

Reduce the annual water consumption per day for each connection by 10% by the year 2013.

Describe Progress in Reaching Goals:

Customer (Demand Side) Goal Progress:

Discovery and repair of customer leaks has reduced the consumption significantly since 2009. the Auhtorized Consumption as of 12/31/2009 and 12/31/2010 has dropped from 9,764,361 gallons to 1,127,746 gallons. A reduction of 115.5%.

Additional Information Regarding Supply and Demand Side WUE Efforts

Include any other information that describes how you and your customers use water efficiently:

The Town of Hamilton continues an aggressive effort to replace old pipes (nearly complete) and to identify leaks within the distribution system. We are working with Evergreen Rural Water of Washington to identify any possible leaks in the large transmission lines, specifically from the well/storage tanks down the hill to the first customer, as this is a steep hillside and is not easily patrolled during our regular system "find the leak" tours. We anticipate a resolution to the water loss problems before the end of 2011.

Do not mail, fax, or email this report to DOH

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

Date Submitted: 7/19/2010

Water Use Efficiency
Annual Performance Report - 2009

WS Name: HAMILTON WATER DEPARTMENT Water System ID# : 30700 WS County: SKAGIT

Report submitted by: *Kelly Wynn*

Meter Installation Information:

Is your water system fully metered? *Yes*

If not fully metered - Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period: *01/01/2009* To *12/31/2009*

Incomplete or missing data for the year? *Yes*

If yes, explain:

Production numbers are suspected to be innacurate. The digital source meter periodically skips around. Upon seeing the water loss numbers the system Board members believe that the meter is reading high. A new meter is being installed with the hope that the production numbers will drop significantly.

Distribution System Leakage Summary:

Total Water Produced and Purchased (TP) – Annual Volume	*18,018,800* gallons
Authorized Consumption (AC) – Annual Volume	*9,764,361* gallons
Distribution System Leakage – Annual Volume TP – AC	*8,254,439* gallons
Distribution System Leakage – Percent DSL = [(TP – AC) / TP] x 100	*45.8 %*
3-year annual average	%

Goal-Setting Information:

Date of Most Recent Public Forum: *07/13/2010* Has goal been changed since last performance report? *Yes*

Note: Customer goal must be re-established every 6 years through a public process

WUE Goals:

Customer Goal (Demand Side):

Reduce the average water consumption per day for each connection by 10% by the year 2013.

Describe Progress in Reaching Goals:

Customer (Demand Side) Goal Progress:

NA

Additional Information Regarding Supply and Demand Side WUE Efforts

Include any other information that describes how you and your customers use water efficiently:

The Town of Hamilton has been actively working to replace old pipe to reduce the potential for large leaks within the distribution system. As noted earlier in this report, there is believed to ba a source meter problem that is currently being dealt with and we hope to report back in the near future that the 45.8% water loss in 2009 was actually a meter problem.

Do not mail, fax, or email this report to DOH

Town of Hamilton
Year: 2012

MONTH	Gal PUMPED	Gal SOLD	Gallons accounted for	% DSL
January	1,009,000	546,085	11,600	45
February	919,300	435,635	3,500	52
March	898,100	482,258	4,200	46
April	577,100	512,724	1,000	11
May	921,100	721,865	6,000	21
June	567,300	510,487	22,000	6
July	707,200	670,447	4,000	5
August	852,700	743,654	11,500	11
September	709,800	562,361	84,500	9
October	648,500	554,432	34,500	9
November	679,400	621,475	6,500	8
December	658,200	538,164	50,000	11
TOTAL (2012)	**9,147,700**	**6,899,587**	**239,300**	**22.0%**
TOTAL (June - December 2012)				**8.5%**

Town of Hamilton
Year: 2011

MONTH	Gal PUMPED	Gal SOLD	Gallons accounted for	% DSL
January	3,012,520	1,572,610	3,000	48
February	1,376,800	572,654	4,500	58
March	1,763,200	673,522	4,500	62
April	1,976,200	547,678	4,500	72
May	1,466,400	841,387	4,500	42
June	1,772,200	553,146	4,500	69
July	1,700,800	746,421	3,000	56
August	1,904,500	987,511	4,500	48
September	1,789,900	611,826	864,000	18
October	1,624,100	559,444	806,400	16
November	1,011,800	595,699	1,000	41
December	1,121,700	537,983	2,000	52
TOTAL	**20,520,120**	**8,799,881**	**1,706,400**	**48.8%**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: December **Year:** 2012

Water Produced this month:	658,200	gallons
Water Produced this mo: (Mitigation Well)	0	gallons

A: Total Water Produced and Purchased = **658,200 gallons**

Sold:	Residential	457,948	gallons
	Commercial	80,216	gallons
	Water Salesman		gallons

Total Sold = **538,164 gallons**

B: Difference: (Produced+Purchased) - Sold = **120,036 gallons**

% Difference = **18 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)	2,000	gallons
Hydrant Flushing	20,000	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	5,000	gallons
Mitigation Well Diversion	0	gallons
Fire Department Use	3,000	gallons
Net Computer Adjustment + / -	0	gallons
Other=construction flushing	20,000	gallons

C: Total Gallons Accounted For = **50,000 gallons**

Loss: Unaccounted-for Water: (B-C) = **70,036 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **11 % unaccounted - for loss**

31 days in month

Gallons / Day Loss = **2,259 gallons/day**

Gallons / Minute Loss = **2 gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: November **2012**

Water Produced this month:	679,400	gallons
Water Produced this mo: (Mitigation Well)	0	gallons

A: Total Water Produced and Purchased = **679,400 gallons**

Sold:	Residential	538,664	gallons
	Commercial	82,811	gallons
	Water Salesman		gallons

Total Sold = **621,475 gallons**

B: Difference: (Produced+Purchased) - Sold = **57,925 gallons**

% Difference = **9 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)		gallons
Hydrant Flushing	2,000	gallons
Storage Tank Overflow		gallons
Water Treatment Plant Use	3,000	gallons
Mitigation Well Diversion		gallons
Fire Department Use	1,500	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For = **6,500 gallons**

Loss: Unaccounted-for Water: (B-C) = **51,425 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **8 % unaccounted - for loss**

30 days in month

Gallons / Day Loss = **1,714 gallons/day**

Gallons / Minute Loss = **1 gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: October **Year:** 2012

Water Produced this month:	648,500	gallons
Water Produced this mo: (Mitigation Well)	18,100	gallons

A: Total Water Produced and Purchased = **666,600 gallons**

Sold:	Residential	477,807	gallons
	Commercial	76,625	gallons
	Water Salesman		gallons

Total Sold = **554,432 gallons**

B: Difference: (Produced+Purchased) - Sold = **112,168 gallons**

% Difference = 17 **% total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)		gallons
Hydrant Flushing	3,000	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	30,000	gallons
Mitigation Well Diversion	18,100	gallons
Fire Department Use	1,500	gallons
Net Computer Adjustment + / -	0	gallons
Other=construction flushing	0	gallons

C: Total Gallons Accounted For = **52,600 gallons**

Loss: Unaccounted-for Water: (B-C) = **59,568 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= 9 **% unaccounted - for loss**

	31	days in month
Gallons / Day Loss =	**1,922**	**gallons/day**
Gallons / Minute Loss =	**1**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: September **Year:** 2012

Water Produced this month:	709,800	gallons
Water Purchased this month:	0	gallons
A: Total Water Produced and Purchased =	**709,800**	**gallons**
Sold: Residential	281,652	gallons
Commercial	280,709	gallons
Water Salesman	0	gallons
Total Sold =	**562,361**	**gallons**
B: Difference: (Produced+Purchased) - Sold =	**147,439**	**gallons**
% Difference =	**21**	**% total water loss**
Gallons of Water Accounted For:		
Breaks (Estimated Total)	80,000	gallons
Hydrant Flushing	0	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	3,000	gallons
Wastewater Treatment Plant Use	0	gallons
Fire Department Use	1,500	gallons
Net Computer Adjustment + / -	0	gallons
Other=construction flushing	0	gallons
C: Total Gallons Accounted For =	**84,500**	**gallons**
Loss: Unaccounted-for Water: (B-C) =	**62,939**	**gallons**
% Loss: Unaccounted-for Water: (B-C)/A %=	**9**	**% unaccounted - for loss**
	30	days in month
Gallons / Day Loss =	**2,098**	**gallons/day**
Gallons / Minute Loss =	**1**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: August **Year:** 2012

Water Produced this month:	852,700	gallons
Water Purchased this month:	0	gallons
A: Total Water Produced and Purchased =	**852,700**	**gallons**
Sold: Residential	551,029	gallons
Commercial	192,625	gallons
Water Salesman	0	gallons
Total Sold =	**743,654**	**gallons**
B: Difference: (Produced+Purchased) - Sold =	**109,046**	**gallons**
% Difference =	13	**% total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)	0	gallons
Hydrant Flushing	5,000	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	3,000	gallons
Wastewater Treatment Plant Use	0	gallons
Fire Department Use	1,500	gallons
Net Computer Adjustment + / -	0	gallons
Other=construction flushing	2,000	gallons

C: Total Gallons Accounted For =	**11,500**	**gallons**
Loss: Unaccounted-for Water: (B-C) =	**97,546**	**gallons**
% Loss: Unaccounted-for Water: (B-C)/A %=	11	**% unaccounted - for loss**
	30	days in month
Gallons / Day Loss =	**3,252**	**gallons/day**
Gallons / Minute Loss =	**2**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: July **Year:** 2012

Water Produced this month:		707,200	gallons
Water Purchased this month:		0	gallons
A: Total Water Produced and Purchased =		**707,200**	**gallons**
Sold:	Residential	549,376	gallons
	Commercial	121,071	gallons
	Water Salesman	0	gallons
Total Sold =		**670,447**	**gallons**
B: Difference: (Produced+Purchased) - Sold =		**36,753**	**gallons**
% Difference =		**5**	**% total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)	0	gallons
Hydrant Flushing	0	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	2,000	gallons
Wastewater Treatment Plant Use	0	gallons
Fire Department Use	0	gallons
Net Computer Adjustment + / -		gallons
Other=construction flushing	2,000	gallons

C: Total Gallons Accounted For =	**4,000**	**gallons**
Loss: Unaccounted-for Water: (B-C) =	**32,753**	**gallons**
% Loss: Unaccounted-for Water: (B-C)/A %=	**5**	**% unaccounted - for loss**
	30	days in month
Gallons / Day Loss =	**1,092**	**gallons/day**
Gallons / Minute Loss =	**1**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: June **Year:** 2012

Water Produced this month:	567,300	gallons
Water Purchased this month:	0	gallons

A: Total Water Produced and Purchased = **567,300 gallons**

Sold:	Residential	455,666	gallons
	Commercial	54,821	gallons
	Water Salesman	0	gallons

Total Sold = **510,487 gallons**

B: Difference: (Produced+Purchased) - Sold = **56,813 gallons**

% Difference = **10 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)	0	gallons
Hydrant Flushing	0	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	2,000	gallons
Wastewater Treatment Plant Use	0	gallons
Fire Department Use	0	gallons
Net Computer Adjustment + / -		gallons
Other=construction flushing	20,000	gallons

C: Total Gallons Accounted For = **22,000 gallons**

Loss: Unaccounted-for Water: (B-C) = **34,813 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **6 % unaccounted - for loss**

30 days in month

Gallons / Day Loss = **1,160 gallons/day**

Gallons / Minute Loss = **1 gallons/min.**

WOOHOO!

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: May **Year:** 2012

Water Produced this month:	921,100	gallons
Water Purchased this month:	0	gallons

A: Total Water Produced and Purchased = **921,100 gallons**

Sold:	Residential	663,326	gallons
	Commercial	58,539	gallons
	Water Salesman	0	gallons

Total Sold = **721,865 gallons**

B: Difference: (Produced+Purchased) - Sold = **199,236 gallons**

% Difference = **22 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)	0	gallons
Hydrant Flushing	1,000	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	2,000	gallons
Wastewater Treatment Plant Use	0	gallons
Fire Department Use	3,000	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For = **6,000 gallons**

Loss: Unaccounted-for Water: (B-C) = **193,236 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **21 % unaccounted - for loss**

	31	days in month
Gallons / Day Loss =	**6,233**	**gallons/day**
Gallons / Minute Loss =	**4**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: April **Year:** 2012

Water Produced this month:	577,100	gallons
Water Purchased this month:	0	gallons

A: Total Water Produced and Purchased = **577,100 gallons**

Sold:	Residential	446,855	gallons
	Commercial	65,869	gallons
	Water Salesman	0	gallons

Total Sold = **512,724 gallons**

B: Difference: (Produced+Purchased) - Sold = **64,376 gallons**

% Difference = **11 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)	0	gallons
Hydrant Flushing	0	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	1,000	gallons
Wastewater Treatment Plant Use	0	gallons
Fire Department Use	0	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For = **1,000 gallons**

Loss: Unaccounted-for Water: (B-C) = **63,376 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **11 % unaccounted - for loss**

30 days in month

Gallons / Day Loss = **2,113 gallons/day**

Gallons / Minute Loss = **1 gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: March **Year:** 2012

Water Produced this month:		898,100	gallons
Water Purchased this month:		0	gallons
A: Total Water Produced and Purchased =		**898,100**	**gallons**
Sold:	Residential	324,774	gallons
	Commercial	157,484	gallons
	Water Salesman	0	gallons
Total Sold =		**482,258**	**gallons**
B: Difference: (Produced+Purchased) - Sold =		**415,842**	**gallons**
% Difference =		46	**% total water loss**
Gallons of Water Accounted For:			
	Breaks (Estimated Total)	0	gallons
	Hydrant Flushing	3,200	gallons
	Storage Tank Overflow	0	gallons
	Water Treatment Plant Use	1,000	gallons
	Wastewater Treatment Plant Use	0	gallons
	Fire Department Use	0	gallons
	Net Computer Adjustment + / -		gallons
	Other		gallons
C: Total Gallons Accounted For =		**4,200**	**gallons**
Loss: Unaccounted-for Water: (B-C) =		**411,642**	**gallons**
% Loss: Unaccounted-for Water: (B-C)/A %=		46	**% unaccounted - for loss**
		31	days in month
Gallons / Day Loss =		**13,279**	**gallons/day**
Gallons / Minute Loss =		**9**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: February **Year:** 2012

Water Produced this month:	919,300	gallons
Water Purchased this month:	0	gallons

A: Total Water Produced and Purchased = **919,300 gallons**

Sold:	Residential	280,934	gallons
	Commercial	154,731	gallons
	Water Salesman		gallons

Total Sold = **435,665 gallons**

B: Difference: (Produced+Purchased) - Sold = **483,635 gallons**

% Difference = **53 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)	0	gallons
Hydrant Flushing	2,500	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	1,000	gallons
Wastewater Treatment Plant Use	0	gallons
Fire Department Use	0	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For = **3,500 gallons**

Loss: Unaccounted-for Water: (B-C) = **480,135 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **52 % unaccounted - for loss**

29 days in month

Gallons / Day Loss = **16,556 gallons/day**

Gallons / Minute Loss = **11 gallons/min.**

Monthly Water Loss Report

Water Company: Town of Hamilton

For the Month of: January **Year:** 2012

Water Produced this month:	1,009,000	gallons
Water Purchased this month:	0	gallons
A: Total Water Produced and Purchased =	**1,009,000**	**gallons**
Sold: Residential	479,917	gallons
Commercial	66,168	gallons
Water Salesman		gallons
Total Sold =	**546,085**	**gallons**
B: Difference: (Produced+Purchased) - Sold =	**462,915**	**gallons**
% Difference =	**46**	**% total water loss**
Gallons of Water Accounted For:		
Breaks (Estimated Total)		gallons
Hydrant Flushing	3,000	gallons
Storage Tank Overflow		gallons
Water Treatment Plant Use	1,600	gallons
Wastewater Treatment Plant Use		gallons
Fire Department Use	7,000	gallons
Net Computer Adjustment + / -		gallons
Other		gallons
C: Total Gallons Accounted For =	**11,600**	**gallons**
Loss: Unaccounted-for Water: (B-C) =	**451,315**	**gallons**
% Loss: System Leakage: (B-C)/A %=	**45**	**% distribution system leakage**
	31	days in month
Gallons / Day Loss =	**14,559**	**gallons/day**
Gallons / Minute Loss =	**10**	**gallons/min.**

There were no huge issues for January.
The chlorinators are under control.THANK YOU TOM!
We will probably experience a drop in distributuion system leakage when we get the rest of the lines replaced. The treatment tanks are backwashed every month.

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: December **Year:** 2011

Water Produced this month:	1,121,700	gallons
Water Purchased this month:	0	gallons

A: Total Water Produced and Purchased = **1,121,700 gallons**

Sold:	Residential	517,983	gallons
	Commercial		gallons
	Water Salesman		gallons

Total Sold = **517,983 gallons**

B: Difference: (Produced+Purchased) - Sold = **603,717 gallons**

% Difference = **54 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)	0	gallons
Hydrant Flushing	1,000	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	1,000	gallons
Wastewater Treatment Plant Use	0	gallons
Fire Department Use	0	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For = **2,000 gallons**

Loss: Unaccounted-for Water: (B-C) = **601,717 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **54 % unaccounted - for loss**

31 days in month

Gallons / Day Loss = **19,410 gallons/day**

Gallons / Minute Loss = **13 gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: November **Year:** 2011

Water Produced this month:		1,011,800	gallons
Water Purchased this month:		0	gallons
A: Total Water Produced and Purchased =		**1,011,800**	**gallons**
Sold:	Residential	595,699	gallons
	Commercial		gallons
	Water Salesman		gallons
Total Sold =		**595,699**	**gallons**
B: Difference: (Produced+Purchased) - Sold =		**416,101**	**gallons**
% Difference =		**41**	**% total water loss**
Gallons of Water Accounted For:			
	Breaks (Estimated Total)	0	gallons
	Hydrant Flushing	0	gallons
	Storage Tank Overflow	0	gallons
	Water Treatment Plant Use	1,000	gallons
	Wastewater Treatment Plant Use	0	gallons
	Fire Department Use	0	gallons
	Net Computer Adjustment + / -		gallons
	Other		gallons
C: Total Gallons Accounted For =		**1,000**	**gallons**
Loss: Unaccounted-for Water: (B-C) =		**415,101**	**gallons**
% Loss: Unaccounted-for Water: (B-C)/A %=		**41**	**% unaccounted - for loss**
		30	days in month
Gallons / Day Loss =		**13,837**	**gallons/day**
Gallons / Minute Loss =		**10**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: October **Year:** 2011

Water Produced this month:	1,624,100	gallons
Water Purchased this month:	0	gallons

A: Total Water Produced and Purchased = **1,624,100 gallons**

Sold:	Residential	559,444	gallons
	Commercial		gallons
	Water Salesman		gallons

Total Sold = **559,444 gallons**

B: Difference: (Produced+Purchased) - Sold = **1,064,656 gallons**

% Difference = **66 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)	806,400	gallons
Hydrant Flushing	0	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	1,000	gallons
Wastewater Treatment Plant Use	0	gallons
Fire Department Use	0	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For = **807,400 gallons**

Loss: Unaccounted-for Water: (B-C) = **257,256 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **16 % unaccounted - for loss**

	31	days in month
Gallons / Day Loss =	**8,299**	**gallons/day**
Gallons / Minute Loss =	**6**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: September **Year:** 2011

Water Produced this month:	1,789,871	gallons
Water Purchased this month:	0	gallons
A: Total Water Produced and Purchased =	**1,789,871**	**gallons**
Sold: Residential	611,826	gallons
Commercial		gallons
Water Salesman		gallons
Total Sold =	**611,826**	**gallons**
B: Difference: (Produced+Purchased) - Sold =	**1,178,045**	**gallons**
% Difference =	**66**	**% total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)	864,000	gallons
Hydrant Flushing	1,000	gallons
Storage Tank Overflow	0	gallons
Water Treatment Plant Use	1,000	gallons
Wastewater Treatment Plant Use	0	gallons
Fire Department Use	0	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For =	**866,000**	**gallons**
Loss: Unaccounted-for Water: (B-C) =	**312,045**	**gallons**
% Loss: Unaccounted-for Water: (B-C)/A %=	**17**	**% unaccounted - for loss**
	30	days in month
Gallons / Day Loss =	**10,402**	**gallons/day**
Gallons / Minute Loss =	**7**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: August **Year:** 2011

Water Produced this month:	1,904,500	gallons
Water Purchased this month:		gallons
A: Total Water Produced and Purchased =	**1,904,500**	**gallons**
Sold: Residential	987,511	gallons
Commercial		gallons
Water Salesman		gallons
Total Sold =	**987,511**	**gallons**
B: Difference: (Produced+Purchased) - Sold =	**916,989**	**gallons**
% Difference =	**48**	**% total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)		gallons
Hydrant Flushing		gallons
Storage Tank Overflow		gallons
Water Treatment Plant Use	3,000	gallons
Wastewater Treatment Plant Use		gallons
Fire Department Use	1,500	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For =	**4,500**	**gallons**
Loss: Unaccounted-for Water: (B-C) =	**912,489**	**gallons**
% Loss: Unaccounted-for Water: (B-C)/A %=	**48**	**% unaccounted - for loss**
	31	days in month
Gallons / Day Loss =	**29,435**	**gallons/day**
Gallons / Minute Loss =	**20**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: July **Year:** 2011

Water Produced this month:		1,700,800	gallons
Water Purchased this month:			gallons
A: Total Water Produced and Purchased =		**1,700,800**	**gallons**
Sold:	Residential	746,421	gallons
	Commercial		gallons
	Water Salesman		gallons
Total Sold =		**746,421**	**gallons**
B: Difference: (Produced+Purchased) - Sold =		**954,379**	**gallons**
% Difference =		**56**	**% total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)		gallons
Hydrant Flushing		gallons
Storage Tank Overflow		gallons
Water Treatment Plant Use	3,000	gallons
Wastewater Treatment Plant Use		gallons
Fire Department Use		gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For =	**3,000**	**gallons**
Loss: Unaccounted-for Water: (B-C) =	**951,379**	**gallons**
% Loss: Unaccounted-for Water: (B-C)/A %=	**56**	**% unaccounted - for loss**
	31	days in month
Gallons / Day Loss =	**30,690**	**gallons/day**
Gallons / Minute Loss =	**21**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: June **Year:** 2011

Water Produced this month:	1,772,200	gallons
Water Purchased this month:		gallons

A: Total Water Produced and Purchased = **1,772,200 gallons**

Sold:	Residential	553,146	gallons
	Commercial		gallons
	Water Salesman		gallons

Total Sold = **553,146 gallons**

B: Difference: (Produced+Purchased) - Sold = **1,219,054 gallons**

% Difference = **69 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)		gallons
Hydrant Flushing		gallons
Storage Tank Overflow		gallons
Water Treatment Plant Use	3,000	gallons
Wastewater Treatment Plant Use		gallons
Fire Department Use	1,500	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For = **4,500 gallons**

Loss: Unaccounted-for Water: (B-C) = **1,214,554 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **69 % unaccounted - for loss**

30 days in month

Gallons / Day Loss = **40,485 gallons/day**

Gallons / Minute Loss = **28 gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: May **Year:** 2011

Water Produced this month:	1,466,400	gallons
Water Purchased this month:		gallons

A: Total Water Produced and Purchased = **1,466,400 gallons**

Sold:	Residential	841,387	gallons
	Commercial		gallons
	Water Salesman		gallons

Total Sold = **841,387 gallons**

B: Difference: (Produced+Purchased) - Sold = **625,013 gallons**

% Difference = **43 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)		gallons
Hydrant Flushing		gallons
Storage Tank Overflow		gallons
Water Treatment Plant Use	3,000	gallons
Wastewater Treatment Plant Use		gallons
Fire Department Use	1,500	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For = **4,500 gallons**

Loss: Unaccounted-for Water: (B-C) = **620,513 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **42 % unaccounted - for loss**

		days in month
Gallons / Day Loss =	**#DIV/0!**	**gallons/day**
Gallons / Minute Loss =	**#DIV/0!**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: April **Year:** 2011

Water Produced this month:	1,976,200	gallons
Water Purchased this month:		gallons

A: Total Water Produced and Purchased = **1,976,200 gallons**

Sold:	Residential	547,678	gallons
	Commercial		gallons
	Water Salesman		gallons

Total Sold = **547,678 gallons**

B: Difference: (Produced+Purchased) - Sold = **1,428,522 gallons**

% Difference = **72 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)		gallons
Hydrant Flushing		gallons
Storage Tank Overflow		gallons
Water Treatment Plant Use	3,000	gallons
Wastewater Treatment Plant Use		gallons
Fire Department Use	1,500	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For = **4,500 gallons**

Loss: Unaccounted-for Water: (B-C) = **1,424,022 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **72 % unaccounted - for loss**

_____ days in month

Gallons / Day Loss = **#DIV/0! gallons/day**

Gallons / Minute Loss = **#DIV/0! gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: March **Year:** 2011

Water Produced this month:	1,763,200	gallons
Water Purchased this month:		gallons
A: Total Water Produced and Purchased =	**1,763,200**	**gallons**
Sold: Residential	673,522	gallons
Commercial		gallons
Water Salesman		gallons
Total Sold =	**673,522**	**gallons**
B: Difference: (Produced+Purchased) - Sold =	**1,089,678**	**gallons**
% Difference =	**62**	**% total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)		gallons
Hydrant Flushing		gallons
Storage Tank Overflow		gallons
Water Treatment Plant Use	3,000	gallons
Wastewater Treatment Plant Use		gallons
Fire Department Use	1,500	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For =	**4,500**	**gallons**
Loss: Unaccounted-for Water: (B-C) =	**1,085,178**	**gallons**
% Loss: Unaccounted-for Water: (B-C)/A %=	**62**	**% unaccounted - for loss**
	31	days in month
Gallons / Day Loss =	**35,006**	**gallons/day**
Gallons / Minute Loss =	**24**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: February **Year:** 2011

Water Produced this month:	1,376,800	gallons
Water Purchased this month:		gallons
A: Total Water Produced and Purchased =	**1,376,800**	**gallons**
Sold: Residential		gallons
Commercial		gallons
Water Salesman		gallons
Total Sold =	**572,654**	**gallons**
B: Difference: (Produced+Purchased) - Sold =	**804,146**	**gallons**
% Difference =	**58**	**% total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)		gallons
Hydrant Flushing		gallons
Storage Tank Overflow		gallons
Water Treatment Plant Use	3,000	gallons
Wastewater Treatment Plant Use		gallons
Fire Department Use	1,500	gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For =	**4,500**	**gallons**
Loss: Unaccounted-for Water: (B-C) =	**799,646**	**gallons**
% Loss: Unaccounted-for Water: (B-C)/A %=	**58**	**% unaccounted - for loss**
	28	days in month
Gallons / Day Loss =	**28,559**	**gallons/day**
Gallons / Minute Loss =	**20**	**gallons/min.**

Monthly Water Loss Report

Water Company: Hamilton Water Department

For the Month of: January **Year:** 2011

Water Produced this month:	3,012,520	gallons
Water Purchased this month:		gallons

A: Total Water Produced and Purchased = **3,012,520 gallons**

Sold:	Residential	1,572,610	gallons
	Commercial		gallons
	Water Salesman		gallons

Total Sold = **1,572,610 gallons**

B: Difference: (Produced+Purchased) - Sold = **1,439,910 gallons**

% Difference = **48 % total water loss**

Gallons of Water Accounted For:

Breaks (Estimated Total)		gallons
Hydrant Flushing		gallons
Storage Tank Overflow		gallons
Water Treatment Plant Use	3,000	gallons
Wastewater Treatment Plant Use		gallons
Fire Department Use		gallons
Net Computer Adjustment + / -		gallons
Other		gallons

C: Total Gallons Accounted For = **3,000 gallons**

Loss: Unaccounted-for Water: (B-C) = **1,436,910 gallons**

% Loss: Unaccounted-for Water: (B-C)/A %= **48 % unaccounted - for loss**

	31	days in month
Gallons / Day Loss =	**46,352**	**gallons/day**
Gallons / Minute Loss =	**32**	**gallons/min.**

Final Report

Water Line Leak Detection Project for:

Hamilton Water Department, WA

Project Date:

10/26/2011

utility services associates
EVALUATE. MANAGE. CONSERVE

919 SW 150th St, Suite B
Burien, WA 98166

Phone: (877) 585-LEAK(5325)
Fax: (206) 244-0278
Email: info@leakdetectionservice.com

Web: www.leakdetectionservice.com

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COVER LETTER

utility services associates
EVALUATE. MANAGE. CONSERVE.

November 22, 2011

Hamilton Water Department
Attn: Cas Hancock
PO Box 528
Hamilton, WA 98255

Dear Ms. Hancock:

Utility Services Associates, LLC, (USA) is pleased to submit the enclosed Final Report on leak detection services recently completed.

The information contained in this Final Report details the procedures and results specific to this project. When applicable, recommendations have been made concerning the best approach for the repair of leaks detected and preparation for future leak detection projects.

As you review this Final Report, please pay close attention to the Field Technician's remarks and field observations in the Project Observation section of this report. These may assist you in determining the best course of action regarding specific leaks.

At times specific individual Leak Reports may differ in the Final Report from those provided during the course of the project. These changes, usually insignificant, generally pertain to the manner in which we report leaks and do not alter the methods used or results of pinpointing.

We strongly suggest you contact us prior to excavating any leak that we have labeled with "CAUTION" for further explanation.

This leak detection project is productive since we pinpointed leakage that, when repaired, can reduce your water loss, saving Hamilton Water Department dollars now and in the future. We appreciate your confidence in USA. If you have any questions, call us at (877) 585-5325 or (206) 244-0370.

Sincerely,

Rob Meston
President

919 SW 150th St.
Suite B
Burien, WA 98166

Office: 877.585.LEAK (5325)
Fax: 206.244.0278
www.leakdetectionservice.com

EXECUTIVE SUMMARY

LEAK DETECTION EXECUTIVE SUMMARY

On October 26, 2011, USA completed a leak survey for **Hamilton Water Department, WA.** Our Field Technician, Rick Cabral, used and appreciated the information provided by Tom and Cas Hancock to expedite and provide an accurate survey. The tables below detail the information gathered.

Time Spent on Project	
Surveying:	5 Hr
Pinpointing:	1.5 Hr
Other Time:	1 Hr
Total Time:	7.5 Hr

Total Areas Surveyed	
Total Distance in Miles	3.5
Total Distance in feet	18,480

The mileage was estimated by the technician and may not match maps.

Access Points Contacted	
Hydrants	20
Valves	46
Services	117
Other	0
Total	183

Leak Type Noises Detected	
Hydrants	0
Valves	1
Services	1
Other	0
Total	2

Leaks Pinpointed	
Main	1
Valve	0
Service Line	1
Service Connection	0
Meter	0
Hydrant	0
Total	2

Total Water Loss Identified	
Gallons Per Minute (GPM):	25
Gallons Per Day (GPD):	36,000
Gallons Per Year (GPY):	13,140,000

Average Water Loss Identified	
Gallons Per Minute (GPM):	12.5
Gallons Per Day (GPD):	18,000
Gallons Per Year (GPY):	6,570,000

This project was divided into two phases; the survey phase and the pinpointing phase. The following pages outline exactly how those two phases progressed and the results of each. Any leaks pinpointed will be detailed in the attached Leak Reports.

PROJECT OBSERVATIONS

PROJECT OBSERVATIONS
(Water Distribution Lines)

GENERAL
On October 26, 2011 USA completed a leak detection project on the ***entire*** water distribution system for the Hamilton Water Department in Hamilton, WA. The notes below have been generated by our Field Technician and have been included as part of the Executive Summary.

SPECIFICS
The survey was broken down in two different phases:

1. *Survey Phase* – sounding of appurtenances and recording leak type noises that were detected.

2. *Pinpointing Phase* – pinpointing noises that were detected during the Survey Phase.

1. Survey Phase Information

Since the majority of the system is comprised of PVC and is rural in nature (long distances between contact points) we conducted a point-to-point survey making contact with all available appurtenances. It should be noted that even with this method, it is entirely possible that a quieter leak noise may have gone undetected. This is also true for the the galvanized lines in the back yards that are tied to PVC at great distances from where we were listening. The AC and IR pipe was also inspected point-to-point.

Overall, the survey went well despite our limited access on the PVC lines.

2. PInpointing Phase Information

As result of our survey, we were able to locate and pinpoint two (2) leaks. Additional information follows. For additional information and a drawing on each leak, please refer to the Leak Report section of this Final Report:

Leak Report #1 – Cumberland Ave. and Elm St.
This large main leak should be right on.

Leak Report #2 – 584 Elm St.
Use caution as this leak location may not be precise. The service line location was not known. We believe that the leak is closer to the meter. We suggest exposing the line in front of the meter and follow until the leak is found.

CONCLUSION
Leakage was detected and pinpointed, indicating leaks do not readily surface in the areas surveyed, although overall, the areas surveyed were found to be in good condition.

If repair of the pinpointed leaks do not lower water loss percentages, we suggest that sections of line be tested by isolating each section and running a pressure or draw down test. If assistance with this method is needed, please contact us for additional assistance.

Make note of our estimates when repairing the leaks as this may have a significant impact when calculating water loss figures.

We wish to thank Tom and Cass Hancock for their field assistance, which proved invaluable. We look forward to working with the Hamilton Water Department on future conservation projects.

Compiled from field notes respectfully submitted by:

Rick Cabral
Field Technician

SURVEY PHASE REVIEW

SURVEY PHASE REVIEW
(Water Distribution Lines)

The first step in our survey was to review the distribution maps of the system for familiarization of the pipe network and available appurtenances to be used for contact points.

As the leak survey progressed, we determined the distances that even quiet leak type sounds traveled in various pipe materials, pipe sizes and pressure zones in each area of the system. This might have been done by slightly turning on fire hydrants, hose bibs, etc., creating a simulated, quiet leak sound. Appurtenances in that area were then checked with a sound amplification instrument to see how far the simulated leak sounds traveled, thus determining how often we would make contact with appurtenances in a given section of the water distribution system. In most areas, contact was made with pipe appurtenances at intervals no greater than 300 feet where contact points were available and accessible at pre-determined distances as noted in Paragraph B (whichever distance is necessary to obtain complete coverage). This allowed for even more quiet leaks to be located. Whenever we surveyed PVC lines, all available appurtenances were contacted.

We then conducted a comprehensive survey by making physical contact with all available main line appurtenances (valves, hydrants, etc.) and necessary customer services. USA used a sonic leak detection amplification instrument designed for this purpose.

Appurtenances Surveyed

Hydrant	20
Valves	46
Services	117
Other	0
Total	183

When normal contact points were not available or could not be created within a reasonable distance, we made an attempt to use a sonic ground listening instrument to make physical ground contact at intervals no greater than 6 feet directly over the pipe. If conditions did not allow this procedure our Field Technician advised you at time of project and notes of such are included in the Project Observations. Ground listening devices are employed when ground cover is pavement, cement or similar hard surface.

When ground cover was not a hard surface and normal contact points were not available, we made an attempt to use probe rods or a specially designed sounding plate at 6-foot intervals. A sound amplification instrument with 3VG or greater transducer was employed in conjunction with this equipment, directly over the pipe. If conditions did not allow this procedure our Field Technician advised you at time of project and was detailed in the Project Observations section of this Final Report. Direct contact to the main line at intervals outlined in Preparation for Service resulted in the most thorough survey.

A detailed report of decibel levels at suspected leak sound locations and observations were compiled during the survey for reinvestigation and possible pinpointing at a later time. This reinvestigation increased the speed of the survey and eliminated correlating on most false leak sounds.

Areas Surveyed

Street	From	To	
Hamilton Cemetery Rd	Tank	Hwy 20	
Shiloh Ln	Hamilton Cemetery Rd	End of road	
IEC Industry	Hwy 20	Jinicki Corp.	
Bella St	Hwy 20	End of road	
Pettit Rd	Hwy 20	End of road	
Division St	Pettit Rd	End of road	
Baker St	Pettit Rd	End of road	
Noble St	Pettit Rd	Cumberland St	
Hamilton Ave	California St	Cumberland St	
Hamilton Alley line	California St	Cumberland St	
Elm St	Cumberland St	California St	
Cumberland St	Noble Ave	Elm St	
California St	Elm St	Hamilton Ave	
Cumberland St	Noble Ave	End of line	
Noble St	Cumberland St	End of line	
Nolle St	Noble Ave	South St	
South St	Nolle St	End of road	
Railroad Ave	Water St	End of road	
Total Area Surveyed in Feet			**18,400**
Total Area Surveyed in Miles			**3.5**

All indications of leaks found during the survey were verified a second time, after which, the leaks were pinpointed with a computer based sound correlator when possible.

Leak Type Noises Detected

Contact Points	Noises Detected
Hydrant	0
Valves	1
Services	1
Other	0
Total	2

Pinpointing information can be found in the Pinpointing and Leak Reports Sections.

End of Section

PINPOINTING PHASE REVIEW

PINPOINTING PHASE REVIEW
(Water Distribution Lines)

All indications of leaks found during the survey were verified a second time, after which, the leaks were pinpointed with a computer based sound correlator when possible. Pinpointing leak locations through interpretation of sound intensity, either by ear, decibel metering or other like methods was not used when contact points were available for use with the correlator. However, ground listening devises were used as a quick double check on pinpointed leaks.

The equipment used did not normally require valves to be operated during surveying and pinpointing. However, on occasion, services or valves were operated to eliminate service draw noises or to change velocity noise.

The correlator equipment used had the capability to prompt the operator to input the variables when different pipe sizes and/or pipe material were encountered in the same span to be investigated. This is necessary to insure accuracy of results based on the automatic computation of the correct leak sound velocity in leak pinpointing operations. Our correlators have the capability of correlating up to seven various pipe sizes and types at one time in a given space. To insure effective performance in all field environments encountered in the distribution system (i.e. traffic noise, draw, pump operation, industrial noise, etc.), the correlator equipment provides 16 auto filter options and/or infinite manual filter options.

We provided a copy of leak reports, when pinpointed, which included leak locations and estimated GPM loss.

Leaks Pinpointed

Number	Leak Type	Location	GPM
1	Main	Cumberland Ave	20.00
2	Service Line	584 A Elm St	5.00
Total			**25.00**

These leak reports, also included a leak repair priority classification. These classifications are as follows:

Class I Any leak which is hazardous in terms of potential undermining, possibly resulting in surface collapse, encroachment and/or damage to nearby utilities, commercial or private properties or leaks severe enough to warrant immediate repair.

Class II All leaks that display water losses significant enough to be monitored on a regular repair schedule.

Class III Relatively small leaks that should be repaired as workload permits.

Repair Priority

Number	Leak Type	Location	GPM
1	Main	Cumberland Ave	20.00
Total Class I			**20.00**

Number	Leak Type	Location	GPM
2	Service Line	584 A Elm St	5.00
Total Class II			**5.00**

Number	Leak Type	Location	GPM
Total Class III			**0.00**

Whenever any of the leaks detected by USA were repaired prior to completion of the field work, we gave Hamilton Water Department the option to have that section of the system re-surveyed to be sure no very quiet leaks were missed due to an over powering noisy leak sound.

Please note that leakage that was detected and pinpointed may be larger or smaller than estimated. Estimates are based on several variables including type and size of pipe, pressure and interpretation of correlation filter results.

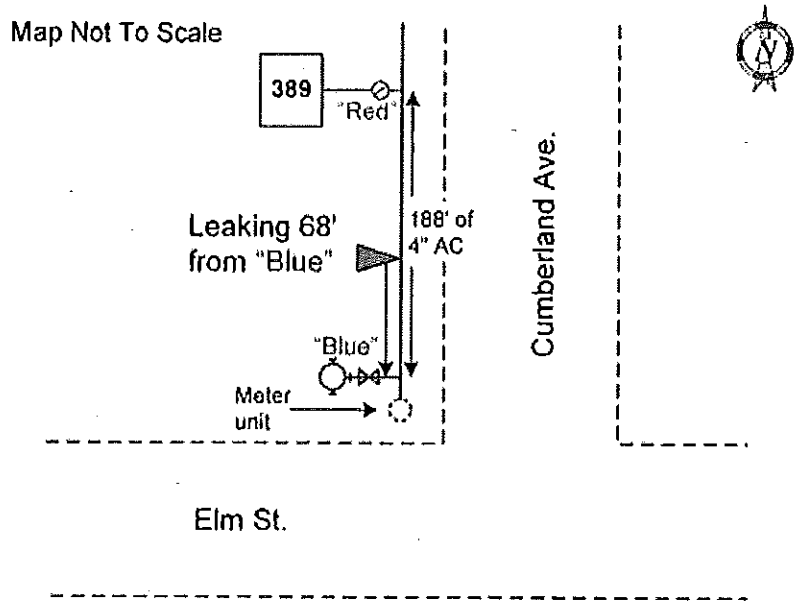
End of Section

LEAK REPORTS

Leak Report

Utility Services Associates, LLC

Location: Cumberland Ave. & Elm St.
Map #: _____ GPS: _____
Remarks: Very good correlation and ground mic results led to this main line leak.
Leak Type: Main
Recommendations: Excavate & Repair



Field Tech: RC
Leak No: 1
Leak Class: 1
Leak Rate: 20.0 GPM
Cover Type: Soil
Site Marked: Yes
Date: 10/26/11
Job No: 11167

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Equipment used: S-30 & LD-12 Portable Listening Devices
LC-2600 Correlator

Computer Correlation Results

Scan Time	Grade	Dist "Red"	Dist "Blue"

Water Loss
(this leak, in gallons)

DAILY 2,880
WEEKLY 20,160
MONTHLY 80,640

Leak Report

Utility Services Associates, LLC

Location: 584 A Elm St.
Map #: _____ GPS: _____
Remarks: Leak on service line. Leak is likely close to meter. There is no main on Elm Ave. Service line location is unknown. Suggest they dig at meter and follow.
Leak Type: Service Line
Recommendations: Excavate & Repair

Map Not To Scale

Elm St.

584 A

Leak on service line

CAUTION: Exact line location not known.

Field Tech: RC
Leak No: 2
Leak Class: II
Leak Rate: 5.0 GPM
Cover Type: Soil
Site Marked: No
Date: 10/26/11
Job No: 11167

Space left blank for digital photo.

Equipment used: S-30 Portable Listening Device

Computer Correlation Results

Scan Time	Grade	Dist "Red"	Dist "Blue"

Water Loss
(this leak, in gallons)

DAILY 7,200
WEEKLY 50,400
MONTHLY 201,600

CONCLUSION

utility services associates
EVALUATE. MANAGE. CONSERVE.

LEAK SURVEY CONCLUSION

Our thanks to Cas Hancock and all persons involved with this project for their assistance in gathering all the necessary paperwork and personnel to create, with USA, a mutually beneficial leak detection project.

With this survey you have demonstrated concern for prudent water utilization and conservation.

Capitalizing on the most advanced leak detection technology available today, USA has successfully completed this Leak Detection Survey. The contents of this Final Report provide Hamilton Water Department with a permanent record of the activities performed to complete a Leak Survey along with the results achieved.

An important characteristic of this Leak Report is that the facts contained herein can be used in formulating a database for decision making regarding: the need for possible future meter programs, rehabilitation and pipe line replacement and/or the investigation of new water sources, etc. These types of decisions, regarding your utilization of water, now can be predicated more on facts rather than supposition or conjecture.

Prompt repair of any leaks reported provide an immediate benefit to Hamilton Water Department, which includes recovery of most water revenue and water conservation, etc.

Having achieved these results, we recommend that you continue to set up the infrastructure necessary to continue investigating leakage in the water distribution system. Implementation of any on-going leak survey program will ensure that leak losses are kept to a minimum, and the added enhancement of saving costs due to emergency call outs.

Utility Services Associates, LLC, is proud to have served Hamilton Water Department in this way and we wish to thank you for your substantial assistance and cooperation in this project.

If you or your staff has any questions regarding this Final Report, please feel free to call us at (877) 585-5325 or (206) 244-0370.

Best Regards,

Rob Meston
President

919 SW 150th St.
Suite B
Burien, WA 98166

Office: 877.585.LEAK (5325)
Fax: 206.244.0278
www.leakdetectionservice.com

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XX
WATER CONSERVATION PLAN DOCUMENTS

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

TOWN OF HAMILTON

Issue 14 **Public Water System ID# 307000** June 2012

A MESSAGE FROM Your Mayor, Tim Bates

I am very pleased to provide you with this year's Annual Water Quality Report. I want to keep you informed about the excellent water and services delivered to you over the past year. The goal has always been to provide you with a safe and dependable water supply.

Your water comes from a well located at the treatment plant. The well draws water from an aquifer approximately 189 feet below the surface. The well was drilled in 2004 and serves our Town, Shiloh Lane and Janicki Industries. I am pleased to report that your drinking water is still safe and meets all current federal and state drinking water standards.

We had no coliform detections in 2011.

Thank you for the patience you have shown while we continue to replace the old transite pipe that remains in the system. We are currently replacing the line on Railroad Avenue and then we will have just two short sections to replace. We may interrupt traffic and create a little dust but we will get things buttoned up as quickly as we can. This project will also provide us with better capacity for firefighting and better flow; and any future growth in this area. When the current project is completed we will also re-paving Railroad Avenue.

If you have any questions about your water system, please feel free to attend any Council meeting. The Council meets the second Tuesday of each month at 7:00 p.m. at Town Hall. If there is a water emergency please call Tom Selin at 360-610-3770 or Mayor Tim Bates, at 826-3027, 826-3141 or 391-6253.

In This Issue:

WATER USE EFFICIENCY REPORT

Municipal water suppliers are required to set water use efficiency goals through a public process and report annually on their performance to customers and to DOH, and also make the information available to the public.

We have worked very hard to eliminate leaks within our distribution system and have found and repaired 4 large ones that have reduced our leakage from a high of 56% to a very reasonable 11%. We will continue to work with all of you to eliminate leaks in your homes and yards and to encourage more efficient use of the water you receive. You have made great progress toward eliminating the leaks around your homes, but it is up to you to notice the leaks on your side of the meter and get them repaired.

Please repair any leaking water lines, faucets or toilets as soon as you discover they are leaking. It will help save our water supply and save you money!

IN CASE YOU ARE WONDERING WHY THERE ARE RESULTS FROM YEARS PRIOR TO 2011

The codified federal regulation states: "Where a system is allowed to monitor for regulated contaminants less often than once a year, the table(s) must include the date and results of the most recent sampling and the report must include a brief statement indicating that the data presented in the report are from the most recent testing done in accordance with the regulations. No data older than 5 years need be included."

2011 Well Water Sample Results

Constituent	MCL or AL	MCLG	Hamilton Water	SRL	Sample Date	Violation	Typical Source
Nitrate (ppm)	10	10	2.0	0.2	Sept 2011	NO	Run off from fertilizer; leaching septic tanks; sewage; or erosion of natural deposits in rocks or soils

About Nitrate: Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask for advice from your health care provider.

2010 Well Water Sample Results

Constituent	MCL or AL	MCLG	Hamilton Water	SRL	Sample Date	Violation	Typical Source
Radium 228 (pCi/L)	50	50	0.9490	4.0	Sep 2010	NO	Decay of natural & man-made deposits

About Radium 226/228: Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.

2010 Distribution System Sample Results

Constituent	MCL or AL	MCLG	Hamilton Homes	SRL	Sample Date	Violation	Typical Source
Average Sample Results (five samples)							
Copper (ppm)	1.3	1.3	0.0315	0.02	Dec 2010	NO	Leaches from pipes, plumbing
Lead (ppb)	15	15	6.0	2.0	Dec 2010	NO	Leaches from pipes, plumbing

About Copper: Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

About Lead: . Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (1-800-426-4791).

2009 Distribution System Sample Results

Constituent	MDRL	MDRLG	Hamilton Water	SRL	Sample Date	Violation	Typical Source
Trihalomethanes / Disinfection Byproducts							
Bromodichloromethane (ug/L)			0.6	0.50	Aug 2009	NO	Result of chlorination
Dibromochloromethane (ug/L)			0.7	1.50	Aug 2009	NO	Result of chlorination
Total Trihalomethanes (ug/L)	80	80	1.3	0.50	Aug 2009	NO	Result of chlorination

About Total Trihalomethanes: Some people who drink water containing trihalomethanes (which include Bromodichloromethane and dibromochloromethane) in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

REQUIRED FEDERAL INFORMATION

WHAT ABOUT BOTTLED WATER?

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 and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radio-active material, and can pick up substances resulting from the presence of animals or from human activity.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. We treat our water according to EPA's regulations. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

****

CONSERVATION TIPS

CONSERVATION IS OUR BEST DEFENSE AGAINST POSSIBLE WATER SHORTAGES.

******

WATER EARLY IN THE MORNING. WATERING **DURING THE HEAT OF THE DAY WASTES MOST OF YOUR WATER BECAUSE IT EVAPORATES BEFORE YOUR LAWN/PLANTS CAN DRINK IT.**

*****

PLEASE MAKE WATER CONSERVATION A DAILY HABIT

Contaminants that may be present in source water before we provide it include:

- *Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.*
- *Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.*
- *Pesticides and herbicides, which may come from a variety of sources such as agriculture and residential uses.*
- *Radioactive contaminants, which are naturally occurring.*
- *Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.*

****

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the

SAFE DRINKING WATER HOTLINE

1-800-426-4791

OR

WWW.EPA.GOV/SAFEWATER

2007Well Water Sample Results

Constituent	MCL or AL	MCLG	Hamilton Water	SRL	Sample Date	Violation	Typical Source
Arsenic (ppb)	10	10	2.0	2	Mar 2007	NO	Erosion of natural deposits Run off from orchards; runoff from glass & electronics production wastes
Lead (ppb)	10	10	2.0	2	Sept 2007	NO	Erosion of natural deposit
Hardness (ppb)	4	4	0.4	0.4	Sept 2007	NO	Erosion of naturol deposits
Conductivity (ppb)	4	4	0.4	0.4	Sept 2007	NO	Erosion of natural deposits'
Turbidity (NTU)	TT	N/A	0.38	0.1	Sept 2007	NO	Soil runoff

About Arsenic: Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have on increased risk of getting cancer.
About Lead: See page 3

All of the following constituents are secondary and are not considered a health risk. They are usually associated with taste and odor problems. As the water travels over the rocks and soil, these constituents are absorbed. Although they may be unpleasant to see, they are not detrimental to your health.

About Hardness: Hardness is a measure of the amount of certain naturally occurring minerals found in water, namely calcium and magnesium. While calcium and magnesium are essential minerals for human health, hardness may cause spotting on dishes and shower walls, affect the lathering of soap (more hardness = less lathering or suds = more soap/detergent required to do the same job) or cause deposits on water related fixtures. Hardness can affect the taste of water and beverages; can leave white, chalky stains on laundry, plumbing fixtures and porcelain; and can lessen the effectiveness of soaps and detergents.
About Conductivity: Conductivity measures the ability of a solution to conduct an electric current between two electrodes. In solution, the current flows by ion transport. Therefore, with an increasing amount of ions present in the liquid, the liquid will have a higher conductivity. If the number of ions in the liquid is very small, the solution will be "resistive" to current flow.
About Turbidity: Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

WHAT DO YOU MEAN BY THAT?

In this newsletter you will find some terms and abbreviations with which you might not be familiar. To help you better understand these terms we've provided the following definitions:
Parts per million (ppm) or Milligrams per liter (mg/L) - one part per million corresponds to one minute in two years or a single penny in $10,000.
Parts per billion (ppb) or Micrograms per liter (ug /L) - one part per billion corresponds to one minute in 2,000 years, or a single penny in $10,000,000.
Parts per trillion (ppt) or Nanograms per liter (nanograms/L) - one part per trillion corresponds to one minute in 2,000,000 years, or a single penny in $10,000,000,000.
Parts per quadrillion (ppq) or Picograms per liter (picograms/L) - one part per quadrillion corresponds to one minute in 2,000,000,000 years or one penny in $10,000,000,000,000.
Picocuries per liter (pCi/L) - picocuries per liter is a measure of the radioactivity in water that can be absorbed by the body.
Millirems per year (mrem/yr) - measure of radiation absorbed by the body.
Million Fibers per Liter (MFL) - million fibers per liter is a measure of the presence of asbestos fibers that are longer than 10 micrometers.
Nephelometric Turbidity Unit (NTU) - nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.
Other terms used:

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 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 (e.g. chlorine, chloramines, chlorine dioxide).*

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.

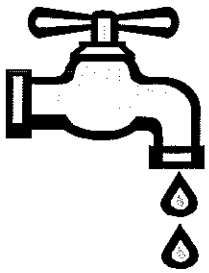
Maximum Residual Disinfectant Level Goal (MRDLG): *The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.*

Action Level (AL): the concentration of a contaminant which, when exceeded, triggers treatment or other requirements which a water system must follow.

Treatment Technique (TT): A treatment technique is a required process intended to reduce the level of a contaminant in drinking water. **N/A:** not applicable **ND:** not detectable at testing limit **SRL:** State Reporting Level

This is Your 2011 Water Quality Report

Questions? 360-826-3027
or
Townofhamilton.2010@gmail.com



DRINKING WATER IS PRECIOUS

Town of Hamilton
584 Maple Street
P. O. Box 528
Hamilton, WA 98255

stamp

Address label

Indoor Water Conservation

Guideline #1

Did you know: Efficient water use can save you money on water & utility bills, and reduce the costs for sewer and septic services. Use the following household tips in the bathroom, kitchen and laundry to help protect the environment and save your family money!

Bathroom

Each flush wastes water. Don't use the toilet as a wastebasket.

Check toilets for leaks. Use food coloring or a leak detection tablet in the toilet tank. If color appears in the bowl without flushing, there is a leak that requires immediate attention.

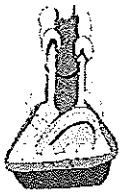
Reduce the water level per flush by installing a ultra low-flow toilet or a toilet displacement device. Use a plastic bottle weighted with pebbles and water. Never use a brick.

Check faucets and pipes for leaks. A small drip can waste 20 or more gallons of water per day.

Don't let the bathroom sink run while wetting your toothbrush, brushing your teeth or when shaving. Use a glass of water to rinse or clean your razor in a small pool of water.

Install water-efficient showerheads and take shorter showers.

Kitchen



Only wash dishes when necessary. Turn the dishwasher on only when it is full.

Use both sides of the sink when washing dishes by hand. Use one side to wash and the other side to rinse. Do not wash dishes under a running faucet.

Install low-flow fixtures, then buy and install aerators for every faucet in the house.

Keep a bottle or pitcher of drinking water in the refrigerator. This eliminates letting the tap run while waiting for the water to get cold.

Clean vegetables in a pan of water and not under a running faucet. Water used to clean vegetables can also be used to water houseplants.

In-sink garbage disposal devices use roughly 11.5 gallons of water each day. Try composting organic wastes instead of throwing them away.

Laundry

Pre-rinse clothes only when absolutely necessary.

Use the proper water level, load size selection and water temperature when washing clothes. Consider installing a water efficient washing machine.

More Information:

Washington State Department of Health
Division of Drinking Water
P.O. Box 47822 • Olympia, WA 98504-7822
(360) 236-3151 • 1-800-521-0323

DOH PUB. # 331-120

Outdoor Water Conservation

Guideline #2

Did you know: Efficient water use is critical to a healthy and clean environment. Fish, trees and animals depend on wise use of our limited water supplies. Use the following tips to save water (and money) outdoors.

Lawn & Garden

The lawn is getting dry when footprints remain after walking on it. (see Guideline #3 - Lawn Watering Guide).

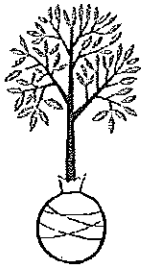
Water in short repeated intervals for best absorbtion, especially on slopes or compacted soils. Prevent water runoff from your sprinkler system.

To reduce evaporation, water the lawn in the early morning or evening. Avoid watering during the heat of the day or when it is windy.

Install a trickle or drip irrigation system for a slow, steady supply of water to the plant roots. (see Guideline #7 - Irrigation & Landscaping).

Water only when needed. Frequency depends on plant and soil type.

Water root areas of your plants to establish hardiness. (see Guideline #6 - Soil Preparation & Planning).



Washington State Department of Health

(Lawn and garden continued)

Low or non-water landscaping require minimal amounts of water, fertilizer and pesticides. This can save you money and will protect the environment.

Place a 2" to 4" layer of mulch around plants and trees to avoid excess evaporation.

Use native and adapted plants when landscaping your yard. These plants usually require less care and water. Consider installing plants that don't require water once they are estabilished for some or all of your yard.

If your lawn is healthy, consider letting your lawn go dormant in the summer. It will turn green again when it rains.

Cleaning

Use a broom to clean walkways and driveways. Do not use the hose. Watering the sidewalk, gutter and street wastes water.

Clean gutters and downspouts manually instead of hosing them down.

Use a hose with a shut-off nozzle along with a bucket of soapy water to wash the car.

More Information:

Washington State Department of Health
Division of Drinking Water
P.O. Box 47822 • Olympia, WA 98504-7822
(360) 236-3151 • 1-800-521-0323

DOH PUB. # 331-120

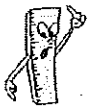
Lawn Watering

Guideline #3

Did you know: During the summer, water use can more than double due to lawn and garden watering. Preserve the environment, save money, save fish and save water by following these simple steps when watering your lawn.

1.  Place three or more flat bottom cans or mugs randomly around your lawn. Inexpensive rainguages may also be used.

2.  Turn on your sprinkler(s) for 15 minutes.

3.  Measure and record the depth of water in each can (mug) with a ruler. Determine the average depth of water for all of the cans combined. Notice the uniformity of your water application.

4.  Refer to the example & chart on the back to determine the number of minutes you should water each week. Record the times for future reference. (See guideline #6 - Soil Preparation & Planning for additional information.)

REMEMBER: Your watering practices should be influenced by the weather. Decrease watering time during cool or humid conditions and skip a scheduled watering after a moderate rainfall. This brochure is only a guide. Consult your local nursery, garden center or county extension office for more information.

Washington State Department of Health

Example
(Season is Spring)

CAN # 1	1/2 inch	12.7 mm
CAN # 2	1/4 inch	6.35 mm
CAN # 3	1/2 inch	12.7 mm
CAN # 4	1/4 inch	6.35 mm
TOTAL	1.5 inches	38.10 mm
AVERAGE *	1.50 / 4 = 3/8 inch (approx.)	38.10 / 4 = 9.52 mm

WATERING TIME: 20 minutes

* Average equals total amount of water in all cans divided by the total number of cans.

* One inch of water a week, including rainfall, is all your lawn needs.

Lawn watering depth chart

Average Depth in Test Can		Minutes to Water Once Each Week In		
Inches	Millimeters	Spring	Summer	Fall
1/8	3.2	60	120	48
1/4	6.3	30	60	24
3/8	9.5	20	40	16
1/2	12.7	15	30	12
5/8	15.9	12	24	9.5
3/4	19.1	10	20	8
1.0	25.4	8	16	6.5
1-1/8	28.6	6	13	5

DOH PUB. # 331-120

Indoor Water Audit

Guideline #4

Did you know: Every time you flush the toilet unnecessarily or leave the sink running, you are wasting water. Find out how many gallons of water your house uses, then save water and money by following these simple steps.

1. Read your water meter before using any water (see guideline #5 - Meter Reading & Leak Repair).
2. Keep track of all indoor water using activities for one day (24 hours). See example on back.
3. Determine the number of gallons each water using activity uses from the chart below.
4. Read your water meter after one day (24 hours) and verify your calculations. (For water meters measuring in cubic feet - 1 cubic foot of water = 7.5 gallons.)
5. Calculate the per-person consumption rate. (Total gallons of water used divided by total people living in home.)
6. Use DOH Water Saving Guidelines 1 through 8 to reduce your water use by 10% (or more) and save money at the same time.

Water Use Activity Chart

(gallons per use)

Toilet:		*Washing Machine:*	
Conventional	5.0	Conventional	37.0
Low-Flow	3.5	Wash Recycle	26.0
Ultra Low-Flow	1.6	Front Load	21.0
		X-Axis	17.5
Faucets:		*Showerheads:*	
Conventional	3.0	Conventional	5.0
Low-Flow	2.5	Low-Flow	2.5

Washington State Department of Health

Example

Beginning Meter Reading *1000*

Bathroom:				
Toilet	18 flushes	X 5 gal/flush	=	90 gal.
Sink	6 minutes	X 3 gal/min	=	18 gal.
Shower	25 minutes	X 5 gal/min	=	125 gal.
Kitchen:				
Sink	6 minutes	X 3 gal/min	=	18 gal.
Dishwasher	1 cycle	X 15 gal/use	=	15 gal.
Other:				
Laundry	1 cycle	X 37 gal/use	=	37 gal.

TOTAL USE *303 gal.*

Per-person Rate – *303* gal / 3 people = *101* gallons per-person

Final Meter Reading * *1303*

* If the beginning meter reading plus total use do not equal the final meter reading, you either used water outdoors and/or you may have a leak.

Worksheet

Beginning Meter Reading _____

Bathroom:				
Toilet	___ flshs	X ___ gal/flsh	=	___ gal.
Sink	___ min	X ___ gal/min	=	___ gal.
Shower	___ min	X ___ gal/min	=	___ gal.
Kitchen:				
Sink	___ min	X ___ gal/min	=	___ gal.
Dishwasher	___ cycle	X ___ gal/use	=	___ gal.
Other:				
Laundry	___ cycle	X ___ gal/use	=	___ gal.

TOTAL USE ___ gal.

Per-person Rate – _____ gals / _____ people = _____ gals per-person

Final Meter Reading * _____

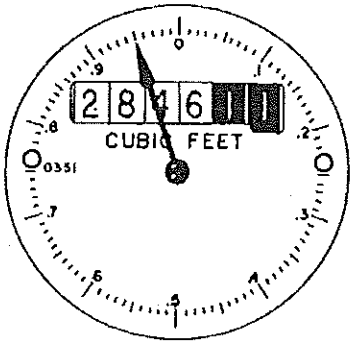
DOH PUB. # 331-120

Meter Reading & Leak Repair

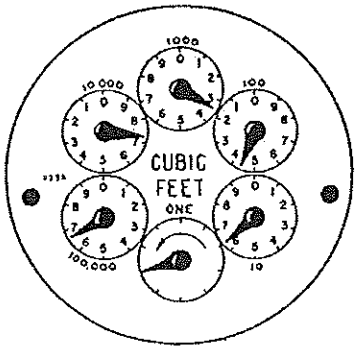
Guideline #5

Did you know: A single dripping faucet can waste far more water in a single day than one person needs for drinking in an entire week. Conserve water and save money by finding and fixing leaks.

How to read a water meter



Some meters read straight across like the odometer on your car. Remember that your meter is never reset.



Some meters are circular with five or six dials. Read each dial clockwise, starting at the 100,000 dial. If a pointer is between two figures, read the lower number.

How to use your water meter to check for leaks

1. Locate your water meter. It is usually found in a meter box in a small concrete vault near the street. (Contact you local water utility if you need assistance locating your water meter).
2. Turn off all water using appliances in the home. This includes all indoor and outdoor faucets.
3. Check and record the current meter reading.
4. Wait 15 minutes (minimum) although overnight is better. **Remember, do not use any water while you are waiting!**
5. Read the water meter again. If the reading has changed, then you have a leak that requires immediate attention.

How to fix a leak

Many leaks (dripping faucets or showerheads) are caused by worn washers which are easy to fix. Your local hardware, plumbing supply or home improvement store will have the correct parts and complete do-it-yourself instructions.

If replacing the washer does not work or the problem is more complicated, contact a certified plumber for assistance.

HINT: Locate the master water supply valve and label it. The master supply valve can then be easily turned off in case of a leak or broken pipe.

Washington State Department of Health

DOH PUB. # 331-120

Irrigation & Landscaping

Guideline #7

Did you know: Gardening professionals agree that most lawns and yards receive more water than they need. Over-watering creates run-off that carries toxic fertilizers and pesticides into our streams. This is not only harmful to wildlife and your plants, it wastes water and money too! The following tips will help protect the environment, keep your yard healthy, and save you money on your water bill.

General

1. Apply water only as fast as the soil can absorb it.
2. Water in the evening or early morning when evaporation is least likely to occur. Drip irrigation may be used during the day with little water lost from evaporation. Do not water when it is windy.
3. Water only once a week. Weekly watering should be sufficient. Water less often if your plants need less moisture (see Guideline #3 - Lawn Watering Guide).

Irrigation and Sprinklers

1. When landscaping, a properly designed and installed irrigation system can be included as a water conservation tool. Automated irrigation systems offer the ultimate in both control and distribution of water over other watering systems.
2. Keep your sprinkler system in good repair. Fix leaks and adjust the sprinkler heads to eliminate over-spray onto paved areas or buildings. Investigate any source of unusual runoff or puddling.

(Irrigation continued)

3. Turn off your sprinkler system at the first sign of saturation or runoff to allow the water to soak in. Water again in an hour or two if needed.
4. Make sure the controller of your automated sprinkler system is properly set to achieve minimum watering levels.

Landscaping

1. Consider alternate landscaping practices. Reduce turf area or use groundcovers and/or mulches instead of turf. Generally, groundcovers use less water than turf areas.
2. Use low water using turf varieties. Consult your county extension office or local nursery to identify low water using turf varieties for your area.
3. Aerate to reduce thatch (dead leaf buildup) in spring or fall. Thatch restricts penetration of water, air and nutrients. Aeration will also increase water penetration in compacted soils.
4. Consider using organic fertilizer. Consult a nursery or landscape professional for a well balanced fertilizer program.
5. Spot spray weeds as needed and consider an integrated pest management program to control bugs and/or disease.
6. Use mulches such as bark compost to help planting beds retain moisture.
7. Consider water consumption when selecting plants. Some plants use more water than others. Consult a good gardening book or your local nursery to determine which low water using plants are correct for your area.
8. Plant placement is important. Remember, right plant, right place! Shade loving plants don't do well if placed in the sun and will require excessive watering to survive. Place plants with similar water needs in common areas so all can benefit from the same application of water.

Washington State Department of Health

DOH PUB. # 331-120

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XXI
FRANCHISE AGREEMENT

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

After Recording Return to:

Skagit County
Public Works Department
Attn: Road Maintenance Division
201 East Avon Avenue
Burlington, WA 98233

SKAGIT COUNTY
Contract # C20080626
Page 1 of 6

INTERLOCAL COOPERATIVE AGREEMENT

BETWEEN
Town of Hamilton

AND
Skagit County

THIS AGREEMENT ("Agreement") is made and entered into by and between Town of Hamilton ("Second Party") and Skagit County, a Political Subdivision of the State of Washington ("County") pursuant to the authority granted by Chapter 39.34 RCW, INTERLOCAL COOPERATION ACT. The Second Party and the County may be individually referred to herein as a "party", and may be collectively referred to herein as the "parties." In consideration of the following, the parties mutually agree as follows:

1. PURPOSE: The COUNTY will perform work, provide materials, and provide the use of County equipment operated by a County operator, for work for the SECOND PARTY as requested, to be reimbursed to the COUNTY at the actual cost incurred by the COUNTY for said work, materials, and equipment rentals, including, but not limited to maintenance repairs and the use of County equipment by a County operator.

1.1 In the event that the Second Party shall use any equipment owned by the County pursuant to this Agreement, the Second Party agrees that any user and/or operator of such equipment shall be a Skagit County operator properly trained and/or certified in accordance with applicable law and industry standards, and (to the fullest extent allowed by law) shall further agree to defend, indemnify, and hold harmless the County for all liability, cost, loss, expense, claims, settlements, and/or judgments against the County arising from and/or related to the use and/or operation of the County's equipment by the County on behalf of the Second Party, pursuant to the terms herein.

2. RESPONSIBILITIES: The COUNTY and the SECOND PARTY in the performance of this Agreement, shall abide by the provisions of RCW 39.34, the terms of this Agreement and/or any other applicable law.

3. TERM OF AGREEMENT: The term of this Agreement shall be from January 1, 2009 through December 31, 2013.

4. MANNER OF FINANCING: The COUNTY will perform work, provide materials, and/or the use of County equipment (to be operated by a County operator), for work on the SECOND PARTY'S facilities upon their request and acceptance by the COUNTY, to be reimbursed by SECOND PARTY to the COUNTY at the actual cost incurred by the COUNTY for said work, materials and use of County equipment (and wages for the County operator provided by the County to operate the equipment); and, in addition thereto, nine percent (9%) of the total cost shall be added for overhead costs for accounting, billing, and administrative services, provided that the COUNTY shall submit to the SECOND PARTY a certified statement of the costs, and within thirty (30) days thereafter, SECOND PARTY shall pay to the COUNTY the amount of said statement.

5. ADMINISTRATION: The following individuals are designated as representatives of the respective parties. The representatives shall be responsible for administration of this Agreement and for coordinating and monitoring performance under this Agreement. In the event such representatives are changed, the party making the change shall notify the other party.

5.1 The County's representative shall be the Skagit County Public Works Department Road Maintenance Division Operation's Division Manager.

5.2 Second Party's representative shall be the Mayor.

6. TREATMENT OF ASSETS AND PROPERTY: No fixed assets or personal or real property will be jointly or cooperatively, acquired, held, used, or disposed of pursuant to this Agreement.

7. NO PARTNERSHIP OR JOINT VENTURE: No partnership and/or joint venture exists between the parties, and no partnership and/or joint venture is created by and between the parties by virtue of this Agreement. No agent, employee, contractor, subcontractor, consultant, volunteer, and/or other representative of the parties shall be deemed an agent, employee, contractor, subcontractor, consultant, volunteer, or other representative of the other party.

8. INDEMNIFICATION: Each party agrees to be responsible and assume liability for its own wrongful and/or negligent acts or omissions or those of their officials, officers, agents, employees, volunteers, assigns, contractors, subcontractors, and/or consultants to the fullest extent required by law, and further agrees to save, indemnify, defend, and hold the other party harmless from any

such liability, loss, and/or expense, including but not limited to, judgments, settlements, attorney's fees and costs by reason of any and all claims and demands upon the other party, its elected or appointed officials or employees for damages because of personal or bodily injury, including death at any time resulting therefrom, sustained by any person or persons and on account of damage to property including loss of use thereof, whether such injury to persons or damage to property is due to the negligence of the other party, its subcontractors, its elected officers, employees, volunteers, and/or their agents. It is further provided that no liability shall attach to the County by reason of entering into this contract except as expressly provided herein.

9. TERMINATION: Any party hereto may terminate this Agreement upon thirty (30) days notice in writing either personally delivered or mailed postage-prepaid by certified mail, return receipt requested, to the party's last known address for the purposes of giving notice under this paragraph. If this Agreement is so terminated, the parties shall be liable only for performance rendered or costs incurred in accordance with the terms of this Agreement prior to the effective date of termination.

10. CHANGES, MODIFICATIONS, AMENDMENTS AND WAIVERS: The Agreement may be changed, modified, amended or waived only by written agreement executed by the parties hereto. Waiver or breach of any term or condition of this Agreement shall not be considered a waiver of any prior or subsequent breach.

11. SEVERABILITY: In the event any term or condition of this Agreement or application thereof to any person or circumstances is held invalid, such invalidity shall not affect other terms, conditions or applications of this Agreement which can be given effect without the invalid term, condition, or application. To this end the terms and conditions of this Agreement are declared severable.

12. ENTIRE AGREEMENT: This Agreement contains all the terms and conditions agreed upon by the parties. All items incorporated herein by reference are attached. No other understandings, oral or otherwise, regarding the subject matter of this Agreement shall be deemed to exist or to bind any of the parties hereto.

13. COMPLIANCE WITH LAWS AND TERMS OF GRANTS: The parties to this Agreement shall comply with all applicable federal, state, and local laws, rules, and regulations in carrying out the terms and conditions of this Agreement. If applicable, compliance with laws shall specifically include, but not be limited to, compliance with laws pertaining to the payment of prevailing wage on public works (including, but not necessarily limited to RCW 39.12). If applicable, compliance with laws shall also specifically include, but not be limited to, compliance with laws for the procurement of contracts for architectural and engineering services (including, but not necessarily limited to RCW 39.80). If nacessary, the parties shall obtain and comply with all necessary permits and approvals from all

applicable jurisdictions prior to commencing any work related to this Agreement. To the maximum extent allowed by law, the Second Party shall indemnify and hold the County harmless for any non-compliance with laws as specifically pertaining and/or related to the Purpose of this Agreement as described herein. The Second Party individually recognizes and agrees that it shall be solely and separately responsible and liable for compliance with all terms and conditions of any grant(s) obtained or procured by the Second Party (and/or on behalf of the Second Party by the County). To the maximum extent allowed by law, the Second Party shall defend, indemnify, and hold the County harmless for any non-compliance with laws the terms of any grants(s) as specifically pertaining and/or related to the Purpose of this Agreement, as described herein.

14. ASSIGNMENT AND SUBCONTRACTING: Unless otherwise expressly provided herein, no portion of this Agreement may be assigned, contracted, and/or subcontracted to any other individual, firm, company, and/or other entity without the express and prior written approval of the County. To the extent provided by law, and by the terms of any applicable grants, the County may assign, contract, and/or subcontract any or all of its duties and/or obligations under this Agreement, without the consent of the Second Party.

15. DEFAULT: Failure of the parties to comply with the terms of this Agreement shall constitute default. The parties shall have all remedies for the enforcement of this Agreement as provided by law.

16. VENUE AND CHOICE OF LAW: In the event that any litigation should arise concerning the construction or interpretation of any of the terms of this Agreement, the venue of such action of litigation shall be in the Superior Court of the State of Washington in and for the County of Skagit. This Agreement shall be governed by the laws of the State of Washington.

17. CAPTIONS & COUNTERPARTS: The captions in this Agreement are for convenience and reference only and do not define, limit, or describe the scope or intent of this Agreement. This Agreement may be executed in any number of counterparts, and each such counterpart hereof shall be deemed to be an original instrument, but all such counterparts together shall constitute but one agreement.

19. NEUTRAL AUTHORSHIP: Each of the terms and provisions of this Agreement have been reviewed and negotiated, and represents the combined work product of the parties hereto. No presumption or other rules of construction which would interpret the provisions of this Agreement in favor of or against the party preparing the same shall be applicable in connection with the construction or interpretation of any of the provisions of this Agreement. The parties represent that they have had a full and fair opportunity to seek legal advice with respect to the terms of this Agreement and have either done so, or have voluntarily chosen not to do so. The parties represent and warrant that they have fully read this Agreement, that they understand its meaning and effect, and that they enter into this Agreement with full

knowledge of its terms. The parties have entered into this Agreement without duress or undue influence.

GOVERNMENT AGENCY:

Timothy a Bates mayor
Title of Signatory
(Date 8-7-08)

Timothy a Bates
Print Name of Signatory

Mailing Address:
(Street address required
in addition to P.O. Box)
Town of Hamilton
584 Maple St
PO Box 538
Hamilton Wash 98255

IN WITNESS WHEREOF, the parties have executed this Agreement this 4th day of November, 2008.

APPROVED:

BOARD OF COUNTY COMMISSIONERS
SKAGIT COUNTY, WASHINGTON

DON MUNKS, Chairman

KENNETH A. DAHLSTEDT, Commissioner

SHARON D. DILLON, Commissioner

For contracts under $5000:

Gary Rowe, County Administrator
(Authorization per Resolution #R20030146)

Recommended:

By:
James E. Voetberg, P.E.
Department Head

By:
Trisha Logue, CPA
Budget & Finance Director

Approved as to Indemnification:

By:
Billie Kadrmas, Risk Manager

Approved as to Form:

By:
Deputy Prosecuting Attorney

Attest:

JoAnne Giesbrecht, Clerk of the Board

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XXII
BUDGETS

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

Town of Hamilton
Budgets

Water Fund Account	2011 (Actual)	2012 (Actual)	2013	2014	2015	2016	2017	2018
ITEM								
BEGINNING BALANCE (1)	**$ 32,569.00**	**$ 51,648.00**	**$ 630.00**	$ -	$ -	$ -	$ -	$ -
Operating Revenues								
Water Sales *	$ 77,244.00	$ 69,546.00	$ 75,000.00	$ 78,750.00	$ 82,687.50	$ 86,821.88	$ 91,162.97	$ 95,721.12
Water Hook-up Fees	$ 160.00	$ 165.00	$ 3,150.00	$ 500.00	$ 500.00	$ 500.00	$ 500.00	$ 500.00
Investment Interest	$ 15.00	$ 10.00	$ 15.00	$ 15.00	$ 15.00	$ 15.00	$ 15.00	$ 15.00
Grant	$ 23,199.00	$ 222,223.00	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL REVENUES (2)	**$ 100,618.00**	**$ 291,944.00**	**$ 78,165.00**	**$ 79,265.00**	**$ 83,202.50**	**$ 87,336.88**	**$ 91,677.97**	**$ 96,236.12**
Maintenance and Operation Expenditures								
Salaries								
Water Clerk Wages	$ 1,883.00	$ 1,887.00	$ 1,900.00	$ 1,900.00	$ 1,900.00	$ 1,900.00	$ 1,900.00	$ 1,900.00
Personnel Benefits	$ 6,267.00	$ 6,903.00	$ 7,500.00	$ 7,875.00	$ 8,268.75	$ 8,682.19	$ 9,116.30	$ 9,572.11
Public Works Wages	$ 17,699.00	$ 28,350.00	$ 18,000.00	$ 18,000.00	$ 18,000.00	$ 18,900.00	$ 18,900.00	$ 18,900.00
PW Payroll Deductions	$ 5,700.00	$ 11,633.00	$ 7,000.00	$ 7,000.00	$ 7,000.00	$ 7,000.00	$ 7,000.00	$ 7,000.00
Professional Services	$ 4,022.00	$ 6,202.00	$ 6,500.00	$ 6,630.00	$ 6,762.60	$ 6,897.85	$ 7,035.81	$ 7,176.53
B & O Utility Tax (6% of water sales)	$ 3,968.00	$ 1,634.00	$ 4,500.00	$ 4,725.00	$ 4,961.25	$ 5,209.31	$ 5,469.78	$ 5,743.27
Supplies	$ 2,148.00	$ 2,116.00	$ 2,500.00	$ 2,550.00	$ 2,601.00	$ 2,653.02	$ 2,706.08	$ 2,760.20
Repairs & Maintenance	$ 4,190.00	$ 6,654.00	$ 7,000.00	$ 7,140.00	$ 7,282.80	$ 7,428.46	$ 7,577.03	$ 7,728.57
Testing	$ 1,498.00	$ 734.00	$ 1,500.00	$ 1,530.00	$ 1,560.60	$ 1,591.81	$ 1,623.65	$ 1,656.12
Insurance	$ 5,000.00	$ 6,000.00	$ 6,000.00	$ 6,120.00	$ 6,242.40	$ 6,367.25	$ 6,494.59	$ 6,624.48
Utility Services	$ 5,223.00	$ 4,031.00	$ 5,500.00	$ 5,610.00	$ 5,722.20	$ 5,836.64	$ 5,953.38	$ 6,072.44
Miscellaneous Fees	$ 498.00	$ 266,752.00	$ 750.00	$ 765.00	$ 780.30	$ 795.91	$ 811.82	$ 828.06
Miscellaneous Services	$ 244.00	$ 66.00	$ 500.00	$ 510.00	$ 520.20	$ 530.60	$ 541.22	$ 552.04
Capital outlay	$ 23,199.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL EXPENDITURES (3)	**$ 81,539.00**	**$ 342,962.00**	**$ 69,150.00**	**$ 70,355.00**	**$ 71,602.10**	**$ 73,793.04**	**$ 75,129.65**	**$ 76,513.82**
BUDGET SURPLUS (2) - (3)	**$ 19,079.00**	**$ (51,018.00)**	**$ 9,015.00**	**$ 8,910.00**	**$ 11,600.40**	**$ 13,543.83**	**$ 16,548.32**	**$ 19,722.29**
CAPITAL IMPROVEMENT COSTS								
2nd well pump for back-up				$ 5,000.00				

FINANCING SOURCE (4)								
Reserve				$ 5,000.00				
Loan								
Grant								

TRANSFER TO SAVING FUNDS								
Emergency			$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ 1,500.00
Water System Plan			$ 6,645.00	$ 910.00	$ 6,900.40	$ 8,843.83	$ 11,848.32	$ 15,022.29
Back-up well drilling			$ 1,500.00	$ 1,500.00	$ 3,200.00	$ 3,200.00	$ 3,200.00	$ 3,200.00
TOTAL SAVINGS (5)			**$ 9,645.00**	**$ 3,910.00**	**$ 11,600.40**	**$ 13,543.83**	**$ 16,548.32**	**$ 19,722.29**

ENDING BALANCE (1) + (2) - (3) - (4) - (5)	**$ 51,648.00**	**$ 630.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

ACCUMULATED SAVINGS								
Water System Plan Fund			$ 6,645.00	$ 7,555.00	$ 14,455.40	$ 23,299.23	$ 35,147.55	$ 50,169.85
2nd well drilling			$ 1,500.00	$ 3,000.00	$ 6,200.00	$ 9,400.00	$ 12,600.00	$ 15,800.00
Emergency			$ 1,500.00	$ 3,000.00	$ 4,500.00	$ 6,000.00	$ 7,500.00	$ 9,000.00
Grand total			**$ 9,645.00**	**$ 13,555.00**	**$ 25,155.40**	**$ 38,699.23**	**$ 55,247.55**	**$ 74,969.85**

* 5% annual increase by Town Ordinance #297

TOWN OF HAMILTON
SKAGIT COUNTY, WA

APPENDIX XXIII
MAINTENANCE & OPERATION SCHEDULE

GARRISON ENGINEERING
1997 Park Lane, Burlington, WA 98233 • Ph (360) 707-5656 • Fax (360) 707-5858 • www.gecorp.net

Operation and Maintenance Schedule

1. Introduction

Reasonable efforts are made by utility staff to notify customers as is required by WAC 246-290 if there are planned interruptions of service for maintenance, repairs, flushing of mains... The duration of the interruption, plus the number of customer affected, is indicated in a written notice. For emergency outages, notice will also be placed on the Bulletin Board at the Post Office. Notification may also include phone calls and/or door hangers. Sample Notifications are attached to this document.

Equipment maintenance is performed on an individualized schedule per manufacturer's recommendations listed in O & M Manuals Volume II, Books 1 through 5 (available at the treatment house). Distribution lines are flushed on a monthly rotation schedule which insures that all hydrants and standpipes are flushed at least twice a year. Isolation valves are exercised on a monthly rotation schedule, providing exercise at least once every two years to ensure proper function.

A Sanitary Survey performed in 2009 set milestones for the system to meet.

- ✓ Calibrate chlorine residual analyzer regularly
- ✓ Submit Coliform Monitoring Plan to DOH
- ✓ Obtain Manganese test kit & record raw and treated levels regularly
- ✓ Collect a TTHM sample
- ✓ Locate & exercise all valves every 1 or 2 years
- ✓ Clarify roles to implement CCCP
- ✓ Estimate Distribution System Leakage using source & service meters

Each of those milestones has been met.

This Section provides a review of the Hamilton water system Operations and Maintenance (O&M) Program. Tasks associated with the well, treatment facility, and storage reservoirs are included. Elements of critical importance are the identification of vulnerable facilities, and details of Hamilton's emergency response plan with key contacts.

2. Water System Management

The Town's water system operations are under the management of Mayor Joan Cromley. Day-to-day operations of the water system are under the direction of Certified Operator Kathleen "Cas" Hancock. With the discontinuation of the greensand filtration system, the minimum requirement for Operator Certification has been reduced to Water Distribution Manager I. This position is currently filled by Kathleen "Cas" Hancock, Certification # 007482, Water Distribution Manager II, Cross Connection Specialist, and Basic Treatment Operator.

3. Routine Operation and Maintenance Procedures

This Section outlines routine O&M activities conducted by utility staff, including customer response activities and water quality monitoring requirements.

3.1. Regular Maintenance

Regularly scheduled maintenance activities are conducted to maintain the integrity of treatment, distribution, and storage facilities. It is important that operators are familiar with all parts of the system and the effects their activities may have on the quality of the water served to customers. Regular O&M activities for the Hamilton water system include:

Daily

- Chlorine residual measurements at entry points
- Chlorine residual monitoring within the distribution system
- Hypochlorite feed system checks
- Record keeping and facility operations reports
- Read source meter
- Check and document reservoir levels
- Check & record stream levels and temperature; source meter readings; and adjust stream mitigation flow accordingly (May through October)

Monthly

- Hypochlorite drum deliveries
- Backwash greensand filters
- Check metering and recycle pumps
- Coliform monitoring within the distribution system
- Read service meters
- Exercise valves and fire hydrants (and repair as necessary)
- Calibrate chlorine residual analyzers
- Monitor and record static water level of monitoring well

Quarterly

- Check and document source water manganese levels
- Clean top of reservoir (vent)

Semi-Annually

- Clean backwash holding tank
- Exercise reservoir fill and drain valves

Annually

- Source water quality monitoring
- DBP monitoring within the distribution system
- Reservoir cleaning (if needed)
- Inspect greensand media condition
- Cross connection inspection

An average of 10 man-hours per week of operator effort is necessary to operate and maintain the treatment facility. Less frequent but more intensive maintenance activities require the addition of approximately 20 man-hours per month on average.

3.2. Customer Inquiries

Hamilton has formally documented customer inquiry response procedures. Water department staff addresses and respond to all inquiries pertaining to system operation and water quality. All other issues pertaining to water service such as policy, fees, and rates are forwarded directly to the Town Clerk or the Mayor and/or Town Council.

When a water quality customer inquiry is received, the water system operator conducts the following sequence of activities:

- ✓ Inspect the service line in question
- ✓ Collect water samples for analyses
- ✓ Report the findings to the customer
- ✓ Take appropriate action to resolve the water quality issue

3.3. Water Quality Monitoring

Water quality monitoring will be conducted in accordance with requirements outlined in WAC 246-290. Each year, DOH will provide the Town with a comprehensive Water Quality Monitoring Report (WQMR) that outlines the monitoring needs for that year.

Table 3.3.1 on page 7 summarizes the current monitoring requirements for Hamilton.

4. Vulnerable Facilities

As a requirement of the water system planning process, Hamilton is required to identify the three most critical elements to the supply of water. Inthe Hamilton system those elements are:

- ✓ Storage reservoirs
- ✓ Well pump
- ✓ Chemical feed pumps

Table 4.1 identifies the system elements, the typical failure mode for each element, and the expected repair or replacement time.

Table 4.1 – Vulnerable Facilities

Facility	Failure Mode	Repair / Replacement Time
Well	Collapse/Contamination	2 days or longer
Well Pump	Seals/Motor/Impeller	2-3 days
Transmission Mains	Leaks/Failure (Break)	Less than 24 hours (typically 4-8 hours)
Distribution Mains	Leaks/Failure (Break)	Less than 24 hours (typically 2-4 hours)
Storage Reservoirs	Leaks/Contamination	1-2 days
Chemical Feed Pumps	Seals/Motor	1-2 days

Backup power is available at the well house to ensure positive system pressure during the event of a power outage, thus reducing the risk of contamination from cross-connections.

5. Emergency Response Program

In the case of an emergency that may threaten the ability to provide continuous water service, several public notification measures are employed. In July 2012 the Town Council approved an Emergency Response Plan (see Appendix XII) to be used for all emergency situations. This plan is to be reviewed annually and updated as needed. In the event of source water contamination, Hamilton will employ a number of measures to protect public health. When source monitoring indicates MCL exceedances, the well will be isolated from the system. Residents will be notified with door hangers to use bottled water for drinking until the problem is remedied. Extensive follow-up monitoring will be performed to ensure the integrity of drinking water quality. There are no existing interties between the Hamilton water system and neighboring systems, thus precluding the possibility of purchasing water under emergency circumstances.

Hamilton operates its own Volunteer Fire District under the direction of Fire Chief Nick Bates. The Fire Marshall for Skagit County is Kelly Blaine. These individuals can be reached at the following numbers:

- ✓ Hamilton (Nick Bates) -(360) 391-6253
- ✓ Skagit County Fire Marshal (Kelly Blaine) – (360) 336-9410

6. Cross-Connection Control Program

Cross-connections are physical arrangements of piping between a public water supply and a non-potable system in such a manner that contamination of the public water supply system could occur. Cross-connection control programs (CCPs) are critical to maintaining safe drinking water distribution systems.

The Town has a documented Cross- Connection Control Program (CCCP) as part of Water Services Ordinance 297 (see Chapter 13.13 in Appendix II). The Town utilizes the following guidelines to maintain their CCCP:

- ✓ Operating ordinances to implement the program.
- ✓ Criteria for assessing the degree of hazard.
- ✓ Provisions for requiring installation of backflow prevention assemblies where cross-connections, which cannot otherwise be practically eliminated, are identified.
- ✓ Provision for a trained person to conduct surveys.
- ✓ Provision for maintenance of records describing potential cross-connection locations.
- ✓ Policies and procedures to have a certified person inspect and test backflow assemblies.
- ✓ Provision to record the inspection and testing history of backflow prevention assemblies.
- ✓ A consumer education and information program to prompt consumers, particularly industrial users, to help identify, eliminate, and control cross connections.

At this time, there are two backflow assemblies installed in the main building of Janicki Industries to prevent cross-connection. Those assemblies are tested annually by a Certified Backflow Assembly Tester.
With respect to requests for new service, the Cross Connection Specialist (CCS) will evaluate the potential for cross-connection and the level of protection needed. Service will not be approved until the CCS certifies that the connection poses no significant risk to the system.

7. Record Keeping and Reporting

Record keeping is an invaluable element of an O&M program. Historical and current information is essential for tracking performance, identifying problem areas of the water system, documenting water quality provided to customers, and for indicating the need for improvement projects. As-built records and updated maps are necessary to assist engineers with future design and construction and to allow system operators to efficiently conduct routine O&M tasks.

7.1. Record Reporting

The following items are documented on a regular basis and reported to the Department of Health monthly:

- ✓ Well pump flow meter readings
- ✓ Chlorine consumption and residual monitoring results
- ✓ Manganese level monitoring results

7.2. Record Keeping

The following items are documented on a regular basis and archived in the Town Hall office:

- ✓ Water quality monitoring results
- ✓ Water Quality Monitoring Reports
- ✓ Static water level in monitoring well
- ✓ Well pump flow meter readings
- ✓ Service meter readings
- ✓ Chlorine consumption and residual monitoring analysis
- ✓ Manganese level monitoring results

- ✓ Water system infrastructure map
- ✓ Water system hydraulic map
- ✓ History of infrastructure repair work
- ✓ Water quality and pressure complaints
- ✓ Equipment maintenance log
- ✓ Pump records
- ✓ Valve and hydrant records
- ✓ Details of tank inspections and maintenance activities
- ✓ Details of pump maintenance and repair activities
- ✓ Plans and manuals
- ✓ Water Facilities Inventory documentation
- ✓ Water rights certificates
- ✓ Easements
- ✓ Written records of actions taken to correct regulatory violations
- ✓ All written reports, summaries, technical memoranda, and written communications relating to the water system

Table 3.3.1

Town of Hamilton

WATER QUALITY MONITORING SCHEDULE

PWSID 307000

CONTAMINANTS	YEAR 2010	YEAR 2011	YEAR 2012	YEAR 2013	YEAR 2014	YEAR 2015	YEAR 2016	YEAR 2017	YEAR 2018
LEAD AND COPPER	Done			Due			Due		
ASBESTOS	At DOH direction								
VOLITILE ORGANIC CONTAMINANTS VOCs			Done			Due			Due
HERBICIDES	At DOH direction								
GENERAL PESTICIDES	At DOH direction								
INSECTICIDES	At DOH direction								
EDB AND OTHER FUMIGANTS	Done	At DOH direction							
DIOXIN, ENDOTHALL, DIQUAT, GLYSOPHATE	Waivers								
INORGANIC CONTAMINANTS IOCs	Waivers			Due			Due		
NITRATES (due each year no IOC samples done)	Done	Done	Done		Due	Due		Due	Due
*MANGANESE (normally part of IOC sampling)	At DOH direction			Due					
RADIONUCLIDES	Done				Due				Due
SYNTHETIC ORGANIC CONTAMINANTS SOCs	Statewide Waivers for General SOCs								
DISINFECTION BYPRODUCTS DBPs			Done			Due			Due
OTHER	At DOH direction								
*Managanese levels are tested in the field on a quarterly basis									

DRINKING WATER WARNING

Parts of Town of Hamilton Water System, ID#307000, located in Skagit County may become contaminated because of a planned water outage and loss of pressure in the water system.

To those customers on the _____ section of the system:

WE ARE PLANNING REPAIRS TO THE WATER SYSTEM. Beginning ___/___/____, DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. After water has been off & when service has been restored you should bring all water to a rolling boil for one minute, and let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice.* Boiling kills bacteria and other organisms in the water

When a loss of pressure occurs, it is possible that contamination from the environment or from human or animal waste may be drawn into the water system. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. These symptoms are not only caused by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

Why are you getting this notice?
During this project, whenever we open the pipes to the atmosphere anywhere, exposure is very controlled and parts are rinsed with chlorine and no visible foreign matter is allowed to enter the system. It is not likely, but it is still possible to contaminate the system.

What is going to happen?

The water will be turned off during the day for _____ section of the system on ___/___/___ from about 8:00 a.m. to 5:00 p.m. in order to make repairs.

Before using your water after the service is restored, be sure to flush your faucets well to get rid of any excess air that has entered the system (or accumulated manganese that settles in the pipes- manganese poses no health risk, just looks purple-ish brown and dirty).

What are we doing to resolve any possible health issues?
After repairs are completed, we are advising those who have had their water off to boil water until further notice. We will be taking samples on ___/___/___ to assure you have good water quality. We should receive results on ___/___/___ & **will telephone** to let those who had water shut off know whether or not to continue to boil your water. This advisory is just a precaution to protect your health.

We have consulted with the Washington State Department of Health about this planned outage and pressure loss. We will notify you by telephone when you no longer need to boil the water.

For more information, please contact Cas Hancock at (360)770-4633
(operator) (phone number)

Please share this notice with all the other people who drink this water, especially those who may not have ceived this notice directly (for example, people in apartments, nursing homes, schools, and businesses). , ou can do this by posting this notice in a public place or distribution copies by hand or mail.

This notice is sent to you by Town of Hamilton Water System on ___/___/___

DRINKING WATER WARNING

The Town of Hamilton Water System, ID# 307000, located in Skagit County is contaminated with fecal coliform/ *E. coli* bacteria.

Fecal coliform/ *E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil 1 minute, and let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice*. Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. *The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.*

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact Cas Hancock at (360)770-4633
(operator) (phone number)

or at 46451 Baker Loop Road, Concrete WA 98237-9558
(address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by Town of Hamilton Water System on ___/___/____

IMPORTANT NOTICE ABOUT YOUR WATER SYSTEM
Coliform Maximum Contaminant Level (MCL) Exceeded: Non-Acute MCL

The Town of Hamilton water system, ID# 307000 in Skagit County routinely monitors for the presence of total coliform bacteria and in _____ this type of bacteria was detected. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did or are doing to correct the situation.

Coliforms are bacteria which are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or E.coli were present.

None of these bacteria were found.

You do **not** need to boil your water. People with severely compromised immune systems, infants, and some elderly may at be an increased risk and may want to contact their health care provider for additional guidance.

What happened? What is the suspected or known source of contamination?

At this time:

☐ The problem is resolved. Additional samples collected were found to be free of coliform bacteria.

☐ We anticipate resolving the problem by ____ / ____ / ____.

☐ Other _____.

For more information, contact Cas Hancock at (360)770-4633 or at 46451 Baker Loop Rd. Concrete, WA 98237

(operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by Town of Hamilton Date Distributed ___ / ___ / ____.