EXHIBIT I. MASTER FEES AND CHARGES SCHEDULE

LAKE WHATCOM WATER AND SEWER DISTRICT

RESOLUTION No 798

A Resolution of the Board of Commissioners
Updating the Master Fees and Charges with Schedule #21
Effective January 1, 2014

WHEREAS, the District needs to periodically adjust its fees and/or charges to better reflect the actual cost of services rendered,

WHEREAS, the District desires to update the Master Fees and Charges Schedule as follows:

1. Increase Equipment Rental and Labor Rates to reflect current costs.
2. Update Wilson Engineering Consultation to Current hourly rate + 10%.
3. Deletion of obsolete Information Reproduction Fees; meeting minutes, meeting packets and video tapes.
4. Add duplicate billing fee.
5. Add Section #48 Violations of Administrative Code.

NOW, THEREFORE, BE IT RESOLVED THAT:

1. The District adopts the fees and charges as set forth in Schedule #21, attached hereto and incorporated herein by this reference as if fully set forth.

2. This schedule replaces schedule #20

ADOPTED by the Board of Commissioners of Lake Whatcom Water and Sewer District, Whatcom County, Washington, at a Regular Meeting thereof, on the 23rd of December 2013.

Leslie Mc Roberts, Commissioner

Deborah Lambert, Commissioner

Todd Citron, Commissioner

Laura Weide, Commissioner

John W. Millar, Commissioner

Approved as to form, District legal counsel

Approved: December 23. 2013

MASTER FEES AND CHARGES
SCHEDULE #21
Effective December 23, 2013 (Resolution 798)

Item	Administrative Fees	Fee/Charge	Reference
1.	**Equipment Charge, Hourly**		
	Air Compressor–Ingersol/Rand 185 CFM Diesel	$20.00	Resolution 798
	Backhoe – John Deere 580D	$45.00	Resolution 798
	Boom Truck – 6,000 Pound	$30.00	Resolution 798
	Combination Vacuum/Flush Truck	$100.00	Resolution 798
	Sewer Camera Van	$75.00	Resolution 798
	Dump Truck – 2-Yard	$25.00	Resolution 798
	Dump Truck – 5-Yard	$45.00	Resolution 798
	Equipment Trailer – 14,000 Pound	$15.00	Resolution 798
	Flush Truck	$65.00	Resolution 798
	Portable Engine Pump – 600 gpm @130-Feet	$40.00	Resolution 798
	Portable Generator – 75 kw	$45.00	Resolution 798
	Portable Generator – 250 kw	$85.00	Resolution 798
	Tanker Truck – 3,000 Gallon	$75.00	Resolution 798
	Tool Truck	$20.00	Resolution 798
2.	**Information Reproduction**		
	Digital Recording - Board Meeting	$35.00	Resolution 680
	Document – standard size – less than 10 pages	No charge	Resolution 680
	Document – standard size –more than 10 pages	.15 per page	Resolution 717
	Document – non-standard size – deposit	$50.00	Resolution 680
	Document – non standard size – reproduction	Cost	Resolution 680
3.	**Labor, Hourly**		
	Accounting Clerk	$34.00	
	Accounts Payable/Payroll	$38.00	
	Accounts Receivable	$38.00	
	Administrative Assistant	$46.00	
	Construction Engineer	$53.00	
	District Engineer	$71.00	
	Engineering Technician	$42.00	
	Finance Manager	$62.00	
	General Manager	$80.00	
	Maintenance Electrician	$53.00	
	Maintenance Supervisor	$57.00	
	Maintenance Worker	$42.00	
	Utility Systems Support Specialist	$42.00	
	Water Treatment Plant Operator	$46.00	
	Wilson Engineering Consultation - Current hourly rate + 10%		Resolution 798 (Direct Labor Costs)
4.	**Document Recording Fees**		
	Document Recording	$105.00	Resolution 753
	Lien Record/Release	$150.00	Resolution 756
	Transfer, real estate closing	$100.00	Resolution 704
	Segregation of assessment	$100.00	Resolution 680
	Assessment transfer	$250.00	Resolution 680
5.	**Payment return item**	$40.00	Resolution 744
6.	**Web/Phone Pay Convenience Fee**		Board Meeting 5/27/09 + Resolution 753
	E-check Transaction	$1.00 each	
	Credit or Debit Card Transaction	$2.00 each	
7.	**Duplicate Bill Fee-Per Billing Period**	$1.00 each	Resolution 798

Item	**Billing – SEWER SERVICE**		Fee/Charge	Reference
	Regular Customer Charge Per Billing Cycle - Sewer			
8.	**Effective January 1, 2009**			
	Billing Cycle Charge		$109.32	Resolution 747
	Account Charge	$6.39		
	Volume Charge per dwelling unit	$102.93		
9.	**Effective January 1, 2010**			
	Billing Cycle Charge		$120.25	Resolution 747
	Account Charge	$7.03		
	Volume Charge per dwelling unit	$113.22		
10.	**Effective January 1, 2011**			
	Billing Cycle Charge		$125.66	Resolution 747
	Account Charge	$7.35		
	Volume Charge per dwelling unit	$118.31		
11.	**Effective January 1, 2012**			
	Billing Cycle Charge		$131.31	Resolution 747
	Account Charge	$7.68		
	Volume Charge per dwelling unit	$123.63		
12.	**Effective January 1, 2013**			
	Billing Cycle Charge		$137.22	Resolution 747
	Account Charge	$8.03		
	Volume Charge per dwelling unit	$129.19		
13.	**Effective January 1, 2014**			
	Billing Cycle Charge		$141.34	Resolution 774
	Account Charge	$8.27		
	Volume Charge per dwelling unit	$133.07		
14.	**Effective January 1, 2015**			
	Billing Cycle Charge		$145.58	Resolution 774
	Account Charge	$8.52		
	Volume Charge per dwelling unit	$137.06		
15.	**Late Fee** Refundable if late due to District staff error or circumstances beyond customer's control (General Manager's approval required)		10% of past due utility services balance	RCW 57.08.081(3)
16.	**Bulk sewage disposal**		$100.00 + 0.0018/gallon	Latest actual bill from COB

MASTER FEES AND CHARGES
SCHEDULE #21
Effective December 23, 2013 (Resolution 798)

Item	**Billing – WATER SALES**	Fee/Charge	Reference
	Regular Customer Charge Per billing cycle – up to 600 cubic feet of water		
17.	**5/8 x 3/4 Inch Meter**		
	Effective January 1, 2011	$38.65	Resolution 747
	Effective January 1, 2012	$42.13	Resolution 747
	Effective January 1, 2013	$45.92	Resolution 747
	Effective January 1, 2014	$50.05	Resolution 774
	Effective January 1, 2015	$52.55	Resolution 774
18.	**1 Inch Meter**		
	Effective January 1, 2011	$48.52	Resolution 747
	Effective January 1, 2012	$52.89	Resolution 747
	Effective January 1, 2013	$57.65	Resolution 747
	Effective January 1, 2014	$62.84	Resolution 774
	Effective January 1, 2015	$65.98	Resolution 774
19.	**1½ Inch Meter**		
	Effective January 1, 2011	$66.64	Resolution 747
	Effective January 1, 2012	$72.64	Resolution 747
	Effective January 1, 2013	$79.18	Resolution 747
	Effective January 1, 2014	$86.31	Resolution 774
	Effective January 1, 2015	$90.63	Resolution 774
20.	**2 Inch Meter**		
	Effective January 1, 2011	$84.77	Resolution 747
	Effective January 1, 2012	$92.40	Resolution 747
	Effective January 1, 2013	$100.72	Resolution 747
	Effective January 1, 2014	$109.78	Resolution 774
	Effective January 1, 2015	$115.27	Resolution 774
21.	**3 Inch Meter**		
	Effective January 1, 2011	$163.74	Resolution 747
	Effective January 1, 2012	$178.48	Resolution 747
	Effective January 1, 2013	$194.54	Resolution 747
	Effective January 1, 2014	$212.05	Resolution 774
	Effective January 1, 2015	$222.65	Resolution 774
22.	**4 Inch Meter**		
	Effective January 1, 2011	$225.46	Resolution 747
	Effective January 1, 2012	$245.75	Resolution 747
	Effective January 1, 2013	$267.87	Resolution 747
	Effective January 1, 2014	$291.98	Resolution 774
	Effective January 1, 2015	$306.58	Resolution 774
23.	**Usage Over 600 Cubic Feet**		
	Effective January 1, 2011	$0.0488/cf	Resolution 747
	Effective January 1, 2012	$0.0532/cf	Resolution 747
	Effective January 1, 2013	$0.0580/cf	Resolution 747
	Effective January 1, 2014	$0.0632/cf	Resolution 774
	Effective January 1, 2015	$0.0664/cf	Resolution 774
24.	**Late Fee** – One adjustment per account per year with General Manager's approval.	10% of past due utility services balance	Resolution 766 RCW 57.08.081(3)

MASTER FEES AND CHARGES
SCHEDULE #21
Effective December 23, 2013 (Resolution 798)

Item	Miscellaneous Water Charges	Fee/Charge	Reference
25.	**Water Interruption - Voluntary**		
	Close/lock curb stop valve With billing suspension During normal business hours Outside normal business hours	 $150.00 $175.00	Resolution 661
	Unlock/reopen curb stop valve With billing suspension During normal business hours Outside normal business hours	 No charge $150.00	Resolution 661
26.	Close/lock curb stop valve Without billing suspension	$50.00	Resolution 661
	Unlock/reopen curb stop valve Without billing suspension During normal business hours Outside normal business hours	 No charge $150.00	Resolution 661
27.	**Water interruption - Involuntary**		
	Delinquent Account Close/lock curb stop valve Unlock/reopen curb stop valve During normal business hours Outside normal business hours	 $50.00 No charge $150.00	Resolution 661
28.	**Water interruption - Other**		
	Failure to comply with emergency order	Same as above	
	Failure to eliminate cross connection	Same as above	
	Failure to repair leak	Same as above	
	Request of agency/higher authority	No charge	
	Visible leak in vacant building	No charge	
	Disaster or calamity	No charge	
29.	**Unauthorized Lock Removal Fee** When customer cuts or removes lock from meter without District authorization.	$150.00	Resolution 726
	Damaged Meter If meter damaged by the customer	Material and labor to repair meter + $150.00	Resolution 726
30.	**Clear obstructed water meter** after request to customer to remove is refused	$50.00	Board meeting 11/10/99
31.	**Hydrant meter, fire hose, fittings**		
	Equipment rental – single continuous use	$35.00	Board meeting 11/10/99
	Bulk water purchase with hydrant meter	$0.0357/cf	Resolution 696

Item	**Developer Extension Agreements**	Fee/Charge	Reference
32.	**Initial Fees**		
	Application – Good for 60 days	$300.00	Resolution 680
	Conformance Deposit	$1,000.00	Resolution 680
	General Administration	$750.00	Resolution 680
33.	**Final Design Review**		
	District Engineer	Cost + 2%	Resolution 680
34.	**Design Review and Inspection***		
	Initial Deposit	$5,000.00	Resolution 680
	Supplemental Deposit	$2,000.00	Resolution 680
35.	**Contract noncompliance**	Cost + 2%	Board Meeting 5/14/97
36.	**Latecomers Reimbursement Agreements, Reimbursement processing**	$185.00 per connection	Board Meeting 6/10/09 + Resolution 753
37.	**Special Agreements**	Cost + 2%	Board Meeting 5/14/97
38.	**Third Party Claims**	Cost + 2%	
39.	**Time Extension**		
	Before expiration date	$250.00	
	After expiration date	$750.00	

*The name of this fee was changed from Facilities Inspection to Design Review and Inspection deposit. Reference April 11, 2007 Minutes

MASTER FEES AND CHARGES
SCHEDULE #21
Effective December 23, 2013 (Resolution 798)

Item	Permitting				Fee/Charge	Reference
40.	**Water Permit**					
Water General Facilities & Installation	Meter Size	Continuous Flow Rating (GPM)	Meter Capacity Ratio	Permit Fee	Installation	Resolution 747 Effective 1/1/2009
	5/8 x 3/4	15	1	$4,110.00	$700.00	
	1"	30	2	$8,2200.00		
	1.5"	75	5	$20,550.00		
	2"	120	8	$32,880.00	$4,200.00	
	3" Compound	330	22	$90,420.00		
	4" Compound	440	29.33	$120,546.30		
41.	Permit administration and processing				$40.00	Board Meeting 1/30/03
	Initial Water Inspection				$25.00	Resolution 667
	Subsequent Water Inspection				$75.00	Board Meeting 8/16/96
42.	**Water Permit – Special Charges**					
	Agate Heights Water Latecomer's Fee – Class A				$9,860.38	Giesbrecht
	Agate Heights Water Latecomer's Fee – Class B				$2,129.12	Evergreen View Vent
	Agate Heights Water Latecomer's Fee – 10" Well				$227.12	NS Well Users Group
	Columbus Street Water Latecomer's Fee				$528.50	Pennington
	North Shore and Eagleridge/COB Reimbursement				$300.00	6/10/88 Agreement
43.	**Sewer Permit**					
Sewer General Facilities	Meter Size	Meter Capacity Ratio	Permit Fee	Installation		Resolution 747 Effective 1/1/2009
	5/8 x 3/4	1	$5,201.00	To be done by Owner's Bonded Side Sewer Contractor		
	1"	2	$10,402.00			
	1.5"	5	$26,005.00			
	2"	8	$41,608.00			
	3" Compound	22	$114,422.00			
	4" Compound	29.33	$152,545.33			
44.	Service Installation – If District installed stub exists				$755.00	
	Permit Processing				$40.00	
	Initial Sewer Inspection				$75.00	
	Subsequent Sewer Inspection				$100.00	
45.	**Sewer Permit – Special Charges**					
	Agate Heights Sewer Latecomer's Fee				$1,077.46	Sunny Cove Ct Sew Ext
	Sewer Collection Special Benefit Fee				$6,000.00	Board Meeting 8/29/03
	ULID #18 Latecomers Fee – see table, next page				See table	Resolution 672
46.	**Other Sewer Charges**					
	Grinder Pump Installation – Customer own/maintain				$150.00	Resolution 645
	Review waiver of claim agreements for customer owned side sewers with less than 2% slope				$50.00	Resolution 645
	Unauthorized Connection to Sewer					
	Investigation, testing, inspection				$500.00	Resolution 645
	Repair and correction				Cost + 2%	Resolution 645
	Disconnect monitoring/enforcement after 90 days				$25.00/day	Board Meeting 8/29/03
	Voluntary sewer service interruption					
	Permit to install two-way clean out				Permit processing & inspection fee	
	Suspend billing – insert plug into side sewer				$250.00	Resolution 709
	Resume billing/remove plug /business hours				No charge	
	Resume billing/remove plug/after business hrs				$150.00	

47. ULID #18 LATECOMER FEE

Year	Equivalent to Assessment	Latecomer Penalty	Total	Reference
2003	$2,792.78	$265.31	$3,058.09	Resolution 672
2004	$2,792.78	$530.63	$3,323.41	
2005	$2,792.78	$795.94	$3,588.72	
2006	$2,792.78	$1,061.26	$3,854.04	
2007	$2,792.78	$1,326.57	$4,119.35	
2008	$2,792.78	$1,591.88	$4,384.66	
2009	$2,792.78	$1,857.20	$4,649.98	
2010	$2,792.78	$2,122.51	$4,915.29	
2011	$2,792.78	$2,387.83	$5,180.61	
2012	$2,792.78	$2,653.14	$5,445.92	
2013	$2,792.78	$2,918.46	$5,711.24	
2014	$2,792.78	$3,183.77	$5,976.55	
2015	$2,792.78	$3,449.08	$6,241.86	
2016	$2,792.78	$3,714.40	$6,507.18	
2017	$2,792.78	$3,979.71	$6,772.49	
2018	$2,792.78	$4,245.03	$7,037.81	
2019	$2,792.78	$4,510.34	$7,303.12	
2020	$2,792.78	$4,775.65	$7,568.43	
2021	$2,792.78	$5,040.97	$7,833.75	
2022	$2,792.78	$5,306.28	$8,099.06	

NOTE: As described in Resolution 672, ULID #18 Latecomer Charges were created to put parcels not assessed on the same footing as those that were assessed for the ULID. Assessed parcels could, and many did, prepay their assessments. To provide the same opportunity for non-assed parcels, prepayment of ULID 18 Latecomer Charges will also be accepted. Therefore, paid in full ULID Latecomer Charges satisfy the ULID Latecomer Charges permanently.

48. **VIOLATIONS of Administrative Code**		
Labor	Staff hourly rates – See page 2	Resolution No. 798
Equipment use	Hourly rate – See page 2	
Materials	Cost of materials used	
Attorney's Fees and Expenses	Reimburse District's Costs	
Administrative Fee	10% of total expenses	

Any person who violates any provision of the Administrative Code shall be liable to the District for any expense, loss, damage, cost of inspection or cost of correction incurred by the District by reason of such violation, including any expenses and attorney fees incurred by the District in collecting from such person of such loss, damage, expense, cost of inspection or cost of correction, plus an administrative fee equal to 10% of the total expenses. (Administrative Code Section 3.3.1 Liability to District)

EXHIBIT J-1 TO J-4. POTENTIAL SEWER GROWTH MAP

LAKE LOUISE ROAD
INTERCEPTOR ±31,600LF
DIAM. & MAT'L VARY

LAKE WHATCOM BLVD.
INTERCEPTOR ±30,800LF
DIAM. & MAT'L VARY

LAKE LOUISE ROAD
INTERCEPTOR ±31,600LF
DIAM. & MAT'L VARY

CITY LIMITS
DISTRICT BOUNDARY

MATCH LINE
EXHIBIT J-2

LAKE WHATCOM

NORTH SHORE

GENEVA

RHODODENDRON WY
OHIO ST
FLYNN ST
LAKESIDE ST
KANSAS ST
IDAHO ST
FRASER ST
SILVERBEACH RD
ELECTRIC AV
DAKIN ST
DECATUR ST
SUMMIT ST
EDGEWATER LN
NORTHSHORE DR
DELLESTA DR
ARBOR ST
E SUNSET LN
MORNING MIST WY
RILEY ST
PORTAL DR
BONANZA WY
SCENIC AV
RAYMOND ST
WHATCOM ST
BIRCH ST
SUSAN CT
YORK ST
CEDAR BROOK CT
LOWELL AV
WILLOWBROOK PL
ANGELA CT
FIR ST
ORIENTAL AV
LOWELL AV
PARK LN
LAKEVIEW AV
GLEN COVE LN
LOWE AV
EUCLID AV
RIDGEWOOD AV
DONDEE CT
CEDAR HILLS AV
COLUMBUS AV
8TH AV
8TH ST
WALL ST
MAPLE LN
FAIRVIEW DR
LAKEWAY DR
LAKEWOOD LN
MORGAN ST
CORDERO DR
SPRING ST
CABLE ST
TERRACE AV
LAKEVIEW ST
FIR TREE WY
FREMONT ST
LASALLE ST
GENEVA ST
AUSTIN LN
DESMOND ST
BEECHER AV
LAKE WHATCOM BLVD
DESOTA AV
STANLEY AV
LIVINGSTON AV
WELLINGTON AV
CASTLE AV
LEWIS AV
LOOKOUT AV
9TH ST
10TH ST
11TH ST
12TH ST
OAK ST
CORONADO AV
LAKE LOUISE RD

FLM
GEN
LOW
GRV
LLR3
EUC
CAB
LLR2
FUTURE
LWB
LLR

EUCLID PS
GENEVA PS
LOWE PS
CABLE PS

0 750 1,500 Feet

N

LEGEND

- LWWSD Boundary
- Existing Sewage Pump Station
- Existing Manhole
- Gravity Sewer
- Existing Sewage Interceptor or Force Main
- Existing Onsite Septic System
- LLR — Pump Station Service Area Boundary
- Watershed Protected Properties
- LWWSD Potential Future Connections
- LWWSD Parcels with 25-Yr Restriction (Developable)

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www.wilsonengineering.com
Wilson SURVEY/ENGINEERING

DESIGNED BY MMM | DRAWN BY RDN | CHECKED BY MMM

LAKE WHATCOM WATER & SEWER DISTRICT
WHATCOM COUNTY WASHINGTON

EXHIBIT J-1
SUDDEN VALLEY – GENEVA
POTENTIAL SEWER GROWTH MAP

DATE JUNE 2013 | SCALE AS SHOWN | JOB NO. 2013-014

SHEET 1 OF 1

SEE TRUNK SEWER CHART EXHIBIT B-1
FOR ADDITIONAL INFORMATION

LAKE WHATCOM

LAKE WHATCOM BLVD.
INTERCEPTOR ±30,800LF
DIAM. & MAT'L VARY

LAKE LOUISE ROAD
INTERCEPTOR ±31,600LF
DIAM. & MAT'L VARY

MATCH LINE
EXHIBIT J–1

MATCH LINE
EXHIBIT J–3

WHITNEY ST
FREMONT ST
CORONADO AVE
LASALLE AVE
COLUMBUS AVE
LEWIS AVE
LK WHATCOM BLVD
GRAND BLVD
LAKE LOUISE RD

CAB
LWB
STP
LLR
BOU
ROC
PLU
WW
STC
PLA
FUTURE

GENEVA
SUDDEN VALLEY

STRAWBERRY POINT PS
BOULEVARD PS
ROCKY RIDGE PS
PLUM PLACE PS
BEAVER PS

DISTRICT BOUNDARY

LEGEND

- LWWSD Boundary
- Existing Sewage Pump Station
- Existing Manhole
- Gravity Sewer
- Existing Sewage Interceptor or Force Main
- Existing Onsite Septic System
- LLR — Pump Station Service Area Boundary
- LWWSD Potential Future Connections
- LWWSD Parcels with 25-Yr Restriction (Developable)
- Watershed Protected Properties

N

0 750 1,500 Feet

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LAKE WHATCOM WATER & SEWER DISTRICT

WHATCOM COUNTY WASHINGTON

EXHIBIT J–2
SUDDEN VALLEY – GENEVA
POTENTIAL SEWER GROWTH MAP

DATE JUNE 2013 | SCALE AS SHOWN | JOB NO. 2013-014

SHEET 1 OF 1

LAKE WHATCOM

LAKE WHATCOM BLVD.
INTERCEPTOR ±30,800LF
DIAM. & MAT'L VARY

MATCH LINE
EXHIBIT J-2

NORTH POINT
FORCE MAIN

NORTH POINT PS
MARINA PS
TOMB PS
AFTERNOON BEACH PS
CAMP FIRWOOD PS
LAKEWOOD PS
AIRPORT PS
ROCKY RIDGE PS
PLUM PLACE PS
PAR LANE PS
RANCH HOUSE PS
COUNTRY CLUB PS
SUDDEN VALLEY PS
STRAWBERRY CANYON PS
LOUISE PARK PS
AUSTIN CREEK PS
FLATCAR PS

FUTURE
NOR
MAR
TOM
AFT
FIR
LAK
ROC
BOU
LWB
PLU
AIR
WV
PAR
RAN
COU
STC
SUD
FLA
AUS
LOU
GSE
SJP

RANCH
HOUSE
FORCE
MAIN

LAKE LOUISE ROAD
INTERCEPTOR ±31,600LF
DIAM. & MAT'L VARY

SUDDEN
VALLEY

LK. WHATCOM BLVD.
LAKE LOUISE RD
DISTRICT BOUNDARY

LEGEND

- LWWSD Boundary
- Existing Sewage Pump Station
- Existing Manhole
- Gravity Sewer
- Existing Sewage Interceptor or Force Main
- Existing Onsite Septic System
- SUD Pump Station Service Area Boundary
- LWWSD Potential Future Connections
- Watershed Protected Properties
- LWWSD Parcels with 25-Yr Restriction (Developable)

0 1,000 2,000 Feet

N

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LAKE WHATCOM WATER & SEWER DISTRICT

WHATCOM COUNTY WASHINGTON

EXHIBIT J-3
SUDDEN VALLEY – GENEVA
POTENTIAL SEWER GROWTH MAP

DATE JUNE 2013 | SCALE AS SHOWN | JOB NO. 2013-014

SHEET 1 OF 1

ACADEMY RD

CITY LIMITS

DISTRICT BOUNDARY

DONALD AVE

NORTH SHORE AREA

EAGLERIDGE DR

EDGEWATER PS

EDGEWATER LN

EDG

AGATE HEIGHTS RD

TOPAZ CT

AGB

NORTH SHORE RD

AGATE BAY LN

Y RD

NORTH SHORE INTERCEPTOR

AGATE BAY PS

AGATE BAY LN

0 1,500 3,000 Feet

N

NSG

DELLESTA PS

DEL

DISTRICT BOUNDARY

LAKEWAY DR

MORGAN ST

SPRING ST

CABLE ST

AUSTIN ST

GENEVA ST

FIR TREE WAY

FREMONT ST

CORONADO AVE

LEWIS AVE

LK WHATCOM BLVD

NORTH SHORE INTERCEPTOR

POTENTIAL FUTURE PUMP STATION LOCATION

NORTH SHORE RD

POTENTIAL FUTURE SEWAGE BASIN

FUTURE

GENEVA

LAKE WHATCOM

SUDDEN VALLEY

FUTURE

NORTH SHORE RD

LEGEND

- LWWSD Boundary
- Existing Sewage Pump Station
- Existing Manhole
- Gravity Sewer
- Existing Sewage Interceptor or Force Main
- Existing Onsite Septic System
- NSG — Pump Station Service Area Boundary
- LWWSD Potential Future Connections
- Watershed Protected Properties

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LAKE WHATCOM WATER & SEWER DISTRICT

WHATCOM COUNTY WASHINGTON

EXHIBIT J-4
NORTH SHORE
POTENTIAL SEWER GROWTH MAP

DATE JUNE 2013 | SCALE AS SHOWN | JOB NO. 2013-014

SHEET 1 OF 1

EXHIBIT K. CAPITAL IMPROVEMENT PLAN

Lake Whatcom Water and Sewer District - Capital Improvement Plan 2014 thru 2019

Program Area / CIP Project # / CIP Project Name		Fund	Total	2014	2015	2016	2017	2018	2019
Both Water and Sewer									
0121	Admin Building (1220 Lakeway) Irrigation System	420	10,000	10,000					
A0005	Accounting & Administration Server - Replace/Update Hardware, Network Security, & OS		20,600			10,300			10,300
V0001	Replace Tool Truck (6 tool trucks in fleet)		154,500		51,500		51,500		51,500
V0002	Replace Administrative Staff Vehicle (3 cars in fleet)		25,133				25,133		
V0003	Replace Locator / Meter Reading Van		25,335				25,335		
V0004	Replace Light Truck		31,669				31,669		
0119	Gravel/Asphalt Material Bin Improvements at Shop	420	5,000	5,000					
	Subtotal		**272,237**	**15,000**	**51,500**	**10,300**	**133,637**		**61,800**
Sewer System									
0032	Agate Bay Pump Station Replacement		669,500				669,500		
0033a	Strawberry Point Pump Station Replacement - Predesign	420	100,000	100,000					
0033b	Strawberry Point Pump Station Replacement (subtraced $100k for predesign in 2014)		592,250		592,250				
0049	Country Club Pump Station Replacement		669,500			669,500			
0038	Geneva Pump Station Replacement		669,500					669,500	
0021	Boulevard Pump Station Replacement (subtracted $90k for predesign in 2013)	420	570,000	570,000					
0055	Rocky Ridge Pump Station Replacement		721,000						721,000
S0001b	EPA Capacity, Management, Operations, & Maintenance (CMOM) Projects - Sewer I&I	420	103,000	103,000					
0113	Lowe Sewer Pump Station - Replace Rotophase with VFD	420	7,000	7,000					
0117	Sewer Push Camera for 2" to 4" Pipe	420	7,000	7,000					
0124	Rehabilitate Old Flat Car Sewer Pump Station		100,000		100,000				
0125	Flow Meter for Sudden Valley Sewer Pump Station Drywell Pumps		10,000		10,000				
A0010	Update Sewer Comprehensive Plan		61,800						61,800
S0001	EPA Capacity, Management, Operations, & Maintenance (CMOM) Projects - Sewer I&I		824,000		164,800	164,800	164,800	164,800	164,800
	Subtotal		**5,104,550**	**787,000**	**867,050**	**834,300**	**834,300**	**834,300**	**947,600**
Water System									
0108	Replace SVWTP Booster Station Roof		25,750		25,750				
0110	Security - Intrusion Alarms at Reserviors, Cameras as SVWTP AHWTP		10,300			10,300			
0072	SVWTP Clearwell Overflow Drain		75,000				75,000		
0060	Eagleridge Fire Pump Control Upgrade		63,339		63,339				
W0002b	Water System Rehab and Replacement Projects		480,000			120,000	120,000	120,000	120,000
W0002	Water System Rehab and Replacement Projects	420	120,000	120,000					
0084	Agate Heights Treatment Plant Additional Capacity		499,550						499,550
0043	Sudden Valley Replace AC and 2" PVC Water Lines		93,108			93,108			
0122	Security Sensors at Reservoir and WTP Sites		19,417		19,417				
W0007	SVWTP Filter 1&2 Media - Replace		20,268			20,268			

Program Area / CIP Project # / CIP Project Name		Fund	Total	2014	2015	2016	2017	2018	2019
W0005	Reservoirs - Inspection & Maintenance		25,750				25,750		
W0003	SVWTP Filter 3&4 Media - Replace		20,268		20,268				
W0001	Water Service Rebuilds	420	36,000	12,000	12,000	12,000			
A0007	Update Water Comprehensive Plan		109,273		109,273				
0123	SVWTP Spare Raw Water Pump VFD	420	5,000	5,000					
0118	Leak Locator Equipment		10,000		10,000				
0114	SVWTP and AHWTP - New Dehumidifiers	420	5,000	5,000					
0126	Mechanical Staff Gauge for SVWTP Clearwell Reservoir		10,000				10,000		
	Subtotal		**1,628,023**	**142,000**	**260,047**	**255,676**	**230,750**	**120,000**	**619,550**
Water System - Funding by Loan or Bond									
0116	Reservoir Seismic Restraints (Place-Holder. Need to develop cost est.)		500,000			500,000			
0115	Division 7 and Geneva Reservoir Coating and Structural Repairs (Place-Holder. Need to develop cost est.)		500,000			500,000			
	Subtotal		**1,000,000**			**1,000,000**			
* Note: Cost Estimates in 2014 Dollars	**Grand Total**		**8,004,810**	**944,000**	**1,178,597**	**2,100,276**	**1,198,687**	**954,300**	**1,628,950**

EXHIBIT L. RESOLUTION 757 – REQUIREMENTS FOR WATER AND SEWER SERVICE REQUESTS

LAKE WHATCOM WATER AND SEWER DISTRICT

RESOLUTION No 757

A Resolution of the Board of Commissioners
Policy to Determine Requirements for
Water and Sewer Service Requests

WHEREAS, the District desires to establish a consistent policy concerning when new developments are: (1) required to connect to existing water and/or sewer systems, (2) extend those systems, or (3) allowed to develop alternate water sources and/or onsite sewage disposal systems, to serve such developments, and

WHEREAS, it is the District's stated mission to provide the best possible water and sewer services to District customers at an affordable cost, and in a way that contributes to protecting Lake Whatcom's water quality, and

WHEREAS, it is the District's goal to provide sewer and water service to those portions of the District as may reasonably be served, and

WHEREAS, District policies for water and sewer extensions outside Urban Growth Areas (UGA) and Limited Areas of More Intensive Rural Development (LAMIRD) must comply with Whatcom County's Comprehensive Plan, and

WHEREAS, to expand in an orderly, consistent, and steady manner, both water and sewer infrastructure must be extended as infill of vacant lots and growth occur to meet current and future service requests.

NOW, THEREFORE, BE IT RESOLVED THAT:

Definition of Overall System Capacity: There is overall system capacity when the system as a whole has the capability to serve additional service connections. There may be localized areas in the system that are insufficient in size or are in too poor condition to allow local connections, but the system can still be considered to have overall system capacity.

1.0 REQUIREMENTS FOR SERVICE WHEN THERE IS OVERALL SYSTEM CAPACITY

1.1 **Single Parcel with Single Family Residence**. A request for service or request for denial of service by an Owner of a single parcel for a single family residence shall be reviewed by determining: (1) the parcel's distance to the District's water and sewer system, and (2) the sufficiency of the size and condition of the mains serving the parcel as determined by the District.

a. **SEWER SERVICE**

i. Parcel is located **inside** UGA or LAMIRD:

1) **District Sewer Adjacent to Property and Main is Sufficient**. Connection to District sewer is required. The connection shall be made in accordance with current District Standards.

2) **Sufficient Sewer Main within 200-feet of Property**. Connection to the District sewer is required. Owner extends and/or replaces main past and/or through property and connects to the sufficient main by Developer Extension Agreement and in accordance with current District Standards.

3) **Sufficient Sewer Main more than 200-feet from Property**. District has the option of extending and/or replacing mains to within 200 feet of the property and then requiring the Owner to complete the extension and/or replacement past or through their property. The Owner extension and/or replacement of the main will be by Developer Extension Agreement and in accordance with current District Standards. If the District elects not to bring a sufficiently sized main in adequate condition within 200 feet of the property, the Owner may develop an onsite sewage disposal system in accordance with Whatcom County and State regulations after executing a "Covenant Binding Property Regarding Future Water and/or Sewer Service."

ii. Parcel is located **outside** UGA or LAMIRD:

1) **Sufficient Sewer Main within 150-feet of Property**. Connection to the District system is required, and shall be in accordance with current District Standards..

2) **Sufficient Sewer Main more than 150-feet from Property**. The Owner may develop an onsite sewage disposal system in accordance with Whatcom County and State regulations after executing a "Covenant Binding Property Regarding Future Water and/or Sewer Service." The Owner also has the option of extending the main to and past the parcel provided Whatcom County determines the extension is consistent with the County's Comprehensive Plan and the District's Sewer Comprehensive Plan is amended to include the extension.

3) **Health Department Required Connection.** The Owner may connect even if more than 150 feet from a sufficient sewer main and outside a UGA or LAMIRD if connection is required by Whatcom County Health Department. The connection shall be made in accordance with current District Standards.

b. **WATER SERVICE INSIDE OR OUTSIDE UGA OR LAMIRD:**

i. **District Water System Adjacent to Property and Main is Sufficient.** Connection to District water system is required. The connection shall be made in accordance with current District Standards.

ii. **Sufficient Water System within 200-feet of Property**. Connection to the District water system is required. Owner extends and/or replaces main past and/or through property and connects to the sufficient main by Developer Extension Agreement and in accordance with current District Standards.

1) If District determines that a public water main extension is not warranted, the District will install a water service from the main to meter. Meters will be set adjacent to the main near the edge of the public right-of-way or easement corridor in which the public water main is located. The property Owner installs the private water service line from the meter to the building. Properties not fronting the public water main such as those located beyond the end of the main or behind lots fronting the main will require a longer private water service line installed by the Owner from their property to the meter.

iii. **Sufficient Water System more than 200-feet from Property**. District has the option of extending and/or replacing mains to within 200 feet of the property and then requiring the Owner to complete the extension and/or replacement past or through their property. The Owner extension and/or replacement of the main will be by Developer Extension Agreement and in accordance with current District Standards. If the District elects not to bring a sufficiently sized main in adequate condition within 200 feet of the property, the Owner may develop an alternate and temporary water supply in accordance with Whatcom County and State regulations after executing a "Covenant Binding Property Regarding Future Water and/or Sewer Service."

1.2 **Other Development**. All other developments (such as but not limited to subdivisions, plats, short plats, commercial, institutional, industrial, etc.) shall connect to the District's water and sewer system as follows:

a. **SEWER SERVICE**

i. Site is located **inside** UGA or LAMIRD:

1) Connection to District sewer system is required. The developer shall extend the sewer system past and/or through property by Developer Extension Agreement and in accordance with current District Standards. Improvements shall be sized, designed, and constructed per District Standards to serve full build-out of the area.

ii. Site is located **outside** UGA or LAMIRD:

1) **Sufficient Sewer Main within 150-feet of Site**. Parcels within 150-feet of sufficient sewer main shall connect to the District sewer system in accordance with current District Standards.

2) **Sufficient Sewer Main more than 150-feet from Property**. The Owner may develop an onsite sewage disposal system in accordance with Whatcom County and State regulations after executing a "Covenant Binding Property Regarding Future Water and/or Sewer Service." The Owner also has the option of extending the main to and past the parcel provided Whatcom County determines the extension is consistent with its Comprehensive Plan and the extension is amended to the District's Sewer Comprehensive Plan. The sewer extension and connections shall be in accordance with current District Standards.

3) **Health Department Required Connection.** The Owner may connect even if more than 150 feet from a sufficient sewer main and outside a UGA or LAMIRD if connection is required by Whatcom County Health Department. The connection shall be made in accordance with current District Standards.

b. **WATER SERVICE INSIDE OR OUTSIDE UGA OR LAMIRD:**

i. Connection to the District water system is required. Owner extends and/or replaces main past and/or through property and connects to the sufficient main by Developer Extension Agreement per current District Standards.

1.3 **Petition to Waive or Adjust Connection Requirements.** The Owner may petition the Board of Commissioners to waive or adjust the connection requirements if the parcel is located such that service is unlikely to be extended to the parcel within the next 20 years as determined by the District.

The Board of Commissioners will evaluate the petition considering: (1) expansion of the system to serve the new development is considered part of the cost of the new development, (2) costs for some developments will be more than others due to location and physical challenges, (3) waiving connection requirements will make it increasingly more difficult and costly to serve the same development in the future, (4) some required improvements may not be immediately placed into service but will greatly reduce the costs and complexity to serve the development in the future (example, building a waterline across the parcel frontage that remains dry until service is extended to the site), (5) a distance of approximately ½ mile is considered close enough to require connection, (6) longer distances to connect to the system may be appropriate for larger developments, and (7) it is considered a minimum requirement to construct the system across or through the development whether they are immediately used for service or are placed into service in the future.

If the connection requirement is waived or the required system improvements cannot immediately be placed into service, the Owner may develop an alternate and temporary water supply and/or onsite sewage disposal systems in accordance with Whatcom County and State regulations after executing a "Covenant Binding Property Regarding Future Water and/or Sewer Service.

1.4 "Covenant Binding Property Regarding Future Water and/or Sewer Service." The covenant runs with the land and is signed and notarized by the property owner and District General Manager. The owner records the document at the County Auditor's office and delivers the original to the District. The covenant allows the owner to develop a temporary water supply and/or onsite disposal system, restricts the owner from protesting the formation of a utility local improvement district to extend water and/or sewer to the parcel, and requires the owner to connect to the District system when service becomes available at such time as the District so determines.

Resolution Conflicts. Resolution 757 replaces Resolution 740. The Board of Commissioners declares that Resolution 757 supersedes any other conflicting Resolution to the extent of such conflict.

Adopted by the Board of Commissioners of Lake Whatcom Water and Sewer District, Whatcom County, Washington at a Regular Meeting thereof on the 14th day of October, 2009.

Leslie Mc Roberts, Commissioner

Deborah Lambert, Commissioner

Todd Citron, Commissioner

Thomas L. Hadd, Commissioner

Blair Ford, Commissioner

EXHIBIT M. STORMWATER AND WATER QUALITY MANAGEMENT ATTACHMENTS

EXHIBIT M. STORMWATER AND WATER QUALITY MANAGEMENT ATTACHMENTS

EXHIBIT 1

District Drainage Powers - RCW 57.08.005 (abbreviated)

(7)(a) To construct, condemn and purchase, add to, maintain, and operate systems of drainage

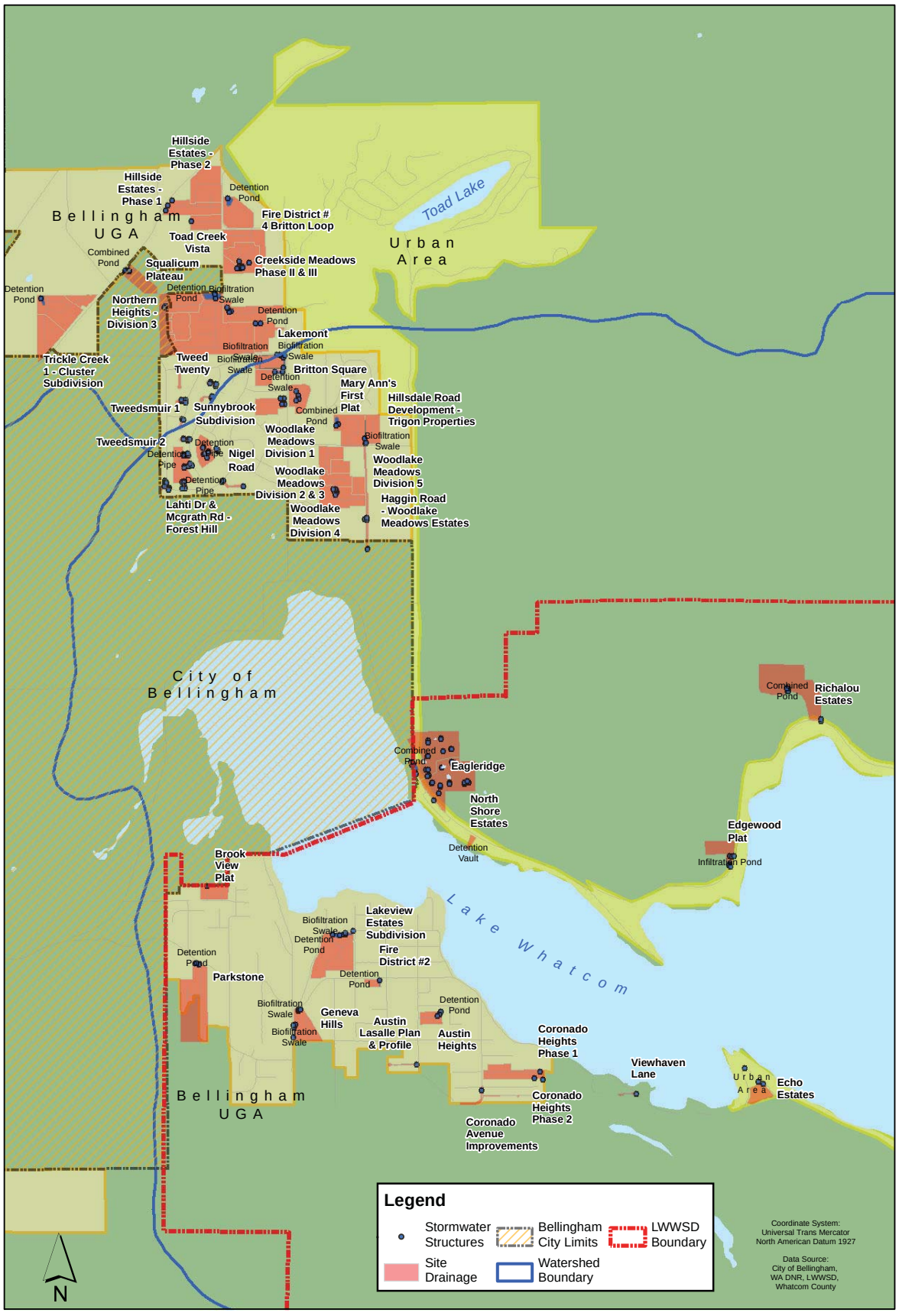
(b) The rate a district may charge under this section for storm or surface water sewer systems shall be reduced by a minimum of ten percent for any new or remodeled commercial building that utilizes a permissive rainwater harvesting system.

(c) Drainage facilities may include natural systems. Drainage facilities may include facilities which result in combined drainage facilities and electric generation, except that the electricity generated thereby is a by-product of the drainage system.

(10) Where a district contains within its borders, abuts, or is located adjacent to any lake, stream, groundwater as defined by RCW 90.44.035, or other waterway within the state of Washington, to provide for the reduction, minimization, or elimination of pollutants from those waters in accordance with the district's comprehensive plan, and to issue general obligation bonds, revenue bonds, local improvement district bonds, or utility local improvement bonds for the purpose of paying all or any part of the cost of reducing, minimizing, or eliminating the pollutants from these waters;

(11) Subject to subsection (7) of this section, to fix rates and charges for water, sewer, reclaimed water, and drain service supplied and to charge property owners seeking to connect to the district's systems, as a condition to granting the right to so connect, in addition to the cost of the connection, such reasonable connection charge as the board of commissioners shall determine to be proper in order that those property owners shall bear their equitable share of the cost of the system…

…A water-sewer district shall not provide on-site sewage system inspection, pumping services, or other maintenance or repair services under this section using water-sewer district employees unless the on-site system is connected by a publicly owned collection system to the water-sewer district's sewerage system, and the on-site system represents the first step in the sewage disposal process.



1 inch = 2,000 feet

Wilson Engineering LLC, GIS

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NPDES Phase II Permit Areas

WHATCOM COUNTY WASHINGTON

Figure 3 – Private Stormwater Systems

Geneva / North Shore

DATE	SHEET
SEPT 2013	1
SCALE 1:24,000	OF
JOB NUMBER 2013-014	1

EXHIBIT N. STUDY AREA CHARACTERISTICS

EXHIBIT N - STUDY AREA CHARACTERISTICS

A. Sudden Valley

Sudden Valley is a planned community of 1,870 acres, 4,395 single family lots, condominium areas, and recreational/open areas located on the west shore of Lake Whatcom. Development of the planned, residential resort began in 1968. The developers included access to all utilities, including water and sewer. Typically, the lot sizes were approximately 6,000 square feet.

The development of lots and utilities in Sudden Valley was unusual. The developers conceived the project as a single, large development with all platting and construction of utilities occurring at one time (as opposed to a phased development). The local economy experienced a down-turn in the late 1970s and early 1980s. All costs for the operation and maintenance of an extensive infrastructure had to be borne by a small base of customers. By the end of the 1970s, developers and home owners had built improvements on less than one-quarter of the lots.

1. Boundaries

For the purposes of this comprehensive plan, the Sudden Valley study area is an area larger than the original Sudden Valley development. The boundaries of the Study Area follow the limits of the original development from the northwest corner of the development south and west to Lake Louise Road.

Upon reaching the District Boundaries at the boundary of Sections 7 and 18 the boundary continues east toward the lake. Beyond this point, the Sudden Valley Study Area Boundary deviates from the original Sudden Valley Development Boundary. The Study Area boundary includes additional areas that have the *potential* for utility service (Camp Firwood, Morrison property, Lane Older, Byron Tract, Airstrip, etc.).

The Sudden Valley *Development* Boundary skirts north of an area zoned for R5A to Lake Whatcom northwest of Reveille Island. This area was down-zoned from UR3and includes both Camp Firwood and an area of undeveloped land. This area was outside the original Sudden Valley Development. Therefore, the original developers did not design the Sudden Valley utilities, storage and treatment facilities to serve the entire area. An exception to this is the Camp Firwood area. When the Sudden Valley Development was designed, the developers negotiated with *the Firs Bible and Missionary Conference* to allow easements and a reservoir site on Camp property. As part of this negotiation, the *Sanwick Corporation* (Sudden Valley's developer) agreed to reserve service capacity for Camp Firwood. The District accepted these obligations when they accepted the Sudden Valley System in 1977.

We have included the area within the study area because of the proximity to the Sudden Valley Area rather than with South Lake Study Area. Therefore, the Sudden Valley *Study Area* Boundary includes Camp Firwood and the area potentially served by the Camp Firwood pump station.

2. Topography

The topography of the Sudden Valley Area is characterized by five topographic sub-areas. Each sub-area has its own slope orientation, height, and development and service challenges. The first area is characterized by a series of steep rides, Beaver Creek, Lake Louise Road and Lookout Mountain. The development on these ridges represents much of the Sudden Valley residential development. Further to the south, the Sudden Valley Development abuts Austin Creek and extends up the slopes of Lookout Mountain. At the extreme southeastern portion of the Study Area (immediately east of Lake Louise) a steep hill rises from Lake Whatcom. Sudden Valley Division 7 occupies the north side of this hill while Camp Firwood occupies the south. The remaining portion of the area is the valley floor and Lake Louise. This area is typically recreational. A topographic map of the District is included in Exhibit A.

3. Geology

The entire Lake Whatcom area forms part of the western foothills of the Cascade Range. Bedrock conditions are important considerations of the suitability of the land for different uses; the cost of development, and the production of ground water.

The predominant rock type in the Sudden Valley Study Area consists of Tertiary sandstone, conglomerate, and shale of the Chuckanut Formation (TKc). This rock type also can be found to the north and east of Lake Whatcom.

Cross-bedding in both the sandstone and conglomerate formations are common. The relationship between the inclined bedding and fractures in the Chuckanut Formation is important to determine slope stability. Potential landslide hazards exist where either bedding or fracture planes intersect the land surface. Chuckanut Sandstone is generally a poor producer of ground water. However, wells that intercept a fracture zone can produce small yields.

4. Soils

Stream and runoff sediments (Qal) have accumulated in the delta of Beaver Creek/Austin Creek in Sudden Valley. These alluvial deposits can produce limited quantities of ground water. However, there has been no significant development of ground water within Sudden Valley.

5. Hydrology

The entire Lake Whatcom Watershed is 35,800 acres, of which approximately 5,003 acres are lake surface. The Lake itself is divided into three major basins. The deepest sections (to 100+ meters or 330 feet) are in the most southern basin north of South Bay. The large central basin has depths of over 85 meters or 280+ feet and is separated from the southern basin by the ***Sunnyside Sill.*** The northern basin is separated from the central basin by the ***Strawberry Sill.*** This is the smallest and shallowest of the basins with depths to 25 meters or 85 feet. The northern basin is separated into two minor basins by the ***Geneva Sill.***

Austin Creek (and a large tributary Beaver Creek) is the major drainage course in the Sudden Valley area. The designation for this stream is Class AA based on the Washington State Water Quality criteria.

Lake Whatcom Water and Sewer District started recording daily rainfall in June 1983. The District maintains three rain gauges: one at the District Facilities at 1010 Lakeview Street; one at

the District's Airport Pump Station on Lake Whatcom Boulevard, and one at the Division 30 water reservoir at the south end of Sudden Valley. The City of Bellingham records their rainfall at the Post Point Sewage Treatment Plant (200 McKenzie Avenue). During some periods, there is significantly more rainfall at Lake Whatcom WSD than at the City of Bellingham Station. The District recorded rainfall at the Lakeview site for the twelve months ending 1984-1985 at 60.45 inches. For the same year, the City of Bellingham recorded 36.81 inches.

On January 9-10 1983, heavy continuous rains caused major slumping of unstable soils and the failure of large debris dams on major streams. Several days of rain (January 2-8) preceded the major storm event. When rainfall occurs, part of the water runs off directly into streams or over land into the Lake within a short period. Due to the combination of shallow soils in the area, bedrock and the heavy rains, the ground was not able to absorb the water. This resulted in the accretion and subsequent failure of large debris dams.

This flooding caused major changes in Lake chemistry, turbidity, phytoplankton, and loading rates of phosphorus, sediment, and other nutrients in streams. Because of the volume and shape of Lake Whatcom, the Lake took several years to return to an equilibrium state.[1]

Future similar flooding events have the potential for similar results. During these events, the Sudden Valley Water Treatment Plant will require careful monitoring. If the changes in water character are significant enough the Water Treatment Plant may require temporary changes in operations to handle the changes in raw water quality.

Records do not show the recurrence interval or the relative magnitude of the 1983 storm event. However, in the 1983 storm five inches of rain fell within the six day period. This combined with the presence of the debris dams made it difficult to evaluate on a relative scale. The Washington State Department of Emergency Services offered long-term mitigation recommendations for their *Flood Mitigation Implementation Measure Report for Whatcom County* in November 1983 (available from Whatcom County Department of Public Works).

These recommendations included suggestions on land use planning, zoning, the installation of rain gauges in higher altitudes, and debris collectors and surge dams.

B. Geneva

1. Boundaries

The Geneva Study Area represents the area between the City of Bellingham and the Sudden Valley Study Area described above. The boundary extends west along the City of Bellingham City Limits (at Lake Whatcom) to the boundary between Township 38-North and Range 4-East Sections 33 and 34. This north-south section line represents the City of Bellingham/ Lake Whatcom Water and Sewer District boundary lines and the approximate watershed boundaries.

The limits of the Geneva Study Area continue along the Lake Whatcom Water and Sewer District boundary south and east along the watershed boundary. Much of the zoning in this area is forestry. The Study Area boundary continues roughly east along the south edge of areas down-zoned to R5A (from RR2 and R2A) to Lake Whatcom (approximately 1/2-mile northwest of Dutch Harbor Road).

[1] The relatively rapid return of the lake to equilibrium was to some degree a result of increased diversion by the City of Bellingham from the Middle Fork of the Nooksack into the Lake through the City's Mirror Lake Inter-basin Water diversion.

2. Topography

The topography of the Geneva Study Area is considerably less complex than the Sudden Valley Area. Most of the area forms moderately steep, north facing slopes leading down to Lake Whatcom. A series of broad north-south ravines and ridges traverse the western portions of this area. Further to the south and east, the topography forms the broad, steep, northeast facing slopes of Lookout Mountain. A topographic map of the District is included in Exhibit A.

3. Geology

The Geneva Study Area also forms part of the western foothills of the Cascade Range. The bedrock conditions are similar to Sudden Valley. The existence of bed rock conditions is an important determinant of the suitability of the land for different uses, costs of development, and the production of ground water.

The predominant rock type in the area consists of Tertiary sandstone, conglomerate, and shale of the Chuckanut Formation (Tkc). Cross-bedding in both sandstone and conglomerate formations are also common in the Geneva Area. Likewise, the relationship between the inclined bedding and fractures in the Chuckanut Formation is important to determine slope stability. Potential landslide hazards exist where ever either bedding or fracture planes intersect the land surface. As above, Chuckanut Sandstone is a poor producer of ground water, although wells that intercept fracture zones can produce small yields.

4. Soils

Soils in the Geneva Area are typically shallow over bedrock. There are no significant ground water sources known in the Geneva Area.

5. Hydrology

No major creeks enter Lake Whatcom in the Geneva Area. However, Whatcom Creek flows from Lake Whatcom immediately north of the Study Area. Although this outfall is outside District Boundaries, the creek is important to all water uses in the area as the natural outlet from Lake Whatcom.

C. North Shore

1. Boundaries

The western boundary of the North Shore Study area starts at Lake Whatcom and heads north following the City of Bellingham / Lake Whatcom Water and Sewer District boundary. It then follows the District boundary to the east. It encompasses the areas adjacent to the North Shore interceptor, pump station service areas, and gravity service areas. Much of the potential development in this service area has been eliminated through density reduction programs where the property is purchased and restricted from development. It also includes areas near the Lake that were developed utilizing septic systems.

2. Topography

The topography of the North Shore Study Area can be divided into five separate sub areas. The areas furthest to the west form moderate slopes. These lead down to North Shore Road and form a portion of the southern flank of Squalicum Mountain. Several shallow ravines with associated small creeks cross this section of the Study Area to Lake Whatcom. The area then levels to form a gently sloped area that is over 1-mile wide.

Immediately west of Agate Bay, a steep north-south escarpment marks the western boundary of the second topographic area of North Shore. As with the area described above, this second area ends with a moderately sloped area approximately 1/8 of a mile wide.

The North Shore Study Area enters a third topographic area of mild slopes that form Squalicum Valley between Squalicum Mountain and Stewart Mountain. Carpenter Creek flows from Stewart Mountain through Squalicum Valley into Lake Whatcom. Further to the east, the larger Olsen Creek flows from a deep ravine on the flanks of Stewart Mountain. Close to the lake, mild slopes continue approximately 1/2 mile east along the shore before running into the steep southwest-facing slopes of Stewart Mountain.

Steep slopes beginning at Olsen Creek form the boundary of the fourth area. Steep slopes lead up to the 2,800 MSL (feet above mean sea level) peak of Stewart Mountain. More moderate slopes exist close to the lake and southwest of the BPA power line. The steeper areas northeast of the power line are zoned for Forestry.

The fifth topographic area is the small area known as Sunnyside. The areas of steep ravines and slopes are zoned ROS (Rural Open Space) and Forestry.

Beyond this last portion of the North Shore Study Area, Stewart Mountain continues as a steep ridge rising from the more southern portions of Lake Whatcom. The steep west facing slopes of this area preclude development. Zoning in this area is forestry. A topographic map of the District is included in Exhibit A.

3. Geology

The predominant rock type in the North Shore Area consists of Tertiary sandstone, conglomerate, and shale of the Chuckanut Formation (Tkc). Cross-bedding in both sandstone and conglomerate formations are common. The same factors we discussed above for this rock type apply in this area.

4. Soils

Along Agate Bay, construction would find out-wash sand and gravel (Qso), and undifferentiated glacial drift (Qf) deposits. Bellingham drift (Qb), and inter-glacial sandy silt occurs north of Agate Bay. Stream and runoff sediments (Qal) have accumulated in deltas at Sunnyside. The ground water developments are typically on the glacial outwash sands and gravels mapped at Agate Bay. The alluvial deposits at Sunnyside produce limited quantities of ground water.

5. Hydrology

Several major creeks enter Lake Whatcom in this Study Area. Olsen, Carpenter, and Smith Creeks all enter the lake from the mountains to the esast and provide significant recharge to the lake. The Washington State Water Quality criteria designate these streams as Class AA waters.

Other, smaller creeks also add significantly to the Lake recharge. The high and steep wet-facing slopes intercept much of the summer rains and winter snows that recharge the Lake. The sparsely developed residential areas and forested slopes combine to form the conditions for high quality surface recharge. In addition to the surface creeks, recharge on these high peaks provides artesian conditions in the Squalicum Aquifer. This aquifer eventually flows into the lake and also provides a significant source of lake water.

D. South Lake

1. Boundaries

The South Lake Study Area begins at the northwest corner where it connects with the southeast corner of the Sudden Valley Study Area. From this point, the Study Area boundary continues south and east along the Lake. This includes all residentially zoned areas south of the Sudden Valley Study Area and the North Shore Study Area.

2. Topography

There are three major topographic regions of the South Lake Study Area. From the Sudden Valley Study Area south to South Lake, the area is steep with east facing slopes cut by small mountain streams. Areas closer to Lake Whatcom have progressively milder slopes and may someday represent a development region. Lake Whatcom Boulevard crosses close to the lake to take advantage of the milder slopes within this first topographic sub-area. The flanks of Lookout Mountain continue to rise to the west beyond the District Boundaries.

South Bay is a narrow bay extending from Lake Whatcom to the southwest. The area including South Bay and the areas from South Bay to Blue Canyon form the second topographic sub-region of the South Lake Study Area. Slopes to the northwest of South Bay are steep. However, slopes to the southeast are considerably milder.

The valley southwest of the Bay broadens as it extends to the Lake watershed/ District boundaries. The topography in these areas is potentially well suited for development. The zoning in these areas is R5A for residential development. However, the lack of utilities and roads and the physical distance to either Bellingham or the Skagit Valley has limited growth in these areas. [2]

Between South Bay and Blue Canyon, the flanks of a knoll form another area potentially suited to development. The eastern slopes of the knoll are gentle and lead to the broad valley of Brannian Creek. However, the residential zoning RR1 is limited to a narrow area next to Lake Whatcom. The higher slopes are zoned for Forestry.

[2] The broadest and most developed sections of this entire area are actually beyond both the watershed and the District Boundaries. This developed area is commonly referred to as either *Glenhaven Lakes* or the *Whatcom Meadows* Area and surrounds Reed (394 MSL) and Cain Lakes (391 MSL). However, both of these lakes drain away from Lake Whatcom south past the town of Alger into Friday Creek and eventually into the Samish River.

The State Fish Hatchery occupies the area zoned ROS (Rural Open Space) south of the Creek. East of Brannian Creek (and immediately west of Blue Canyon) mild slopes lead up to Anderson Mountain.

Blue Canyon also forms a steep walled canyon. The flanks of Anderson Mountain bound one side of the canyon while the northeast side of the Canyon forms slopes leading up to Stewart Mountain. The floor of Blue Canyon is narrow and contains the small Mirror Lake. The outlet to this lake flows into Lake Whatcom. The City of Bellingham uses Mirror Lake and Anderson Creek as part of the inter-basin diversion from the Middle Fork of the Nooksack River. [3]

Areas immediately to the east of Mirror Lake flow the opposite direction. The water enters the South Fork of the Nooksack River close to the town of Acme. The County has zoned almost all of the floor of Blue Canyon as R5A. The surrounding slopes are zoned for Forestry. A topographic map of the District is included in Exhibit A.

3. Geology

Near Blue Canyon, pre-Jurassic phyllite (metamorphic slate, pJm) occurs in limited quantity. The ground water characteristics are similar to those of the Chuckanut Formation near South Bay, Sudden Valley and Geneva. Water in some locations in the phyllite yield sufficient quantities for single family residential use.

4. Soils

Along South Bay, there are areas of out-wash sand and gravel (Qso), and undifferentiated glacial drift (Qf) deposits. Stream and runoff sediments (Qal) have accumulated in deltas at the Lake Whatcom outlet of Anderson Creek. In some areas on the glacial out-wash sands wells have developed limited ground water. Limited quantities of ground water may also be available from the alluvial deposits at Anderson Creek.

5. Hydrology

Both Anderson Creek and Brannian Creek flow into Lake Whatcom in the South Lake area. While Anderson Creek is larger, Brannian Creek is important as a source of water for the State Fish Hatchery. The Washington State Water Quality criteria have designated both of these streams as Class AA waters. Anderson Mountain, Anderson Creek, Brannian Creek and the sparse density and forestry zoning make this sub-area another valuable watershed area.

[3] The City of Bellingham diverts water from the Middle Fork of the Nooksack because that fork provides a better source than the closer South Fork. Waters from the Middle Fork are piped under the South Fork before entering Mirror Lake.