Water Rates Analyses

Rates

Monthly service fee	Current	FY2015	FY2016	FY2017	FY2018	FY2019	Total increase $/mo	Total Increase %	Number of Service Lines	% of service lines	Total Incremental $ / yr	Total Incremental % / yr	Total Baseline $ / yr	Total Baseline % / yr	FY2015 (per month)	As % of baseline	Total Contribution $ / yr	Total contribution % / yr	FY2016 (per month)	As % of baseline	Total Contribution $ / yr	Total contribution % / yr
5/8-in line	17.41	19.16	21.08	23.19	25.51	28.07	10.66	61%	22,414	89.73%	2,867,199	64.85%	4,682,733	64.80%	7.37	38%	1,982,294	64.79%	2.45	12%	658,972	64.79%
3/4-in	17.41	19.16	21.08	23.19	25.51	28.07	10.66	61%	264	1.06%	33,771	0.76%	55,155	0.76%	7.37	38%	23,348	0.76%	2.45	12%	7,762	0.76%
1-in	43.52	47.88	52.67	57.94	63.74	70.12	26.60	61%	1,369	5.48%	436,985	9.88%	714,947	9.89%	18.43	38%	302,768	9.90%	6.13	12%	100,704	9.90%
1-1/2 in	87.05	95.76	105.34	115.88	127.47	140.22	53.17	61%	434	1.74%	276,909	6.26%	453,356	6.27%	36.85	38%	191,915	6.27%	12.25	12%	63,798	6.27%
2-in	139.27	153.20	168.52	185.38	203.92	224.32	85.05	61%	404	1.62%	412,322	9.33%	675,181	9.34%	58.96	38%	285,838	9.34%	19.60	12%	95,021	9.34%
3-in	261.14	287.26	315.99	347.59	382.35	420.59	159.45	61%	48	0.19%	91,843	2.08%	150,417	2.08%	110.55	38%	63,677	2.08%	36.75	12%	21,168	2.08%
4-in	435.24	478.77	526.65	579.32	637.26	700.99	265.75	61%	24	0.10%	76,536	1.73%	125,349	1.73%	184.25	38%	53,064	1.73%	61.25	12%	17,640	1.73%
6-in	870.46	957.51	1,053.27	1,158.60	1,274.46	1,401.91	531.45	61%	12	0.05%	76,529	1.73%	125,346	1.73%	368.50	38%	53,064	1.73%	122.50	12%	17,640	1.73%
8-in	2,002.05	2,202.26	2,422.49	2,664.74	2,931.22	3,224.35	1,222.30	61%	4	0.02%	58,670	1.33%	96,098	1.33%	847.55	38%	40,682	1.33%	281.75	12%	13,524	1.33%
10-in	2,472.09	2,713.30	2,991.23	3,290.36	2,619.40	3,981.34	1,509.25	61%	5	0.02%	90,555	2.05%	148,325	2.05%	1,046.54	39%	62,792	2.05%	347.90	12%	20,874	2.05%
									24,978	100%	4,421,320	100.00%	7,226,907	100.00%			3,059,443	100.00%			1,017,102	100.00%

(Drought Recovery columns at right)

39%

SFR ($/ccf)	Current	FY2015	FY2016	FY2017	FY2018	FY2019	Total increase $	Total Increase %	Number of Units sold at this price	% of Units Sold	Total Incremental $ / yr	Total Incremental % / yr	Total Baseline $ / yr	Total Baseline % / yr
Tier 1	1.57	1.73	1.91	2.11	2.33	2.57	1.00	64%	813,927	24.6%	813,927	11.53%	1,277,866	11.17%
Tier 2	4.00	4.40	4.84	5.33	5.87	6.46	2.46	62%	401,640	12.1%	988,035	13.99%	1,606,561	14.05%
Tier 3	5.14	5.66	6.23	6.86	7.55	8.31	3.17	62%	81,881	2.5%	259,564	3.68%	420,870	3.68%
Tier 4	7.05	7.76	8.54	9.40	10.34	11.38	4.33	61%	11,727	0.4%	50,776	0.72%	82,673	0.72%
Tier 5	8.79	9.67	10.64	11.71	12.89	14.18	5.39	61%	9,297	0.3%	50,109	0.71%	81,718	0.71%
Non-SFR	4.00	4.40	4.84	5.33	5.87	6.46	2.46	62%	1,991,408	60.2%	4,898,865	69.38%	7,965,633	69.66%
									3,309,881	100.0%	7,061,276	100.0%	11,435,321	100.0%

61%

Service Line Data

Service Line Data	Inside-City	Outside-City	Capitola	North Coast	Total
5/8-in line	14,660	7,517	191	46	22,414
3/4-in	192	70	1	1	264
1-in	780	553	29	7	1,369
1-1/2 in	297	137	0	0	434
2-in	232	139	16	17	404
3-in	34	13	1	0	48
4-in	15	9	0	0	24
6-in	7	5	0	0	12
8-in	3	1	0	0	4
10-in	4	1	0	0	5
Total	16,224	8,445	238	71	24,978

Consumption by Tier (FY 2015)

Consumption by Tier (FY 2015)	Inside-City	Outside-City		North Coast	Total	
Tier 1	521,651	292,277			813,927	24.3%
Tier 2	251,016	150,624			401,640	12.0%
Tier 3	50,860	31,021			81,881	2.4%
Tier 4	6,994	4,732			11,727	0.4%
Tier 5	5,260	4,037			9,297	0.3%
Non-SFR	1,276,554	714,854			1,991,408	59.5%
Raw Water				37,086	37,086	1.1%
	2,112,336	1,197,544	-	37,086	3,346,967	2,503,530,942
	63.1%	35.8%	0.0%	1.1%		

Equitable SFR Water Rates
Bill Malone   3/7/16   billmalone@pacbell.net

I attempted to design a water rate schedule that will reward conservation, provide revenue stability and meet social equity goals simultaneously. There is no inherent reason why these goals cannot be harmonized.

My objective is to devise a SFR water rate structure that lowers the monthly total water bill (fixed charges+usage fees) for customers that use small amounts of water. Also, the average water user will pay about the same as they do under the current rate structure and the large water users will pay more.

The new SFR rate structure will be revenue neutral, that is it will provide the same amount of annual revenue to the Water Department as the current rate structure. I am only working on SFRs because, as a SFR customer, I have a vague idea how the rate structure works for SFRs. The rate structures for non-SFRs and large meters (¾ inch+) would remain the same.

Basically, the idea is to take the total revenue generated by the fixed Monthly Service Fee and spread that evenly over the usage unit rates. In this (SFR) case, take the total annual revenue generated by the Monthly Service Fee (Ready-to-serve, etc) divide it by the total annual number of SFR units sold, and then add the resulting monthly cost (surcharge) per unit to the existing SFR tiered usage unit rate structure.

New Surcharge $ per unit = (Total Annual Fixed Service Fee $ / total annual units sold)

For this example, I used data from the 2014 Water Rates Analysis document (water rates analyses.2014.07.15-1-3.xlsx). I used this FY2014 data for this example because the total revenue from fixed fees and usage rates were known as well as the number of units sold that year. I could then verify that my new Rate Structure would generate the about the same amount of revenue as the current Rate Structure. Also, one can easily refer to that document to see where I got the numbers for my calculations.

Using this document I made an assumption that the 5/8-inch line are all of the SFR customers (and the only SFR customers). (If this is not the case, the Water Department can probably easily adjust my numbers.) From the document the total annual fixed charge revenue (in 2014) generated by these 5/8-inch line customers is $4,682,733.

From the SFR ($/ccf) table I get the Number of SFR Units Sold (year): 823,927 + 401,640 + 81,881 + 11,727 + 9,297 = 1,318,473 units (in 2014)

Computing New Surcharge: $ per unit = ($4,682,733 / 1,318,473) = 3.55 $/unit.

New Rates: Add $3.55 per unit to rates in current SFR Tier rates:

	Current	+ $3.55	=	New
Tier 1	$1.57	+ $3.55	=	$5.12
Tier 2	$4.00	+ $3.55	=	$7.55
Tier 3	$5.14	+ $3.55	=	$8.69
Tier 4	$7.05	+ $3.55	=	$10.60
Tier 5	$8.79	+ $3.55	=	$12.34

<div align="center">Comparison of Total Monthly Water Bills for Various Customer Usage</div>

Units	Current Rates Structure	New Rates Structure
2	$17.41 +2@1.57 = $20.59	2@5.12 = $10.24
4	$17.41 +4@1.57 = $23.69	4@5.12 = $20.48
5	$17.41 +4@1.57+1@4.00 = $27.69	4@5.12+1@7.55 = $28.03
6	$17.41 +4@1.57+2@4.00 = $31.69	4@5.12+2@7.55 = $35.58
8	$17.41 +4@1.57+4@4.00 = $39.69	4@5.12+4@7.55 = $50.68
10	$17.41 +4@1.57+4@4.00+2@5.14 = $49.97	4@5.12+4@7.55+2@8.69 = $68.06

The average SFR customer uses (1,318,473 units / 22,414 lines) = 58.8 units/yr or 4.90 units/mo. I have underlined 5 units in the table to show that this close to average customer's total water bill is about the same with the current rate structure and the New rate structure.

The fixed Drought Recovery of $7.37 per month could be similarly spread over the total units sold (i.e.: $1,292,294 / 1,318,473 units in 2014 = $0.98/unit) and similarly added to the New Rate Structure.

The higher Monthly Service Fee for FY2015, FY2016, etc, can also be similarly spread over the total units sold on the higher Tier Rates for FY2015, FY2016, etc.

For a SFR user with a 1 inch meter (for example) that currently has a $43.52 fixed monthly charge perhaps it would be easy to charge them with a new ($43.52 – 17.41=) $26.11 fixed monthly charge and then use the new tiered Rate Structure.

Prop 218 Considerations

The current SFR rate structure with set fixed fees in addition to per usage fees makes the cost per unit of water for customers that use small amounts of water disproportionately much more expensive than the cost per unit paid by customer that use a lot of water.

My rates proposal does comply (to the best of my understanding) with the letter / spirit of Prop 218 - that the bills for users relate to the utility's costs of delivering their service. Customers may not subsidize one another under Prop 218.

A review of the Comparison Cost for a Unit of Water for Various Customer Usage table shows that with the current rate structure the low water users are paying more for their water and therefore may be subsidizing the high water users. With the new rates, the Cost for a Unit of Water starts low then increases consistently and fairly with increased usage.

<div align="center">Comparison Cost for a Unit of Water for Various Customer Usage</div>

Units	2	4	6	8	10
Current Rates Structure	$10.30	$5.92	$5.28	$4.96	$5.00
New Rates Structure	$5.12	$5.12	$5.93	$6.34	$6.81

These New Equitable SFR Water Rates will promote water use conservation. The higher rates on large water users will encourage them to use less water. The lower total water bill of small water users will encourage them to continue to use less water now that they will not be hit with an oppressive fixed charge that is more than the cost of their usage charge.

Water Supply Reliability
A New Top-Down Investigation

A presentation to the
Santa Cruz Water Commission

Jerry Paul, M.S.E.E.

2016-03-07

Five Realizations

1. Total In-Lieu
2. GHWTP Capacity
3. Filling the Loch during Climate Change
4. Cost
5. Rights

1. Total In-Lieu (TIL)

Annual Well Pumping by Local Districts

Water District	mgy	AFY
Soquel Creek	1140	3500
Scotts Valley	400	1200
Santa Cruz	160	500
TOTAL	1700	5200

**Finding a way to shut off the wells totally for _only 2 years_ would leave in the aquifers the 3 billion gallons of extra storage which SCWD consultant Gary Fiske said would make us
drought proof against a fairly worst-case 8-year drought.**

Total In-Lieu (TIL), continued

Provides over ==3x more water== than the SCWD2 desal plan.

==Injection would be completely unnecessary.==
   Injection's costs & years of delay are avoidable.

(BTW, "ASR" is too general of a term to differentiate between in-lieu and injection. Also, <u>desal</u> does ASR & IL.)

SCWD takes about 9% of the San Lorenzo River.
Total In-Lieu would take another ==~5% for a decade or two== until aquifers are sufficiently charged.

2. GHWTP Capacity

Summer Peak Demand in Local Districts

Water District	mgd	CFS
Soquel Creek	4.5	7.0
Scotts Valley	1.5	2.3
Santa Cruz	9.5	14.6
TOTAL	15.5	23.9

Confirmed in extensive discussions with SCWD operating staff: GHWTP, as is, can satisfy a 16mgd summer demand. That's 0.5 mgd more than the districts need. Total In-Lieu requires no new water treatment plant or upgrade. Backup plans: 1. During a few peak summer weeks use wells at low mgy. 2. In non-rainy seasons, run Loch water (~gravity feed, low energy use) to surface-spread in ~SV.

3. Filling the Loch During Climate Change

Loch Lomond holds 2.7 Bg.

It's been drawn down to 25% of capacity three times.

Thus, from that 25% level, fill-up takes **2.0 Bg**.

A 2 Bg fill-up @ 13 mgd takes <u>154 days</u>.

Actual 2 Bg fill-up time would exceed most rainy seasons, due to first flushes, lack of rights, low flows offering less than 13 mgd, etc.

However, at **30 mgd**, a 2 Bg fill-up takes only **67 days**.

A 30 mgd pipeline is a must, to maximize Loch fill-up in crucial recovery years & years of few rainy days especially.

Probably 42" diameter or better.

Costs only about 20% more than the present 13 mgd plan.

4. Costs (approximate; financing is additional)

General category--costs which are planned to be incurred to maintain existing infrastructure and/or to enhance water supply security, regardless of whether the source of new water turns out to be the river, the sea or the sewer. Examples include:

- **Repair Loch Lomond Dam $120M**
- **Repair or replace aging items at GHWTP   62M**
- **Repair or Replace Felton-Loch pipeline   17M**
- **Upgrade SqCWD potable intertie   11M**
- **Build SVWD potable intertie   7M**

These costs generally are <u>not</u> part of the desal, recycling or Total In-lieu programs per se, even though they all would result in storing water in aquifers.

Costs, continued

Costs attributable to the Total In-Lieu program per se:

Extra cost to build the new Felton-Loch pipeline
at 30 mgd capacity instead of 13 mgd   **$4M**

Install a Ranney collector* at Felton   **10M**

Misc.   **2M**

TOTAL COST OF TOTAL IN-LIEU: ~ $16M

NOTE: **Other districts will pay SCWD for virtually all the water in their entire demand. SqCWD probably would scrap its $70M plan and cost-share with SCWD instead.**

*The Ranney collector fish-friendly filtering well will feed purer water to GHWTP, the Loch & SV at high capacity, and at less energy cost than Tait St., due to elevation.

5. Rights

SCWD has been reluctant to apply for water rights because it triggers a more general review and risks a disastrous outcome.

Solution: <mark>Have the County apply jointly with other agencies.</mark> The County holds a 17,000 AFY (5.5 Bgy) reserve right on Zayante Creek, part of which might easily be moved to Felton.

Recent SCWD GANTT charts show water rights are reasonably attainable in some 3.5 years. The Total In-Lieu program's attractive cost and lead time, and SqCWD's sense of urgency, suggest that there is a possibility of obtaining water rights much sooner.

- **Total In-Lieu**
  - Over 3x more water
  - Very low operating cost
    - *and* neighbors pay us for water
  - Only ~$16M capital cost
    - *and* neighbors may cost-share 10s of $M

  Net cost to SCWD is near ZERO;
           may even defray <u>general</u> CIP costs

  - Ramps up starting <u>now</u>
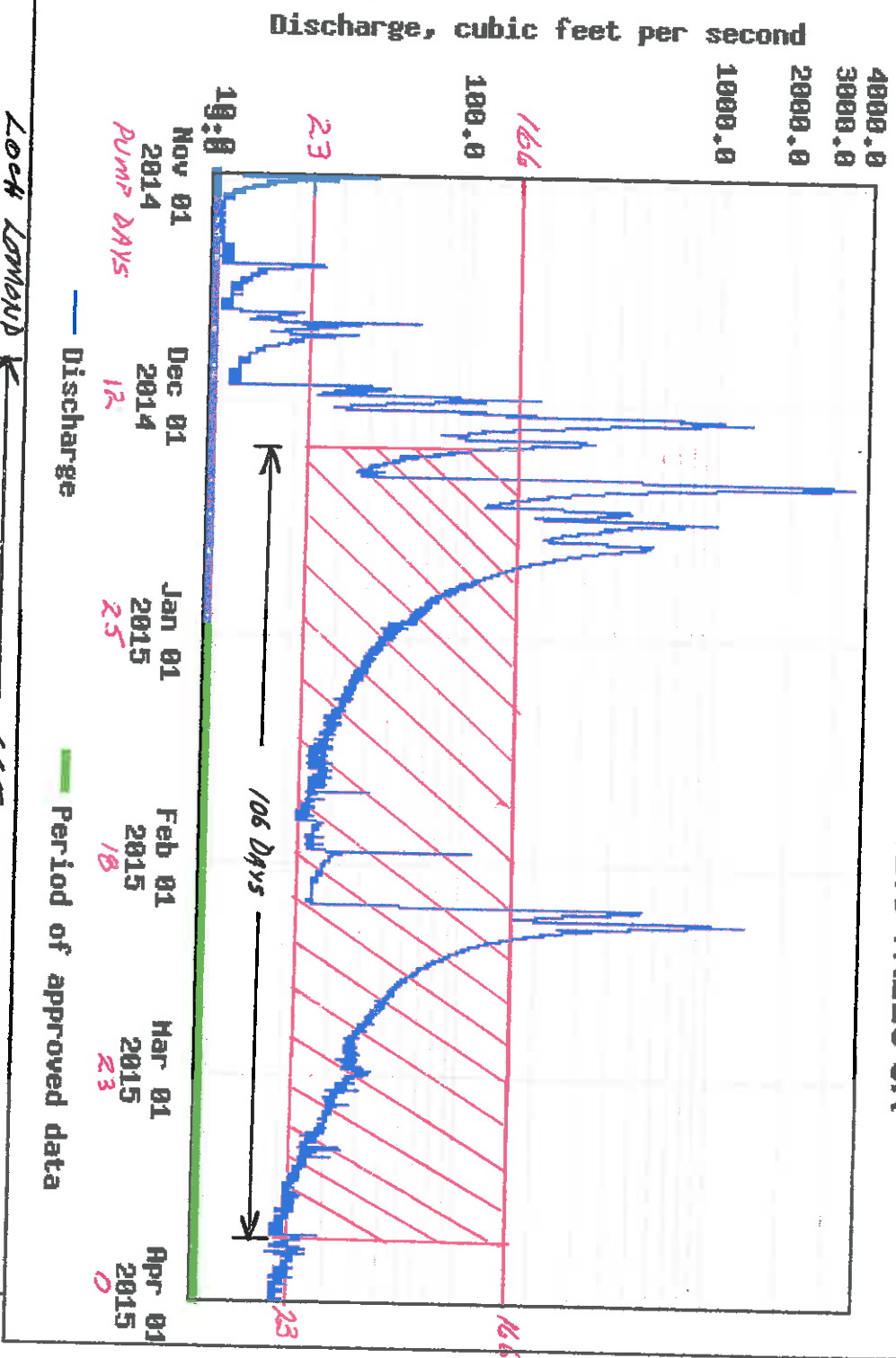
- **Felton-Loch pipeline--at least <u>30 mgd</u>**

- **Felton Ranney collector--boosts capacity**

- **Expedite joint water rights**

WINTER 2014 — 2015

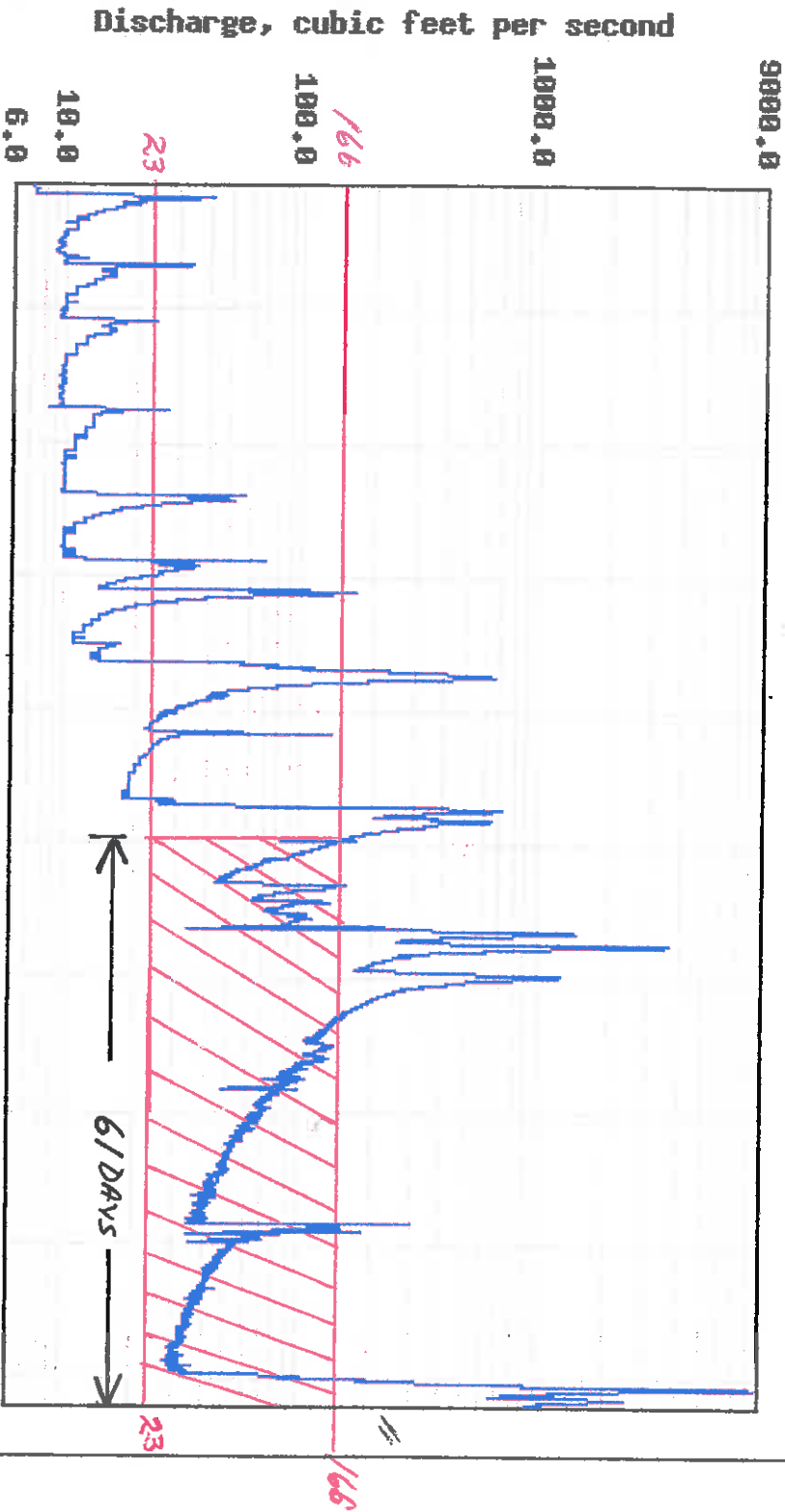USGS 11160500 SAN LORENZO R A BIG TREES CA

Discharge, cubic feet per second

Discharge

Period of approved data

LOCH LOMOND

53%

365 Mgallons
WATERSHED

665 MGALLONS

300 MGallons
FELTON DIVERSION

83%

PUMP DAYS

106 DAYS

WINTER 2015 — 2016

USGS

USGS 11160500 SAN LORENZO R A BIG TREES CA

Discharge, cubic feet per second

9000.0
1000.0
100.0
10.0
6.0

166
23

Nov 14 2015
Nov 28 2015
Dec 12 2015
Dec 26 2015
Jan 09 2016
Jan 23 2016
Feb 06 2016
Feb 20 2016
Mar 05 2016

61 DAYS

23
166

LOCH LOMOND
65%
460 M Gallons
82%
3/2/2016

— Provisional Data Subject to Revision ——

⑮