Public Works & Special Projects

City of White Salmon
PO Box 2139
100 North Main
White Salmon, WA 98672

Michael S Wellman PE, Public Works Director, City Engineer
Dixie Walker, Assoc. Plnr/Admin. Asst.
Tom Smith, Deputy Director PWD

Tele: [509] 493-1133
FAX: [509] 493-1231
E-Mail: Mikew@ci.white-salmon.wa.us

March 31, 2008

Alvin Josephy
Department of Ecology
Water Resources Program
PO Box 47600
Olympia, WA 98504-7600
Fax 360-407-7162

RE: Columbia River Basin Water Management Program Grant Application

Dear Alvin:

Enclosed please find the City of White Salmon's grant application for the above referenced program. The huge volume of material we have on our wells, Buck Creek source, watershed and water rights coupled with the technical analysis necessary for your review requires limitations on the amount of material we send to you. If you find our project interesting, the City is more than willing to provide any and all information you may need. We are also willing to come to Olympia or elsewhere and further explain and possibly modify our project to better fit the criteria.

Following is a short narrative explaining how we see the project work.

Background:

The City of White Salon used the Buck Creek Source for 80 years. It is a good quality source with a highly spring fed and therefore uniform base flow. Essentially the entire watershed is owned by DNR, and the City leases grazing rights to prevent livestock trespass and water contamination. City water rights on Buck Creek total 4 cfs and 688 acre-feet per year. A diversion dam, headworks, roughing filter and 40,000 feet of 14" pipeline bring the water by gravity to the City's reservoirs.

Even in the 1977 severe drought year, Buck Creek provided adequate water for the City, although there was not much left in the stream at that time. Historic low flows at the diversion dam would appear to be greater than 3 cfs at all times, with 8 cfs being normal in an average summer.

Buck Creek periodically became turbid from poor water quality management practices by DNR and others. At these times, the City violated the Safe Drinking Water Act Surface Treatment Rules. In 1997 the City decided to complete a Watershed Management Plan and actually look for additional water source.

In the course of drilling wells for new source, the City encountered what they believed to be large volumes of groundwater at depths from 700 to 1100 feet. Studies and tests of the aquifer yielded estimates of capacity at 2,400 gpm from wells and two combined. Since this was in excess of peak daily demand for at least 40 years in the future, the City decided, with DOE and DOH's blessing to pursue a ground water only source. This was accomplished at a cost in excess of $6 million by the year 2002.

Currently:

By 2006, it was apparent that the wells were losing capacity. Pumping depths and volumes were not even stable at 1200 gpm during the summer of 2007, however, levels recovered during the winter months when system demand dropped to less than 500 gpm. At present, the City of White Salmon is under a moratorium for new users, and this will continue until new source and possibly new Qa water rights are obtained (as the existing 688 acre-feet per year is inadequate. The new wells were covered as an additional point of withdrawal under the City's existing rights.

The City of White Salmon is in extreme danger of losing a pump and not being able to provide adequate flows even for emergency use in the high usage times of the year. Summer 2008 and 2009 are of special concern, as any new source will not be on line yet, requiring Buck Creek unfiltered water to be used in a "boil water" mode during a water supply emergency.

Because it seems that utilizing Buck Creek for source may be the City's best option, long term tests are in progress. These include monitoring raw water for e-coli and coliform (MPN Method), as well as the operation and testing of 6 slow sand pilot filters at the intake. So far, results are excellent.

Filter and ASR Plan:

After a year of study, the City hopes to move forward with full slow and filtration of the Buck Creek source. The highly reliable, excellent nature of the source, along with the fact that the City has 80 years of experience and existing water rights and infrastructure to utilize the water make Buck Creek a good option for the future.

During the study period for the Filter Plant, the City would like to proceed with a feasibility study for the ASR Project, with an approximate cost of $120,000. Then, after the filter plant is installed and operating, the ASR portion of the project can be done. The enclosed estimates have adequate funds to complete the entire project.

It is currently anticipated that well #2 will be the primary vessel for the ASR project. Since all pipelines and isolation valves are in place, Buck Creek Water can be injected into Well #2 with only minor modifications to the pump itself. A sophisticated SCADA system, flow controls and level monitors exist to make sure the process is automated and safe.

Currently it is estimated that 581 acre-feet of water will be injected into the well at a peak rate of less than 1.5 cfs. The injection period will occur only while White Salmon demand is low and Buck Creek flow is high (from November through May), although some water will go to storage in almost every month.

To comply with granting requirements, the City will dedicate approximately ¼ of the stored amount to be returned to the White Salmon River from the artesian component of Well #2. Only in times of a Water Emergency would this flow not be available.

So the City would not normally use the full 4 cfs Water Right on Buck Creek, as the design capacity of the Filter Plant is only 2.2 cfs. The city will, however, maintain the pipeline and bypass actively so that the full 4 cfs may be utilized in an emergency.

I feel this plan allows the fullest use of a surface water source at the lowest overall operating cost, and benefits low flows in both Buck Creek and the White Salmon Rivers by supplying additional in-stream flows during the summer months.

As I said earlier, the City will come to Olympia or other designated location to provide additional information for the review team. I will mail a copy of this letter and the Grant Application, both signed by Mayor David Poucher in tomorrow's mail.

If you have any questions, please call or email me.

Sincerely,

Michael S Wellman, PE
Public works Director, City Engineer

Cc: *f:\public works data\projects\buck creek\2008 asr project\narrative.doc*

OFFICE USE ONLY: CR 01 07 01
☐ Draft/Worksheet
☐ Submission/ Final Date Rcvd: ____/____/____

COLUMBIA RIVER WATER MANAGEMENT PROGRAM GRANT APPLICATION

Project Name: Buck Creek to Grand Ronde Aquifer ASR Project

County: Klickitat

IF MORE SPACE IS NEEDED, ATTACH ADDITIONAL SHEETS

1. APPLICANT INFORMATION

APPLICANT/BUSINESS NAME	PHONE NO.	FAX NO.
City of White Salmon	(509) 493-1133	(509) 493-1231
ADDRESS: PO Box 2139 100 North Main		
CITY: White Salmon	STATE: WA	ZIP CODE: 98672

2. NEW (PROPOSED) WATER USE AND PROJECT BUDGET

PROJECT NAME
Buck Creek to Grand Ronde Aquifer ASR Project

PROJECT LOCATION
In western Klickitat County, from the Grand Ronde Well Field to the Buck Creek intake - see Enclosure #1.

STREAM REACH MILE/ LOCATION
See Enclosure #1, Diversion is at Buck Creek Mile 3.7. Well Field injection site is at White Salmon River Mile 3.2. .

PROJECT DESCRIPTION (TYPE) See Enclosure #1. Elements: A new 1000 gpm capacity filter plant utilizing the existing Buck Creek diversion, roughing filter, and 14" pipeline to inject surplus ccapacity water (at approximately 500 gpm) during the 6 month winter season into Well #1 or Well #2. Wells and other infrastructure are essentially in-place, but may require some valves and piping to control the injection rate. Included in this project are high and low level reservoir for contact time and peak instantaneous flow smoothing.

FEASIBILITY STUDY BUDGET See Enclosure #2.

OPERATIONS AND MAINTENANCE BUDGET
(INDICATE DURATION OF AGREEMENT PROPOSED) See Enclosure #3.

	MATERIALS	LABOR
ESTIMATED CONSTRUCTION COST	$1,466,703	$1,466,703

DESIGN FEES	$33,040	$297,360
PROFESSIONAL FEES	$17,288	$235,588
SOFT COSTS (ALL PERMITS, LOCAL FEES, AND SO ON)	$10,000	$10,000
OTHER CONTINGENCIES	$68,209	$272,875

3. DETAILED PROJECT DESCRIPTIONS

(PROVIDE EXPLANATIONS AS REQUESTED. ESTIMATE PROJECT AMOUNTS (COSTS, WATER QUANTITIES, AND SO ON) AS CLOSELY AS POSSIBLE.

A. PROJECT COSTS AND FUNDING SOURCES

TOTAL PROJECT AMOUNT REQUESTED FROM THIS PROGRAM (DOLLAR TOTAL AND PERCENT OF PROJECT BUDGET)

$956,950, 24% of Total Project Budget

TOTAL EXPECTED COST (PROGRAM GRANT) PER ACRE FOOT OF WATER GAINED FOR THE PROGRAM FROM THIS PROJECT.

139.4 (24%) Acre-feet = Typical Flow Year, Cost = $6,800/ AF

B. FUNDING SOURCE INFORMATION

TOTAL PROJECT AMOUNT EXPECTED TO BE PROVIDED BY SOURCES OTHER THAN THIS PROGRAM (DOLLAR TOTAL AND PERCENT OF PROJECT BUDGET)

$3,070,000, 76%

IDENTIFY SOURCES AND TYPE OF FUNDING OTHER THAN THROUGH THIS PROGRAM GRANT. INCLUDE EXPECTED DATES OF PARTICIPATION. INCLUDE AS AN ATTACHMENT; LETTERS OF COMMITMENT, OFFER LETTERS, APPLICATION APPROVALS, AND SO ON.

SOURCE AND TYPE OF FUNDING: State Capital Budget Grant

AMOUNT: $ 1,500,000

STATUS: Awarded

DATES OF PARTICIPATION: September 2007 forward

SOURCE AND TYPE OF FUNDING: Klickitat County Economic Development Fund

AMOUNT: 500,000

STATUS: Verbal award, final Contract Agreement pending final financing

DATES OF PARTICIPATION: September 2007 forward

SOURCE AND TYPE OF FUNDING: Revenue Bond or PWTF Loan

AMOUNT: $1,100,000

STATUS: Not yet obtained

DATES OF PARTICIPATION: Not yet obtained

SOURCE AND TYPE OF FUNDING: _____

AMOUNT: _____

STATUS: _____

DATES OF PARTICIPATION: _____

SOURCE AND TYPE OF FUNDING: _____

AMOUNT: _____

STATUS: _____

DATES OF PARTICIPATION: _____

SOURCE AND TYPE OF FUNDING: _____

AMOUNT: _____

STATUS: _____

DATES OF PARTICIPATION: _____

C. ESTIMATED TOTAL WATER SAVINGS

CONSERVATION PROJECT: ESTIMATE THE WATER TO BE CONSERVED THROUGH THIS PROJECT. PROVIDE ENGINEERING OR TECHNICAL ANALYSIS TO SUPPORT THIS ESTIMATE.

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
Qa (ACRE-FEET)													
Qi (CFS)													

HOW MUCH WATER IS THE APPLICANT PREPARED TO PLACE IN TRUST? _____AF
(NOTE: THE MINIMUM TRUST QUANTITY IS PROPORTIONATE TO FUNDING UNDER THIS PROGRAM.)

HOW MUCH OF THE TRUST WATER QUANTITY ACCRUES IN A TRIBUTARY? (AMOUNT) _____

TRIBUTARY NAME _____

HOW MUCH OF THE TRUST WATER QUANTITY ACCRUES TO THE COLUMBIA RIVER? (AMOUNT) _____

STORAGE PROJECT: ESTIMATE THE WATER TO BE STORED UNDER THIS PROJECT. PROVIDE ENGINEERING OR TECHNICAL ANALYSIS TO SUPPORT THIS ESTIMATE. ESTIMATED ACRE-FEET= 581, See Enclosure #4 AF

ESTIMATE THE TOTAL QUANTITIES AND TIMING WATER WILL BE DIVERTED INTO STORAGE BELOW.

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
Qa (ACRE-FEET)	84.65	80.75	91.86	82.71	49.14	29.52	0.0	0.0	0.0	21.16	55.24	85.69	581
Qi (CFS)	1.38	1.45	1.49	1.39	0.8	0.5	0.0	0.0	0.0	.34	0.93	1.39	

HOW MUCH STORED WATER IS THE APPLICANT PREPARED TO ASSIGN FOR STATE USE FOR THE COLUMBIA RIVER PROGRAM?
24%, 139.4 AF

NOTE: THE MINIMUM QUANTITY ASSIGNED IS PROPORTIONATE TO FUNDING UNDER THIS PROGRAM.

HOW MUCH OF THE STORED WATER QUANTITY WILL BE RELEASED IN A TRIBUTARY? 139.4 AF

TRIBUTARY NAME White Salmon River, 3 miles from the columbia River

HOW MUCH OF THE STORED WATER QUANTITY WILL BE RELEASED TO THE COLUMBIA RIVER? _____AF

FOR THE PORTION OF STORED WATER ASSIGNED TO THE STATE, DESCRIBE ANY CONSTRAINTS (HYDRAULIC, DEMAND, ETC.) ON THE RELEASE OF THE WATER FOR STATE USE. The water volumes listed should be available except in the case of emergency.

D. TO WHAT EXTENT IS THE PROJECT CONSISTENT WITH, SUPPORTIVE TO, OR CITED IN LOCAL NATURAL RESOURCE PLANS?

CITATION PROVIDED ✓	PLAN TYPE	PLAN TITLE	PAGE NUMBER OR OTHER CITATION
☐	WATERSHED PLAN		
☐	CONSERVATION DISTRICT		
☐	LEAD ENTITY STRATEGY		
☐	NPCC SUBBASIN PLAN		
☐	SALMON RECOVERY PLAN		
☐	OTHER RECOVERY PLAN		
☐	COMPREHENSIVE WATER SYSTEM PLAN		
☐	GMA COMPREHENSIVE PLAN		
☐	OTHER PUBLISHED PLAN		
☐	OTHER PUBLISHED PLAN		

E. ATTACH LETTERS OF SUPPORT FROM LOCAL COMMUNITY ENTITIES INVOLVED IN NATURAL RESOURCES.
Provide entity type and title, and attach letters to application.

LETTER PROVIDED ✓	PLANNING ENTITY TYPE	PLANNING ENTITY TITLE
☐	TRIBE	
☐	COUNTY	
☐	WATERSHED PLANNING UNIT	
☐	CONSERVATION DISTRICT	
☐	IRRIGATION DISTRICT	
☐	SALMON RECOVERY LEAD ENTITY	
☐	OTHER PLANNING ENTITY	

F. RESOURCES CURRENTLY COMMITTED TO ENSURE LONG-TERM PERFORMANCE OF THE PROPOSED PROJECT (OPERATION AND MAINTENANCE).

WHO IS RESPONSIBLE FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PROJECT? The City of White Salmon

HAVE OPERATION AND MAINTENANCE COSTS BEEN IDENTIFIED? ☒ YES ☐ NO IF YES, PROVIDE REFERENCE. Enclosed Estimate

HOW WILL ONGOING OPERATION AND MAINTENANCE COSTS BE FUNDED? As long as the system operates

ARE MEASUREMENT DEVICES OTHER THAN DIVERSION SOURCE METERS NECESSARY TO MONITOR COMPLIANCE WITH THE PROJECT INTENT OR PLAN? IF YES, DESCRIBE IN THE BOX BELOW. ☐ YES ☒ NO

DOES A WATER MEASUREMENT DEVICE EXIST ON THE SOURCE AND DOWNSTREAM OF THE PROPOSED PROJECT? ☐ YES ☒ NO

IF NO, WILL A WATER MEASUREMENT DEVICE BE INSTALLED AS PART OF THIS PROJECT? ☒ YES ☐ NO

IF YES, DESCRIBE LOCATION AND OPERATING ENTITY At the diversion dam, installed wier for low flows during summer months

IF YES, PROVIDE RIVER MILE Buck Creek, Mile 3.7

WHAT IS THE NEAREST STREAM GAGE DOWNSTREAM OF THE PROPOSED PROJECT? SOURCE NAME USGS 14123500 WHITE SALMON RIVER NEAR UNDERWOOD, WA,

RIVER MILE : White Salmon River Mile 1.5 (above confluence with Columbia River)

G. PROPONENT'S READINESS TO PROCEED:

DESCRIBE STATUS OF FEASIBILITY REPORTS, ENGINEERING DESIGN, AND PERMITS. PROVIDE DOCUMENTATION FOR THESE DELIVERABLES AND DESCRIBE THE PROJECT EFFORT TIMELINE AS APPROPRIATE. (SUBMIT TWO (2) COPIES OF ALL REQUIRED DOCUMENTS)

Preliminary studies of completing the Slow sand filtration plant are underway. Pilot Plants have been installed and are being tested in accordance with DOH requirements. Construction of Slow Sand Filters should begin May 2009 and be complete by December 2009. Filters will begin operation January 2010, with full scale ASR injection to begin in Febuary 2010 .

DOES PROJECT PROPONENT OWN THE LAND FOR THE PROPOSED PROJECT? IF NOT, DOES THE PROPONENT HAVE DOCUMENTED ACCESS TO THE RIGHT OF WAY OR OWNS AN EASEMENT TO THE PROPERTY PROPOSED (PLEASE ATTACH APPROPRIATE DOCUMENTATION INCLUDING TITLE REPORTAS APPLICABLE)

The City of White Salmon owns the exsting well field sites in fee simple. The Buck Creek Diversion/Slow Sand Pilot Site is a long term lease from the State of Washington Department of Natural Resources

DESIGN/ ENGINEERING STATUS:

PRE-PLANNING (Pre – permitting)	☒	Status: Complete
PRE-DESIGN (DESIGN REPORTS) (10%)	☒	Status: 65% Complete
SCHEMATIC DESIGN (30%)	☒	Status: 25% complete
DESIGN DEVELOPMENT (75%)	☒	Status: Not Started
CONSTRUCTION DOCUMENTS (95%)	☒	Status: Not Started
BID DOCUMENTS (Ready for bid)	☒	Status: Not Started

PERMIT STATUS

SEPA	☒	Status: Review process begun
401	☐	Status:
FISH AND WILDLIFE CONSULTATION	☒	Status: Initiated
STORAGE AND /OR SECONDARY USE PERMIT	☐	Status:
OTHER ( )	☐	Status:
OTHER ( )	☐	Status:
OTHER ( )	☐	Status:

4. SIGNATURES

I certify that the information above is true and accurate to the best of my knowledge. I understand that in order to process my application, I am hereby granting staff from the Department of Ecology access to the above site(s) for inspection and monitoring purposes. If assisted in the preparation of the above application, I understand that all responsibility for the accuracy of the information rests with me. I also understand that I may rescind this application at any time prior to signing the Agreement with no other obligations or requirements.

Mayor, City of White Salmon — 3/31/08
(Applicant/ Grant Recipient) (Date)

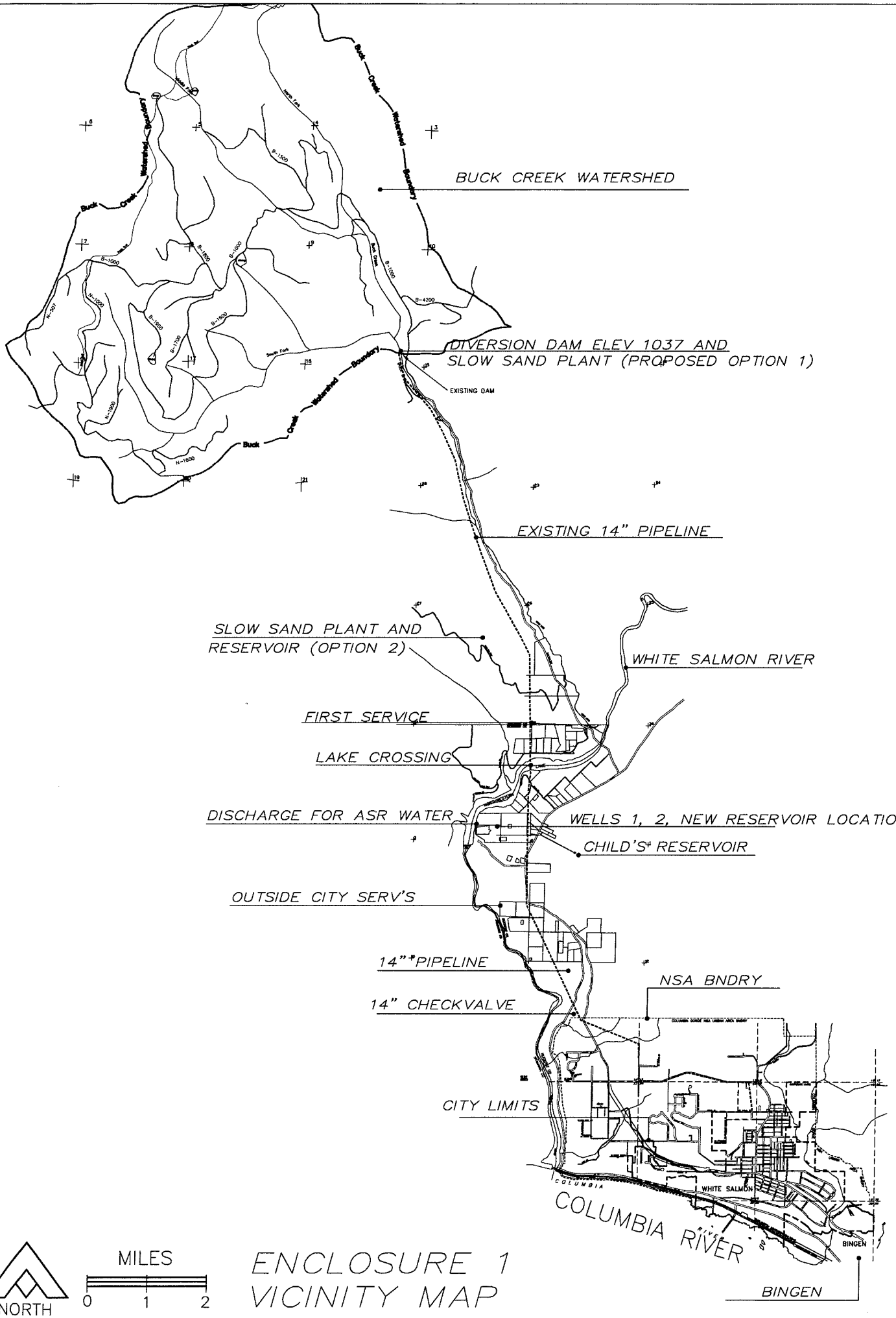
Mayor — 3/31/08
(Water Right Holder) (Date)

Mayor — 3/31/08
(Land Owner(s) of Existing Place of Use) (Date)

For More Information

Contact:	Alvin Josephy
Voice:	(360) 407-6456
Email:	ajos461@ecy.wa.gov
Web:	http://www.ecy.wa.gov/programs/wr/cwp/crwmp.html

If you need this document in an alternate format, please call the Water Resources Program at 360-407-6600. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.



ENCLOSURE 1
VICINITY MAP

CITY OF WHITE SALMON PRELIMINARY ENGINEERING ESTIMATE, MARCH 10, 2008
BUCK CREEK SOURCE FILTRATION, AQUIFER STORAGE AND RECHARGE

ITEM	DESCRIPTION	QTY	UNIT	UNIT $	SUBTOTAL	SALES TAX	TOTAL	Labor %	Material labor %	Material $	Material $
1	Source Study, Preliminary Engineering, Pilot Plant, Survey, Layout, ASR Feasiblity	100	%	$ 2,000	$ 200,000	N	$ 200,000	90%	10%	$ 180,000	$ 20,000
2	Final Design of Filter Plant, Reservoirs, Control System and Interties	100	%	$ 1,200	$ 120,000	N	$ 120,000	90%	10%	$ 108,000	$ 12,000
3	Construction of Improvements	100	%	$ 12,950	$ 1,295,000	Y	$ 1,392,125	50%	50%	$ 696,063	$ 696,063
4	Engineering Inspection, Supervision, Administration	100	%	$ 1,295	$ 129,500	N	$ 129,500	90%	10%	$ 116,550	$ 12,950
5	Contingency	100	%	$ 1,619	$ 161,875	N	$ 161,875	80%	20%	$ 129,500	$ 32,375
	TOTAL						**$ 2,003,500**	61%	39%	$1,230,113	$ 773,388

RESERVOIR CONSTRUCTION AND IMPROVEMENTS

ITEM	DESCRIPTION	QTY	UNIT	UNIT $	SUBTOTAL	SALES TAX	TOTAL
1	Preliminary Engineering, Survey, Layout	100	%	$ 400	$ 40,000	N	$ 40,000
2	Final Design	100	%	$ 1,274	$ 127,400	N	$ 127,400
3	Construction of Improvements	100	%	$ 14,338	$ 1,433,750	Y	$ 1,541,281
4	Engineering Inspection, Supervision, Administration	100	%	$ 1,434	$ 143,375	N	$ 143,375
5	Contingency	100	%	$ 1,792	$ 179,219	N	$ 179,219
	TOTAL						**$ 2,031,275**
	TOTAL COMBINED PROJECTS						**$ 4,034,775**

Labor %	Material labor %	Material $	Material $
90%	10%	$ 36,000	$ 4,000
90%	10%	$ 114,660	$ 12,740
50%	50%	$ 770,641	$ 770,641
90%	10%	$ 129,038	$ 14,338
80%	20%	$ 143,375	$ 35,844
59%	41%	$1,193,713	$ 837,562
60%	40%	$2,423,826	$1,610,949

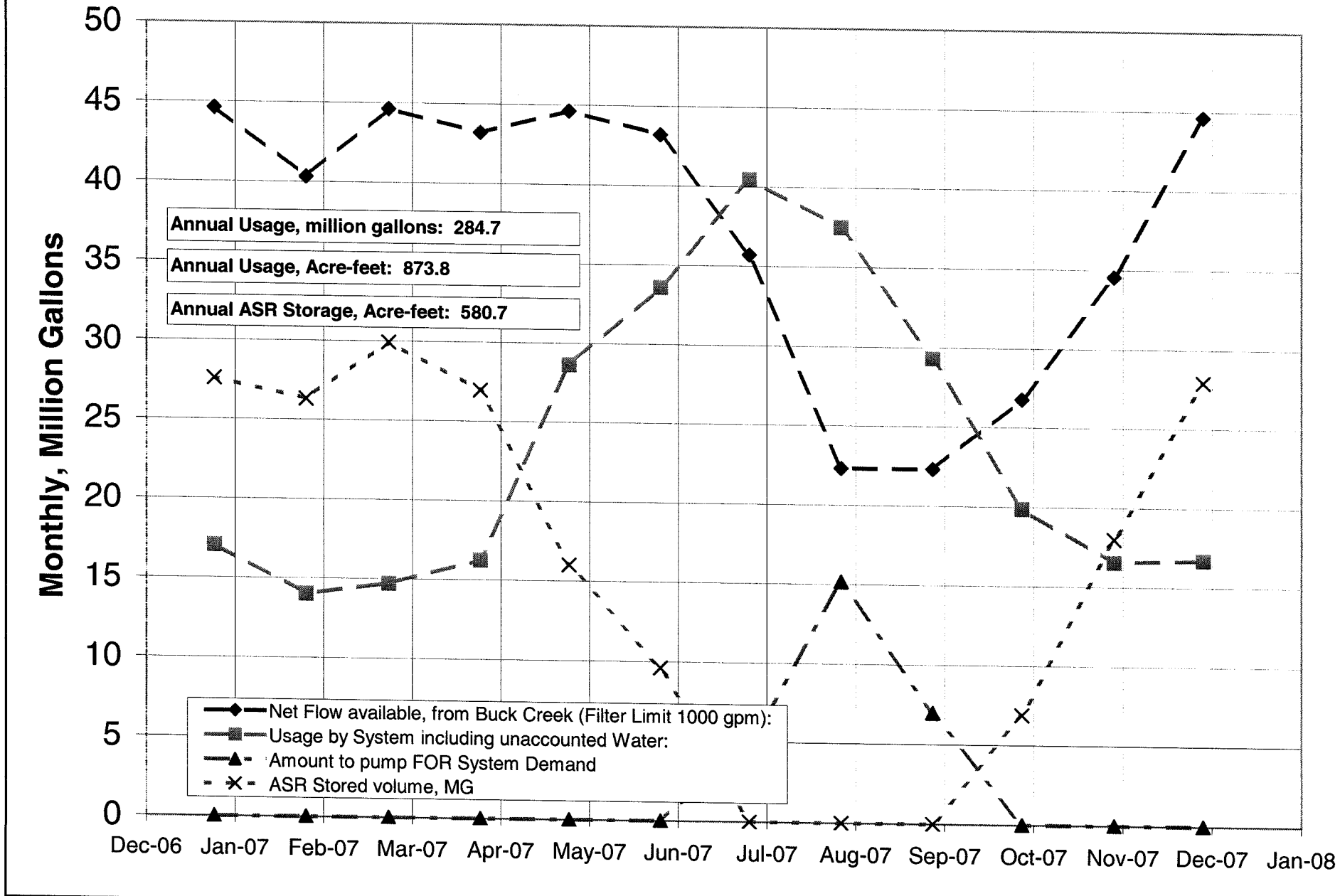
ENCLOSURE TWO
PRELIMINARY ENGINEERING ESTIMATE

CITY OF WHITE SALMON PRELIMINARY OPERATING BUDGET, MARCH 10, 2008
BUCK CREEK SOURCE FILTRATION, AQUIFER STORAGE AND RECHARGE

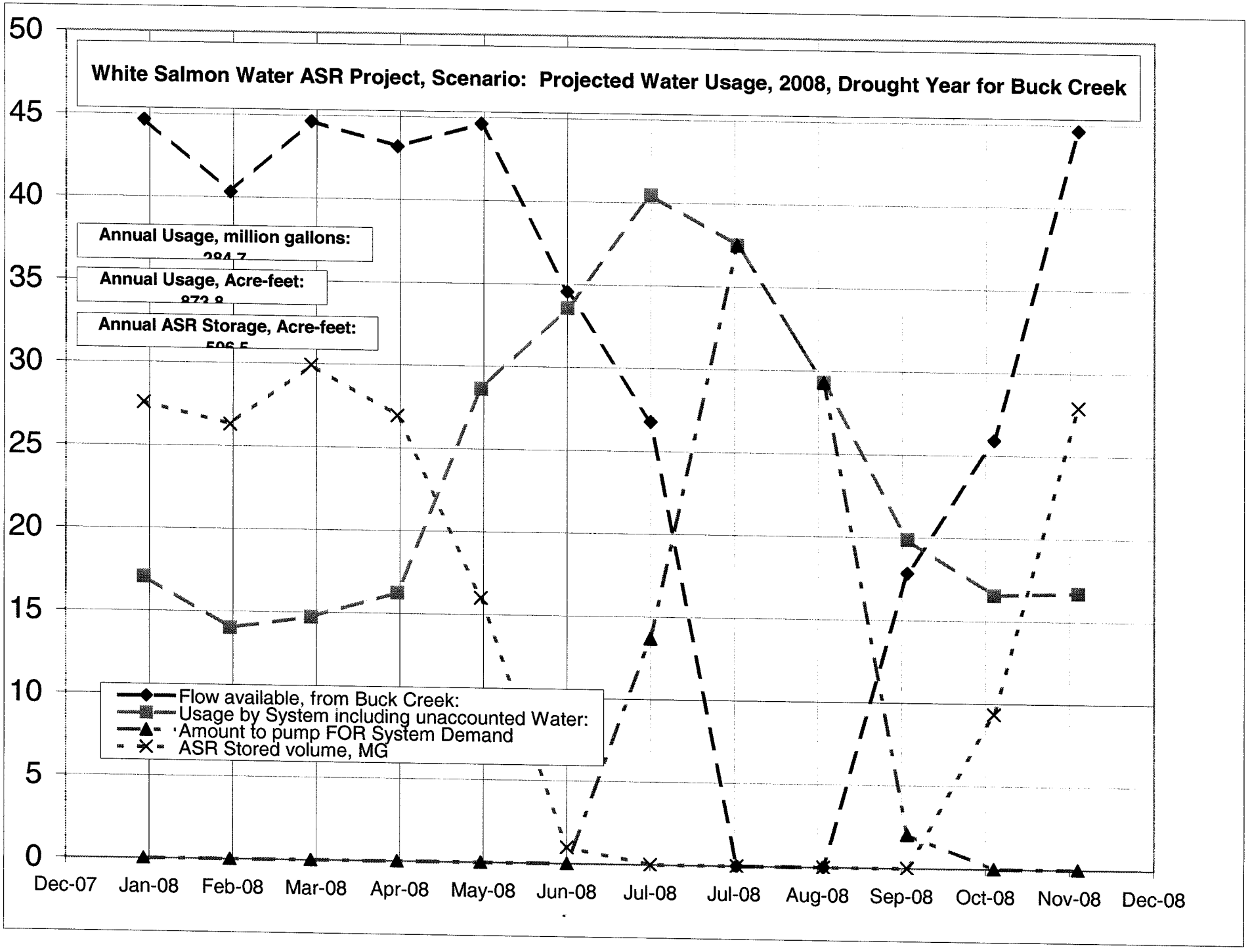
ITEM	DESCRIPTION	QTY	UNIT	UNIT $	SUBTOTAL	SALES TAX	TOTAL
1	Daily filter Maintenance/year	520	hrs	$ 30	$ 15,600	N	$ 15,600
2	Annual Filter Cleaning	100	%	$ 20	$ 2,000	N	$ 2,000
3	Monthly Slow Sand Testing/year	12	ea	$ 500	$ 6,000	N	$ 6,000
4	Monthly ASR Monitoring Reports/year	12	ea	$ 1,000	$ 12,000	N	$ 12,000
5	General O&M	100	%	$ 100	$ 10,000	N	$ 10,000
6	Reserve Fund for Replacement	2%	%	$ 4,000,000	$ 80,000	N	$ 80,000
	TOTAL ANNUAL COST						**$ 125,600**

White Salmon Water ASR Project,												
Scenario:	**Current Water Usage, 2007, Typical Flow year for Buck Creek**											
Month	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
Days/month	31	28	31	30	31	30	31	31	31	31	30	31
Net Flow available, from Buck Creek (Filter Limit 1000 gpm):												
GPM	1000	1000	1000	1000	1000	1000	800	500	500	600	800	1000
Acre-ft/month	137.00	123.75	137.00	132.58	137.00	132.58	109.60	68.50	68.50	82.20	106.07	137.00
mg/month	44.64	40.32	44.64	43.2	44.64	43.2	35.712	22.32	22.32	26.784	34.56	44.64
Usage by System including unaccounted Water:												
Usage, MG	17.06	14.01	14.71	16.25	28.63	33.58	40.47	37.51	29.31	19.89	16.56	16.72
Excess Available from Buck Creek, MG	27.58	26.31	29.93	26.95	16.01	9.62	-4.758	-15.19	-6.99	6.894	18	27.92
ASR Stored volume, MG	27.58	26.31	29.93	26.95	16.01	9.62	0.00	0.00	0.00	6.89	18.00	27.92
ASR Stored volume, AF	84.65	80.75	91.86	82.71	49.14	29.52	0.00	0.00	0.00	21.16	55.24	85.69
ASR Stored Volume, Qi, CFS	1.38	1.45	1.49	1.39	0.80	0.50	0.00	0.00	0.00	0.34	0.93	1.39
Amount to pump FOR System Demand	0	0	0	0	0	0	4.758	15.19	6.99	0	0	0
Average pumping, gpm	0	0	0	0	0	0	107	340	157	0	0	0
Annual Usage, million gallons:	284.7	mg										
Annual Usage, Acre-feet:	874	Acre-feet										
Annual ASR Storage, Acre-feet:	581	Acre-feet										

White Salmon Water ASR Project, Scenario: Current Water Usage, 2007, Typical Flow year for Buck Creek



White Salmon Water ASR Project,												
Scenario:	**Water Usage, 2008, Drought Year Flow for Buck Creek**											
Month	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08
Days/month	31	28	31	30	31	30	31	31	31	31	30	31
Net Flow available, from Buck Creek (Filter Limit 1000 gpm):												
GPM	1000	1000	1000	1000	1000	800	400	0	200	400	600	1000
Acre-ft/month	137.00	123.75	137.00	132.58	137.00	106.07	54.80	0.00	27.40	54.80	79.55	137.00
mg/month	44.64	40.32	44.64	43.2	44.64	34.56	17.856	0	8.928	17.856	25.92	44.64
Usage by System including unaccounted Water:												
Usage, MG	17.06	14.01	14.71	16.25	28.63	33.58	40.47	37.51	29.31	19.89	16.56	16.72
Excess Available from Buck Creek, MG	27.58	26.31	29.93	26.95	16.01	0.98	-22.614	-37.51	-20.382	-2.034	9.36	27.92
ASR Stored volume, MG	27.58	26.31	29.93	26.95	16.01	0.98	0.00	0.00	0.00	0.00	9.36	27.92
ASR Stored volume, AF	84.65	80.75	91.86	82.71	49.14	3.01	0.00	0.00	0.00	0.00	28.73	85.69
ASR Stored Volume, Qi, CFS	1.38	1.45	1.49	1.39	0.80	0.05	0.00	0.00	0.00	0.00	0.48	1.39
Amount to pump FOR System Demand	0	0	0	0	0	0	22.614	37.51	20.382	2.034	0	0
Average pumping, gpm	0	0	0	0	0	0	507	840	457	46	0	0
Annual Usage, million gallons:	284.7	mg										
Annual Usage, Acre-feet:	874	Acre-feet										
Annual ASR Storage, Acre-feet:	507	Acre-feet										


White Salmon Water ASR Project, Scenario: Projected Water Usage, 2008, Drought Year for Buck Creek
Annual Usage, million gallons:
Annual Usage, Acre-feet:
Annual ASR Storage, Acre-feet:
Flow available, from Buck Creek:
Usage by System including unaccounted Water:
Amount to pump FOR System Demand
ASR Stored volume, MG
50
45
40
35
30
25
20
15
10
5
0
Dec-07
Jan-08
Feb-08
Mar-08
Apr-08
May-08
Jun-08
Jul-08
Jul-08
Aug-08
Sep-08
Oct-08
Nov-08
Dec-08