APPENDIX D – Hydraulic Model

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

900 North Skyline Drive, Suite B • Idaho Falls, ID 83402 • (208) 528-2650

C. L. "Butch" Otter, Governor
Curt A. Fransen, Director

October 30, 2013

Daniel Mayo
Zoning Administrator
City of Salmon
200 Main Street
Salmon, ID 83467

Water Pressure Requirements for the City of Salmon Public Water System PWS No. 7300042

Dear Mr. Mayo:

Thank you for meeting with me on the afternoon of September 19, 2013 and your email with approximate lengths of the City's water distribution system mains for 1987 and mains installed since 1987. We discussed the "Idaho Rules for Public Drinking Water Systems" (IDAPA 58.01.08) pressure requirements for public water systems. IDAPA 58.01.08.552.b.v states the following:

> The following public water systems or service areas of public water systems shall maintain a minimum pressure of forty (40) psi throughout the distribution system, during peak hour demand conditions, excluding fire flow, measured at the service connection or along the property line adjacent to the consumer's premises.
>
> (1) Any public water system constructed or substantially modified after July 1, 1985.
> (2) Any new service areas.
> (3) Any public water system that is undergoing material modification where it is feasible to meet the pressure requirements as part of the material modification.

Moreover, IDAPA 58.01.08.003.132 states:

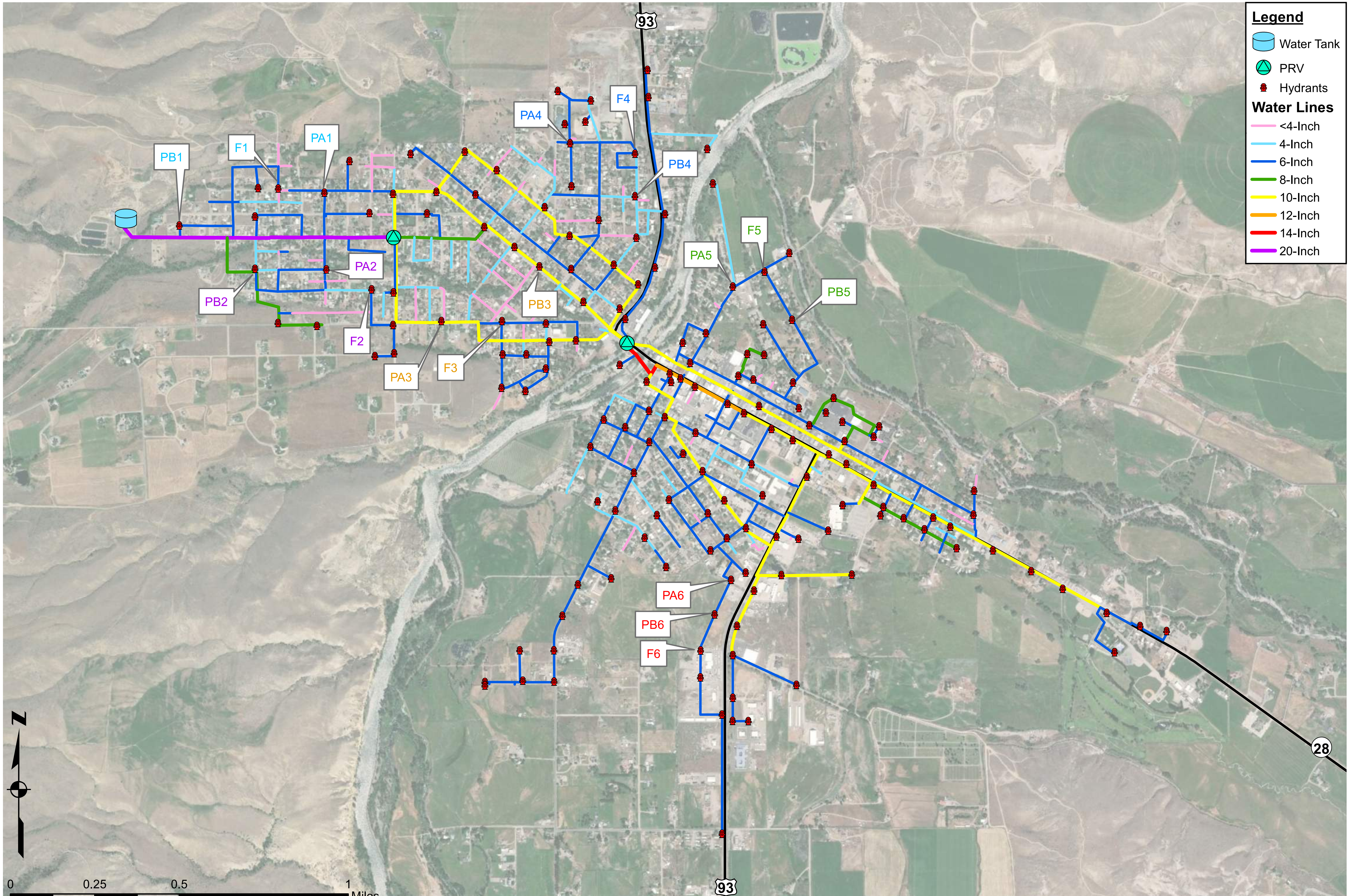
> **Substantially Modified**. The Department shall consider a public water system to be substantially modified when, as the result of one (1) or more projects, there is a combined increase of twenty-five percent (25%) or more above the system's existing configuration in the population served or number of service connections, the total length of transmission and distribution water mains, and the peak or average water demand.

Since 1985, the City's population since 1985 has decreased, peak and average water demand have remained stable and the total length of water mains increased 15%. Therefore, the regulatory water pressure requirement for the City of Salmon's public water system is **35 psi**. The regulatory water pressure requirement will be 40 psi when the water system satisfies the conditions of IDAPA 58.01.08.552.b.v.

I appreciate your and Harry Shanafelt's time and effort to provide DEQ with the requested information. If you have any questions, please call me at (208) 528-2650.

Sincerely,

Greg Eager, PE
Engineering Manager



PROJECT NO. 217105

FILENAME Fire Flow Testing.mxd

KELLER ASSOCIATES
305 N. 3rd Avenue
Pocatello, ID 83201
208.238.2146

City of Salmon

Water Facilities Planning Study

Fire Flow Testing

FIGURE NO. 1

2018 ADD Results

FlexTable: Junction Table

Label	Zone	Pressure (psi)
J-532	LowerZone	80
J-528	LowerZone	80
J-548	LowerZone	80
J-594	LowerZone	80
J-550	LowerZone	80
J-595	LowerZone	80
J-660	LowerZone	80
J-1038	UpperZone	80
J-601	LowerZone	80
J-658	LowerZone	80
J-619	LowerZone	80
J-1037	UpperZone	80
J-951	LowerZone	80
J-1009	UpperZone	80
J-657	LowerZone	80
J-654	LowerZone	81
J-603	LowerZone	81
J-551	LowerZone	81
J-620	LowerZone	81
J-618	LowerZone	81
J-535	LowerZone	81
J-656	LowerZone	81
J-667	LowerZone	81
J-525	LowerZone	81
J-949	LowerZone	81
J-622	LowerZone	81
J-655	LowerZone	81
J-621	LowerZone	81
J-590	LowerZone	81
J-661	LowerZone	81
J-950	LowerZone	81
J-939	LowerZone	81
J-591	LowerZone	81
J-662	LowerZone	81
J-549	LowerZone	81
J-668	LowerZone	81
J-670	LowerZone	81
J-965	UpperZone	81
J-669	LowerZone	81
J-978	MiddleZone	81
J-678	LowerZone	81
J-602	LowerZone	81
J-674	LowerZone	81
J-592	LowerZone	81
J-663	LowerZone	81
J-526	LowerZone	81
J-942	LowerZone	81
J-941	LowerZone	81
J-953	LowerZone	81

FlexTable: Junction Table

Label	Zone	Pressure (psi)
J-530	LowerZone	82
J-527	LowerZone	82
J-671	LowerZone	82
J-675	LowerZone	82
J-533	LowerZone	82
J-545	LowerZone	82
J-981	MiddleZone	82
J-624	LowerZone	82
J-544	LowerZone	82
J-537	LowerZone	82
J-536	LowerZone	82
J-679	LowerZone	82
J-546	LowerZone	82
J-623	LowerZone	82
J-952	LowerZone	82
J-685	LowerZone	82
J-664	LowerZone	82
J-676	LowerZone	82
J-543	LowerZone	82
J-677	LowerZone	82
J-680	LowerZone	82
J-672	LowerZone	82
J-681	LowerZone	83
J-625	LowerZone	83
J-871	MiddleZone	83
J-538	LowerZone	83
J-876	MiddleZone	83
J-683	LowerZone	83
J-684	LowerZone	83
J-627	LowerZone	83
J-534	LowerZone	83
J-1033	LowerZone	83
J-1032	LowerZone	83
J-539	LowerZone	83
J-542	LowerZone	83
J-688	LowerZone	83
J-626	LowerZone	83
J-1055	LowerZone	84
J-628	LowerZone	84
J-1054	LowerZone	84
J-540	LowerZone	84
J-818	UpperZone	84
J-753	MiddleZone	84
J-665	LowerZone	84
J-682	LowerZone	84
J-693	LowerZone	84
J-982	MiddleZone	84
J-874	MiddleZone	85
J-979	MiddleZone	85

FlexTable: Junction Table

Label	Zone	Pressure (psi)
J-872	MiddleZone	85
J-673	LowerZone	85
J-631	LowerZone	85
J-1000	LowerZone	85
J-976	MiddleZone	85
J-814	MiddleZone	85
J-630	LowerZone	85
J-691	LowerZone	86
J-862	UpperZone	86
J-629	LowerZone	86
J-541	LowerZone	86
J-686	LowerZone	86
J-797	UpperZone	86
J-971	UpperZone	87
J-877	MiddleZone	87
J-692	LowerZone	87
J-973	UpperZone	87
J-873	MiddleZone	87
J-813	MiddleZone	88
J-694	LowerZone	88
J-749	MiddleZone	88
J-970	UpperZone	88
J-687	LowerZone	88
J-820	UpperZone	88
J-633	LowerZone	89
J-666	LowerZone	89
J-974	UpperZone	89
J-632	LowerZone	89
J-1019	LowerZone	89
J-689	LowerZone	90
J-1006	LowerZone	90
J-961	UpperZone	90
J-821	UpperZone	90
J-977	MiddleZone	90
J-690	LowerZone	90
J-812	MiddleZone	90
J-1017	UpperZone	91
J-878	MiddleZone	91
J-864	UpperZone	93
J-1016	UpperZone	93
J-975	UpperZone	93
J-748	MiddleZone	94
J-755	UpperZone	95
J-865	UpperZone	95
J-1011	MiddleZone	95
J-863	UpperZone	95
J-972	UpperZone	95
J-819	UpperZone	96
J-879	MiddleZone	96

FlexTable: Junction Table

Label	Zone	Pressure (psi)
J-881	MiddleZone	97
J-866	UpperZone	99
J-984	MiddleZone	99
J-757	MiddleZone	99
J-983	MiddleZone	101
J-756	MiddleZone	101
J-793	MiddleZone	102
J-752	MiddleZone	102
J-880	MiddleZone	103
J-792	MiddleZone	104
J-810	MiddleZone	104
J-791	MiddleZone	105
J-759	MiddleZone	106
J-960	MiddleZone	106
J-811	MiddleZone	107
J-809	MiddleZone	107
J-746	MiddleZone	108
J-927	MiddleZone	108
J-915	MiddleZone	109
J-916	MiddleZone	109
J-747	MiddleZone	109
J-985	MiddleZone	111
J-758	MiddleZone	111
J-784	MiddleZone	112
J-788	MiddleZone	113
J-914	MiddleZone	113
J-727	MiddleZone	113
J-785	MiddleZone	113
J-745	MiddleZone	113
J-786	MiddleZone	115
J-987	MiddleZone	115
J-917	MiddleZone	115
J-726	MiddleZone	115
J-926	MiddleZone	116
J-911	MiddleZone	116
J-1008	MiddleZone	118
J-928	MiddleZone	118
J-986	MiddleZone	118
J-744	MiddleZone	118
J-913	MiddleZone	119
J-743	MiddleZone	119
J-910	MiddleZone	119
J-725	MiddleZone	120
J-918	MiddleZone	120
J-779	MiddleZone	120
J-742	MiddleZone	120
J-789	MiddleZone	120
J-728	MiddleZone	122
J-724	MiddleZone	122

FlexTable: Junction Table

Label	Zone	Pressure (psi)
J-740	MiddleZone	123
J-741	MiddleZone	123
J-919	MiddleZone	123
J-790	MiddleZone	124
J-925	MiddleZone	124
J-735	MiddleZone	124
J-996	MiddleZone	125
J-739	MiddleZone	125
J-787	MiddleZone	126
J-738	MiddleZone	126
J-760	MiddleZone	127
J-737	MiddleZone	127
J-723	MiddleZone	128
J-777	MiddleZone	129
J-920	MiddleZone	130
J-764	MiddleZone	130
J-1007	MiddleZone	130
J-730	MiddleZone	130
J-732	MiddleZone	131
J-924	MiddleZone	131
J-761	MiddleZone	131
J-778	MiddleZone	132
J-959	MiddleZone	132
J-717	MiddleZone	132
J-988	MiddleZone	132
J-734	MiddleZone	132
J-1034	MiddleZone	132
J-922	MiddleZone	132
J-733	MiddleZone	132
J-729	MiddleZone	133
J-731	MiddleZone	133
J-718	MiddleZone	133
J-762	MiddleZone	133
J-722	MiddleZone	133
J-763	MiddleZone	134
J-713	MiddleZone	139
J-768	MiddleZone	139
J-765	MiddleZone	139
J-776	MiddleZone	140
J-1041	MiddleZone	142
J-923	MiddleZone	142
J-720	MiddleZone	143
J-989	MiddleZone	144
J-719	MiddleZone	144
J-721	MiddleZone	144
J-709	MiddleZone	144
J-1012	MiddleZone	144
J-714	MiddleZone	144
J-708	MiddleZone	145

FlexTable: Junction Table

Label	Zone	Pressure (psi)
J-710	MiddleZone	147
J-769	MiddleZone	149
J-707	MiddleZone	150
J-990	MiddleZone	150
J-706	MiddleZone	150
J-1042	MiddleZone	151
J-716	MiddleZone	153
J-771	MiddleZone	153
J-715	MiddleZone	155
J-993	MiddleZone	155
J-1045	MiddleZone	156
J-997	MiddleZone	156
J-994	MiddleZone	156
J-712	MiddleZone	159
J-1018	MiddleZone	159
J-1013	MiddleZone	159
J-711	MiddleZone	160
J-701	MiddleZone	161
J-704	MiddleZone	162
J-1004	MiddleZone	162
J-696	MiddleZone	162
J-695	MiddleZone	162
J-702	MiddleZone	162
J-699	MiddleZone	162
J-700	MiddleZone	162
J-1003	MiddleZone	163
J-703	MiddleZone	164
J-1005	MiddleZone	168
J-698	MiddleZone	170
J-697	MiddleZone	171

FlexTable: Junction Table

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
J-518	LowerZone	False	1,500	566	25
J-519	LowerZone	False	1,500	583	25
J-520	LowerZone	False	1,500	558	25
J-521	LowerZone	False	1,500	607	25
J-522	LowerZone	False	1,500	666	28
J-523	LowerZone	False	1,500	822	29
J-524	LowerZone	False	1,500	770	25
J-525	LowerZone	False	1,500	1,149	30
J-526	LowerZone	False	1,500	630	25
J-527	LowerZone	False	1,500	514	25
J-528	LowerZone	False	1,500	591	27
J-529	LowerZone	False	1,500	389	25
J-531	LowerZone	False	1,500	510	25
J-532	LowerZone	False	1,500	552	26
J-536	LowerZone	False	1,500	490	25
J-546	LowerZone	False	1,500	1,428	25
J-549	LowerZone	False	1,500	744	25
J-551	LowerZone	False	1,500	1,108	25
J-558	LowerZone	False	1,500	1,447	25
J-559	LowerZone	False	1,500	1,473	25
J-560	LowerZone	False	1,500	1,473	29
J-561	LowerZone	False	1,500	707	25
J-562	LowerZone	False	1,500	1,045	28
J-563	LowerZone	False	1,500	814	26
J-565	LowerZone	False	1,500	740	29
J-566	LowerZone	False	1,500	1,217	25
J-567	LowerZone	False	1,500	1,490	28
J-569	LowerZone	False	1,500	985	25
J-581	LowerZone	False	1,500	859	25
J-604	LowerZone	False	1,500	1,455	25
J-612	LowerZone	False	1,500	1,447	25
J-634	LowerZone	False	1,500	825	25
J-635	LowerZone	False	1,500	849	27
J-636	LowerZone	False	1,500	808	25
J-637	LowerZone	False	1,500	750	25
J-639	LowerZone	False	1,500	1,084	30
J-640	LowerZone	False	1,500	1,095	26
J-644	LowerZone	False	1,500	1,283	25
J-645	LowerZone	False	1,500	921	28
J-646	LowerZone	False	1,500	1,364	29
J-648	LowerZone	False	2,500	2,021	25
J-681	LowerZone	False	1,500	1,403	25
J-682	LowerZone	False	1,500	1,006	25
J-689	LowerZone	False	1,500	464	29
J-690	LowerZone	False	1,500	366	30
J-691	LowerZone	False	1,500	355	25
J-695	MiddleZone	False	1,500	1,185	25

FlexTable: Junction Table

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
J-696	MiddleZone	False	1,500	1,407	25
J-697	MiddleZone	False	1,500	635	27
J-698	MiddleZone	False	1,500	582	25
J-704	MiddleZone	False	4,500	4,052	25
J-721	MiddleZone	False	1,500	1,132	25
J-731	MiddleZone	False	1,500	1,300	27
J-732	MiddleZone	False	1,500	1,247	25
J-733	MiddleZone	False	1,500	1,155	25
J-735	MiddleZone	False	1,500	1,259	25
J-737	MiddleZone	False	1,500	1,357	29
J-738	MiddleZone	False	1,500	1,441	27
J-739	MiddleZone	False	1,500	1,391	25
J-740	MiddleZone	False	1,500	1,479	28
J-741	MiddleZone	False	1,500	1,191	25
J-742	MiddleZone	False	1,500	1,353	25
J-743	MiddleZone	False	1,500	1,131	33
J-744	MiddleZone	False	1,500	805	33
J-745	MiddleZone	False	1,500	646	29
J-746	MiddleZone	False	1,500	533	25
J-750	MiddleZone	False	1,500	1,319	27
J-751	MiddleZone	False	1,500	1,217	25
J-755	UpperZone	False	1,500	818	25
J-759	MiddleZone	False	1,500	1,197	25
J-795	UpperZone	False	1,500	1,171	25
J-798	UpperZone	False	1,500	670	34
J-799	UpperZone	False	1,500	655	37
J-800	UpperZone	False	1,500	641	29
J-801	UpperZone	False	1,500	641	29
J-802	UpperZone	False	1,500	621	25
J-803	UpperZone	False	1,500	692	32
J-804	UpperZone	False	1,500	502	25
J-805	UpperZone	False	1,500	419	25
J-807	NonFF	False	1,500	0	22
J-808	UpperZone	False	1,500	476	25
J-809	MiddleZone	False	1,500	848	25
J-810	MiddleZone	False	1,500	1,038	25
J-811	MiddleZone	False	1,500	939	25
J-813	MiddleZone	False	1,500	1,316	27
J-814	MiddleZone	False	1,500	915	25
J-817	UpperZone	False	1,500	825	25
J-818	UpperZone	False	1,500	871	31
J-819	UpperZone	False	1,500	966	43
J-820	UpperZone	False	1,500	1,059	35
J-821	UpperZone	False	1,500	1,306	37
J-837	NonFF	False	1,500	0	23
J-842	UpperZone	False	1,500	939	29
J-844	UpperZone	False	1,500	784	25

FlexTable: Junction Table

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
J-845	UpperZone	False	1,500	832	31
J-846	UpperZone	False	1,500	838	34
J-847	UpperZone	False	1,500	1,389	25
J-850	UpperZone	False	1,500	571	28
J-851	UpperZone	False	1,500	571	25
J-856	UpperZone	False	1,500	928	25
J-864	UpperZone	False	1,500	767	25
J-865	UpperZone	False	1,500	1,341	27
J-866	UpperZone	False	1,500	1,452	31
J-876	MiddleZone	False	1,500	1,235	25
J-877	MiddleZone	False	1,500	1,306	25
J-879	MiddleZone	False	1,500	724	25
J-880	MiddleZone	False	1,500	627	25
J-910	MiddleZone	False	1,500	384	25
J-911	MiddleZone	False	1,500	301	25
J-913	MiddleZone	False	1,500	300	28
J-914	MiddleZone	False	1,500	433	25
J-916	MiddleZone	False	1,500	132	25
J-928	MiddleZone	False	1,500	427	25
J-930	LowerZone	False	1,500	825	26
J-939	LowerZone	False	1,500	1,426	25
J-946	LowerZone	False	1,500	398	26
J-961	UpperZone	False	1,500	1,139	37
J-970	UpperZone	False	1,500	140	25
J-972	UpperZone	False	1,500	98	25
J-973	UpperZone	False	1,500	222	32
J-974	UpperZone	False	1,500	163	25
J-975	UpperZone	False	1,500	1,400	29
J-976	MiddleZone	False	1,500	289	25
J-978	MiddleZone	False	1,500	1,388	25
J-981	MiddleZone	False	1,500	73	25
J-987	MiddleZone	False	1,500	232	25
J-989	MiddleZone	False	1,500	235	25
J-996	MiddleZone	False	1,500	1,487	26
J-1003	MiddleZone	False	1,500	1,283	27
J-1005	MiddleZone	False	1,500	820	25
J-1006	LowerZone	False	1,500	694	30
J-1010	UpperZone	False	1,500	692	33
J-1014	LowerZone	False	3,500	1,628	25
J-1020	LowerZone	False	1,500	617	25
J-1021	LowerZone	False	1,500	582	25
J-1022	LowerZone	False	1,500	1,190	28
J-1023	LowerZone	False	1,500	679	25
J-1024	LowerZone	False	1,500	776	25
J-1025	LowerZone	False	1,500	947	25
J-1030	LowerZone	False	1,500	963	25
J-1036	UpperZone	False	1,500	690	25

FlexTable: Junction Table

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
J-1037	UpperZone	False	1,500	1,267	25
J-1039	LowerZone	False	1,500	1,435	38
J-1040	LowerZone	False	1,500	1,307	34
J-1046	LowerZone	False	1,500	808	27
J-1047	LowerZone	False	1,500	824	26
J-1051	UpperZone	False	1,500	1,129	36
J-1055	LowerZone	False	1,500	1,113	25
J-1060	UpperZone	False	1,500	1,079	25
J-1061	MiddleZone	False	1,500	838	25
J-1062	MiddleZone	False	1,500	889	25
J-1079	LowerZone	False	1,500	520	25

2018 PHD Results

FlexTable: Junction Table

Label	Zone	Pressure (psi)
J-804	UpperZone	32
J-839	UpperZone	35
J-844	UpperZone	35
J-1036	UpperZone	35

FlexTable: Junction Table

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
J-518	LowerZone	False	1,500	515	25
J-519	LowerZone	False	1,500	529	25
J-520	LowerZone	False	1,500	507	25
J-521	LowerZone	False	1,500	547	25
J-522	LowerZone	False	1,500	597	28
J-523	LowerZone	False	1,500	727	29
J-524	LowerZone	False	1,500	689	25
J-525	LowerZone	False	1,500	998	30
J-526	LowerZone	False	1,500	577	25
J-527	LowerZone	False	1,500	475	25
J-528	LowerZone	False	1,500	511	27
J-529	LowerZone	False	1,500	340	25
J-531	LowerZone	False	1,500	455	25
J-532	LowerZone	False	1,500	493	26
J-536	LowerZone	False	1,500	457	25
J-541	LowerZone	False	1,500	1,410	25
J-546	LowerZone	False	1,500	1,371	25
J-549	LowerZone	False	1,500	699	25
J-551	LowerZone	False	1,500	1,044	25
J-558	LowerZone	False	1,500	1,362	25
J-559	LowerZone	False	1,500	1,384	25
J-560	LowerZone	False	1,500	1,377	29
J-561	LowerZone	False	1,500	673	25
J-562	LowerZone	False	1,500	987	28
J-563	LowerZone	False	1,500	773	26
J-564	LowerZone	False	1,500	1,476	25
J-565	LowerZone	False	1,500	659	29
J-566	LowerZone	False	1,500	1,149	25
J-567	LowerZone	False	1,500	1,392	28
J-569	LowerZone	False	1,500	938	25
J-581	LowerZone	False	1,500	821	25
J-604	LowerZone	False	1,500	1,379	25
J-610	LowerZone	False	1,500	1,496	25
J-611	LowerZone	False	1,500	1,370	25
J-612	LowerZone	False	1,500	1,319	25
J-613	LowerZone	False	1,500	1,487	44
J-634	LowerZone	False	1,500	751	25
J-635	LowerZone	False	1,500	761	27
J-636	LowerZone	False	1,500	728	25
J-637	LowerZone	False	1,500	687	25
J-639	LowerZone	False	1,500	964	30
J-640	LowerZone	False	1,500	971	27
J-644	LowerZone	False	1,500	1,184	25
J-645	LowerZone	False	1,500	823	29
J-646	LowerZone	False	1,500	1,201	30
J-648	LowerZone	False	2,500	1,862	25
J-679	LowerZone	False	1,500	1,484	25

FlexTable: Junction Table

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
J-680	LowerZone	False	1,500	1,477	25
J-681	LowerZone	False	1,500	1,299	25
J-682	LowerZone	False	1,500	946	25
J-683	LowerZone	False	1,500	1,475	25
J-684	LowerZone	False	1,500	1,468	25
J-687	LowerZone	False	1,500	1,468	25
J-689	LowerZone	False	1,500	451	29
J-690	LowerZone	False	1,500	358	30
J-691	LowerZone	False	1,500	347	25
J-695	MiddleZone	False	1,500	1,085	25
J-696	MiddleZone	False	1,500	1,281	25
J-697	MiddleZone	False	1,500	594	26
J-698	MiddleZone	False	1,500	544	25
J-704	MiddleZone	False	4,500	3,516	25
J-717	MiddleZone	False	1,500	1,433	37
J-721	MiddleZone	False	1,500	1,011	25
J-731	MiddleZone	False	1,500	1,124	27
J-732	MiddleZone	False	1,500	1,081	25
J-733	MiddleZone	False	1,500	1,007	25
J-734	MiddleZone	False	1,250	1,174	27
J-735	MiddleZone	False	1,500	1,075	25
J-737	MiddleZone	False	1,500	1,152	29
J-738	MiddleZone	False	1,500	1,220	27
J-739	MiddleZone	False	1,500	1,182	25
J-740	MiddleZone	False	1,500	1,235	28
J-741	MiddleZone	False	1,500	1,013	25
J-742	MiddleZone	False	1,500	1,139	25
J-743	MiddleZone	False	1,500	952	34
J-744	MiddleZone	False	1,500	678	34
J-745	MiddleZone	False	1,500	547	29
J-746	MiddleZone	False	1,500	457	25
J-750	MiddleZone	False	1,500	1,098	27
J-751	MiddleZone	False	1,500	1,019	25
J-755	UpperZone	False	1,500	760	25
J-759	MiddleZone	False	1,500	1,083	25
J-794	UpperZone	False	1,500	1,419	34
J-795	UpperZone	False	1,500	1,037	25
J-797	UpperZone	False	1,500	1,469	25
J-798	UpperZone	False	1,500	529	37
J-799	UpperZone	False	1,500	521	39
J-800	UpperZone	False	1,500	509	30
J-801	UpperZone	False	1,500	509	32
J-802	UpperZone	False	1,500	493	25
J-803	UpperZone	False	1,500	486	32
J-804	UpperZone	False	1,500	364	25
J-805	UpperZone	False	1,500	385	25
J-806	UpperZone	False	1,500	1,136	29

FlexTable: Junction Table

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
J-807	NonFF	False	1,500	0	21
J-808	UpperZone	False	1,500	421	25
J-809	MiddleZone	False	1,500	777	25
J-810	MiddleZone	False	1,500	914	25
J-811	MiddleZone	False	1,500	836	25
J-813	MiddleZone	False	1,500	1,174	27
J-814	MiddleZone	False	1,500	828	25
J-817	UpperZone	False	1,500	766	25
J-818	UpperZone	False	1,500	808	31
J-819	UpperZone	False	1,500	895	43
J-820	UpperZone	False	1,500	979	35
J-821	UpperZone	False	1,500	1,202	37
J-823	UpperZone	False	1,500	1,335	32
J-824	UpperZone	False	1,500	1,436	28
J-837	NonFF	False	1,500	0	22
J-839	UpperZone	False	1,500	1,289	25
J-841	UpperZone	False	1,500	1,384	26
J-842	UpperZone	False	1,500	788	29
J-844	UpperZone	False	1,500	662	25
J-845	UpperZone	False	1,500	701	31
J-846	UpperZone	False	1,500	706	35
J-847	UpperZone	False	1,500	1,132	25
J-850	UpperZone	False	1,500	520	28
J-851	UpperZone	False	1,500	520	25
J-856	UpperZone	False	1,500	839	25
J-864	UpperZone	False	1,500	715	25
J-865	UpperZone	False	1,500	1,244	27
J-866	UpperZone	False	1,500	1,346	31
J-876	MiddleZone	False	1,500	1,160	25
J-877	MiddleZone	False	1,500	1,224	25
J-879	MiddleZone	False	1,500	671	25
J-880	MiddleZone	False	1,500	583	25
J-910	MiddleZone	False	1,500	350	25
J-911	MiddleZone	False	1,500	270	25
J-913	MiddleZone	False	1,500	270	28
J-914	MiddleZone	False	1,500	392	25
J-916	MiddleZone	False	1,500	119	25
J-928	MiddleZone	False	1,500	388	25
J-930	LowerZone	False	1,500	742	26
J-936	LowerZone	False	1,500	1,475	25
J-939	LowerZone	False	1,500	1,320	25
J-946	LowerZone	False	1,500	346	26
J-961	UpperZone	False	1,500	1,052	37
J-970	UpperZone	False	1,500	124	25
J-971	UpperZone	False	1,500	1,463	31
J-973	UpperZone	False	1,500	197	32
J-974	UpperZone	False	1,500	152	25

FlexTable: Junction Table

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
J-975	UpperZone	False	1,500	1,299	29
J-976	MiddleZone	False	1,500	261	25
J-978	MiddleZone	False	1,500	1,237	25
J-987	MiddleZone	False	1,500	208	25
J-989	MiddleZone	False	1,500	208	25
J-996	MiddleZone	False	1,500	1,241	27
J-1003	MiddleZone	False	1,500	1,173	26
J-1005	MiddleZone	False	1,500	762	25
J-1006	LowerZone	False	1,500	673	29
J-1010	UpperZone	False	1,500	487	33
J-1014	LowerZone	False	3,500	1,547	25
J-1015	LowerZone	False	1,500	1,416	43
J-1016	UpperZone	False	1,500	1,387	36
J-1020	LowerZone	False	1,500	559	25
J-1021	LowerZone	False	1,500	529	25
J-1022	LowerZone	False	1,500	1,040	28
J-1023	LowerZone	False	1,500	616	25
J-1024	LowerZone	False	1,500	722	25
J-1025	LowerZone	False	1,500	878	25
J-1026	LowerZone	False	1,500	1,449	25
J-1030	LowerZone	False	1,500	922	25
J-1036	UpperZone	False	1,500	585	25
J-1037	UpperZone	False	1,500	1,166	25
J-1039	LowerZone	False	1,500	1,237	38
J-1040	LowerZone	False	1,500	1,134	34
J-1041	MiddleZone	False	1,500	1,484	25
J-1046	LowerZone	False	1,500	723	27
J-1047	LowerZone	False	1,500	742	26
J-1051	UpperZone	False	1,500	943	36
J-1055	LowerZone	False	1,500	1,043	25
J-1060	UpperZone	False	1,500	765	25
J-1061	MiddleZone	False	1,500	775	25
J-1062	MiddleZone	False	1,500	820	25
J-1079	LowerZone	False	1,500	464	25

FlexTable: Junction Table

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
J-518	LowerZone	False	1,500	1,035	25
J-519	LowerZone	False	1,500	1,213	25
J-520	LowerZone	False	1,500	1,009	25
J-524	LowerZone	False	1,500	1,245	25
J-527	LowerZone	False	1,500	826	25
J-546	LowerZone	False	1,500	1,387	25
J-549	LowerZone	False	1,500	708	25
J-551	LowerZone	False	1,500	1,074	25
J-561	LowerZone	False	1,500	709	25
J-562	LowerZone	False	1,500	1,104	28
J-563	LowerZone	False	1,500	828	26
J-566	LowerZone	False	1,500	1,319	25
J-569	LowerZone	False	1,500	957	25
J-581	LowerZone	False	1,500	833	25
J-604	LowerZone	False	1,500	1,418	25
J-612	LowerZone	False	1,500	1,459	25
J-634	LowerZone	False	1,500	1,491	25
J-637	LowerZone	False	1,500	969	25
J-644	LowerZone	False	1,500	1,460	25
J-689	LowerZone	False	1,500	457	29
J-690	LowerZone	False	1,500	361	30
J-691	LowerZone	False	1,500	350	25
J-697	MiddleZone	False	1,500	570	26
J-698	MiddleZone	False	1,500	513	25
J-704	MiddleZone	False	4,500	3,276	25
J-733	MiddleZone	False	1,500	1,336	25
J-779	MiddleZone	False	1,500	1,188	33
J-784	MiddleZone	False	1,500	935	25
J-801	UpperZone	False	1,500	1,246	25
J-802	UpperZone	False	1,500	1,455	25
J-805	UpperZone	False	1,500	711	25
J-807	NonFF	False	1,500	1,255	32
J-837	NonFF	False	1,500	1,255	38
J-856	UpperZone	False	1,500	1,184	25
J-864	UpperZone	False	1,500	818	25
J-865	UpperZone	False	1,500	1,424	27
J-916	MiddleZone	False	1,500	82	25
J-925	MiddleZone	False	1,500	1,270	38
J-1005	MiddleZone	False	1,500	792	25
J-1006	LowerZone	False	1,500	690	29
J-1014	LowerZone	False	3,500	1,586	25
J-1020	LowerZone	False	1,500	597	25
J-1021	LowerZone	False	1,500	561	25
J-1022	LowerZone	False	1,500	1,276	28
J-1023	LowerZone	False	1,500	662	25
J-1024	LowerZone	False	1,500	750	25
J-1025	LowerZone	False	1,500	923	25

FlexTable: Junction Table

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
J-1030	LowerZone	False	1,500	940	25
J-1036	UpperZone	False	1,500	1,492	25
J-1040	LowerZone	False	1,500	1,451	34
J-1046	LowerZone	False	1,500	800	27
J-1047	LowerZone	False	1,500	819	26
J-1057	UpperZone	False	1,500	1,492	35
J-1063	UpperZone	False	1,500	1,484	25

APPENDIX E – O&M Budget

Description	Commercial	None	Residential	Totals
Water Usage	36,098,014	0	101,088,279	137,186,293

Description	Commercial	None	Residential	Totals
Water Amount	24,870.55	-	58,956.97	83,827.52
WBase Amount	114,415.37	-	401,331.16	515,746.53
WTCF Amount	275.00	-	3,038.77	3,313.77
Sewer Amount	98,742.34	-	332,662.82	431,405.16
SDHP Amount	105.00	-	-	105.00
SBond Amount	-	-	41.03-	41.03-
SWCF Amount	-	-	104.18-	104.18-
Misc Amount	-	-	-	-
AL Amount	-	-	-	-
Pnlty Amount	645.64	-	3,819.39	4,465.03
Total Charges:	239,053.90	-	799,663.90	1,038,717.80

Description	Commercial	None	Residential	Totals
Previous Balance	-	-	-	-
Payments	199,514.59-	-	669,277.33-	868,791.92-
Contract Adjustments	-	-	-	-
Assistance Applied	-	-	-	-
Deposits Applied	-	-	4,562.74-	4,562.74-
Interest Applied	-	-	-	-
Balance Transfers	66.00	-	66.00-	-
Balance Write-offs	550.12-	-	10,738.86-	11,288.98-
Reallocations	-	-	-	-
Total Charges	239,053.90	-	799,663.90	1,038,717.80
Current Balance:	39,055.19	-	115,018.97	154,074.16

Year To Date: 01/01/2017 - 12/31/2017

Description	Commercial	None	Residential	Totals
Water Usage	36,098,014	0	101,088,279	137,186,293

Description	Commercial	None	Residential	Totals
Water Amount	24,870.55	-	58,956.97	83,827.52
WBase Amount	114,415.37	-	401,331.16	515,746.53
WTCF Amount	275.00	-	3,038.77	3,313.77
Sewer Amount	98,742.34	-	332,662.82	431,405.16
SDHP Amount	105.00	-	-	105.00
SBond Amount	-	-	41.03-	41.03-
SWCF Amount	-	-	104.18-	104.18-
Misc Amount	-	-	-	-
AL Amount	-	-	-	-
Pnlty Amount	645.64	-	3,819.39	4,465.03
Total Charges:	239,053.90	-	799,663.90	1,038,717.80

Description	Commercial	None	Residential	Totals
Previous Balance	-	-	-	-
Payments	199,514.59-	-	669,277.33-	868,791.92-
Contract Adjustments	-	-	-	-
Assistance Applied	-	-	-	-
Deposits Applied	-	-	4,562.74-	4,562.74-
Interest Applied	-	-	-	-
Balance Transfers	66.00	-	66.00-	-
Balance Write-offs	550.12-	-	10,738.86-	11,288.98-
Reallocations	-	-	-	-
Total Charges	239,053.90	-	799,663.90	1,038,717.80
Current Balance:	39,055.19	-	115,018.97	154,074.16

APPENDIX F – Sanitary Survey

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

900 North Skyline Dr., Suite B • Idaho Falls, Idaho 83402 • (208) 528-2650

C.L. "Butch" Otter, Governor
Curt Fransen, Director

September 10, 2013

City of Salmon
Attn: Paul Stokes
200 Main Street
Salmon ID, 83467

PWS# 7300042

Subject: Enhanced Sanitary Survey conducted on *August 13, 2013*

Dear Mr. Stokes:

Thank you for your cooperation in the sanitary survey that was conducted on August 13, 2013. No significant deficiencies were identified at the time of the sanitary survey inspection.

The only item that must be addressed is in the reporting of the chlorine residual on the Monthly Disinfection Report form. There seems to be an error in the actual residual that is recorded by the automated system. During the midnight hour on several days of each month the reported residual is 0.0 mg/L. Since the residual is taken after storage the reported residual of 0.0 cannot be an accurate residual. The error must be a computer or instrumentation error. Please address this error to ensure accurate reporting in the future.

Thank you for your time in the completion of this survey. If you have any questions, please contact Carlin Feisthamel at the IDEQ Idaho Falls Regional Office at (208)-528-2650

Sincerely,

Carlin Feisthamel, P.E.
Water Quality Engineer
Idaho Falls Regional Office

State of Idaho Public Water System Enhanced Sanitary Survey

WATER SYSTEM INVENTORY INFORMATION

SURVEY DATE: 8/11/2016 (mm/dd/yyyy) | PWS #: 7300042

Name of Public Water System: **City of Salmon**

# of Groundwater Sources: 0 | # of Storage Facilities: 1

#of Surface Water Sources: 1 | Total Storage (gal) :

Date of Last Survey: 08/12/2013 | Health District: ☑ N/A | DEQ Region: ☐ N/A IFRO | County: Custer

Number of Service Connections: 1620 | Residential Population: 3122 | Status: ☑ Approved ☐ Disapproved

Water Purchased From: ☑ N/A PWS #: Name: | Water Sold To: ☑ N/A PWS #: Name:

Owner Type: local govt | Legal Entity: GA

Water System Classification: ☑ Community Water System ☐ Nontransient Noncommunity ☐ Transient Noncommunity - NC

Combined Sources? ☐ Yes ☑ No If yes, ☐ Well Field ☐ Manifold/Spring Box Sources Combined:

System Classification: Distribution: DIST 1 Treatment: ☐ N/A Treatment II

Seasonal Operation Dates: ☐ N/A Date Open: Date Closed:

Responsible Charge Operator (DO): ☐ No DO ☐ N/A - Identify Operator for GW-NC PWS)

☑ Mr. ☐ Ms. James Miller

Properly Licensed? ☑ Yes ☐ No ☐ N/A-GW-NC | License Type: DWT2-18937 ☐ N/A | License Number: DWD2-18424

Mailing Address: 200 Main Street

City, State, Zip Code: Salmon, ID 83467

Telephone: Day: 208-756-3214 Night: 208-756-7506 Fax: 208-756-3540

E-mail: slmnwater@centurytel.net

Legal Owner's Name: ☐ Mr. ☐ Ms. City of Salmon

Mailing Address: 200 Main Street

City, State, Zip Code: Salmon, ID 83467

Telephone: Day: 208-756-3214 Night: Fax:

E-mail: slmnwater@centurytel.net

Substitute Responsible Charge Operator (OP): ☐ No OP ☐ N/A for GW-NC PWS

☑ Mr. ☐ Ms. Harry Shanafelt

Properly Licensed? ☑ Yes ☐ No ☐ N/A-GW-NC | License Type: ☐ N/A | License Number: DWT2-11913

Mailing Address: 200 Main Street

City, State, Zip Code: Salmon, ID 83467

Telephone: Day: 208-756-3214 Night: 208-303-0384 Fax: 208-756-7049

E-mail: slmnwater@centurytel.net

Individuals present during inspection:

Name	Title
James Miller	Operator

Physical location of the PWS (Township, Range, Section):

Samples taken at the time of survey by inspector? ☐ Yes ☑ No

If yes, what:

Survey performed by: Name: Carlin Feisthamel Title: Water Quality Engineer Phone #: 208-528-2650

Agency: ☑ IDEQ ☐ Health Dept. ☐ Other:

General Information

yes	no	n/a	unk	note	
☐	☐	☑	☐	☐	1. Have previously required Significant Deficiencies & Deficiencies been addressed?
☐	☑	☐	☐	☐	2. Have modifications been made to the PWS since the last ESS?
☐	☐	☑	☐	☐	3. If yes, are the modifications considered to be significant?
☐	☐	☑	☐	☐	4. If yes, were plans and specs submitted to and approved by DEQ?
☐	☑	☐	☐	☐	5. Are there any known issues or problems with equipment or operation of the PWS that could negatively effect the quality of the water produced? (*If yes, comment*)

Comments:

Backflow preventors are overdue for testing.

Sanitary Survey Index

Modules used:	#
☑ General Information	1
☐ Groundwater Source	
☑ Storage	1
☐ Hydropneumatic Tanks	
☑ Distribution	1
☑ Pumping	1
☑ Financial Capacity	1
☑ Managerial Capacity	1
☑ Treatment Application	1
☑ Disinfection	1
☐ Notes	
☐ Photo Log	
Total Modules	8

STORAGE

SURVEY DATE: 8/11/2016 (mm/dd/yyyy) | PWS #: 7300042

A separate storage form must be filled out for **each** storage unit in the PWS.

Storage Structure Name: Storage Tank

Storage Structure ID #:

Physical Location: Near Treatment Plant

Date in service: ☑ Unk

Volume (gal): ☐ Unk 1.5 MG

Storage Type: ☑ Reservoir/Tank ☐ Standpipe

Construction: ☐ Elevated ☑ Above Ground ☐ Partially Below Ground ☐ Below Ground

Type of material: ☐ Plastic ☐ Wood ☐ Fiberglass ☐ Metal ☑ Concrete ☐ Naturally Contained

Total Days Supply (This structure): 0.5-1 day ☐ Unk

Date Last: Inspected: 2016 ☐ Unk

Cleaned: 2016 ☐ Unk

How is the water level measured? Telemetry ☐ Unk

COMMENTS: (Please indicate question number)

10. During inspection the surface cracks were inspected and determined to be superficial.

yes	no	n/a	unk	note	**ALL STORAGE STRUCTURES**
☑	☐	☐	☐	☐	1. Is the storage structure safely accessible to the inspector?
☐	☑	☐	☐	☐	2. Is the PWS storage tank located within 500 feet of any municipal or Industrial wastewater treatment plant or any land which is spray irrigated with wastewater or used for sludge disposal?
☐	☑	☐	☐	☐	3. Are any of the storage structure drains directly connected to a sewer or storm drain?
☑	☐	☐	☐	☐	4. Is an overflow provided that discharges to daylight in a way that will preclude the possibility of backflow to the reservoir and, where practical, provided with an expanded metal screen installed within the pipe that will exclude rodents and deter vandalism?
☑	☐	☐	☐	☐	5. Are overflows brought down to an elevation between 12 and 24 inches above the ground surface? *(2X the diameter of the discharge pipe above a basin rim)*
☑	☐	☐	☐	☐	6. Do overflows discharge over a drainage inlet structure or splash plate?(storm or sanitary)
☑	☐	☐	☐	☐	7. Is the storage structure secure from unauthorized access?
☑	☐	☐	☐	☐	8. Does the storage reservoir have a watertight roof or cover and is it sloped to facilitate drainage?
☑	☐	☐	☐	☐	9. Is the storage water protected from contamination?
☑	☐	☐	☐	☑	10. Is the storage structure structurally sound?
☐	☑	☐	☐	☐	11. Could vegetation in the area potentially impact the storage structure?*(Recommended)*
☑	☐	☐	☐	☐	12. Is the storage structure designed so that it can be isolated from the distribution system without necessitating loss of pressure in the distribution system?
☐	☑	☐	☐	☐	13. Is leakage evident at time of inspection?
☐	☑	☐	☐	☐	14. Is the storage structure interior coating or liner peeling or cracked?
☑	☐	☐	☐	☐	15. Is the storage structure used to store finished water?
☑	☐	☐	☐	☐	16. Are access manhole openings for the storage structure 4 inches or greater above the surface of the roof, with a cover 2 inches overlapping, water tight, hinged and locked?
☑	☐	☐	☐	☐	17. Are all vents extended 12 inches above the roof and constructed to exclude potential sources of contamination? *(The overflow pipe shall not be considered a vent)*

yes	no	n/a	unk	note	**ABOVE GROUND STORAGE**
☑	☐	☐	☐	☐	18. Do all vents open downward and are they fitted with a 4 mesh non-corrodible screen?

yes	no	n/a	unk	note	**GROUND-LEVEL, PARTIALLY BURIED, or BELOW-GROUND STORAGE**
☐	☐	☑	☐	☐	19. Does the overflow for the storage structure have a vertical section of pipe at least 2 pipe diameters in length?
☐	☐	☑	☐	☐	20. Is the overflow for the storage structure provided with either a 24 mesh non-corrodible screen installed within the pipe when practical, or an expanded metal screen installed within the pipe plus a weighted flapper or check?
☐	☐	☑	☐	☐	21. Is the area surrounding the storage structure graded in a manner that will prevent surface water from standing within 50 feet of it?
☐	☐	☑	☐	☐	22. Are all vents for the storage structure open downward with the opening at least 24 inches above the roof or the ground level and covered with 24 mesh non-corrodible screen to exclude potential contamination?

yes	no	n/a	unk	note	**PARTIALLY BURIED OR BELOW-GROUND STORAGE**
☐	☐	☑	☐	☐	23. Are "ALL" manholes elevated 24 inches above the surface of the roof or the ground level, which ever is higher?
☐	☐	☑	☐	☐	24. Is there a minimum distance of 50 feet between the storage structure and any non-potable main, standing water, or other possible source of contamination?

DISTRIBUTION

SURVEY DATE: 8/11/2016 (mm/dd/yyyy) | PWS #: 7300042

One form for **all** distribution systems in the PWS.

What are water lines made of:

Material(s): ☐ Unk

☐ Steel ☐ HDPE (black) ☑ Asbestos/Cement

☐ PVC ☑ Ductile Iron ☐ Copper

☐ Other:

Size(s): ☐ Unk

6 -12 inch

How many services are metered?

1620 out of **1620**

Number of Fire Hydrants:

56

COMMENTS:
(Please indicate the question number)

6. The city is currently seeking DEQ funding to finance a water study to determine if all fire flow needs are being met.

yes	no	n/a	unk	note	**DISTRIBUTION**
☐	☑	☐	☐	☐	1. Have there been any interruptions in service during the past year? (including pressure loss)
☐	☑	☐	☐	☐	2. If a loss of pressure occurred (>20 psi), did the PWS provide public notice and disinfect the system? *(Reminder)*
☑	☐	☐	☐	☐	3. Is the PWS able to maintain a minimum pressure of twenty (20) psi throughout the distribution system (including fire flow), or forty (40) psi for PWSs constructed after 7/1/1985 (excluding fire flow), during maximum hourly demand conditions?
☐	☑	☐	☐	☐	4. Was the pressure observed at a service connection?
					5. If yes: ____ psi. Location: ____ Time: ____ ☐ A.M. ☐ P.M.
☑	☐	☐	☐	☑	6. Do all water mains that provide fire flow have a diameter of at least 6 inches?
☑	☐	☐	☐	☐	7. Are valves exercised regularly? *(Recommended)* If yes, how often? **1/year**
☑	☐	☐	☐	☐	8. Is there a leak detection program? *(Recommended)*
☐	☑	☐	☐	☐	9. Is 15% or more of the water unaccounted for?
☐	☑	☐	☐	☐	10. Is a water conservation program in effect? *(Recommended)*
☑	☐	☐	☐	☐	11. Is an adequate map of the distribution system maintained? *(Recommended)*
☑	☐	☐	☐	☐	12. Does the system flush all main lines annually? *(Recommended)*
☑	☐	☐	☐	☐	13. Are all dead end water mains equipped with a means to flush?
☑	☐	☐	☐	☐	14. If yes, are the deadends flushed at least semiannually?
☐	☑	☐	☐	☐	15. Are there any distribution materials used that should not be in contact with the drinking water? *If yes, explain in comments section.*
☑	☐	☐	☐	☐	16. Is the system adequately protected from freezing?
☑	☐	☐	☐	☐	17. Is there a cross connection control program? *(Community PWSs Only)*
☑	☐	☐	☐	☐	18. Is the operator trained in cross connection control? *(Recommended)*
☐	☑	☐	☐	☐	19. Is the operator aware of any cross connections or were any cross connections observed during the course of the survey?
☐	☐	☑	☐	☐	20. If a separate non-potable irrigation system is provided for the consumer, are all mains, hydrants, and appurtenances easily identified as non-potable? (Purple Tape or other) *(Recommended)*

yes	no	n/a	unk	note	**Air/Vacuum Relief Valves** - *Placed at high points in water mains.*
☐	☐	☑	☐	☐	21. Are all automatic air relief valves equipped with a means of backflow protection?

PUMPING - PG. 1

SURVEY DATE 8/11/2016 (mm/dd/yyyy) | PWS # 7300042

One form for **all** Pumps.

PUMPS, PUMPHOUSES, AND CONTROLS

Pump ID#:	Physical Location:	Type of Pump:	Brand:	Model:	Horsepower:	Purpose:
1	Treatment Plant	Vert turbine	Goulds		100	raw water
2	Treatment Plant	Vert turbine	Goulds		100	raw water
3	Treatment Plant	Vert turbine	Goulds		100	raw water
4	Treatment Plant	horizontal. Suction	Goulds		20	reverse filtration
5	Treatment Plant	horizontal. Suction	Goulds		20	reverse filtration

COMMENTS: (Please indicate the question number)

yes	no	n/a	unk	note	
					ALL PUMPS
☐	☐	☑	☐	☐	1. Are all pumps capable of providing the maximum pumping demand of the system?
☐	☑	☐	☐	☐	2. Does the pump(s) cycle excessively? *(Recommended)*
☑	☐	☐	☐	☐	3. Are all pumps provided with readily available spare parts and tools?
☐	☐	☑	☐	☐	4. Is a water pressure relief valve installed where the pump is directly connected to the distribution system?
☑	☐	☐	☐	☐	5. Is a standard pressure gauge installed on the discharge line?
					WELL PUMPS
☐	☐	☑	☐	☐	6. Is there an accessible check valve installed in the discharge line of each well between the pump and the shut-off valve?
☐	☐	☑	☐	☐	7. If the system has a vertical turbine motor driven pump(s), is an air release-vacuum relief valve located upstream from the check valve, with exhaust/relief piping terminating in a down-turned position at least 18 inches above the floor and covered with a 24 mesh corrosion resistant screen?
☐	☐	☑	☐	☐	8. If the pump(s) is "oil lubricated", is the oil NSF approved and suitable for human consumption?
					WATER PUMPS *(not well pumps)*
☐	☐	☑	☐	☐	9. Is an accessible check valve on the discharge side between the pump and the shut-off valve?
					AUXILIARY POWER
☑	☐		☐	☐	10. Is there auxiliary power on-site?
☐ Significant	☐ Deficiency				
☑	☐	☐	☐	☐	11. Is auxiliary power tested? *(Recommended)*
☐	☐	☑	☐	☐	12. If a diesel or gasoline fueled engine is used on the well lot; is the fuel tank and connecting piping double walled?
☐	☐	☑	☐	☐	13. Is the fuel tank above ground?
☐	☐	☑	☐	☐	14. Is a certified operator present during the filling of the fuel tank?
					If the engine is in the well house
☐	☐	☑	☐	☐	15. Is the engine exhaust directly discharged outside the well house?
☐	☐	☑	☐	☐	16. Is a spill containment structure surrounding all fuel tanks adequate? *(Secondary containment - 110% fuel tank volume)*
					Community Systems Only
☑	☐	☐	☐	☐	17. (*Community Systems built after 4/15/07 only*) Is on-site power or standby storage provided so water can be treated and supplied to pressurize the entire distribution system during a power outage for a minimum of 8 hours?
☑	☐	☐	☐	☐	18. (*Community Systems built after 4/15/07 only*) If standby power is provided, Is there a minimum of 8 hours of fuel stored and located on site?

PUMPING - PG. 2

SURVEY DATE 8/11/2016 (mm/dd/yyyy) | PWS # 7300042

COMMENTS: (Please indicate the question number)

BOOSTER PUMPS

yes	no	n/a	unk	note	
☐	☐	☑	☐	☐	19. Is an instantaneous and totalizing flow meter installed where the booster pump is directly connected to the distribution system? ☐ Unnecessary
☐	☐	☑	☐	☐	20. Are all in-line booster pumps supplied with an automatic cutoff that activates when intake pressure is less than or equal to 5 psi?
☐	☐	☑	☐	☐	21. Is the booster pump located on a suction line that is directly connected to any storage reservoir?
☐	☐	☑	☐	☐	22. If yes, are all booster pumps protected by an automatic cutoff to prevent pump damage and avoid excessive reservoir drawdown?

PUMP HOUSE *(Only pump houses that don't contain a Groundwater Source)*

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	23. Is the pump house kept clean and in good repair? *(Floor cracks?)*
☑	☐	☐	☐	☐	24. Is the pump house protected from unauthorized personnel?
☑	☐	☐	☐	☐	25. Does the pump house have adequate lighting throughout? *(Recommended)*
☑	☐	☐	☐	☐	26. Are all non-sample taps installed in the pump house equipped with an appropriate backflow prevention device?
☑	☐	☐	☐	☐	27. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment? ☐ Significant ☐ Deficiency
☑	☐	☐	☐	☐	28. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment *(prevent moisture buildup and/or freezing)*? ☐ Significant ☐ Deficiency
☑	☐	☐	☐	☐	29. Is the pump house protected from flooding, have adequate drainage, is the floor surface at least six (6) inches above the final ground surface, and is the ground surface graded so as to lead surface water away from the pump house?
☐	☑	☐	☐	☐	30. Is the sump for pump house floor drains closer than 30 feet from the well?
☐	☑	☐	☐	☐	31. Is the floor drain connected to sewer, storm drains, chlorination room drains, or any other source of contamination?

FINANCIAL CAPACITY

SURVEY DATE: 8/11/2016 (mm/dd/yyyy) | PWS #: 7300042

yes	no	n/a	unk	note	FINANCIAL CAPACITY
☑	☐	☐	☐	☐	1. Is the PWS current with the payment of drinking water fees?
☑	☐	☐	☐	☐	2. Does the PWS charge a drinking water fee to the user? If yes, what is the fee: $ **varies by volume**
☐	☑	☐	☐	☐	3. Is the PWS in the business of selling water?

#3 Note: → **- If no, identify why in the comments section and mark "N/A" on questions 4 - 19.**

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	4. Does the PWS provide and use an annual budget? *(Recommended)*
☑	☐	☐	☐	☐	5. If applicable, is the PWS fund separate from the waste water/sewer utility fund? *(Recommended)*
☑	☐	☐	☐	☐	6. Do water system revenues exceed expenditures? *(Recommended)*
☑	☐	☐	☐	☐	7. Are controls established to prevent expenditures from exceeding revenues?
☐	☐	☐	☑	☐	8. Has an independent financial audit been completed? *(Recommended)*
☑	☐	☐	☐	☐	9. If yes, is a copy of the most recent balance sheet for the water system available? *(Recommended)*
☑	☐	☐	☐	☐	10. Does the water system include a cash budget within its annual budget for cash flow? *(Recommended)*
☑	☐	☐	☐	☐	11. Does the water system management review the user fee, user charge, or rate system at least annually? *(Recommended)*
					12. When was the last user fee, user charge, or rate system adjustment? **2015** *mm/dd/yyyy*
☑	☐	☐	☐	☐	13. Does the water system management review financial reports at least monthly? *(Recommended)*
☑	☐	☐	☐	☐	14. Does the PWS provide and use a capital budget? *(Recommended)*
☐	☑	☐	☐	☑	15. Has this PWS produced and does it currently utilize a capital improvements plan? *(Recommended)*
					16. If yes, when was the capital improvements budget produced? *mm/dd/yyyy*
☐	☐	☑	☐	☐	17. Has the capital improvement budget been updated in the last 18 months? *(Recommended)*
☐	☐	☑	☐	☐	18. Does the water system budget provide funding for depreciation of existing plant in service and/or for the funding of reserves for system replacement?
☑	☐	☐	☐	☐	19. Are there sufficient funds for training personnel?

COMMENTS:
(Please indicate the question number)

15. The system is currently seeking DEQ funding to complete a study to determine necessary improvements

MANAGERIAL CAPACITY

SURVEY DATE 08/11/2016 (mm/dd/yyyy) | PWS # 7300042

MANAGERIAL CAPACITY

yes	no	n/a	unk	note		
☑	☐	☐	☐	☐	1.	Is a properly licensed operator available at all times? (N/A for GW-NC PWS)
☐	☑	☐	☐	☐	2.	Is there a Drinking Water Source Protection Plan developed for this system? Date:
☑	☐	☐	☐	☐	3.	Does this PWS have a governing body or board of directors?

If no, please indicate:

- ☐ Sole Proprietorship
- ☐ Partnership
- ☐ Limited Liability Corp.
- ☑ Other: **City Government**

4. How often does the board meet? ☑ N/A
   - ☐ weekly ☐ semi-annually ☐ never
   - ☐ monthly ☐ annually ☐ unknown
   - ☐ bimonthly ☐ as necessary ☐ other:

yes	no	n/a	unk	note		
						Are the following records maintained onsite or located near by?
☑	☐	☐	☐	☐	5.	- Bacteriological Analysis - **5 years retention.**
☑	☐	☐	☐	☐	6.	- Chemical Analysis - **10 years retention.**
☑	☐	☐	☐	☐	7.	- Records of actions taken to correct violations - **3 years retention.**
☑	☐	☐	☐	☐	8.	- Copies of reports, summaries or communication related to sanitary surveys - **10 years retention.**
☑	☐	☐	☐	☐	9.	- Reports concerning variances or exemptions - **5 years retention.**
☑	☐	☐	☐	☐	10.	- Copies of public notices issued - **3 years retention.**
☑	☐	☐	☐	☐	11.	- Daily free chlorine residuals *(required disinfection)* - **1 year retention.**
☑	☐	☐	☐	☐	12.	Are routine maintenance schedules established? *(Recommended)*
☑	☐	☐	☐	☐	13.	Is an operation and maintenance manual(s) provided for the PWS and does it include; daily operating instructions, operator safety procedures, location of valves and other key system features, parts list and parts order form, and information for contacting the water system operator?
☑	☐	☐	☐	☐	14.	Is there a clear plan of organization and control among the people responsible for management and operations of the water system? *(Recommended)*
yes	no	n/a	unk	note		Are any samples of the following parameters past due?
☐	☑	☐	☐	☐	15.	Coliform
☐	☑	☐	☐	☐	16.	Nitrates
☐	☑	☐	☐	☐	17.	Nitrites
☐	☑	☐	☐	☐	18.	Lead and Copper
☐	☑	☐	☐	☐	19.	IOCs
☐	☑	☐	☐	☐	20.	VOCs
☐	☑	☐	☐	☐	21.	SOCs
☐	☑	☐	☐	☐	22.	Disinfection Byproducts
☐	☑	☐	☐	☐	23.	Radionuclide
☑	☐	☐	☐	☐	24.	Is a written total coliform rule (TCR) sample site plan available for review?
☑	☐	☐	☐	☐	25.	Does the (TCR) sample site plan meet the minimum requirements?
☑	☐	☐	☐	☐	26.	Does the system have a sufficient supply of approved sampling bottles properly stored? *(Recommended)*
☑	☐	☐	☐	☐	27.	Does the PWS provide stairways, ladders and handrails where needed?
☑	☐	☐	☐	☐	28.	Are treads of non-slip material provided where needed?
☐	☑	☐	☐	☐	29.	Is a health concern produced from inadequately protected electrical wiring?
☑	☐	☐	☐	☐	30.	Are all confined space entry requirements considered?*(Recommended)*
☐	☑	☐	☐	☐	31.	Are there any unused subsurface water storage tanks that need to be abandoned?
☐	☑	☐	☐	☐	32.	Are there any water supply wells that are no longer being used that need to be abandoned?

COMMENTS:
(Please indicate the question number)

TREATMENT APPLICATION & CONTROL

Survey Date: 8/11/2016 (mm/dd/yyyy) | PWS #: 7300042

A separate form must be filled out for **each** Treatment Application in the PWS.

Purpose of Treatment:	Treatment Facility Location:	Date Online: ☐ Unk	Treated Water (GPD): ☐ Unk
Mico Filtration	Treatment Plant	2006	2.6 - 5

Identify **one** process in the treatment train for inspection: ☐ N/A

☐ Sedimentation Basin ☑ Filtration ☐ Blending ☐ Oxidation ☐ Ion Exchange ☐ Aeration ☐ Reverse Osmosis ☐ Sequestration by Polyphosphates
☐ Detention Basin ☐ Chemical Coagulation ☐ Softening ☐ Disinfection (Complete Disinfection Mod.) ☐ Sequestration by Sodium Silicates

Sources Treated by Facility: (Tag #)	Equipment Manufacturer:	Model #:
All surfacewater diversions	Pall	

Chemical Trade Name:	Chemical Manufacturer:	NSF/ANSI certified?
		☐ Yes ☐ No ☐ N/A ☐ Unk
		☐ Yes ☐ No ☐ N/A ☐ Unk
		☐ Yes ☐ No ☐ N/A ☐ Unk

yes	no	n/a	unk	note	**WASTE HANDLING and DISPOSAL**	Comments: (Please indicate the question number)
☑	☐	☐	☐	☐	1. Are provisions made for proper disposal of water treatment plant waste such as sanitary, laboratory, clarification sludge, softening sludge, iron sludge, filter backwash water, brines and treatment media?	
		☐		☑	2. If yes, how are wastes being disposed of? (Identify in comments)	2. Backwash is sent to the pre-sedimentation basin.
yes	no	n/a	unk	note	**SAMPLE TAPS**	
☑	☐	☐	☐	☐	3. Are smooth-nosed sampling taps provided prior to and after each form of treatment?	
		☐	N/A 4-23		**CHEMICAL APPLICATION** If no chemical applied, questions 4-23 are n/a	6. chemical processess other than Cl are for cleaning of the filters only.
yes	no	n/a	unk	note		
☑	☐	☐	☐	☐	4. Are spare parts available for all chemical feeders to replace parts which are subject to frequent wear and damage?	
		☐			5. Are the feeders manually or automatically controlled? ☐ Manual ☑ Automatic	
☐	☐	☐	☐	☑	6. For chemical application control systems, is the chemical feeder controlled by a flow sensing device so that injection of the chemicals will not continue when the flow of water stops?	
☑	☐	☐	☐	☐	7. Is a means to measure water flow provided in order to determine chemical feed rates?	
☑	☐	☐	☐	☐	8. Are provisions made for measuring the quantities of chemicals used?	
☑	☐	☐	☐	☐	9. Is cross-connection control provided on the service water lines that discharge to the solution tanks?	
☑	☐	☐	☐	☐	10. Is cross-connection control provided so that liquid chemical solutions cannot be siphoned through solution feeders into the water supply?	
☑	☐	☐	☐	☐	11. Is the chemical feed equipment readily accessible for servicing, repair, and observation of operation?	
☑	☐	☐	☐	☐	12. Is space provided for convenient/efficient storage and handling of chemicals? *(Recommende*	
☐	☑	☐	☐	☐	13. Are chemicals that are incompatible stored or handled together?	
☑	☐	☐	☐	☐	14. Are chemical solution tanks kept covered?	
☑	☐	☐	☐	☐	15. Are chemical solution tank overflow pipes, when provided, turned downward with the end screened? *(Recommended)*	
☑	☐	☐	☐	☐	16. Do chemical solution tank overflow pipes, when provided, have free fall discharge? *(Recommended)*	
☑	☐	☐	☐	☐	17. Where more than one (1) chemical is stored or handled, are tanks and pipelines clearly labeled to identify the chemical they contain?	
☑	☐	☐	☐	☐	18. Are floor surfaces smooth and impervious, slip-proof and well drained? *(Recommended)*	
☑	☐	☐	☐	☐	19. Are vents from feeders, storage facilities and equipment exhaust discharged to the outside atmosphere above grade and remote from air intakes?	
☑	☐	☐	☐	☐	20. Are chemical shipping containers fully labeled to include chemical name, purity, concentration, supplier name and address, and evidence of ANSI/NSF certification?	
☑	☐	☐	☐	☐	21. Are acids and caustics kept in closed corrosion-resistant shipping containers or storage units?	
☑	☐	☐	☐	☐	22. Are at least one pair of rubber gloves, a dust respirator of a type certified by NIOSH for toxic dusts, an apron or other protective clothing and goggles or face mask provided for each operator as required by the reviewing authority?	
☑	☐	☐	☐	☐	23. Is a deluge shower and/or eyewashing device installed where strong acids and alkalis are used or stored?	

DISINFECTION - PG. 1 - Systems Using Only Groundwater

Survey Date: 1/0/1900 | PWS #: 7300042

A separate form must be filled out for each disinfection unit in the PWS.

(mm/dd/yyyy): 8/11/2016

Treatment Facility Name:	Treatment Facility Location:	Date Online: ☐ Unk	Treated Water (GPD): ☐ Unk
Treatment Plant	Treatment Plant	2006	2.6-5

Select all disinfection types used:

☐ Gas cl2 ☐ UV Light ☑ Sodium Hypochlorite ☐ Calcium Hypochlorite ☐ Miox ☐ Ozone ☐ Chlorine Dioxide ☐ Other

yes	no	n/a	unk	note	DISINFECTION
☐	☑	☐	☐	☐	1. Is disinfection used on a voluntary basis to prevent bacterial contamination of the distribution system?
☐	☑	☐	☐	☐	2. Any interruptions in disinfection in the past year? If yes, comment.
☐	☑	☐	☐	☐	3. Have any changes been made to this treatment facility since the last ESS?
☐	☐	☑	☐	☐	4. If yes, were plans and specs submitted to DEQ? Date approved:
☑	☐	☐	☐	☐	5. Does the system have a means of measuring the residual disinfectant concentrations of free chlorine, combined chlorine (chloramines), and/or chlorine dioxide?
☑	☐	☐	☐	☐	6. Is a smooth nosed sample tap provided before and after treatment?
☑	☐	☐	☐	☐	7. Is a chlorine residual being recorded when all compliance total coliform samples are being taken?

yes	no	n/a	unk	note	VOLUNTARY DISINFECTION
☐	☐	☑	☐	☐	8. Is a measurable free chlorine residual maintained throughout the distribution system? *(Recommended)*
☐	☐	☑	☐	☐	9. Is the free chlorine residual being measured daily? *(Recommended)*
☐	☐	☑	☐	☐	10. Is an automatic proportioning chlorinator being used where the rate of flow is not reasonably constant?
☐	☐	☑	☐	☐	11. Is the analysis for free chlorine residual being made at a frequency that is sufficient to detect variations in chlorine demand or changes in water flow?

yes	no	n/a	unk	note	REQUIRED DISINFECTION
☑	☐	☐	☐	☐	12. Is the free chlorine residual being measured daily at a location prior to the first service connection?
☑	☐	☐	☐	☐	13. Is the daily free chlorine residual being recorded and kept on file for a minimum of 1 year?
☑	☐	☐	☐	☐	14. Is a detectable chlorine residual maintained throughout the distribution system?
☑	☐	☐	☐	☐	15. Is an automatic proportioning chlorinator being used where the rate of flow is not reasonably constant?
☑	☐	☐	☐	☐	16. Where chlorination is required for protection of the supply, is there standby equipment of sufficient capacity available to replace the largest unit?
☐	☐	☑	☐	☐	17. If primary disinfection is accomplished using ozone or some other chemical that does not provide a residual disinfectant, is chlorine added to provide a residual disinfectant?

Comments:
(Please indicate the question number)

12. Residual is measured continuously and is measured at the discharge from the 1.5 MG storage tank.

GAS DISINFECTION ONLY - Fill out any time Gas Chlorination is connected to the PWS.

Comments: (Please indicate the question number)

yes	no	n/a	unk	note	
					PROTECTIVE EQUIPMENT
☐	☐	☐	☐	☐	18. Is respiratory protection equipment, meeting the requirements of NIOSH available where chlorine gas is handled, and is it stored at a convenient location, but not inside any room where chlorine is used or stored?
☐	☐	☐	☐	☐	19. Does the respiratory protection equipment consist of compressed air, that has at least a 30 minute capacity, and is compatible with or exactly the same as units used by the fire department responsible for the plant?
					CHLORINE LEAK DETECTION
☐	☐	☐	☐	☐	20. Is a bottle of ammonium hydroxide (56 percent ammonia solution) available for chlorine leak detection?
☐	☐	☐	☐	☐	21. Where ton containers are used, is a leak repair kit approved by the Chlorine Institute provided?
☐	☐	☐	☐	☐	22. Is chlorine gas leak detection equipment provided?
☐	☐	☐	☐	☐	23. Where a leak detector is provided, is it equipped with both an audible alarm and a warning light?
					CHLORINE ROOM
☐	☐	☐	☐	☐	24. Is a separate room provided for gas chlorination equipment?
☐	☐	☐	☐	☐	25. Do pressurized chlorine feed lines carry chlorine gas beyond the chlorinator room?
☐	☐	☐	☐	☐	26. Is the chlorine room provided with a shatter resistant inspection window installed in an interior wall?
☐ Significant	☐ Deficiency				
☐	☐	☐	☐	☐	27. Is the chlorine room constructed in such a manner that all openings between the chlorine room and the remainder of the plant are sealed?
☐	☐	☐	☐	☐	28. Are the chlorine room doors equipped with panic hardware, assuring ready means of exit and opening outward only to the building exterior?
☐	☐	☐	☐	☐	29. Where chlorine gas is used, does each room have a ventilating fan.
☐	☐	☐	☐	☐	30. Does the ventilating fan take suction near the floor and discharge away from any air inlets?
☐	☐	☐	☐	☐	31. Are all air inlets through louvers near the ceiling?
☐	☐	☐	☐	☐	32. Are there separate switches for the fan and lights located outside of the chlorine room and at the inspection window?
☐	☐	☐	☐	☐	33. Are outside switches protected from vandalism?
					CHLORINE GAS CYLINDERS
☐	☐	☐	☐	☐	34. Are chlorinator rooms heated to 60 °F, and protected from excessive heat?
☐	☐	☐	☐	☐	35. Are full and empty cylinders of chlorine gas isolated from operating areas?
☐	☐	☐	☐	☐	36. Are full and empty cylinders of chlorine gas restrained in position to prevent upset?
☐	☐	☐	☐	☐	37. Are full and empty cylinders of chlorine gas stored in rooms separate from ammonia storage?
☐	☐	☐	☐	☐	38. Are full and empty cylinders of chlorine gas stored in areas that are not in the direct sunlight or exposed to excessive heat?
☐	☐	☐	☐	☐	39. Is a reasonably precise weight scale provided for weighing cylinders, at all plants utilizing chlorine gas?
☐	☐	☐	☐	☐	40. Is there an automatic switch-over of chlorine cylinders provided, where necessary, to assure continuous disinfection? *(Recommended)*

Idaho Department of Environmental Quality
Idaho Falls Regional Office
Sanitary Survey Report
City of Salmon
August 11, 2016

I. INTRODUCTION

A. Purpose of Report

The purpose of this report is to present a sanitary engineering review of the City of Salmon water system that was conducted on August 11, 2016. The purpose of this report is also to identify significant deficiencies (health hazards) that must be corrected by the water system. There were not significant deficiencies identified during the inspection of the water system. During the inspection two items were identified as needing additional attention, they are as follows:

1. **The ladder in the storage tank is rusting and the system should be aware that the structural integrity of the ladder will continue to degrade.**
2. **The backflow preventers located within the treatment plant are overdue for testing.**

B. Summary and Description of System

The primary drinking water supply sources for the City of Salmon are the three creek intakes; Chipps Creek, Pollard Creek, and Jesse Creek. The city also obtains water from the Salmon River, but due to the need for pumping and the increased suspended solids, the Salmon River is used as a supplemental source. All four sources of water are treated with membrane filtration at the Water Treatment Plant (WTP). The WTP is located on a high bench west of town against the foothills. Adjacent to the WTP is the 1.5 million gallon (MG) finished water concrete storage reservoir. The storage reservoir delivers finished water by gravity to the distribution system.

The WTP is designed to treat 4.0 million gallons per day (mgd), and could be easily expanded to 5.2 mgd. The WTP consists of four racks of pressure membrane filters each capable of treating 1 mgd, the racks can accept additional membrane modules to achieve the 5.2 mgd design capacity. Currently the maximum daily demand for the City of Salmon water system is approximately 2.6 mgd.

II. INVESTIGATION AND ANALYSIS

A. Sources of Information

1. James Miller, Water System Operator
3. Plans and Specifications

4. Field Investigation

B. Sources

The primary drinking water supply sources for the City of Salmon are the three creek intakes; Chipps Creek, Pollard Creek, and Jesse Creek. The creeks feed the water system by gravity and are of high quality and low in suspended solids. The Salmon River intake requires delivery to the WTP through pumping, and typically has higher suspended solids, therefore, is used as a supplemental source of supply.

1. Creek Sources

The primary source of raw water for the City of Salmon is from a combination of Chipps Creek, Pollard Canyon Creek, and Jesse Creek. All creek diversions are manually operated and adjusted. The Chipps Creek diversion flows into Pollard Creek by gravity through a transmission main. The Chipps Creek transmission line discharges water immediately upstream of the Pollard Creek intake structure.

The Pollard Creek diversion consists of weirs on the main stream equipped with adjustable stop-logs that can be used to pool the water and diverted to the diversion channel and transmission pipeline. The diversion channel is equipped with course screens to keep out large objects. Periodic cleaning of the screens is necessary to ensure maximum flow.

The combined Chipps Creek and Pollard Creek water flow to the Jesse Creek intake by gravity through a transmission main. A slide gate at the Jesse Creek diversion can be manually adjusted to divert an approximate flow rate of 1,500 gpm. Unlike the other diversions, the Jesse Creek diversion can be manually or automatically controlled using the flow control valve at the pre-sedimentation pond valve house. With the exception of isolated times of the year when runoff produces elevated levels of color and turbidity, water from the creek sources is of high quality. The three creek sources account for approximately 80 percent of the City's water usage.

2. Salmon River Intake

The Salmon River is used as a supplementary water source. The Salmon River intake is located at Island Park at an elevation approximately 500 feet lower than the WTP. Therefore, water from the Salmon River intake must be pumped to the sedimentation basins through a 12 inch diameter transmission line. Upon reaching the WTP the Salmon River intake water can be blended with the creek intakes prior to the sedimentation ponds, discharged directly into the North Pre-sedimentation Pond, or diverted directly to the WTP.

Raw water from the Salmon River Intake is pumped to the WTP through two vertical turbine pumps with the following capacities:

- 125 Hp – 900 gpm
- 200 Hp – 1,300 gpm

- Both pumps 1,950 gpm

C. Treatment

The Salmon WTP treats the raw water with three treatment processes; pretreatment, membrane filtration, and disinfection.

1. Pre-treatment

There are three pre-treatment processes at the Salmon WTP. The pretreatment removes the more settleable solids, color, and other organics, and improves membrane filtration efficiency. The pretreatment process consists of pre-sedimentation, coagulation/rapid mixing, and flocculation.

The pre-sedimentation ponds are clay-lined earthen ponds with an approximate capacity of 1.5 MG each. Each pond has rock baffle walls on the inlet and outlet to help remove large debris. The pre-sedimentation ponds help remove settleable solids such as sand. All of the surface water intakes can be routed into the pre-sedimentation ponds prior to the Salmon WTP.

The WTP has a single rapid mixer, located in the Membrane room near the entrance in a grated over vault. The type of mixer is a mechanical in-line rapid mixer, it provides high intensity mixing to disperse alum as it is added to the raw water. The mixer has injection ports for alum, sodium hydroxide, and chlorine solution. The process of coagulant addition (alum) and mixing is referred to as coagulation. Coagulant addition is only necessary during the times of the year that the raw water is high in color and TOC.

Following coagulation the water enters a single-stage flocculator. The flocculation basin is equipped with a vertical turbine type mixer (flocculator) that promotes flocculation by gently mixing the coagulated water. The mixer is mounted above the flocculation basin and is accessible by bridge and ladder. The detention time in the basin is 10.9 minutes at the design capacity of 4 MGD. The flocculation basin is equipped with a drain mud valve which connects to a sump, and an overflow pipe which discharges to daylight to a ditch at the east side of the WTP building near the 1.5 MG reservoir.

2. Membrane Filtration

After pretreatment the water is pumped through four modular racks or membrane filters. The water is drawn through the membrane filters from the pretreatment by a differential pressure developed with feed pumps. Thc microfiltration process at the WTP is the Microza® Microfiltration system manufactured by the PALL Corporation. The Microza® Microfiltration system utilizes pressure vessels containing hollow fiber membranes which are operated in an outside-to-inside flow path. The membranes have a nominal pore size of 0.1 microns forming a physical barrier that prevents the passage of larger contaminants and solids. The filtered water is referred to as filtrate or permeate. The filtrate is discharged from the microfiltration unit, while the concentrated solids (reject) remain captured on the surface of the membrane fibers.

The removal of solids on the outside of the membrane fibers results in headloss and a rise in the trans-membrane pressure (TMP). As in the case with conventional filters, the membranes require periodic cleaning for efficient operation. Because membrane filtration is a straining process with the bulk of the solids removed at the surface, the cleaning is quite frequent, currently every 23,000 gallons. The method of cleaning is to back-flush with filtrate (reverse flow) while applying air to the module to agitate the fibers (air scrub). Low pressure air is applied to the module to create turbulence at the membrane fiber surface. The turbulence helps to dislodge the accumulated solids, allowing them to be flushed to waste. In addition, the membranes are backwashed with a heavy dose of chlorine every 5 MG.

The Pall Microza® microfiltration system is a pre-engineered membrane system designed to filter up to 4.16 MGD of water. The Pall system consists of feed pumps, pre-filter strainers, four filter racks with 200 modules, reverse filtration pumps, a clean-in-place (CIP) chemical system, compressed air equipment, and control equipment required for system operation.

Each individual module produces filtered water while operating in forward flow. It would not be beneficial or practical to control each of the modules. Therefore, the Pall Corporation has designed a filter rack system. Each filter rack system consists of two main parts:

- The "valve rack" is a pre-assembled unit that consists of all of the control valves, electronic controls and instruments for that filter rack.
- The "module racks" are long manifolds that support the modules, supply feed water, collect treated water, and also carry chemical cleaning solutions to and from the modules. The module racks for one filter rack connect to each other in series and, in addition, connect to a valve rack by a set of shaped pipe spools.

D. Storage

The water system is equipped with a 1.5 MG concrete storage tanks. The storage tank is partially buried and located adjacent to the WTP. Water enters the storage tank through a 16 inch connection and exits the tanks via a 20 inch transmission ma in. The Finished water reservoir "floats" on the city distribution system, therefore, the effluent flow rate fluctuates with system demand. The storage tank also serves as the chlorine contact basin for the WTP. The storage tank is equipped with two access hatches that have overhanging locking covers. The tank is also equipped with screened vents and a valved drain. The tank is not equipped with an overflow and is showing some signs of wear. Small cracks in the tank lid and along the sides are present. It appears that there have been some patches to the concrete on the side of the tank in the past. The storage reservoir was cleaned in November of 2012 and is routinely cleaned approximately every five years.

E. Distribution System

The distribution system is a mostly looped system that consists of mostly ductile iron pipe. The water system has been expanding in recent years in order to add more customers. Currently the distribution system serves approximately 3122 people through approximately 1620 service

connections. Individual service connections are metered and consumers are assessed a fee according to usage. The City of Salmon water system is designed to supply fire flow, and fire hydrants are located throughout the distribution system.

F. Pump Facilities and Controls

The City of Salmon water system is equipped with several pumps that are integral to water system performance. The water pumps that have already been discussed include the two pumps at the Salmon River Intake, and the rapid mixer inside the WTP for coagulation.

In Addition, the water system has three vertical turbine feed pumps that are installed at the end of the flocculation basin and are used to deliver the pre-treated water to the membrane racks with sufficient inlet pressure for the process. All three pumps are Goulds pumps equipped with a 100 Hp U.S. Electric motors. Under normal operation, two of the feed pumps are used; the third is a redundant pump. The feed pumps are equipped with adjustable speed drives (ASDs) to control membrane inlet flow/pressure to meet the process requirements. After the vertical turbine pumps are the four pre-filter strainers to remove coarse particles that potentially could damage the membrane filters. The pre-filters are 300 micron screens that are automated to backwash when the pressure diffential between inlet and outlet becomes too great.

The treatment system is equipped with several chemical feed pumps that supply the water system with disinfectant and chemicals for cleaning (alum, caustic soda, chlorine). The backwash of the membrane filtration system is performed by two reverse filtration pumps. The reverse filtration pumps are horizontal end suction type pumps equipped with a 20 Hp variable frequency drive motor. The pumps are designed to deliver a reverse flow rate of 8 gpm/module.

The clean in place system (CIP) is equipped with 4 vertical multi-stage centrifugal pumps. The pumps are equipped with a 7.5 Hp motor with a constant speed drive. The finished water is protected from the CIP system by a reduced principle backflow preventer to protect the finished water from accidental chemical contamination.

Plant Control Systems:

The Salmon WTP process instrumentation and control system provides centralized monitoring and control of treatment processes and equipment. Monitoring and control functions are implemented through operator interactions with process graphic displays contained on operator workstations located in the plant control room and the membrane room. The plant control system is used to implement automatic control strategies such as equipment interlocking, chemical feed control, flow control for membrane filters, filter backwashing, and clearwell level. To alert the operators of process equipment malfunctions, the control system displays and logs alarm conditions. In addition, the system has the capability to trend measured process variables such as flow turbidities, and chlorine residuals.

G. Monitoring and Reporting

The City of Salmon water system is classified as a community water system and is required to monitor for Total Coliform bacteria, Turbidity, Nitrate/Nitrite, Inorganic Chemicals (IOC), Volatile Organic Chemicals (VOC), Synthetic Organic Chemicals (SOC), Lead/Copper, and Radiological constituents. The water system is currently in significant compliance with the Idaho Rules for Public Drinking Water Systems. Earlier this year the water system exceeded the Maximum Contaminant Level (MCL) for the disinfection by-product haloacetic acid (HAA5) and total trihalomethanes. The water system is currently monitoring quarterly for disinfection by-products, and subsequent samples have all been below the MCL. Records are maintained for bacteriological and chemical analysis, repairs and maintenance, and correspondence with the DEQ. The water system does an adequate job of keeping records for the water system.

H. Operation and Maintenance

The overall management of the water system is under the control of the City of Salmon. James Miller is the certified responsible in charge (RIC) operator for the water system and Harry Shanafelt is the certified backup operator. The city of salmon water system is a metered system and customers pay a set rate for water consumption. The system has established some maintenance and cleaning schedules for the parts of the water system that require routing maintenance and cleaning (e.g. storage tank, membranes, intake screens).

The maintenance process for the membrane filtration system is referred to as flux maintenance. In flux maintenance the membrane modules undergo a programmed cleaning regimen in order to recover the transmembrane pressure and remove any solids that have accumulated on the membrane surfaces. The majority of the accumulated solids are readily removed by the reverse flow/air scrub process. Some organic and inorganic residuals (foulants) are not removed by the RF/AS and require more rigorous chemical cleaning to restore membrane permeability. Enhanced flux maintenance (EFM) and clean-in-place (CIP) cleaning regimes for dealing with these more stubborn foulants. The following processes are included in the flux maintenance regimen:

- Air Scrub (AS)
- Feed flush (FF)
- Reverse flush (RF)
- Integrity test (IT)
- Enhanced flux maintenance (EFM)
- Clean-in-place (CIP)

Air Scrub – Air is introduced to the feed side of the membranes at a rate of 4 scfm/module, while the reverse-flush pump back flushes at a rate of 8 gpm/module. The air agitates the fiber bundle. The combination of the air scrub and back-flush dislodges any accumulated solids and carries the solids to the process drain. The AS process lasts for approximately 1 minute. An air backwash is performed every 23,000 gallons, and the membranes are given an air pressure test daily to determine membrane integrity.

Feed Flush – The FF follows the air scrub process. The FF is performed using the feed pump

operating at 18 gpm/module to flush the modules for about 30 seconds. Any remaining solids and air bubbles are carried to the process drain.

Reverse Flush – The RF process can be used in lieu of the FF process. When used in the flushing role, the RF process follows the AS process. The RF process uses the reverse filtrate pump to pump filtrate at a rate of 8 gpm/module back through the modules to flush any remaining solids and air bubbles to the drain. The RF process lasts for about 30 seconds. It is also possible to program the membrane system to utilize hydraulic back-flushing only. During an RF only wash, the RF wash water and solids removed from the membranes are discharged to the process drain.

Integrity Test – The system undergoes an automatic 7-minute IT based on a predetermined interval (i.e. runtime hours). This test checks for broken fibers in the modules. During the IT, feed flow and filtrate flow are interrupted. The IT is performed once daily at the Salmon WTP.

Enhanced Flux Maintenance – The EFM process utilizes a chemical solution of sodium hypochlorite to remove organic matter that may have accumulated on the membrane surfaces. The frequency of the EFM is generally based on raw water quality, however, would typically be performed no more frequently than once per day. The EFM increases overall system efficiency and extends the interval between more rigorous CIP cleanings. The EFM is performed similarly to the CIP, however, utilizes a weaker chlorine solution and the cleaning interval is substantially shorter. The EFM is an automated process. The EFM cleaning solution is batched and heated and is circulated through the membrane rack cleaned for 15-60 minutes. The Salmon WTP performs an EFM every 5 million gallons.

Clean-in-place – The flux maintenance processes described earlier are not 100 percent effective and solids will eventually build up that cannot be removed using AS, FF, RF, or EFM processes. When this happens, the membranes must undergo a more rigorous chemical cleaning known as clean-in-place, or CIP. Cleaning compounds used in the CIP process include sodium hypochlorite, caustic soda, and citric acid. The CIP process is automatically controlled. Again, the cleaning solutions are batched in dedicated tanks and the solution is heated for greater cleaning efficiency. At the time of inspection the CIP frequencies where as follows:

CIP solution conducted every 5 million gallons

- 1600 gallons water
- 1.0 gallons caustic soda
- 11.5 gallons chlorine

CIP solution conducted every 3 months

- 1500 gallons water
- 102 gallons caustic soda
- 11.5 gallons chlorine

Overall the system is relatively new and the operation and maintenance is being performed and adequate.

Photographic Documentation

Name of Facility: City of Salmon

Inspector(s): Carlin Feisthamel

Inspection Date: Thursday, August 11, 2016

Purpose of Inspection: Enhanced Sanitary Survey

Publish Date: Wednesday 14 September 2016

Table of Photographs:

Photograph 1: Flow Meter

Photograph 2: RP device located inside water treatment plant

Photograph 3: Backflow tester inspection tag, testing overdue

Photograph 4: Flocculation tank

Photograph 5: Waterline in the flocculation tank

Photograph 6: Prefiltration

Photograph 7: Pumps to filters with air release and pressure gauges

Photograph 8: Micro filtration system

Photograph 9: RP device for filter backwash

Photograph 10: Citric Acid solution for backwash

Photograph 11: Citric Acid solution with secondary containment

Photograph 12: Overflow protection and drain on chlorine tank

Photograph 13: Chlorine tank with liquid level sight glass

Photograph 14: Tank access and ladder

Photograph 15: Storage tank screened vent

Photograph 16: Storage tank vent with overlapping lid

Photograph 17: Storage tank access ladder. Ladder does show signs of corrosion

Photograph 18: Raw water reservoir

Photograph 19: Creek diversion capturing raw water

Photograph 20: Surface water diversion which feed raw water reservoir

APPENDIX G – Cost Estimates

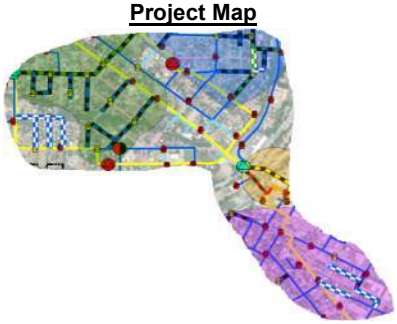
City of Salmon
Water Facilities Planning Study: Cost Estimates

Improvements to be Completed by City

Objective:
Upgrade undersized or aging distribution lines
Replace aging water meters
Improve chemical feed system at water treatment plant
Replace aging instrumentation at water treatment plant

Potential Issues:
High static pressures in some areas of distribution system

Project Map



See Figure 5-1

Description	Unit	Unit Price	Estimated Quantity	2019 Cost
8" PVC Pipe	LF	$66.00	400	$26,400
6" PVC Pipe	LF	$60.00	4,215	$252,900
Service Connections	EA	$1,200.00	60	$72,000
New Hydrant Assembly	EA	$6,400.00	1	$6,400
Asphalt Surface Restoration - half lane repair	LF	$40.00	4,615	$184,600
Replacement of Water Meters (purchase)	EA	$250.00	1,620	$405,000
Chemical Feed System Improvements at WTP	LS	$70,000.00	1	$70,000
Instrumentation Replacement at WTP (Turbidimeters and Current Meters)	LS	$60,000.00	1	$60,000
Construction Subtotal				***$1,078,000***
Mobilization - Percent of Item Cost Sum	%	0%		$0
Contingency - % of Construction Costs	%	20%		$215,600
Total Construction Costs				***$ 1,293,600***
Engineering and CMS - % of Construction Costs	%	0%		$ -
Total Project Cost				***$ 1,294,000***

* All costs in 2019 Dollars.

The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

City of Salmon
Water Facilities Planning Study: Cost Estimates

Storage Alternative - New Generator

Objective:
Provide emergency power to the water treatment plant

Potential Issues:
Electrical connnection

Project Map

Description	Unit	Unit Price	Estimated Quantity	2019 Cost
Generator at Water Treatment Plant	LS	$150,000.00	1	$150,000
Concrete Pad	LS	$5,000.00	1	$5,000
Electrical Improvements (ATS, wiring)	LS	$50,000.00	1	$50,000
Construction Subtotal				***$205,000***
General Conditions - % of Construction Subtotal	%	15%		$30,750
Contractor OH&P - % of Construction Subtotal	%	15%		$30,750
Contingency - % of Construction Subtotal	%	30%		$61,500
Total Construction Costs				***$ 328,000***
Engineering, CMS, Legal, Funding, Misc. - % of Construction Costs	%	25%		$ 82,000
Total Project Cost (rounded)				***$ 410,000***

* All costs in 2019 Dollars.

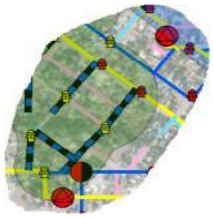
City of Salmon
Water Facilities Planning Study: Cost Estimates

Distribution Alternative - New PRVs

Objective:
Split current middle zone into two pressure zones to decrease pressure at bridge and lower PRV station.

Potential Issues:
High static pressures in some areas of distribution system

Project Map



See Figure 5-1

Description	Unit	Unit Price	Estimated Quantity	2019 Cost
New PRV station (vault, valves, etc.)	EA	$40,000.00	2	$80,000
Cut in New 6" Isolation Valve	EA	$5,000.00	1	$5,000
Asphalt Surface Restoration - half lane repair	LF	$40.00	60	$2,400
Construction Subtotal				***$88,000***
General Conditions - % of Construction Subtotal	%	15%		$13,200
Contractor OH&P - % of Construction Subtotal	%	15%		$13,200
Contingency - % of Construction Subtotal	%	30%		$26,400
Total Construction Costs				***$ 141,000***
Engineering, CMS, Legal, Funding, Misc. - % of Construction Costs	%	25%		$ 35,250
Total Project Cost (rounded)				***$ 176,000***

* All costs in 2019 Dollars.

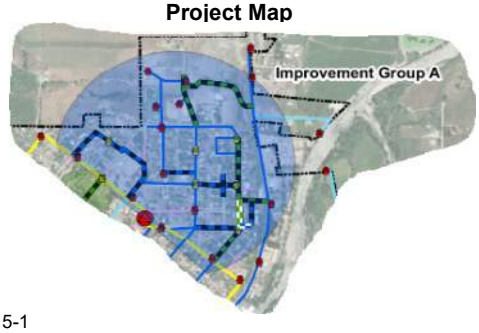
City of Salmon
Water Facilities Planning Study: Cost Estimates

Distribution Alternative - Group A

Objective:
Upgrade undersized or aging distribution lines

Potential Issues:
High static pressures in some areas of distribution system

Project Map



See Figure 5-1

Description	Unit	Unit Price	Estimated Quantity	2019 Cost
8" PVC Pipe	LF	$85.00	3,831	$325,635
6" PVC Pipe	LF	$80.00	4,225	$338,000
Service Connections	EA	$1,200.00	40	$48,000
New Hydrant Assembly	EA	$6,400.00	5	$32,000
Asphalt Surface Restoration - half lane repair	LF	$40.00	8,056	$322,240
Construction Subtotal				***$1,066,000***
General Conditions - % of Construction Subtotal	%	15%		$159,900
Contractor OH&P - % of Construction Subtotal	%	15%		$159,900
Contingency - % of Construction Subtotal	%	30%		$319,800
Total Construction Costs				***$ 1,706,000***
Engineering, CMS, Legal, Funding, Misc. - % of Construction Costs	%	25%		$ 426,500
Total Project Cost (rounded)				***$ 2,133,000***

* All costs in 2019 Dollars.

City of Salmon
Water Facilities Planning Study: Cost Estimates

Distribution Alternative - Group B

Objective:
Upgrade undersized or aging distribution lines

Potential Issues:
High static pressures in some areas of distribution system

Project Map

See Figure 5-1

Description	Unit	Unit Price	Estimated Quantity	2019 Cost
8" PVC Pipe	LF	$85.00	2,003	$170,255
6" PVC Pipe	LF	$80.00	4,876	$390,080
Service Connections	EA	$1,200.00	55	$66,000
New Hydrant Assembly	EA	$6,400.00	11	$70,400
Asphalt Surface Restoration - half lane repair	LF	$40.00	6,879	$275,160
Creek/Canal Crossing (casing, end seals, restrained pipe)	LS	$20,000.00	1	$20,000
Construction Subtotal				***$992,000***
General Conditions - % of Construction Subtotal	%	15%		$148,800
Contractor OH&P - % of Construction Subtotal	%	15%		$148,800
Contingency - % of Construction Subtotal	%	30%		$297,600
Total Construction Costs				***$ 1,588,000***
Engineering, CMS, Legal, Funding, Misc. - % of Construction Costs	%	30%		$ 476,400
Total Project Cost (rounded)				***$ 2,064,000***

* All costs in 2019 Dollars.

The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

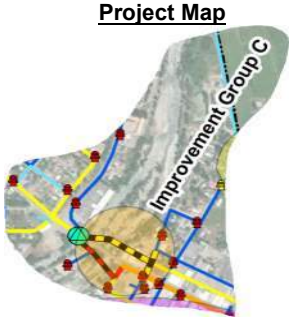
Shoshone-Bannock Tribes
Water Facilities Planning Study: Cost Estimates

Distribution Alternative - Group C

Objective:
Upgrade 14" line feeding lower zone from PRV. Line is exposed in the Salmon River and will be replaced using open cut method by bypassing the river into one channel, installling the pipe, then bypassing the water into the other channel while the rest of the pipe is installed. Redo both crossings at the same time while the river is bypassed.

Potential Issues:
Sensitive area due to environmental protections on Salmon River.

Project Map



See Figure 5-1

Description	Unit	Unit Price	Estimated Quantity	2019 Cost
14" PVC Pipe	LF	$100.00	640	$64,000
10" PVC Pipe	LF	$90.00	1,000	$90,000
Steel Casing, Seals, Restrained Pipe	LS	$80,000.00	1	$80,000
River Isolation & Dewatering	LS	$210,000.00	1	$210,000
Asphalt Surface Restoration - half lane repair	LF	$40.00	400	$16,000
Gravel Surface Repair	LF	$8.00	600	$4,800
Construction Subtotal				***$465,000***
General Conditions - % of Construction Subtotal	%	15%		$69,750
Contractor OH&P - % of Construction Subtotal	%	15%		$69,750
Contingency - % of Construction Subtotal	%	30%		$139,500
Total Construction Costs				***$ 744,000***
Engineering, CMS, Legal, Funding, Misc. - % of Construction Costs	%	25%		$ 186,000
Total Project Cost (rounded)				***$ 930,000***

* All costs in 2019 Dollars.

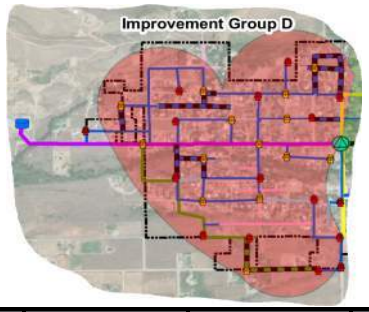
City of Salmon
Water Facilities Planning Study: Cost Estimates

Distribution Alternative - Group D

Objective:
Upgrade undersized or aging distribution lines

Potential Issues:
High static pressures in lower part of zone

Project Map



See Figure 5-1

Description	Unit	Unit Price	Estimated Quantity	2019 Cost
8" PVC Pipe	LF	$85.00	1,460	$124,100
6" PVC Pipe	LF	$80.00	5,129	$410,320
Service Connections	EA	$1,200.00	47	$56,400
New Hydrant Assembly	EA	$6,400.00	11	$70,400
Asphalt Surface Restoration - half lane repair	LF	$40.00	6,589	$263,560
Creek/Canal Crossing (casing, end seals, restrained pipe)	EA	$20,000.00	1	$20,000
Construction Subtotal				***$945,000***
General Conditions - % of Construction Subtotal	%	15%		$141,750
Contractor OH&P - % of Construction Subtotal	%	15%		$141,750
Contingency - % of Construction Subtotal	%	30%		$283,500
Total Construction Costs				***$ 1,512,000***
Engineering, CMS, Legal, Funding, Misc. - % of Construction Costs	%	25%		$ 378,000
Total Project Cost (rounded)				***$ 1,890,000***

* All costs in 2019 Dollars.

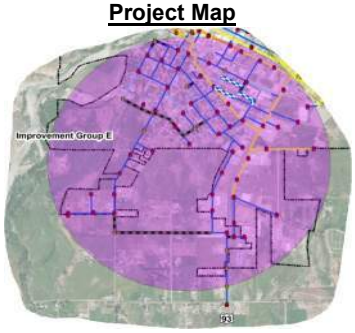
City of Salmon
Water Facilities Planning Study: Cost Estimates

Distribution Alternative - Group E

Objective:
Upgrade undersized or aging distribution lines

Potential Issues:
High static pressures in some areas of distribution system

Project Map



See Figure 5-1

Description	Unit	Unit Price	Estimated Quantity	2019 Cost
8" PVC Pipe	LF	$85.00	5,401	$459,085
6" PVC Pipe	LF	$80.00	1,102	$88,160
Service Connections	EA	$1,200.00	12	$14,400
New Hydrant Assembly	EA	$6,400.00	10	$64,000
Asphalt Surface Restoration - half lane repair	LF	$40.00	3,803	$152,120
Misc. Surface Restoration	LF	$5.00	2,700	$13,500
Bore Highway Crossing	LF	$450.00	100	$45,000
Creek/Canal Crossing (casing, end seals, restrained pipe)	EA	$20,000.00	2	$40,000
Construction Subtotal				***$877,000***
General Conditions - % of Construction Subtotal	%	15%		$131,550
Contractor OH&P - % of Construction Subtotal	%	15%		$131,550
Contingency - % of Construction Subtotal	%	30%		$263,100
Total Construction Costs				***$ 1,404,000***
Engineering, CMS, Legal, Funding, Misc. - % of Construction Costs	%	25%		$ 351,000
Total Project Cost (rounded)				***$ 1,755,000***

* All costs in 2019 Dollars.

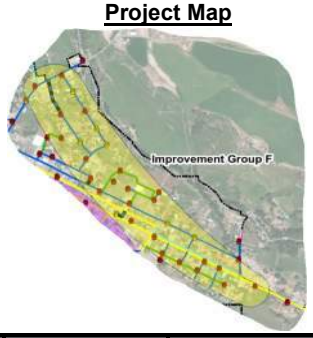
City of Salmon
Water Facilities Planning Study: Cost Estimates

Distribution Alternative - Group F

Objective:
Upgrade undersized or aging distribution lines

Potential Issues:
High static pressures in some areas of distribution system

Project Map



See Figure 5-1

Description	Unit	Unit Price	Estimated Quantity	2019 Cost
10" PVC Pipe	LF	$100.00	50	$5,000
6" PVC Pipe	LF	$80.00	1,224	$97,920
Service Connections	EA	$1,200.00	3	$3,600
New Hydrant Assembly	EA	$6,400.00	9	$57,600
Asphalt Surface Restoration - half lane repair	LF	$40.00	1,274	$50,960
Construction Subtotal				***$216,000***
General Conditions - % of Construction Subtotal	%	15%		$32,400
Contractor OH&P - % of Construction Subtotal	%	15%		$32,400
Contingency - % of Construction Subtotal	%	30%		$64,800
Total Construction Costs				***$ 346,000***
Engineering, CMS, Legal, Funding, Misc. - % of Construction Costs	%	25%		$ 86,500
Total Project Cost (rounded)				***$ 433,000***

* All costs in 2019 Dollars.

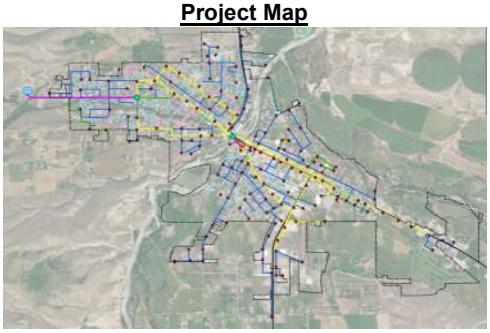
City of Salmon
Water Facilities Planning Study: Cost Estimates

Distribution Alternative - Remaining 4-inch Pipes

Objective:
Upgrade undersized distribution lines
Add fire hydrants to improve coverage not included in other improvements

Potential Issues:
High static pressures in some areas of distribution system

Project Map



Description	Unit	Unit Price	Estimated Quantity	2019 Cost
6" PVC Pipe	LF	$90.00	26,056	$2,345,040.00
Asphalt Surface Restoration - half lane repair	LF	$40.00	26,056	$1,042,240.00
Service Connections	EA	$1,200.00	520	$624,000
New Hydrant Assembly	EA	$6,400.00	21	$134,400
Construction Subtotal				***$4,146,000***
General Conditions - % of Construction Subtotal	%	15%		$621,900
Contractor OH&P - % of Construction Subtotal	%	15%		$621,900
Contingency - % of Construction Subtotal	%	30%		$1,243,800
Total Construction Costs				***$ 6,634,000***
Engineering, CMS, Legal, Funding, Misc. - % of Construction Costs	%	25%		$ 1,658,500
Total Project Cost (rounded)				***$ 8,293,000***

* All costs in 2019 Dollars.