

Tables

Table 3.1
Summary of Well Construction Information and Geologic Information.

Well Identification Number	General Well Information					Well Information												Geologic Information																		
	Well Not Included in Original List	USGS Video and/or Geophysics Available	GSI Field Assessment Completed	Year Drilled	Well Type	Well Diameter (inches)	Casing Depth (ft bgs)	Seal Depth (ft bgs)	Original Static Water Level			Most Recent Static Water Level			Rate of Decline (ft/year)	Well Depth (ft bgs)	Land Surface Elevation (ft)	Glaciofluvial deposits	Dalles Formation	Pomona Basalt	Selah Interbed	Priest Rapids Lolo	Priest Rapids Rosalia	Quincy Squaw Creek Interbed	Frenchman Springs	Source of Geologic Information	Open Interval (could include casing, but no seal)	Current Saturated Open Units (Tdc, Tpr, Tfr, Tf)	Well Location and Construction Priority							
									Depth (ft bgs)	GW Elevation (ft MSL)	Date	Depth (ft bgs)	GW Elevation (ft MSL)	Date																Top of Formation (ft bgs)	Top of Formation (ft bgs)	Top of Formation (ft bgs)	Top of Formation (ft bgs)	Top of Formation (ft bgs)	Top of Formation (ft bgs)	Top of Formation (ft bgs)
1				1979	Domestic	6	20	18	351	393	4/9/1979	N/A	N/A	N/A	N/A	560	744		0	170		341		531	541	Kienle	Tp-Tpr-Tfs	Tpr-Tfs	2							
2				1979	Domestic	6	20	18	332	403	4/12/1979	360	375	10/24/2007	1.0	580	735		0	165	330	350		550	570	Kienle	Tp-Tpr-Tfs	Tpr-Tfs	2							
3		X		1977	Domestic	8	40	38	240	435	10/18/1977	375	300	10/26/2005	4.8	505	675		0	75	239	247	272	475	495	Kienle/Well Log/Lite	Tp-Tpr-Tfs	Tpr-Tfs	2							
4				1978	Irrigation	8	158	18	270	454	1/23/1978	N/A	N/A	N/A	N/A	450	724		0	153	302	330				Kienle	Tp-Tpr	Tpr?	2							
5			X	2005	Domestic	6	318	318	340	326	4/27/2005	349	317	3/13/2014	1.0	523	666		0	85	237	245	270	467	483	Lite	Tpr-Tfs	Tpr-Tfs	2							
6			X	1978	Irrigation	8	139	18	217	441	1/17/1978	345.1	313	12/23/2013	3.6	515	658		0	123	275	290	315			Kienle/Well Log/Lite	Tp-Tpr	Tpr	2							
7			X	1968	Domestic	8	32.5	32.5	192	479	6/18/1968	369.3	302	12/23/2013	3.9	553	671		0	159	345	365	390			Kienle/Lite	Tp-Tpr	Tpr	2							
8				1993	Domestic	6	23	23	93	289	6/1/1993	N/A	N/A	N/A		190	382		0	10	170	190				Jervey/Log/KL Leon Well Picks	Tp-Tpr	Tp-Tpr	1							
9				1982	Domestic	8	23	23	160	445	6/15/1982	271	334	9/8/2005	4.8	353	605		0	134	282	288	329			Kienle	Tp-Tpr	Tpr?	2							
10				1979	Domestic	6	25	23	+2	461	4/26/1979	N/A	N/A	N/A		235	459		0	18	220	230				Kienle	Tp-Tpr	Tp-Tpr	1							
11		X		1977	Irrigation	8	40	18	255	434	11/14/1977	361	328	3/24/2005	3.9	480	689		0	103		225	240			Kienle/Lite	Tp-Tpr	Tpr	2							
12				1976	Domestic	6	29	28	4	493	8/11/1976	120	377	10/24/2007	3.7	150	497		0	23	140					Kienle	Tp-Tpr	Tpr	2							
13				1985	Domestic/Irrigation	8	20	20	82	401	4/29/1985	107	376	10/2/1992	3.4	256	483		0	14	174	192	230			Kienle	Tp-Tpr	Tp-Tpr	1							
14				1966	Irrigation	6	300	20	+3	399	6/21/1966	80	316	10/13/2005	2.0	315	396		0	70	235	261				Kienle	Tp-Tpr	Tp-Tpr	1							
15				1981	Domestic/Irrigation	8	335	335	+37	411	5/12/1981	62.63	311	7/21/2011	0.8	495	374		0	79	284	339	414			Well Log/Lite	Not commingling based on observations by OWRD staff.									
16		X		1980	Domestic	8	260	85	30	339	3/27/1980	68.21	301	4/12/2011	1.2	340	369		0	78	265	332				Well Log	Not commingling based on observations by OWRD staff.									
17			X	1983	Domestic	6	120	50	158	369	7/14/1983	211.5	315	5/2/2014	1.7	355	527		0	95	290	310	345			Well Log/Lite	Tp-Tpr	Tp-Tpr	1							
18		X		1988	Irrigation	6	53	24	169	418	4/13/1988	N/A	N/A	N/A	N/A	315	587		0	44	225	233	253	450		Kienle/Lite	Not commingling based on observations by OWRD staff.									
19		X		1947	Domestic	6	160	UNK	+18	461	1/1/1947	127	316	2/7/2007	1.8	620	443		0	158	345	395	440			Kienle	Tp-Tpr	Tp-Tpr	1							
20				1990	Irrigation	8	230	18	333	351	10/12/1990	361.7	322	10/7/2013	N/A	576	684		0	105	224	378	400	433		Kienle	Not commingling based on observations by OWRD staff.									

Table 3.1
Summary of Well Construction Information and Geologic Information.

Well Identification Number	General Well Information					Well Information											Geologic Information												
	Well Not Included in Original List	USGS Video and/or Geophysics Available	GSI Field Assessment Completed	Year Drilled	Well Type	Well Diameter (inches)	Casing Depth (ft bgs)	Seal Depth (ft bgs)	Original Static Water Level			Most Recent Static Water Level			Rate of Decline (ft/year)	Well Depth (ft bgs)	Land Surface Elevation (ft)	Glaciofluvial deposits	Dalles Formation	Pomona Basalt	Selah Interbed	Priest Rapids Lolo	Priest Rapids Rosalia	Quincy Squaw Creek Interbed	Frenchman Springs	Source of Geologic Information	Open Interval (could include casing, but no seal)	Current Saturated Open Units (Tdc, Tp, Tpr, Tf)	Well Location and Construction Priority
									Depth (ft bgs)	GW Elevation (ft MSL)	Date	Depth (ft bgs)	GW Elevation (ft MSL)	Date				Top of Formation (ft bgs)	Top of Formation (ft bgs)	Top of Formation (ft bgs)	Top of Formation (ft bgs)	Top of Formation (ft bgs)	Top of Formation (ft bgs)	Top of Formation (ft bgs)					
21				1991	Irrigation	8	437	40	204	400	1/20/1991	N/A	N/A	N/A	N/A	550	604	0	181	241	425	440	494		Kienle/Lite	Not commingling based on observations by OWRD staff.			
22				1944	Domestic/Irrigation	6	431	134	155	528	7/30/1944	386.49	296	4/19/2010	3.5	431	683	0	139	284			424		Jervey	Not commingling based on observations by OWRD staff.			
23				1979	Other	8	300	40	255	415	10/31/1979	391.6	279	10/7/2013	4.0	425	670	0	240	280			408		Kienle	Not commingling based on observations by OWRD staff.			
24		X		1971	Community	8	275	275	+80	373	9/22/1971	N/A	N/A	N/A	N/A	404	293	0		10	193		327		Kienle/Lite	Well decommissioned in 2013			
25				1973	Domestic	6	66	19	12	315	3/7/1973	N/A	N/A	N/A	N/A	120	327	0		57					Kienle	Dalles-Tp	Dalles-Tp	1	
26			X	1981	Domestic	8	210	20, 180-210	90	255	10/29/1981	99.8	245	3/4/2014	0.3	335	345	0		206					Kienle/revise from KL geochem	Glaciofluvial - Tp	Glaciofluvial - Tp	1	
27	X			1986	Domestic/Irrigation	8	272	70	220	263	4/26/1986	N/A	N/A	N/A	N/A	383	483	0	62	345					Kienle/Well Log	Not commingling based on observations by OWRD staff.			
28	X			1975	Domestic	8	275	18	42	393	10/9/1975	N/A	N/A	N/A	N/A	275	435	0							Kienle	Not commingling based on observations by OWRD staff.			
29	X		X	1991	Irrigation	6	254	18	143	389	7/24/1991	158.5	374	3/4/2014	0.7	460	532	0	6	245	360	430			Well Log	Tp-Tpr	Tp-Tpr	1	
30	X		X	1992	Irrigation	8	53	18	160	327	10/28/1992	196.6	290	3/25/2014	1.7	353	487	0		57	222	250	325		Well Log	Tp-Tpr	Tp-Tpr	1	
31	X		X	1997	Irrigation	10 and 8	81	81	46	348	3/21/1997	85	309	3/14/2014	2.3	344	394	0		81	244	296	340		Lite	Tp-Tpr	Tp-Tpr	1	
32	X			2000	Domestic	6	35	35	30	381	9/1/2000	94	317	10/4/2007	9.0	265	411	0		29	101	145	180		Lite/Well Log	Tp-Tpr	Tp-Tpr	1	
33	X			1973	Domestic	6	57	26	7.5	262	4/1/1973	N/A	N/A	N/A	N/A	90	270	0		65					Lite/Well Log	Glaciofluvial-Tp	Glaciofluvial-Tp	1	
34	X			1968	Domestic	8	54	54	104	687	2/26/1968	N/A	N/A	N/A	N/A	144	791	0							Well Log	Glaciofluvial	Glaciofluvial	Not Commingling	
35	X		X	1984	Domestic	8 and 6	360	18	217	525	9/20/1984	422.5	320	5/7/2014	6.9	483	742	0		187	328	353	406		Jervey/Well Log/Lite	Tp-Tpr	Tpr	2	
36	X			1977	Domestic	6	60	30	65	628	6/3/1977	N/A	N/A	N/A	N/A	282	693	0		125					Well Log	Glaciofluvial-Tp	Glaciofluvial-Tp	2	
37	X			1966	Domestic	6	30	30	180	513	10/14/1966	N/A	N/A	N/A	N/A	335	693	0		72		150	170		Well Log/Lite	Tp-Tpr	Tpr	2	
38	X		X	1999	Domestic	8	19	19	48	363	12/8/1999	101	310	5/7/2014	3.7	270	411	0				11	32	264		Lite	Tpr-Tfs	Tpr-Tfs	2
39	X			2005	Domestic	6	139	139	410	444	6/8/2005	N/A	N/A	N/A	N/A	520	854	0		4		87	108	308	315	Lite	Tpr-Tfs	Tfs	3
40	X			1971	Domestic	6	88	86	220	508	10/22/1971	222	506	11/30/1973	0.9	292	728	0		138					Well Log	Dalles-Tp	Tp	Not Commingling	

Notes:
ft bgs = feet below ground surface
ft MSL = feet Mean Sea Level
N/A = Information Not Available
Tp = Pomona Basalt
Tpr = Priest Rapids Basalt (undifferentiated)
Tfs = Frenchman Springs Basalt

Well Location and Construction Priority is based on the the saturated open interval of the well. Wells open and saturated across the Pomona (Tp) and Priest Rapids (Tpr) Basalt aquifers have the highest priority because of historically large pressure differentials between these aquifers. Priority 2 wells may be open to the Pomona (Tp) and Priest Rapids (Tpr) Basalt aquifers, but only the Priest Rapids (Tpr) is currently saturated, reducing the potential for commingling. Priority 3 wells are open to the Priest Rapids (Tpr) and Frenchman Springs (Tfs) Basalt aquifers, but only the Frenchman Springs is saturated, resulting in a very low potential for commingling.

References:
Kienle, C.F., 1995, Hydrogeologic Investigation Transition Lands Study Area, report prepared for: Wasco County Planning and Economic Development Office, Wasco County, Oregon, Northwest Geological Services, Inc., 49 p.
Jervey, G.M. 1996. Transition Lands Study Area Groundwater Evaluation, Wasco County, Oregon. Jervey Geological Consulting, Mosier, Oregon.
Oregon Water Resources Water Well Report, Interpretation based on geologic description
Lite Personal communication with Ken Lite, Oregon Water Resources Department, December 10, 2013, December 16, 2013, May 15, 2014, and July 11, 2014.

Table 3.2
Summary of Well Construction, Geologic Information, and Field Assessment Information.

Well Identification Number	General Well Information															Geologic Information										Commingle Information				
	USGS Video and/or Geophysics Available	GSI Field Assessment Completed	Year Drilled	Well Type	Current Well Diameter (inches)	Casing Depth (ft bgs)	Seal Depth (ft bgs)	Original Static Water Level			Most Recent Static Water Level			Rate of Decline (ft/year)	Well Depth (ft bgs)	Land Surface Elevation (ft)	Glaciofluvial deposits	Dalles Formation	Pomona Basalt	Selah Interbed	Priest Rapids Lolo	Priest Rapids Rosalia	Quincy Squaw Creek Interbed	Frenchman Springs	Source of Geologic Information	Open Interval (could include casing, but no seal)	Current Saturated Open Units (T4c, Tp, Tpr, Tf)	Well Location and Construction Priority	Field Assessment Summary	Relative Amount of Active Commingling Observed
								Depth (ft bgs)	GW Elevation (ft MSL)	Date	Depth (ft bgs)	GW Elevation (ft MSL)	Date																	
3	X		1977	Domestic	8	40	38	240	435	10/18/1977	375	300	10/26/2005	4.8	505	675		0	75	239	247	272	475	495	Kienle/Well Log/Lite	Tp-Tpr-Tfs	Tpr-Tfs	2	Casing appears to be in good condition. Water observed weeping from the sedimentary unit (clay/sandstone) starting at 70' bgs. Basalt contact observed at 300' bgs (broken/brecciated to 109' bgs). Slight iron staining around fractures in borehole suggest water dripping into borehole. Increased seepage observed in a fracture at 241' bgs. Vesicular basalt observed from 290'-315' and 485'-520' bgs. No flow observed in the borehole.	Video indicates no flow, but flow profile indicates moderate flow.
5		X	2005	Domestic	6	318	318	340	326	4/27/2005	349	317	3/13/2014	1.0	523	666		0	85	237	245	270	467	483	Lite	Tpr-Tfs	Tpr-Tfs	2	Casing shows some iron staining and tubercles (increases with depth). The PVC liner and joints appear to be in good condition. Particles observed moving into the liner perforations around 522' bgs, and out of the liner perforations at 450'. Upward flow of approximately 3-7 gpm observed within the liner.	Moderate flow
6		X	1978	Irrigation	8	139	18	217	441	1/17/1978	345.1	313	12/23/2013	3.6	515	658		0	123	275	290	315			Kienle/Well Log/Lite	Tp-Tpr	Tpr	2	Casing appears to be in good condition. Fractured and/or brecciated zones observed at 287'-290', 331'-332' bgs. Occasional large fractures observed from 380'-425' bgs. No flow observed in the borehole.	None
7		X	1968	Domestic	8	32.5	32.5	192	479	6/18/1968	369.3	302	12/23/2013	3.9	553	671		0	159	345	365	390			Kienle/Lite	Tp-Tpr	Tpr	2	Casing appears to be in good condition. Water weeping from clay/cobble unit from 116'-125' bgs. Brecciated basalt and void observed at 137'-139' bgs. Fractured basalt observed at 155', 163', 194', 315'-325', 342', 374', and 539'-542' bgs. No flow observed in the borehole.	None
11	X		1977	Irrigation	8	40	18	255	434	11/14/1977	361	328	3/24/2005	3.9	480	689		0	103		225	240			Kienle/Lite	Tp-Tpr	Tpr	2	Casing appears to be in good condition. Cascading water observed at 82' bgs. Basalt contact observed at 104' bgs. Pressurized water observed flowing (cascading) into borehole at 253' bgs. Vesicular basalt observed from 440'-460' bgs. No other flow observed in the borehole.	Minor flow
17		X	1983	Domestic	6	120	50	158	369	7/14/1983	211.5	315	5/2/2014	1.7	355	527		0	95	290	310	345			Well Log/Lite	Tp-Tpr	Tp-Tpr	1	Casing and welds appear to be in good condition. Fractured basalt observed at 160'-175', 215'-240', 273'-280' bgs. Water observed flowing (cascading) into borehole at 178' bgs. No other flow observed.	Minor flow
19	X		1947	Domestic	6	160	UNK	+18	461	1/1/1947	127	316	2/7/2007	1.8	620	443		0	158	345	395	440			Kienle	Tp-Tpr	Tp-Tpr	1	Slight scaling observed on the casing above and below static water level. Extremely poor visibility in water column. Hole is collapsed at 385' bgs in 2007 video. Video completed in 2010 shows hole collapsed at 402' (well log indicates borehole has a total depth of 620'). No flow observed in the borehole.	None
26		X	1981	Domestic	8	210	20, 180-210	90	255	10/29/1981	99.8	245	3/4/2014	0.3	335	345		0	206						Kienle/revise from KL geochem	Glaciofluvial - Tp	Glaciofluvial - Tp	1	Casing and welds appear to be in good condition. Slight upward flow observed around base of casing (4 gpm). Vesicular/broken basalt observed from 220'-280' bgs. Upward flow of 5-8 gpm observed from 230'-250' bgs.	Minor/Moderate flow
29		X	1991	Irrigation	6	254	18	143	389	7/24/1991	158.5	374	3/4/2014	0.7	460	532		6	245	360	430				Well Log	Tp-Tpr	Tp-Tpr	1	Casing appears to be very corroded and pitted. Vesicular/fractured basalt observed from 260'-300', 410'-400' bgs. Slight fractures observed over most of borehole. Upward flow of approximately 2-3 gpm observed over entire borehole. However, upward flow was only observed on one side of the borehole.	Moderate flow
30		X	1992	Irrigation	8	53	18	160	327	10/28/1992	196.6	290	3/25/2014	1.7	353	487		0	57	222	250	325			Well Log	Tp-Tpr	Tp-Tpr	1	Casing and joints appear to be in good condition. Water observed weeping from base of casing. Fractured basalt observed from 275'-340' bgs. Borehole deviates from straight at 337'-340' bgs. Upward flow of approximately 3-5 gpm observed from 330'-354' bgs.	Moderate flow
31		X	1997	Irrigation	10 and 8	81	81	46	348	3/21/1997	85	309	3/14/2014	2.3	344	394		0	81	244	296	340			Lite	Tp-Tpr	Tp-Tpr	1	Casing appears to be very corroded and pitted. Casing is misaligned/poorly welded at 77' bgs. Casing weld is broken at 118' bgs. Turbulent flow is observed (approximately 12 gpm) at the broken weld, but direction is not apparent. Slight upward flow (2 gpm) at the base of the liner (306.5' bgs).	Moderate/High flow
35		X	1984	Domestic	8 and 6	360	18	217	525	9/20/1984	422.5	320	5/7/2014	6.9	483	742		0	187	328	353	406			Jervey/Well Log/Lite	Tp-Tpr	Tpr	2	Casing appears to be slightly pitted and covered with some scaling. Water is observed dripping into the casing through a hole at 331.6' bgs. Water is also observed dripping into and running behind a hole in the casing at 339' bgs. Significant flow (~3 gpm) dripping around the base of the casing at 361.5' bgs. Fractured basalt observed from 365'-420' bgs. Upward flow of approximately 2 gpm observed from 450'-460' bgs.	Minor flow
38		X	1999	Domestic	8	19	19	48	363	12/8/1999	101	310	5/7/2014	3.7	270	411		0		11	32	264			Lite Verbal	Tpr-Tfs	Tpr-Tfs	2	Casing appears to be in good condition. Large void observed at 36' bgs. Fractured basalt observed from 70'-87'. Vesicular/brecciated basalt observed at 190' and 264' bgs. Upward flow of approximately 1-2 gpm observed from 110'-140' bgs. Upward flow of approximately 2 gpm observed from 170'-264' bgs.	Minor flow

Notes:
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ft MSL = feet Mean Sea Level
N/A = Information Not Available
Tp = Pomona Basalt
Tpr = Priest Rapids Basalt (undifferentiated)
Tfs = Frenchman Springs Basalt

Well Location and Construction Priority is based on the the saturated open interval of the well. Wells open and saturated across the Pomona (Tp) and Priest Rapids (Tpr) Basalt aquifers have the highest priority because of historically large pressure differentials between these aquifers. Priority 2 wells may be open to the Pomona (Tp) and Priest Rapids (Tpr) Basalt aquifers, but only the Priest Rapids (Tpr) is currently saturated, reducing the potential for commingling. Priority 3 wells may be open to the Priest Rapids (Tpr) and Frenchman Springs (Tfs) Basalt aquifers, but only the Frenchman Springs is saturated, resulting in a very low potential for commingling.

Table 3.3
Summary of Field Assessments, USGS Information Review, and Well Repair/Replacement Costs and Priority.

Well Identification Number	General Well Information									Commingling Information				Priority and Well Repair/Replacement Costs							
	USGS Video and/or Geophysics Available	GSI Field Assessment Completed	Year Drilled	Well Type	Well Diameter (inches)	Most Recent Static Water Level			Well Depth (ft bgs)	Open Interval (could include casing, but no seal)	Current Saturated Open Units (T0c, Tp, Tpr, Tf)	Field Assessment Summary	Relative Amount of Active Commingling Observed	Well Location and Construction Priority	Overall Priority	Repair Costs		Replacement Costs			Repair/Replacement Recommendation
						Depth (ft bgs)	GW Elevation (ft MSL)	Date								Upper Repair	Lower Repair	Decommission Existing Well	Well Replacement	Sub-Total	
3	X		1977	Domestic	8	375	300	10/26/2005	505	Tp-Tpr-Tfs	Tpr-Tfs	Casing appears to be in good condition. Water observed weeping from the sedimentary unit (clay/sandstone) starting at 70' bgs. Basalt contact observed at 100' bgs (broken/brecciated to 109' bgs). Slight iron staining around fractures in borehole suggest water dripping into borehole. Increased seepage observed in a fracture at 241' bgs. Vesicular basalt observed from 290'-315', and 485'-520' bgs. No flow observed in the borehole.	Video indicates no flow, but flow profile indicates moderate flow.	2	1	\$ 50,600	\$ 19,800	\$ 34,100	\$ 66,000	\$ 100,100	Based on USGS flow profile data, an uncertain amount of uphole commingling flow was occurring in 2005. USGS well video does not show visual indications of commingling flow. Well is constructed similarly to Well 5 and in the same general location, so commingling is suspected from the Frenchman Springs to the Priest Rapids Basalt aquifer. Recommended repair is to seal the Frenchman Springs with the lower repair option.
5		X	2005	Domestic	6	349	317	3/13/2014	523	Tpr-Tfs	Tpr-Tfs	Casing shows some iron staining and tubercles (increases with depth). The PVC liner and joints appear to be in good condition. Particles observed moving into the liner perforations around 522' bgs, and out of the liner perforations at 450'. Upward flow of approximately 3-7 gpm observed within the liner.	Moderate flow	2	1	\$ 39,600	\$ 16,500	\$ 28,600	\$ 53,900	\$ 82,500	Commingling pathway appears to be from the Frenchman Springs to the Priest Rapids Basalt aquifer. Recommended repair is to seal the Frenchman Springs with the lower repair option.
6		X	1978	Irrigation	8	345.1	313	12/23/2013	515	Tp-Tpr	Tpr	Casing appears to be in good condition. Fractured and/or brecciated zones observed at 287'-290', 331'-332' bgs. Occasional large fractures observed from 380'-425' bgs. No flow observed in the borehole.	None	2	3	\$ 48,400	N/A	\$ 34,100	\$ 48,400	\$ 82,500	Based on current groundwater level below the bottom of the Pomona Basalt aquifer, commingling is not actively occurring in this well and repair or replacement not necessary at this time. If necessary in the future, recommend upper repair if pump diameter will allow. Otherwise, recommend replacement with well targeting the Priest Rapids Basalt aquifer.
7		X	1968	Domestic	8	369.3	302	12/23/2013	553	Tp-Tpr	Tpr	Casing appears to be in good condition. Water weeping from clay/cobble unit from 116'-125' bgs. Brecciated basalt and void observed at 137'-139' bgs. Fractured basalt observed at 155', 163', 194', 315'-325', 342', 374', and 539'-542' bgs. No flow observed in the borehole.	None	2	3	\$ 50,600	N/A	\$ 35,200	\$ 56,100	\$ 91,300	Based on current groundwater level below the bottom of the Pomona Basalt aquifer, commingling is not actively occurring in this well and repair or replacement not necessary at this time. If necessary in the future, recommend upper repair if pump diameter will allow. Otherwise, recommend replacement with well targeting the Priest Rapids Basalt aquifer.
11	X		1977	Irrigation	8	361	328	3/24/2005	480	Tp-Tpr	Tpr	Casing appears to be in good condition. Cascading water observed at 82' bgs. Basalt contact observed at 104' bgs. Pressurized water observed flowing (cascading) into borehole at 253' bgs. Vesicular basalt observed from 440'-460' bgs. No other flow observed in the borehole.	Minor flow	2	3	\$ 46,200	N/A	\$ 33,000	\$ 41,800	\$ 74,800	Based on current groundwater level below the bottom of the Pomona Basalt aquifer, only very minor commingling is occurring in this well and repair or replacement not necessary at this time. If necessary in the future, recommend upper repair if pump diameter will allow. Otherwise, recommend replacement with well targeting the Priest Rapids Basalt aquifer.
17		X	1983	Domestic	6	211.5	315	5/2/2014	355	Tp-Tpr	Tp-Tpr	Casing and welds appear to be in good condition. Fractured basalt observed at 160'-175', 215'-240', 273'-280' bgs. Water observed flowing (cascading) into borehole at 178' bgs. No other flow observed.	Minor flow	1	1	\$ 38,500	\$ 15,400	\$ 26,400	\$ 40,700	\$ 67,100	If pump diameter allows, attempt upper repair. Otherwise, replacement recommended for well targeting Priest Rapids Basalt Aquifer.
19	X		1947	Domestic	6	127	316	2/7/2007	620	Tp-Tpr	Tp-Tpr	Slight scaling observed on the casing above and below static water level. Extremely poor visibility in water column. Hole is collapsed at 385' bgs in 2007 video. Video completed in 2010 shows hole collapsed at 402' (well log indicates borehole has a total depth of 620'). No flow observed in the borehole.	None	1	3	N/A	N/A	N/A	N/A	N/A	Well does not appear to be actively commingling as a result of borehole collapse. Well repair or replacement does not appear necessary at this time, but may if borehole re-opens.
26		X	1981	Domestic	8	99.8	245	3/4/2014	335	Glaciofluvial - Tp	Glaciofluvial - Tp	Casing and welds appear to be in good condition. Slight upward flow observed around base of casing (4 gpm). Vesicular/broken basalt observed from 220'-280' bgs. Upward flow of 5-8 gpm observed from 230'-250' bgs.	Minor/Moderate flow	1	1	N/A	N/A	\$ 30,800	\$ 37,400	\$ 68,200	Commingling pathway is uncertain and current well construction does not permit effective repair. Well replacement is recommended targeting the Pomona Basalt aquifer.
29		X	1991	Irrigation	6	158.5	374	3/4/2014	460	Tp-Tpr	Tp-Tpr	Casing appears to be very corroded and pitted. Vesicular/fractured basalt observed from 260'-300', 410'-400' bgs. Slight fractures observed over most of borehole. Upward flow of approximately 2-3 gpm observed over entire borehole. However, upward flow was only observed on one side of the borehole.	Moderate flow	1	1	\$ 47,300	\$ 14,300	\$ 27,500	\$ 49,500	\$ 77,000	Commingling pathway appears to be from Priest Rapids Basalt aquifer into the Pomona and possibly into the bottom of the Glaciofluvial Deposits behind the casing. If pump diameter allows, attempt upper repair including deepening the well to 600 feet bgs. Otherwise, replacement recommended for well targeting the Priest Rapids Basalt aquifer and would include deepening the well to approximately 600 feet bgs.
30		X	1992	Irrigation	8	196.6	290	3/25/2014	353	Tp-Tpr	Tp-Tpr	Casing and joints appear to be in good condition. Water observed weeping from base of casing. Fractured basalt observed from 275'-340' bgs. Borehole deviates from straight at 337'-340' bgs. Upward flow of approximately 3-5 gpm observed from 330'-354' bgs.	Moderate flow	1	1	\$ 41,800	\$ 19,800	\$ 30,800	\$ 39,600	\$ 70,400	Commingling pathway appears to be from Priest Rapids into the Pomona Basalt aquifer. If pump diameter allows, attempt upper repair. Otherwise, replacement recommended for well targeting the Priest Rapids Basalt aquifer.
31		X	1997	Irrigation	10 and 8	85	309	3/14/2014	344	Tp-Tpr	Tp-Tpr	Casing appears to be very corroded and pitted. Casing is misaligned/poorly welded at 77' bgs. Casing weld is broken at 118' bgs. Turbulent flow is observed (approximately 12 gpm) at the broken weld, but direction is not apparent. Slight upward flow (2 gpm) at the base of the liner (306.5' bgs).	Moderate/High flow	1	1	\$ 57,200	\$ 27,500	\$ 30,800	\$ 48,400	\$ 79,200	Commingling pathway appears to be from Priest Rapids into the Pomona Basalt aquifer. If pump diameter allows or if existing casing can be removed, attempt upper repair including deepening the well to 500 feet bgs. Otherwise, replacement recommended for well targeting the Priest Rapids Basalt aquifer and would include deepening the well to 500 feet bgs.
35		X	1984	Domestic	8 and 6	422.5	320	5/7/2014	483	Tp-Tpr	Tpr	Casing appears to be slightly pitted and covered with some scaling. Water is observed dripping into the casing through a hole at 331.6' bgs. Water is also observed dripping into and running behind a hole in the casing at 339' bgs. Significant flow (~3 gpm) dripping around the base of the casing at 361.5' bgs. Fractured basalt observed from 365'-420' bgs. Upward flow of approximately 2 gpm observed from 450'-460' bgs.	Minor flow	2	2	N/A	N/A	\$ 34,100	\$ 52,800	\$ 86,900	Commingling pathway appears to be from either the Dalles Formation or Pomona Basalt aquifer via cascading water. The existing 6 inch casing appears to be sealed over the upper 18 feet, preventing removal and/or monitoring grout returns if an upper repair was attempted, likely making it not feasible. The current production zone within the well is currently the Priest Rapids Basalt aquifer, so lower repair is not feasible. Replacement is recommended for a well targeting the Priest Rapids Basalt aquifer.
38		X	1999	Domestic	8	101	310	5/7/2014	270	Tpr-Tfs	Tpr-Tfs	Casing appears to be in good condition. Large void observed at 36' bgs. Fractured basalt observed from 70'-87'. Vesicular/brecciated basalt observed at 190' and 264' bgs. Upward flow of approximately 1-2 gpm observed from 110'-140' bgs. Upward flow of approximately 2 gpm observed from 170'-264' bgs.	Minor flow	2	2	\$ 46,200	\$ 14,300	\$ 29,700	\$ 42,900	\$ 72,600	Uncertain if Priest Rapids Basalt aquifer is capable of producing accustomed well yield, but if so, lower repair is recommended. Otherwise, upper repair to seal off the Priest Rapids and produce water exclusively from the Frenchman Springs Basalt aquifer is recommended assuming pump diameter allows.

Notes:
ft bgs = feet below ground surface
ft MSL = feet Mean Sea Level
N/A = Information Not Available
Tp = Pomona Basalt
Tpr = Priest Rapids Basalt (undifferentiated)
Tfs = Frenchman Springs Basalt

Well Location and Construction Priority is based on the the saturated open interval of the well. Wells open and saturated across the Pomona (Tp) and Priest Rapids (Tpr) Basalt aquifers have the highest priority because of historically large pressure differentials between these aquifers. Priority 2 wells may be open to the Pomona (Tp) and Priest Rapids (Tpr) Basalt aquifers, but only the Priest Rapids (Tpr) is currently saturated, reducing the potential for commingling. Priority 3 wells may be open to the Priest Rapids (Tpr) and Frenchman Springs (Tfs) Basalt aquifers, but only the Frenchman Springs is saturated, resulting in a very low potential for commingling. Overall Priority is based on a combination of the Location/Construction Priority and Field Assessment (or USGS well video/geophysics) information.