

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 02/25/2021
 FROM: Groundwater Section Phillip I. Marcy
 Reviewer's Name
 SUBJECT: Application G- 19053 Supersedes review of _____
 Date of Review(s)

PUBLIC INTEREST PRESUMPTION; GROUNDWATER

OAR 690-310-130 (1) *The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525.* Department staff review groundwater applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation.**

A. GENERAL INFORMATION: Applicant's Name: Dale Eisiminger County: Union

A1. Applicant(s) seek(s) 0.63 cfs from 1 well(s) in the Grande Ronde Basin,
 _____ subbasin

A2. Proposed use Irrigation (36.84 acres) Seasonality: March 1st – October 1st (215 days)

A3. Well and aquifer data (**attach and number logs for existing wells; mark proposed wells as such under logid**):

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	Proposed	1	Basalt	0.63	2S/38E-11 SW-SE	100°N, 2540°W fr SE cor S 11
2	Proposed	2	Basalt	0.63	2S/38E-11 SE-SE	120°N, 1280°W fr SE cor S 11
3	Proposed	3	Basalt	0.63	2S/38E-11 NW-SE	2540°N, 2540°W fr SE cor S 11

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	2744	NA	NA	NA	Unknown	0-18; 5-10' into basalt	0-700+	Unkno wn	Unknown	NA	NA	NA
2	2749	NA	NA	NA	Unknown	0-18; 5-10' into basalt	0-700+	Unkno wn	Unknown	NA	NA	NA
3	2746	NA	NA	NA	Unknown	0-18; 5-10' into basalt	0-700+	Unkno wn	Unknown	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** Well details and descriptions are the same for this application as for application G-18825. It is stated in the application that the acreage proposed as a place of use herein was purchased after filing application G-18825 (4.99 cfs), and was too late to amend the permit. Since the resulting Point of Appropriation (POA) well will be the same for both uses (one well out of three proposed POA locations), considerations must be made for the cumulative impact of both potential permits, pumping from the same groundwater source.

The applicant proposes to develop groundwater from basalt at one of three proposed sites for irrigation. In this area of the Grande Ronde Valley, depth to the top of the volcanic sequence is greater than 1,500' below land surface, based on nearby logs, cuttings, and geochemical data. This sequence, as determined from nearby borehole cuttings and the stratigraphic section of Mount Emily to the west mapped by Jason McClaughry of DOGAMI, includes roughly 900' of Powder River Volcanics (PRV) overlying Grande Ronde Basalt of the CRBG (see attached cross-section). The proposed construction appears to target 'basalt', likely the PRV, resembling the construction of nearby UNIO 52415. This includes a split-seal, with a surface seal from 0-18' and another 5-10' of seal proposed immediately above the water-bearing zone within the target basalt aquifer.

A5. **Provisions of the Grande Ronde** _____ Basin rules relative to the development, classification and/or management of groundwater hydraulically connected to surface water are, or are not, activated by this application. (Not all basin rules contain such provisions.)
 Comments: _____

A6. **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction. Name of administrative area: _____
 Comments: _____

B. GROUNDWATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that groundwater* for the proposed use:

- a. is over appropriated, is not over appropriated, or cannot be determined to be over appropriated during any period of the proposed use. * This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;
- b. will not or will likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;
- c. will not or will likely to be available within the capacity of the groundwater resource; or
- d. will, if properly conditioned, avoid injury to existing groundwater rights or to the groundwater resource:
 - i. The permit should contain condition #(s) 7N, "Large Water Use Reporting";
 - ii. The permit should be conditioned as indicated in item 2 below.
 - iii. The permit should contain special condition(s) as indicated in item 3 below;

- B2.
- a. **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;
 - b. **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;
 - c. **Condition** to allow groundwater production only from the _____ **basalt** groundwater reservoir between approximately 1500+ ft. and _____ ft. below land surface;
 - d. **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): _____

B3. **Groundwater availability remarks:** The applicant proposes to develop "Basalt". In our current conceptual hydrogeologic model, rocks of the Columbia River Basalt Group (CRBG) provide a high degree of confinement, due to the presence of laterally continuous lava flows that include dense interiors that are often tens of meters in thickness. Hydrologic characteristics of the PRV, which appear to be the targeted lithology of this proposed construction, are not as well understood. Nearby UNIO 54215, constructed under permit G-17020, and UNIO 50684, constructed under permit G-15504, access both PRV and CRBG interflow zones, with no noted head difference between the two sequences. In the case of UNIO 52415, the driller did note a head difference between the compound volcanic sequence and overlying sedimentary sequence, but no difference was noted between the two volcanic sequences. In the case of UNIO 50684, two water-bearing zones are reported within each of the volcanic sequences, but no head measurements are reported on the driller's log. Therefore, lacking any further information, an assessment of whether the CRB, PRV, or any combination of thereof comprises a single aquifer system is not possible. As a result, more information is needed to approve construction of a POA well that does not risk commingling discreet aquifers, and furthermore to establish a reasonable basis for the conclusion that hydraulic connection with surface water has been avoided.

Interference to neighboring wells, particularly UNIO 50684 which is within one mile of all three proposed POA locations (3,200' to POA 1, 4,480' to POA 2, and 5,080' to POA 3) and completed to similar depths as proposed, is possible if there are no impediments to groundwater movement between these sites. The geometry of bedrock geology beneath the thick succession of alluvium in the Grande Ronde Valley is largely unknown due to extreme depth and sparse distribution of wells accessing this bedrock. Thus, the difference in elevations where drillers have encountered these lithologies may be explained by fault offset of bedrock units, dip of bedrock units, or a combination of these. Therefore it cannot be assumed that the resulting POA well will be hydraulically isolated from UNIO 50684, nor can it be assumed that it will be hydraulically connected.

Special Condition: If a permit is issued, a constant rate aquifer test at the POA well shall be conducted before water use begins. The test shall be performed at a pumping rate similar to the cumulative rate (5.62 cfs) authorized under this permit (0.63 cfs) and permit G-18328 (4.99 cfs - resulting from application G-18825) from the POA well. The test shall include observations from selected wells completed into the volcanic sequence and wells completed into overlying alluvium to assess potential impacts of this pumping, and hydraulic connectivity between these lithologies. OWRD staff will conduct the aquifer test for a minimum of 24 hours and analyze the test data to evaluate the potential for injury to other water users and the capacity of the resource.

C3b. **690-09-040 (4):** Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells.** Otherwise same evaluation and limitations apply as in C3a above.

	SW #		Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

Comments: This section does not apply as hydraulic connection to surface water is not assumed.

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.													
(B) = 80 % Nat. Q													
(C) = 1 % Nat. Q													
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		%	%	%	%	%	%	%	%	%	%	%	%

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Basis for impact evaluation: This section does not apply.

C4b. **690-09-040 (5) (b)** The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.

- C5. **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or groundwater use under this permit can be regulated if it is found to substantially interfere with surface water:
- i. The permit should contain condition #(s) _____;
 - ii. The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:**

If a permit is issued, the following special conditions shall apply:

1. Wells shall be open to a single aquifer in either the Powder River Volcanics or Columbia River Basalt Group and shall meet applicable well construction standards (OAR 690-200 and OAR 690-210). In addition, the open interval shall be no greater than 100 feet. However, a larger open interval may be approved by the Department if the applicant can demonstrate to the satisfaction of the Department that each well is only open to a single aquifer. Following well completion, the well shall be thoroughly developed to remove cuttings and drilling fluids. Substantial evidence of a single aquifer completion may be collected by video log, downhole flowmeter, water chemistry and temperature, or other downhole geophysical methods approved by the Department. These methods shall characterize the nature of the basalt rock and assess whether water is moving in the borehole. Any discernable movement of water within the well bore when the well is not being pumped shall be assumed as evidence of the presence of multiple aquifers in the open interval.
2. Drill cuttings shall be collected at 10-foot intervals and at changes in formation in the well and a split of each sampled interval shall be provided to the Department.

References Used: Local well logs, Application reviews G-16533, G-16602, and G-17558,

Development Potential of Ground Water in the Grande Ronde Valley, Union County, Oregon, Ham, 1966

Ferns, M. L., McConnell, V. S., Madin, I. P., and Johnson, J. A., 2010, Geology of the upper Grande Ronde River basin, Union County, Oregon; Oregon Department of Geology and Mineral Industries Bulletin 107, scale 1:100,000, 65 p.

Application G-18825 and subsequent groundwater review.

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: _____ Logid: _____

D2. **THE WELL does not appear to meet current well construction standards based upon:**

- a. review of the well log;
- b. field inspection by _____;
- c. report of CWRE _____;
- d. other: (specify) _____

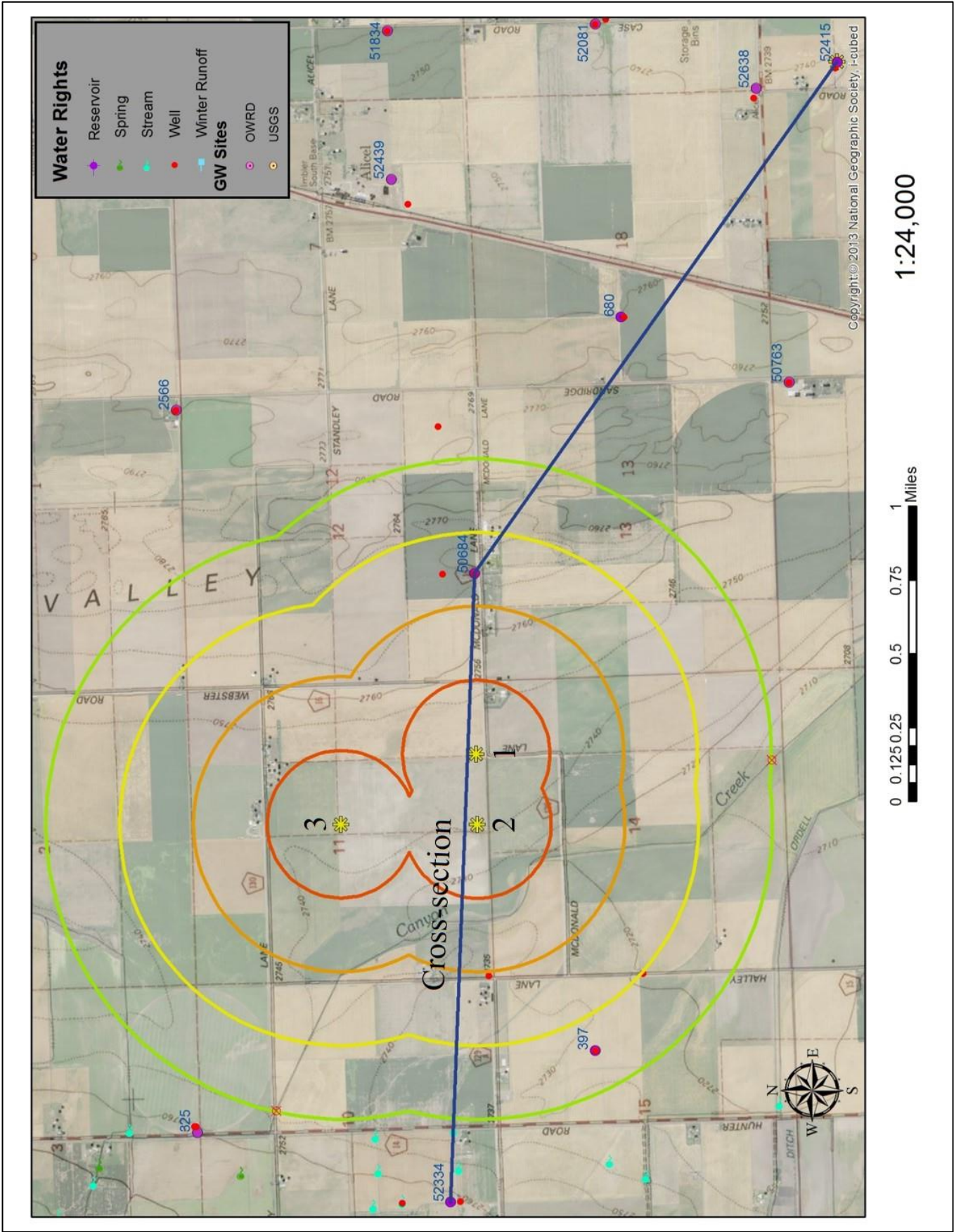
D3. **THE WELL construction deficiency or other comment is described as follows:** _____

D4. **Route to the Well Construction and Compliance Section for a review of existing well construction.**

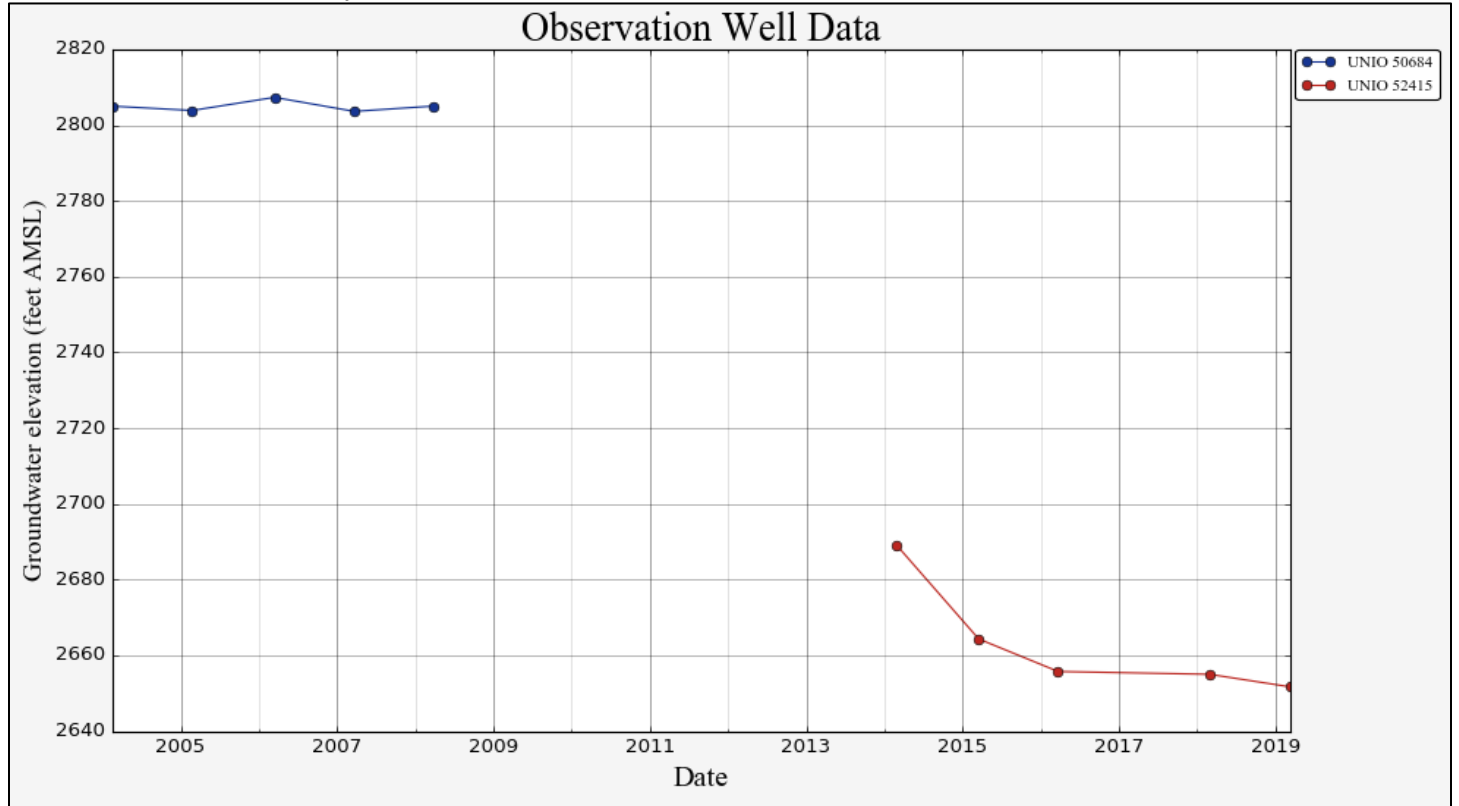
Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION						
Watershed ID #: 30810407		GRANDE RONDE R > SNAKE R - AB WILLOW CR			Exceedance Level: 80	
Time: 1:50 PM		Basin: GRANDE RONDE			Date: 06/10/2019	
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net water Available
Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.						
JAN	138.00	17.70	120.00	23.70	0.00	96.60
FEB	246.00	21.70	224.00	62.30	0.00	162.00
MAR	431.00	23.40	408.00	118.00	0.00	290.00
APR	966.00	148.00	818.00	131.00	0.00	687.00
MAY	1,100.00	332.00	768.00	187.00	0.00	581.00
JUN	530.00	293.00	237.00	58.40	0.00	179.00
JUL	257.00	138.00	119.00	0.00	0.00	119.00
AUG	185.00	90.20	94.80	0.00	0.00	94.80
SEP	127.00	63.50	63.50	0.00	0.00	63.50
OCT	85.60	23.30	62.30	1.55	0.00	60.80
NOV	93.10	15.00	78.10	0.00	0.00	78.10
DEC	111.00	16.80	94.20	13.00	0.00	81.20
ANN	429,000	71,500	358,000	35,900	0	322,000

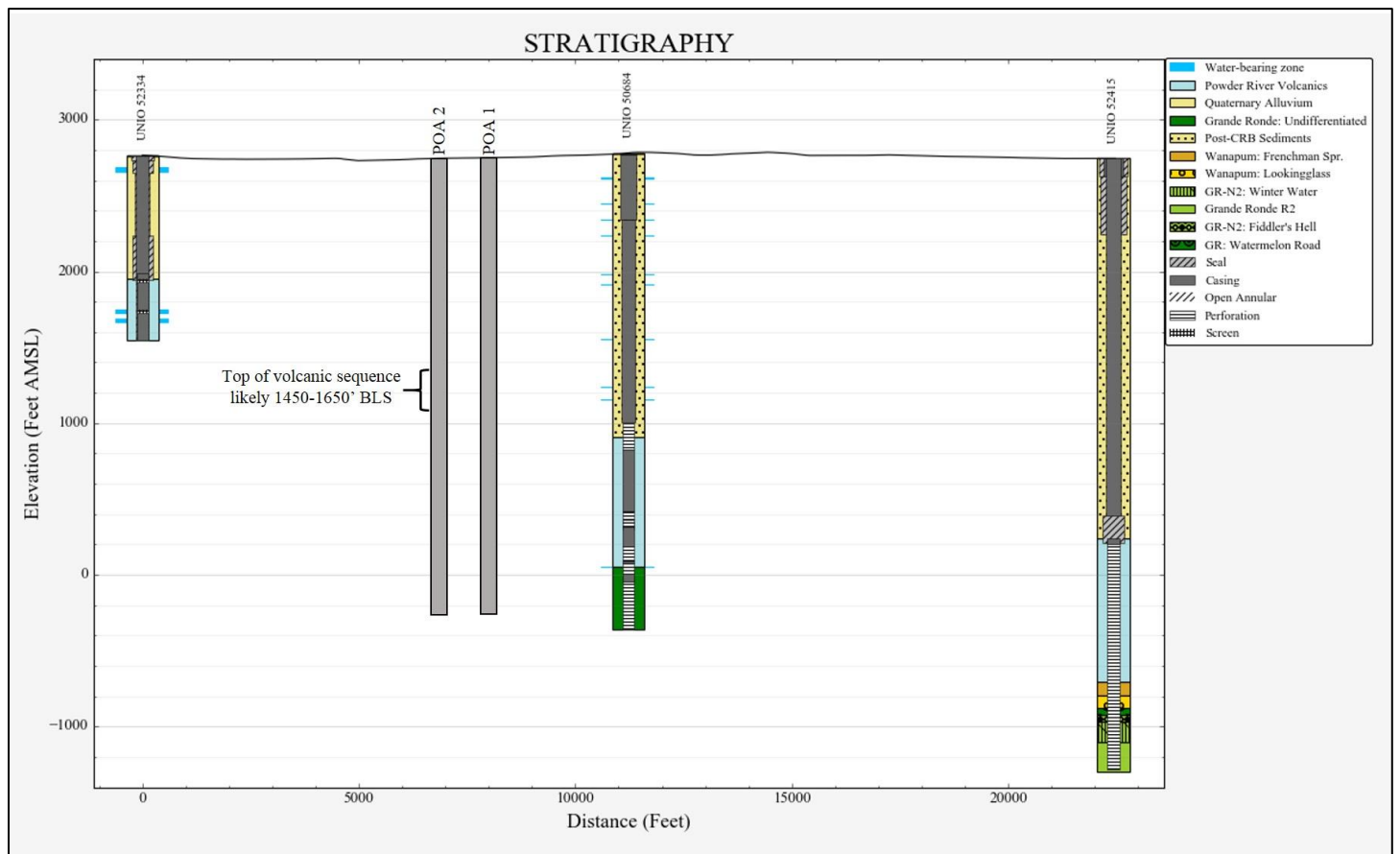
Well Location Map



Water-Level Trends in Nearby Wells



Water level data for wells completed into the volcanic sequence underlying alluvium in this area are severely limited. This limitation renders conclusions concerning capacity of the resource and well-to-well interference unreliable. From the above data, for example, it cannot be concluded that the two wells have similar or dissimilar trends.



Lithologic information from driller's well reports suggest that depth to the top of the volcanic sequence increases with distance from the valley margin to the west. There are not adequate data at this time to indicate whether this trend is due to offset by concealed faults between these sites or represents the dip slope of these units.