Groundwater Application Review Summary Form

Application # G- 18403

GW Reviewer Phil Marcy **Date Review Completed:** 4/27/2017

Summary of GW Availability and Injury Review:

[ ] Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

Summary of Potential for Substantial Interference Review:

[X] There is the potential for substantial interference per Section C of the attached review form.

Summary of Well Construction Assessment:

[ ] The well does not appear to meet current well construction standards per Section D of the attached review form. Route through Well Construction and Compliance Section.

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).

WATER RESOURCES DEPARTMENT

MEMO April 27, 2017

TO: **Application G-** 18403

FROM: **GW:** Phil Marcy
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☒ YES
The source of appropriation is within or above a Scenic Waterway
☐ NO

☒ YES
Use the Scenic Waterway condition (Condition 7J)
☐ NO

☒ Per ORS 390.835, the Groundwater Section is **able** to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below.

☐ Per ORS 390.835, the Groundwater Section is **unable** to calculate ground water interference with surface water that contributes to a scenic waterway; **therefore, the Department is unable to find that there is a preponderance of evidence that the proposed use will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway.**

DISTRIBUTION OF INTERFERENCE

Calculate the percentage of consumptive use by month and fill in the table below. If interference cannot be calculated, per criteria in 390.835, do not fill in the table but check the "unable" option above, thus informing Water Rights that the Department is unable to make a Preponderance of Evidence finding.

Exercise of this permit is calculated to reduce monthly flows in Grande Ronde Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.032	0.026	0.023	0.053	0.083	0.112	0.180	0.183	0.142	0.086	0.047	0.033

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date **04/24/2017**

FROM: Groundwater Section **Phillip I. Marcy**
Reviewer's Name

SUBJECT: Application G- **18403** 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: **John and Julie Bodfish** County: **Union**

A1. Applicant(s) seek(s) **0.9** cfs from **1** well(s) in the **Grande Ronde** Basin, _____ subbasin

A2. Proposed use **Irrigation (7 acres)** Seasonality: **March 1st – October 31st (245 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	UNIO 50491	1	Alluvium	0.9	2S/38E-33 SE-SW	37'N, 38'W fr S1/4 cor S 33
2						
3						
4						
5						

* 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	2760	70	28	03/04/1999	304	0-26	0-300		200-300	250	NA	Air

Use data from application for proposed wells.

A4. **Comments:** The POA well was originally constructed for use on what is now a cancelled right (application G-14871, permit G-13663 CN). The owner remarks that the recession beginning in 2001 put his nursery out of business, and therefore, the claim of beneficial use was never completed, resulting in cancellation of the right.

A5. ☒ **Provisions of the** Grande Ronde (690-508) 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**;
   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 _____ groundwater reservoir between approximately_____ 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:** Nearby observation well, located less than 1 mile to the SE of the proposed POA location shows declines of greater than 10 feet within the past decade. These two wells produce from similar depths within the valley fill alluvial sequence and increased volume of pumping may cause more rapid drawdowns within this system. If a permit is issued, condition 7N is recommended to provide the Department with ongoing data, and if declines become severe, shut off or curtail production from the POA well.

C. GROUNDWATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**Fluvial fan delta deposits (Qfd of Ferns, 2010)**	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The static water level upon completion of the well (UNIO 50491) is significantly higher than the elevation of reported water-bearing zones within the well, indicating some degree of local confinement as groundwater discharges toward the surface here. The well is only sealed to 26 feet, however, leaving the possibility that multiple zones reported on the well log are potentially commingling.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Grande Ronde River**	**2732**	**2745**	**575**	☒	☐	☐	☒	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: The proposed POA well (UNIO 50491) produces from multiple horizons of sand and gravel in an alluvial fan setting on the fringes of the Grande Ronde Valley (unit Qfd of Ferns and others, 2010). In this geologic framework, there does not likely exist any laterally extensive barrier to groundwater movement, either horizontally or vertically. The driller's log reports a 10' thick layer of brown clay, well below the lowest depth of the surface seal. Since the well is within ¼ mile of, and hydraulically connected to, the Grande Ronde River, PSI is triggered according to 690-09-040.

Water Availability Basin the well(s) are located within: Grande Ronde R > Snake R – AB Willow Cr, (ID# 30810407)

C3a. **690-09-040 (4):** Evaluation of stream impacts for each well that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% *natural* flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked ☒ box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	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?
1	**1**	☒	☐	**NA**	**NA**	☐	**85.60**	☐	**28.66**	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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?
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: Assuming the presence of a streambed clogging layer, which delays impacts of groundwater pumping to the stream, the model of Hunt (1999) was used to assess interference after 30 days of pumping at the proposed rate. Using model parameters determined by local pump tests, the percentage of groundwater pumpage from the proposed POA resulting from streamflow depletion is estimated to be greater than 25%.

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													
		%	%	%	%	%	%	%	%	%	%	%	%
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:** The minimal distance between the proposed POA and the Grande Ronde River, in addition to the lack of any significant confining unit above the water-bearing zone within the well establishes hydraulic connection, leading to a finding of Potential to Substantially Interfere (PSI) with surface water.

If a permit were issued, condition 7J would be required, as the proposed POA is adjacent to a scenic waterway.

Attached is the evaluation of scenic waterway stream depletion, using the results of the Hunt(1999) model, which considers a streambed confining layer.

References Used: Application file G-18403, local pump tests, OWRD well log database

Hunt, B., 1999, Unsteady stream depletion from ground water pumping: Ground Water, v. 37, no. 1, p. 98-102.

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.

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

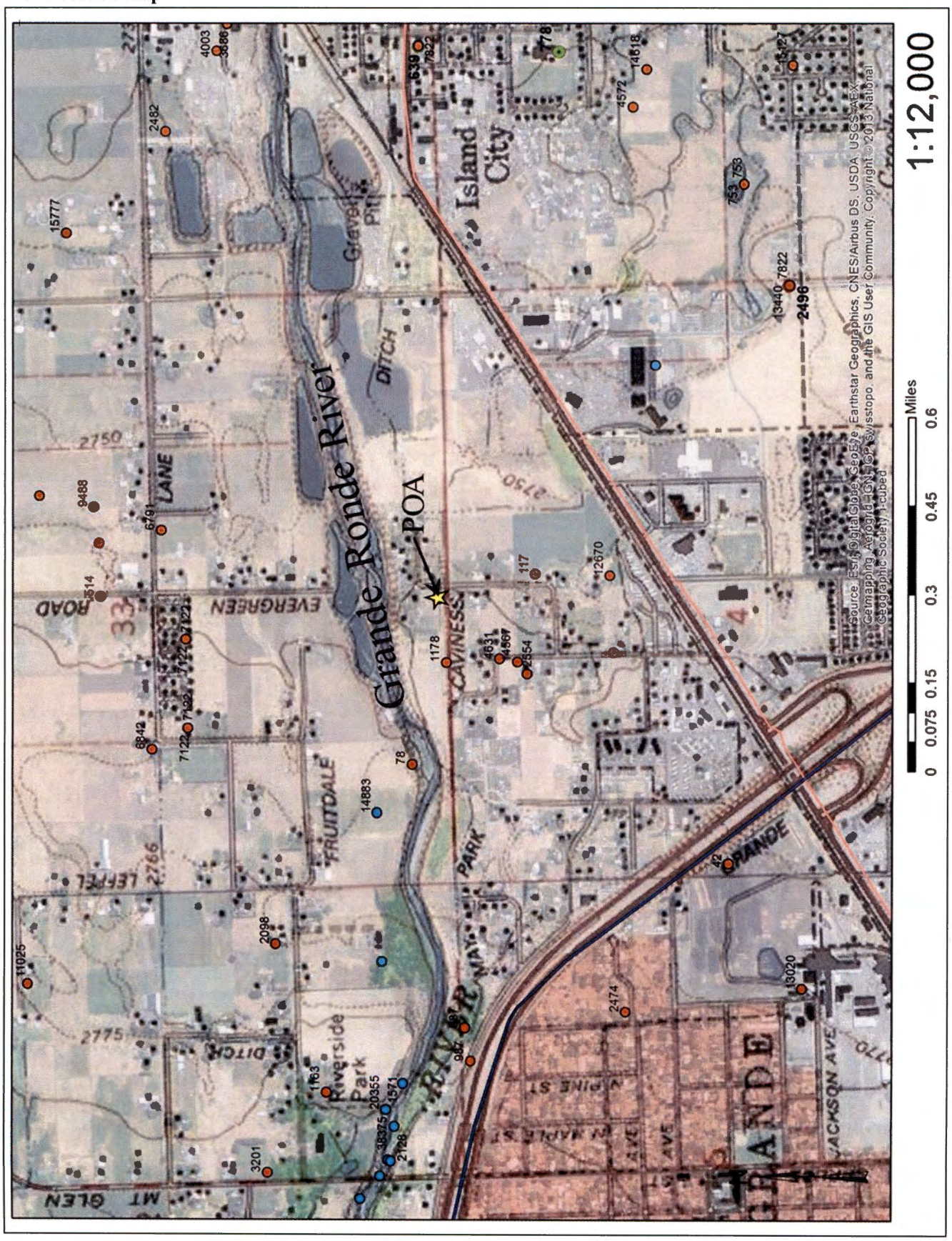
DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

GRANDE RONDE R > SNAKE R - AB WILLOW CR

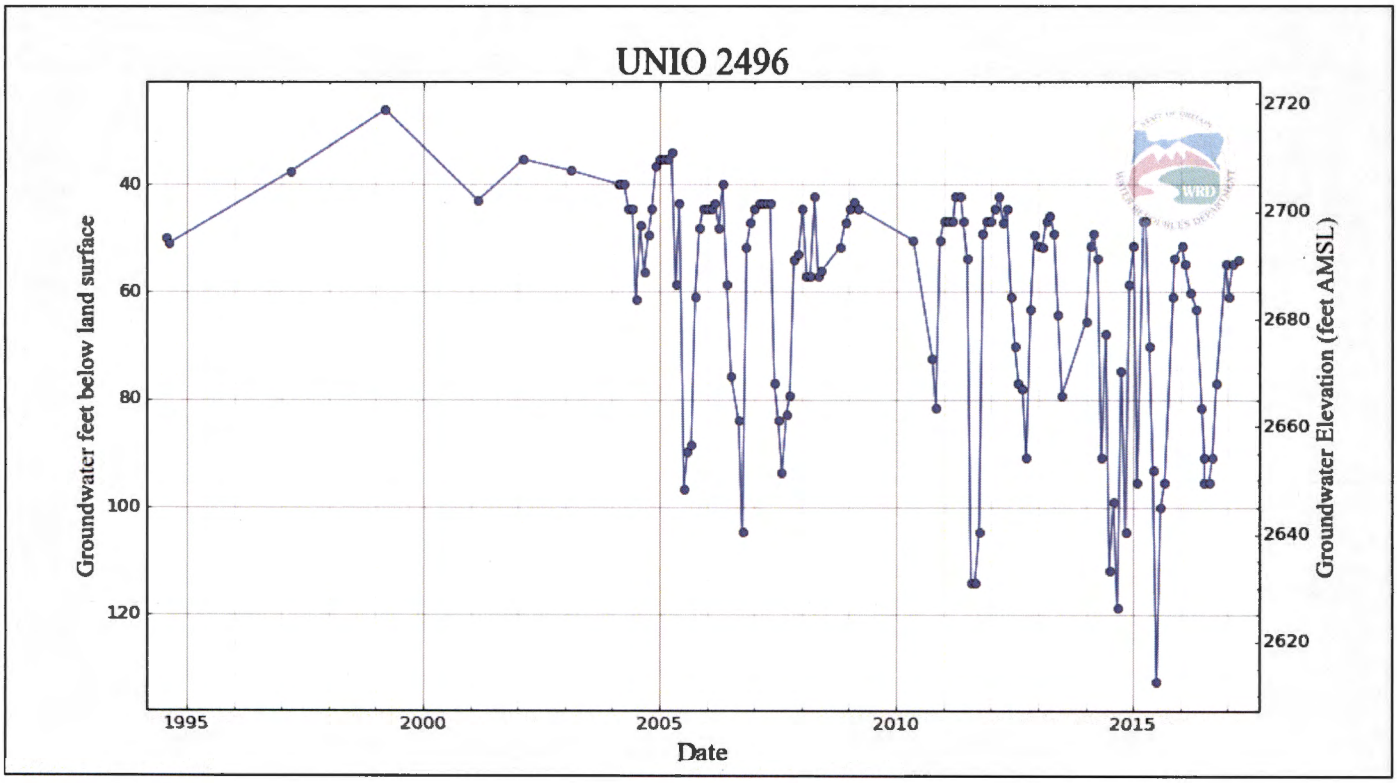
Watershed ID #: 30810407 Basin: GRANDE RONDE Exceedance Level: 80
Time: 4:14 PM Date: 04/24/2017

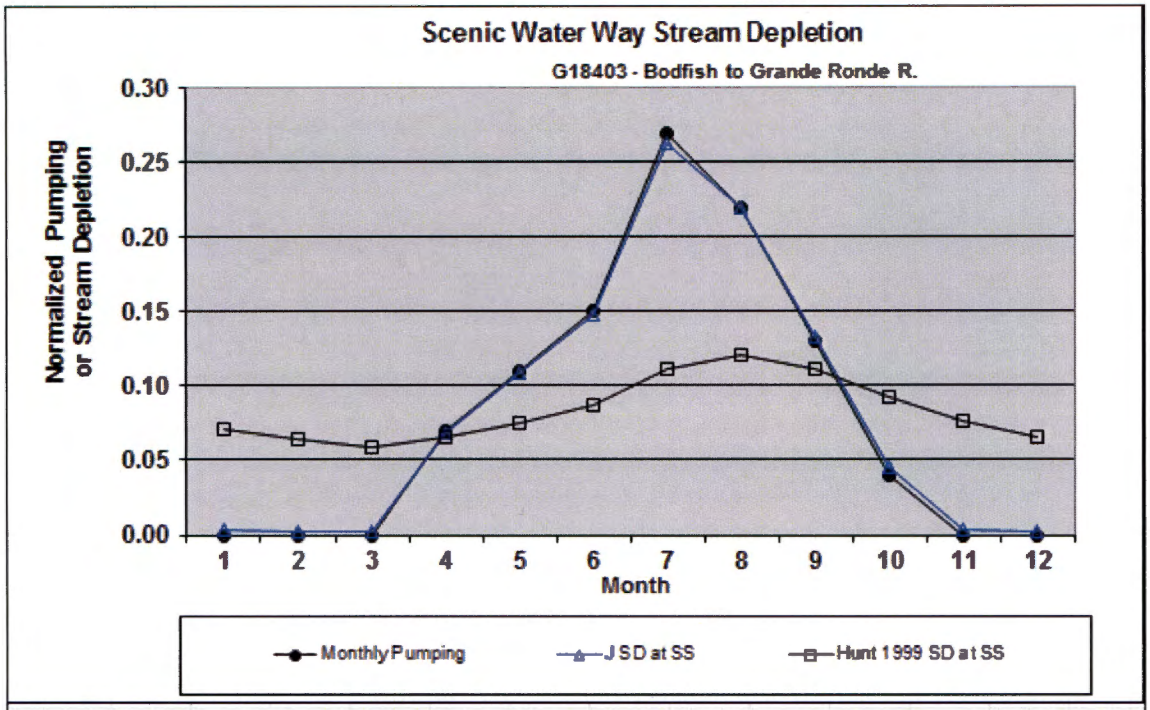
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
	Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.					
JAN	138.00	18.00	120.00	23.70	0.00	96.40
FEB	246.00	21.50	225.00	62.30	0.00	162.00
MAR	431.00	23.10	408.00	118.00	0.00	290.00
APR	966.00	148.00	818.00	131.00	0.00	686.00
MAY	1,100.00	332.00	768.00	187.00	0.00	580.00
JUN	530.00	293.00	237.00	58.40	0.00	178.00
JUL	257.00	139.00	118.00	0.00	0.00	118.00
AUG	185.00	90.70	94.30	0.00	0.00	94.30
SEP	127.00	64.10	62.90	0.00	0.00	62.90
OCT	85.60	23.80	61.80	1.55	0.00	60.30
NOV	93.10	15.60	77.50	0.00	0.00	77.50
DEC	111.00	17.10	93.90	13.00	0.00	80.90
ANN	429,000	71,800	357,000	35,900	0	321,000

Well Location Map



Water-Level Trends in Nearby Wells





Region	23	Steady state stream depletion as a fraction of pumping normalized to crop water use c										
Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Resid
Qw	0.00	0.00	0.00	0.07	0.11	0.15	0.27	0.22	0.13	0.04	0.00	0.00	0.01
J SD SS	**0.003**	**0.003**	**0.002**	**0.068**	**0.108**	**0.148**	**0.263**	**0.220**	**0.133**	**0.045**	**0.004**	**0.002**	**0.000**
H99 SD SS	**0.071**	**0.064**	**0.059**	**0.065**	**0.075**	**0.087**	**0.112**	**0.121**	**0.112**	**0.093**	**0.076**	**0.066**	**0.000**

Parameters:		Values	Units	
Maximum number of years pumped	yrmax	25	years	
Days pumped each month	tpoff	30.4375	days/month	
Perpendicular from well to stream	a	575	ft	
Well depth	d	304	ft	
Aquifer hydraulic conductivity	K	700	ft/day	
Aquifer saturated thickness	b	100	ft	
Aquifer transmissivity	T_ft	70,000	ft*ft/day	= K*b
Aquifer transmissivity	T_gal	523,600	gpd/ft	= K*b
Aquifer storativity or specific yield	S	0.01		
Streambed conductivity (Hunt 1999)	Ks	0.1	ft/day	
Streambed thickness, Hunt 1999	bs	3	ft	
Stream width (Hunt 1999)	ws	70	ft	
Streambed conductance (lambda)	sbc	2.3333	ft/day	= Ks*ws/bs
Stream depletion factor	sdf	0.0472	days	= (a^2*S)/(T)
Streambed factor	sbf	0.0192		= sbc*a/T