

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date September 15, 2016
 FROM: Groundwater Section Michael J Thoma
 SUBJECT: Application G- 18315 Reviewer's Name
 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: Ron's Stuff LLC County: Lane

A1. Applicant(s) seek(s) 2.5 cfs from 5 well(s) in the Willamette Basin,
Middle Willamette subbasin

A2. Proposed use Irrigation (200 ac) Seasonality: March 15 – October 31 (230 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	PROP	1	Alluvium	0.5	16S/04W-21 NWNW	475'S, 1268'E of NW cor S 21*
2	PROP	2	Alluvium	0.5	16S/04W-21 SWNW	1340'S, 177'E of NW cor S 21*
3	PROP	3	Alluvium	0.5	16S/04W-21 SENW	1416'S, 1255'E of NW cor S 21*
4	PROP	4	Alluvium	0.5	16S/04W-21 SENW	1465'S, 2366'E of NW cor S 21*
5	PROP	5	Alluvium	0.5	16S/04W-21 SENW	2365'S, 1232'E of NW cor S 21*

* 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	~350	**	5†		150	0-20	+1.5-150		50-150	**	**	**
2	~350	**	5†		150	0-20	+1.5-150		50-150	**	**	**
3	~350	**	5†		150	0-20	+1.5-150		50-150	**	**	**
4	~350	**	5†		150	0-20	+1.5-150		50-150	**	**	**
5	~350	**	5†		150	0-20	+1.5-150		50-150	**	**	**

Use data from application for proposed wells.

A4. **Comments:** *Well locations provided on application do not reference the correct section corner – application provides distance from NE corner of Section 21 but based on application map relative to taxlots the correct distances are from the NW corner of Section 21. Attached email corrects this issue.

**Wells are proposed

†SWL listed is the approx. average spring SWL from SOW 468 (LANE 8029) which is ~0.5 miles north of the proposed POU

A5. **Provisions of the Willamette (OAR 690-502)** 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: The proposed wells are not within 1/4 mile of a surface water source.

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) 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 _____ 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:** The nearest OWRD Observation well is located < 0.5 miles to the north of the proposed POU and shows stable long-term SWLs over the past several decades so it appears that groundwater is not over-appropriated in the area. There are several permitted groundwater POAs in the vicinity of the proposed POAs (43 within 1 mile of applicant's Well #3) but given the alluvial nature of the aquifer material, and strong connection between the aquifer and surface water in alluvial sediments, it is unlikely that substantial interference or injury will result from the proposed use. However, standard interference conditions should be applied to any resulting permit.

iii) Special Conditions: If more than one well is drilled for use on this permit, the permittee must perform an aquifer test using two or more of the permitted wells with one pumping well and one or more observation wells. The test shall be designed and conducted by an Oregon Registered Geologist with the test design subject to the approval of the Department. The test should adhere to conditions set forth in OAR 690-217 (Requirement for Pump Testing) with the additional conditions that at least 1 non-pumping well be used as an observation well and that the results of the test be presented in a report to the Department and include drawdown analysis and estimation of aquifer hydraulic parameters.

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	Alluvium of Willamette Aquifer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Alluvium of Willamette Aquifer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Alluvium of Willamette Aquifer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Alluvium of Willamette Aquifer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Alluvium of Willamette Aquifer	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer confinement evaluation: A review of well logs in the area show that despite what the reported 'first water' is, SWLs from > 90% of the wells are reported as between 5 and 20 ft bls. This implies a vertically-hydraulically connected aquifer system that is likely better represented as an unconfined aquifer than a confined one.

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?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Willamette River	345	330-350	11460	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	2	Willamette River	345	330-350	12800	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	3	Willamette River	345	330-350	11900	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	4	Willamette River	345	330-350	10900	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	5	Willamette River	345	330-350	12250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: The aquifer is an unconfined alluvial aquifer within the greater Willamette Valley floodplain; SWLs in the aquifer are coincident with surface water elevations.

Water Availability Basin the well(s) are located within: Willamette R > Columbia R – AB Periwinkle Cr at Gage 14174

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?
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

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"/>

Comments: No surface water sources within 1 mile were evaluated (see C6).

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
4*	1	%	%	< 1 %	1.2%	3.3%	5.9%	8.6%	11.2%	13.7%	16.0%	17.9%	18.5%
Well Q as CFS		0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0
Interference CFS				< 0.01	< 0.01	0.02	0.03	0.04	0.06	0.07	0.08	0.09	0.09
1*	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
2*	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
3*	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
5*	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.**				< 0.05	< 0.1	0.10	0.15	0.20	0.30	0.35	0.40	0.45	0.45
(B) = 80 % Nat. Q				11000	9760	8430	5360	3270	2560	2540	2860	4170	8150
(C) = 1 % Nat. Q				110	97.6	84.3	53.6	32.7	25.6	25.4	28.6	41.7	81.5
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		%	%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%

(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:

*Only the well nearest to surface water (Well #4) was modeled using the Hunt (1999) stream-depletion model. The reviewer assumes that all other wells would be producing from similar aquifer material so the only difference to the stream-depletion model would be the distance to surface water and interference would decrease with increasing distance. Thus the nearest well will have the greatest impact to surface water.

**The total interference was calculated by multiplying the interference from Well #4 by five. Since all wells are producing from the same aquifer and are proposed to be similarly constructed the overall impact (i.e., Total Interference) to surface water will be the sum of interference from all five wells with the impacts from any other well being less than the impact from Well #4 because the distance to surface water is greater and all other parameters are equal. This analysis therefore represents an exaggerated estimate of surface water interference but the results still do not require that PSI be assumed.

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 applicant's proposed POAs would be producing from an aquifer that has been found to be hydraulically connected to nearby surface water – specifically the Willamette River. The proposed wells are > 1 mile from the river and results of stream-depletion modeling suggests that impacts to surface water will be less than 1% of the 80%-exceedance monthly flows for all months. Therefore the Department does not assume that the proposed use will have the Potential for Substantial Interference per OAR 690-009.

Flat Cr was not evaluated against for PSI because there are no surface water POAs on the creek itself. Surface water rights are limited to depressions along the creek that are inferred to be penetrating groundwater and the mapped creek is likely a seasonal connection between these depressions during the high-water season and not a viable surface water source.

References Used:

Gannet, M. W. and R. R. Caldwell. 1998. *Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington*. USGS Professional Paper 1424-A.

Hunt, B. 1999. *Unsteady Stream Depletion from Ground Water Pumping*. Journal of Hydrologic Engineering, Vol 8(1), pp 12-19

Woodward, D. G., M. W. Gannett, and J. J. Vaccaro. 1998. *Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington*. USGS Professional Paper 1424-B.

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) _____

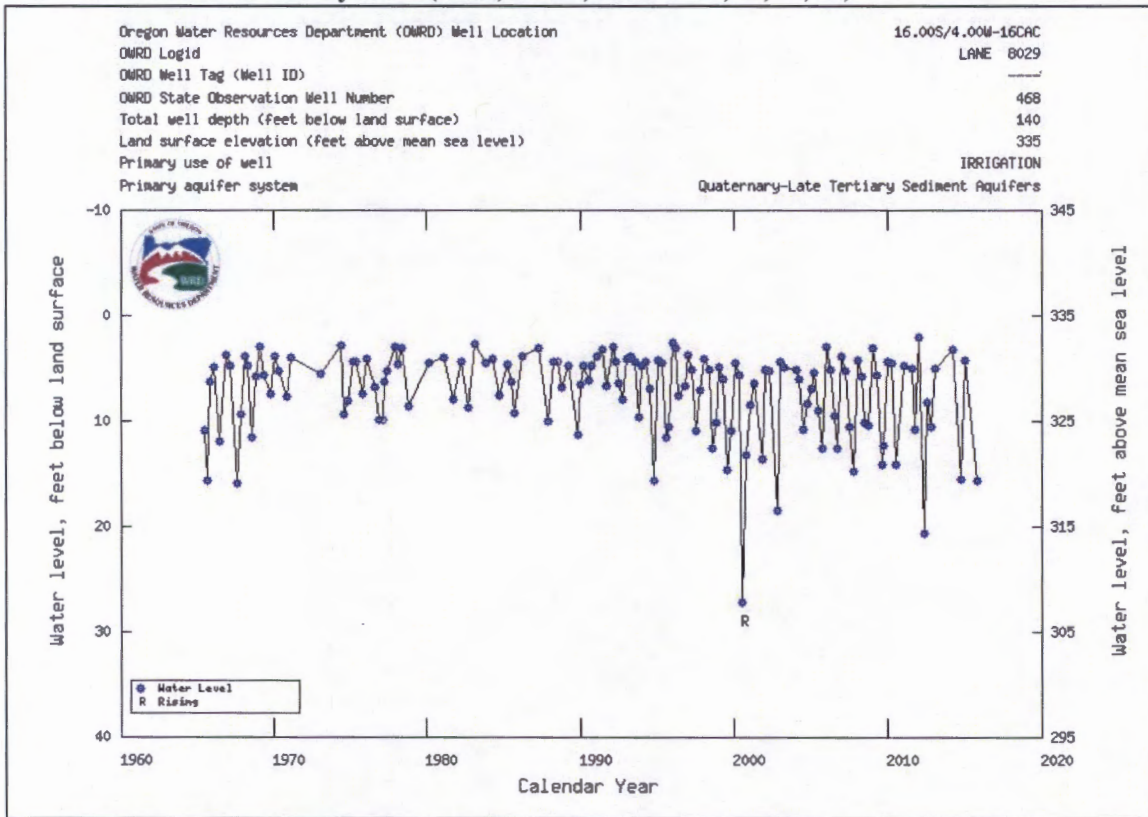
D3. THE WELL construction deficiency or other comment is described as follows: _____

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

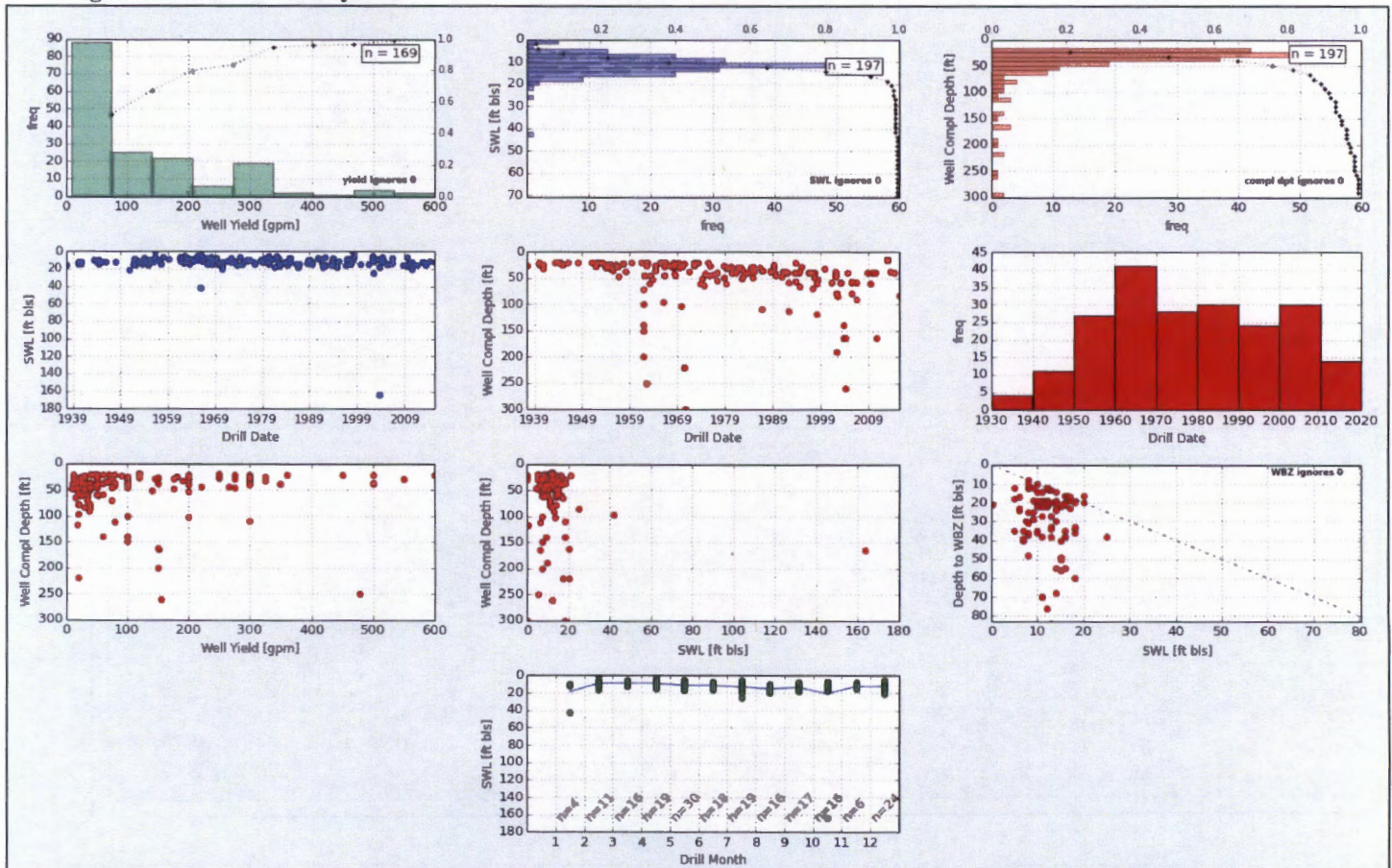
Water Availability Tables

WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE 14174							
WILLAMETTE BASIN							
Water Availability as of 9/7/2016							
Watershed ID #: 30200321 (Map)				Exceedance Level: 80%			
Date: 9/7/2016				Time: 9:36 AM			
Water Availability Calculation		Consumptive Uses and Storages		Instream Flow Requirements		Reservations	
Water Rights		Watershed Characteristics					
Water Availability Calculation							
Monthly Streamflow in Cubic Feet per Second							
Annual Volume at 50% Exceedance in Acre-Feet							
Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available	
JAN	10,100.00	1,370.00	8,730.00	0.00	1,750.00	6,980.00	
FEB	11,600.00	4,280.00	7,320.00	0.00	1,750.00	5,570.00	
MAR	11,000.00	4,560.00	6,440.00	0.00	1,750.00	4,690.00	
APR	9,760.00	4,260.00	5,500.00	0.00	1,750.00	3,750.00	
MAY	8,430.00	2,540.00	5,890.00	0.00	1,750.00	4,140.00	
JUN	5,360.00	855.00	4,510.00	0.00	1,750.00	2,760.00	
JUL	3,270.00	661.00	2,610.00	0.00	1,750.00	859.00	
AUG	2,560.00	601.00	1,960.00	0.00	1,750.00	209.00	
SEP	2,540.00	517.00	2,020.00	0.00	1,750.00	273.00	
OCT	2,860.00	269.00	2,590.00	0.00	1,750.00	841.00	
NOV	4,170.00	353.00	3,820.00	0.00	1,750.00	2,070.00	
DEC	8,150.00	377.00	7,770.00	0.00	1,750.00	6,020.00	
ANN	7,460,000.00	1,230,000.00	6,230,000.00	0.00	1,270,000.00	4,960,000.00	

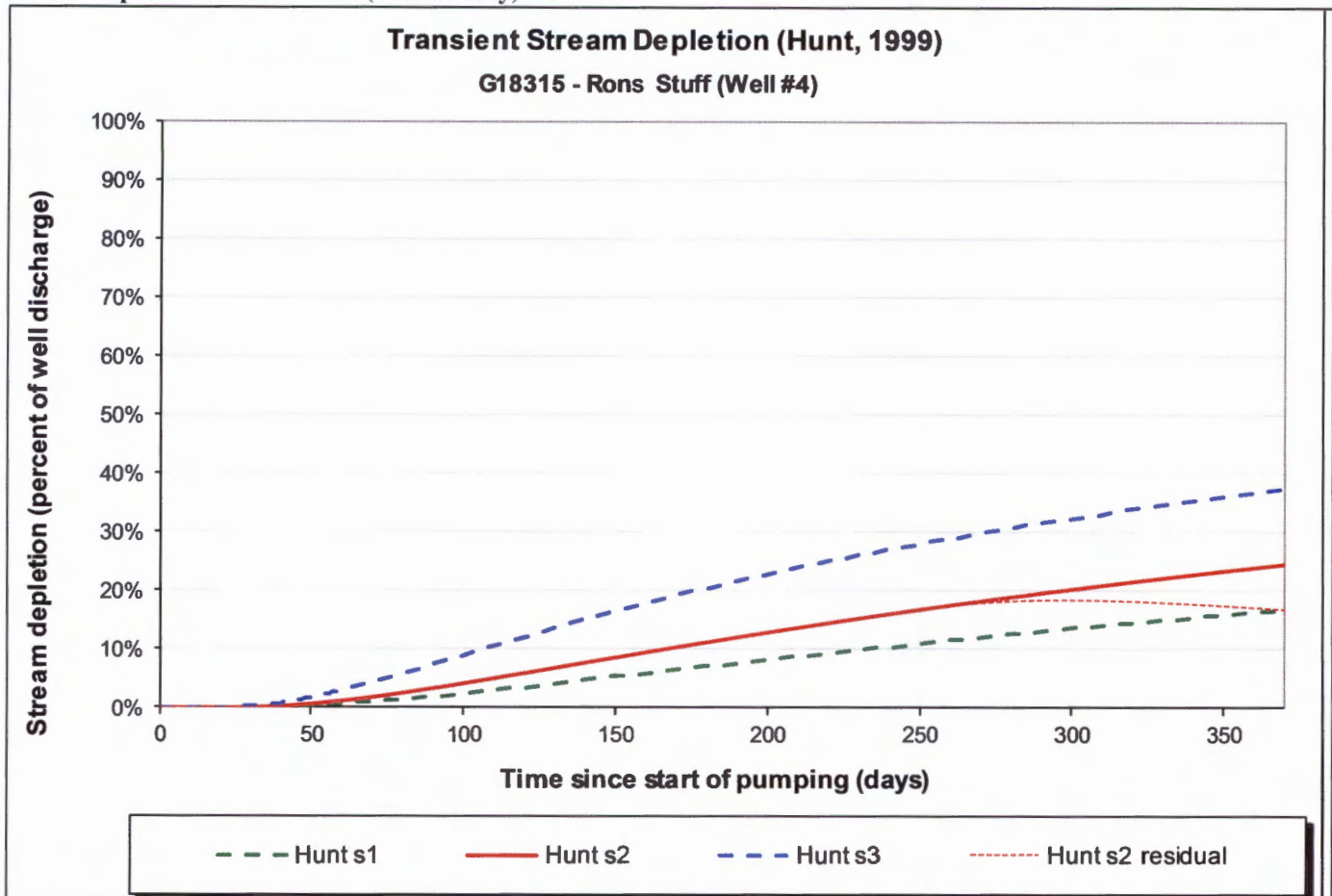
Water-Level Trends in Nearby Wells (T16S, R04W, Sections 15, 16, 21, 22)



Well Log Statistics from Nearby Wells



Stream-depletion Model Results (Well #4 only)



Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 230 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
Jenk SD s2 %	0.49	4.66	10.42	15.94	20.82	25.06	28.75	31.97	33.34	30.81	27.29	24.02
Jen SD s2 cfs	0.002	0.023	0.052	0.080	0.104	0.125	0.144	0.160	0.167	0.154	0.136	0.120
Hunt SD s2 %	0.08	1.17	3.32	5.91	8.59	11.20	13.68	16.02	17.93	18.46	18.02	17.18
Hunt SD s2 cfs	0.000	0.006	0.017	0.030	0.043	0.056	0.068	0.080	0.090	0.092	0.090	0.086

Parameters:

		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.5	0.5	0.5	cfs
Distance to stream	a	10900	10900	10900	ft
Aquifer hydraulic conductivity	K	50	50	50	ft/day
Aquifer thickness	b	250	250	250	ft
Aquifer transmissivity	T	12500	12500	12500	ft*ft/day
Aquifer storage coefficient	S	0.05	0.05	0.05	
Stream width	ws	400	400	400	ft
Streambed hydraulic conductivity	Ks	0.05	0.1	0.5	ft/day
Streambed thickness	bs	10	10	10	ft
Streambed conductance	sbc	2	4	20	ft/day
Stream depletion factor (Jenkins)	sdf	475.2	475.2	475.2	days
Streambed factor (Hunt)	sbf	1.7	3.5	17.4	

Email Correspondence

FW: Appl G 18315 Map - Message (HTML)

File Message

Ignore X Meeting Rules OneNote Mark Unread Categorize Follow Up Translate Find Related Select Zoom

Junk Delete Reply Reply All Forward More Move Actions Tags Editing Zoom

Delete Respond Move Tags Editing Zoom

From: POAGE Barbara J Sent: Tue 9/6/2016 3:58 PM
To: THOMA Michael J
Cc:
Subject: FW: Appl G 18315 Map

From: Steven I. Recca [mailto:steverecca@egrassoc.com]
Sent: Tuesday, September 06, 2016 3:21 PM
To: POAGE Barbara J; reganm@akdco.net
Subject: RE: Appl G 18315 Map

Michael is correct the notations should be from the NW corner of section 21 not the NE corner. My apologies.

Steve Recca

From: POAGE Barbara J [mailto:barbara.j.poage@state.or.us]
Sent: Tuesday, September 06, 2016 3:13 PM
To: reganm@akdco.net; steverecca@egrassoc.com
Subject: FW: Appl G 18315 Map

From: THOMA Michael J
Sent: Tuesday, September 06, 2016 2:52 PM
To: FRENCH Kim R
Cc: POAGE Barbara J
Subject: Appl G 18315 Map

Hi Kim,
Could you contact the agent for application G 18315 and confirm that the location distances listed on their map are actually from the NW corner of Section 21 and not the NE corner of Section 21? I'm nearly certain, but want to confirm before I complete the groundwater review. The map is attached

Thanks,
- Mike

Michael J Thoma, Ph.D.
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Oregon Water Resources Department
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Salem, OR 97301
ph. 503-986-0845

POAGE Barbara J