

Groundwater Application Review Summary Form

Application # G- 18719

GW Reviewer Phil Marcy Date Review Completed: 11/15/2018

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:

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).

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 11/15/2018
 FROM: Groundwater Section Phillip I. Marcy Reviewer's Name
 SUBJECT: Application G- 18719 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: Jimmy Lee County: Linn

A1. Applicant(s) seek(s) 1.67 cfs from 1 well(s) in the Willamette Basin, _____ subbasin

A2. Proposed use Irrigation (139.35 acres) Seasonality: April 1st-October 31st (214 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	Alluvium	1.67	12S/3W-1 SE-SE	790' N, 650' W fr SE cor S1
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	300	NA	*3-5'	NA	300	None listed	0-130	NA	50-125	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** No target aquifer or seal depth proposed on the application. The applicant recently completed LINN 61631 for use as a POA under permit 17611, having identical depth and perforated interval to that described on this application. Therefore, for this review, the construction of the proposed POA well will be assumed the same as LINN 61631.

* Static water level based upon measurements in LINN 61631.

A5. **Provisions of the** Willamette 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 _____ 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 proposed wells are in an area underlain by thick alluvial fan deposits referred to as the Lebanon Fan by Woodward et al., (1998). These deposits are composed of coarse to fine sediments that reach > 140 ft thick and are considered to be very productive aquifer system within the Willamette Valley. The aquifer is generally unconfined to semi-confined in the deeper zones and SWLs (both observed and reported on driller’s logs) are typically within a 20 ft of land surface and fluctuate seasonally. The thickness of these deposits, the overall high transmissivity of them, and sparse development in the area suggest little concern of negative impacts of the proposed use.

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 the Lebanon Fan	<input type="checkbox"/>	<input checked="" 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"/>

Basis for aquifer confinement evaluation: Many of the shallow wells (< 100 ft) in the area show evidence of unconfined conditions as do some deeper wells (although few wells > 150 ft are in the area). Assuming a shallow case and seal depth, as reported on the applicant's nearby, recently drilled well, LINN 61631, deeper water-bearing zones exhibiting partial confinement are not likely to be the predominant source of groundwater.

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	Calapooia River	284	200-245	34,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	S. Fk. Santiam River	284	360	25,500	<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: Proposed well construction would result in production from shallow, highly permeable materials in efficient connection with nearby surface water. According to published groundwater elevation maps by Conlon et al. (2005) groundwater flows from the S Fk Santiam River near Lebanon northwest to the Calapooia and Willamette Rivers. Appropriation of water from the applicant's proposed POAs would be intersecting water that would eventually flow into the Calapooia River. Smaller creeks in the immediate area are not perennial.

Water Availability Basin the well(s) are located within: Calapooia R. > Willamette R – AB Mouth (ID# 76)

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"/>
		<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"/>	<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"/>			<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"/>
			<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: No perennial surface water within 1 mile.

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
1	1	%	%	%	<1 %	<1 %	<1 %	<1 %	<1 %	<1 %	<1 %	<1 %	<1 %
Well Q as CFS		0	0	0	1.67	1.67	1.67	1.67	1.67	1.67	1.67	0	0
Interference CFS					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
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													
(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: Impacts to the Calapooia River where evaluated using the Hunt (1999) analytical model for stream depletion by pumping. Ultimately, the high transmissivity and thickness of the aquifer and large distance between the proposed POAs and the river greatly reduces the potential for significant impacts.

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:** Impacts of pumping from the applicant's proposed POAs will be spread out over a large area and will have minimal impact to perennial surface water reaches.

References Used:

Herrera, N. B., Burns, E. R., and T. D. Conlon. 2014. *Simulation of Groundwater Flow and the Interaction of Groundwater and Surface Water in the Willamette Basin and Central Willamette Subbasin*, Oregon. USGS Scientific Investigations Report 2014-5136

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). 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) _____

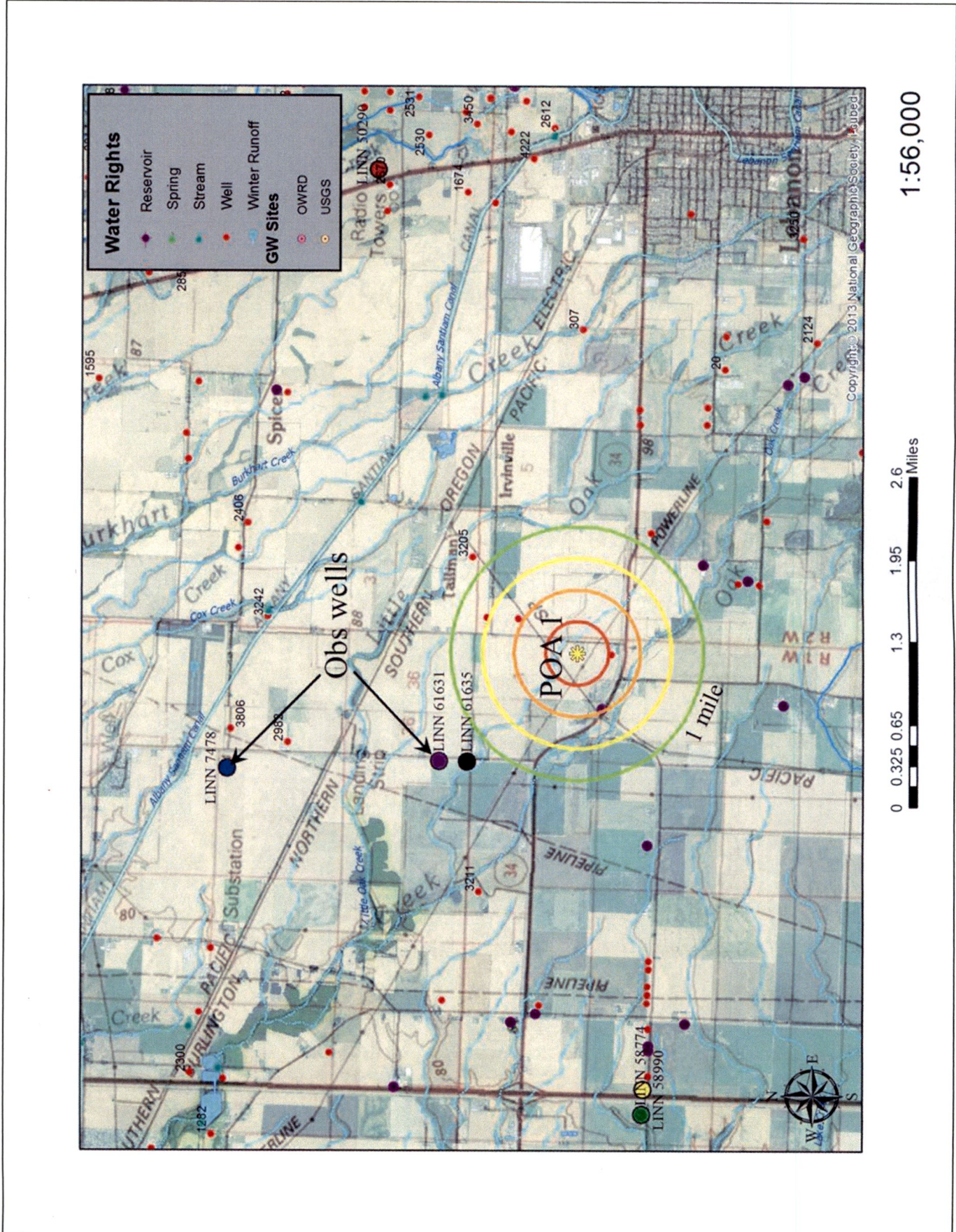
D3. **THE WELL construction deficiency or other comment is described as follows:** _____

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

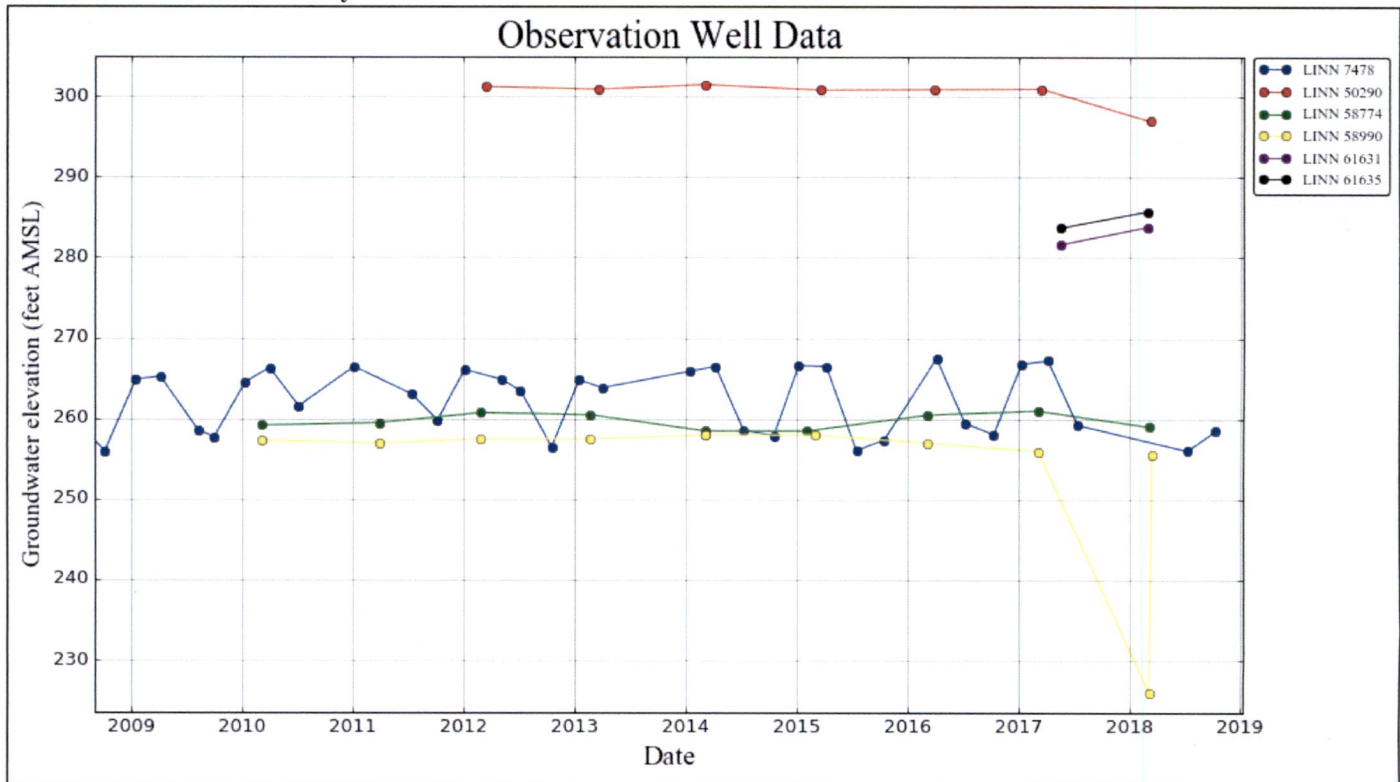
Water Availability Tables

WATER AVAILABILITY TABLE															
Watershed ID #: 76		CALAPOOIA R > WILLAMETTE R - AB MOUTH										Exceedance Level: 80			
Time: 8:52 AM		Basin: WILLAMETTE										Date: 11/15/2018			
# watershed	Nest ID	Stream Name	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	STOR
1	181	WILLAMETTE R > COLUMBIA R - AT MOUTH	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
2	182	WILLAMETTE R > COLUMBIA R - AB MOLALLA R	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
3	183	WILLAMETTE R > COLUMBIA R - AB MILL CR AT GAGE 14191	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
4	30200321	WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
5	76	CALAPOOIA R > WILLAMETTE R - AB MOUTH	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES

Well Location Map



Water-Level Trends in Nearby Wells



Model Run Details for Expected Stream Depletion

Output for Hunt Stream Depletion, Scenario 2 (s2):												
Time pump on = 214 days												
Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	1.670	1.670	1.670	1.670	1.670	1.670	1.670	1.670	1.670	1.670	1.670	1.670
Jenk SD s2 %	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.05	0.09	0.15	0.24
Jen SD s2 cfs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.003	0.004
Hunt SD s2 %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Hunt SD s2 cfs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	1.67	1.67	1.67	cfs
Distance to stream	a	25500	25500	25500	ft
Aquifer hydraulic conductivity	K	10	70	200	ft/day
Aquifer thickness	b	140	140	140	ft
Aquifer transmissivity	T	1400	9800	28000	ft*ft/day
Aquifer storage coefficient	S	0.1	0.1	0.1	
Stream width	ws	100	100	100	ft
Streambed hydraulic conductivity	Ks	0.01	0.01	0.01	ft/day
Streambed thickness	bs	3	3	3	ft
Streambed conductance	sbc	0.333333333	0.333333333	0.333333333	ft/day
Stream depletion factor (Jenkins)	sdf	46446.42857	6635.204082	2322.321429	days
Streambed factor (Hunt)	sbf	6.071428571	0.867346939	0.303571429	

Construction and Reported Lithology of Nearby Well LINN 61631

