

Groundwater Application Review Summary Form

Application # G- 18801

GW Reviewer Phil Macey Date Review Completed: 4/22/2019

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.

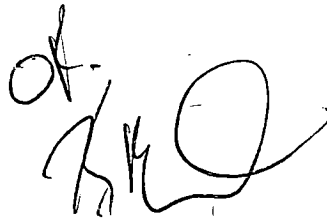
Summary of Well Construction Assessment:

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.

31 4/22/19

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).

MEMO



To: Kristopher Byrd, Well Construction and Compliance Section Manager
From: Joel Jeffery, Well Construction Program Coordinator
Subject: Review of Water Right Application G-18801
Date: April 29, 2019

The attached application was forwarded to the Well Construction and Compliance Section by Water Rights. Phil Marcy reviewed the application. Please see Phil's Groundwater Review and the Well Log.

Applicant's Well #1 (LINN 61779): Based on a review of the Well Report, Applicant's Well #1 seems to protect the groundwater resource.

The construction of Well #1 may not satisfy hydraulic connection issues.

Applicant's Wells #2 and #3 are proposed wells and have not been constructed; therefore a review could not be completed.

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 04/22/2019
 FROM: Groundwater Section Phillip I. Marcy
 Reviewer's Name
 SUBJECT: Application G- 18801 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: William Tenbusch County: Linn

A1. Applicant(s) seek(s) 2.68 cfs from 3 well(s) in the Willamette Basin,
 _____ subbasin

A2. Proposed use Irrigation (214.6 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	LINN 61779	1	Alluvium	2.68	14S/2W-9 NW-NE	15'N, 2140'W fr NE cor S 9
2	PROPOSED	2	Alluvium	2.68	14S/2W-9 NW-NW	950'S, 4360'W fr NE cor, S 9
3	PROPOSED	3	Alluvium	2.68	14S/2W-9 SW-NW	1375'S, 4460'W fr NE cor S 9
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	384	95	-20	08/22/2016	205	0-19	0-90		90-112	60	NA	Air
2	376	NA	NA	NA	-200	TBD	TBD	TBD	TBD	NA	NA	NA
3	379	NA	NA	NA	-200	TBD	TBD	TBD	TBD	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** Proposed POA 1 (LINN 61779) was recently constructed to produce from sands and gravels underlying Willamette Silt. No construction details except proposed total depth were provided for POA wells 2 & 3. LINN 61779 is also listed as a POA on limited license LL-1753, authorized to pump 0.2005 cfs. This diminished rate was proposed after a finding of Potential to Substantially Interfere (PSI) with surface water was triggered on the initial proposed rate of 0.5 cfs.

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: Proposed wells are not within 1/4 mile of a perennial stream reach and the well will produce from a confined aquifer. Thus the pertinent rules (OAR 690-502-0240) do not apply.

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) _____;
 - 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 senior POA to any of the proposed POAs on this application is 1,200 feet. Data from nearby pump tests submitted to the department suggest fairly low values for hydraulic conductivity (15-30 ft²/day) in the sand and gravel aquifer here. This parameter, in conjunction with fairly sparse distribution of coarse-grained sediments within the alluvial sequence, results in fairly low transmissivity for the local alluvial aquifer. Considering these factors, a time-drawdown calculation based on the full requested rate of 2.68 cfs from proposed POA well 3 to LINN 13422, authorized under Certificate 43189. Resulting values for expected drawdown at this location range from less than 45 to greater than 165 feet, using storativity values typical of confined to semi-confined systems.

Groundwater level data are limited in this area, but three wells with at least four consecutive annual measurements exist roughly two miles west of the proposed POA well locations. These wells suggest that groundwater levels within the past 5-6 years have been stable (see attached hydrograph).

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	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Alluvium	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Alluvium	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: The static water level in well 1 (LINN 61779) is far above the first reported water-bearing zone at 95-107 ft bls, a sand and gravel deposit overlain by primarily low-permeability silts and clays. This indicates confined conditions in the alluvial aquifer tapped by Well 1.

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	370	350-380	3050	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Calapooia River	~370	350-380	4750	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1	Calapooia River	~370	350-380	5140	<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"/>
						<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"/>

Basis for aquifer hydraulic connection evaluation: The estimated groundwater elevation is nearly coincident with the estimated elevation range for SW 1 within approximately one mile. Also, the USGS water table map for this area shows groundwater in the alluvial aquifer system flowing towards the Calapooia River (gaining reach) (Gannett and Caldwell, 1998). These facts indicate that the alluvial aquifer system is hydraulically connected to SW1.

The depletion of local streams by the proposed well will be attenuated, but not eliminated, by the low vertical hydraulic conductivity (permeability) of silts and clays that lie between the deeper sands and gravels and the stream beds. Net impacts will be relatively small at the onset of pumping, but will increase with time until a new equilibrium between local recharge and discharge is reached. After that time stream depletion is expected to be relatively constant throughout the year.

Water Availability Basin the well(s) are located within: Calapooia River > Willamette River – Above mouth (WAB #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?
1	1	<input type="checkbox"/>	<input type="checkbox"/>	MF76A	20.00	<input checked="" type="checkbox"/>	22.70	<input checked="" type="checkbox"/>	<<25%	<input checked="" type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	MF76A	20.00	<input checked="" type="checkbox"/>	22.70	<input checked="" type="checkbox"/>	<<25%	<input checked="" type="checkbox"/>
3	1	<input type="checkbox"/>	<input type="checkbox"/>	MF76A	20.00	<input checked="" type="checkbox"/>	22.70	<input checked="" type="checkbox"/>	<<25%	<input checked="" 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: C3a: previous analytical stream depletion modeling for similar hydrogeologic settings indicate that stream depletion at 30 days is expected to be much less than 25% due largely to relatively-thick sequence of low-permeability sediments present between the stream and the deeper aquifer water-bearing zones.

C3b: not applicable.

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:** Potential to Substantially Interfere with surface water has been found for the proposed use, due to the requested rate of 2.70 cfs being higher than 10% of the instream water right (ME76A = 20.00 cfs), and higher than 1% of the 80% exceedance level for minimum stream flow (September = 22.70 cfs) (section C).

In addition, the proposed use is likely to interfere with neighboring senior rights, based upon the distance, timing, and rate of production proposed (section B).

If a permit is issued, conditions 7N and "Large water use reporting" are recommended.

References Used:

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005, Ground-water hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

Gannett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32 p.

Theis, C.V., 1941, The effect of a well on the flow of a nearby stream: Am. Geophys. Union Trans., v. 22, pt.3, p. 734-738.

Application review LL-1753.

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) _____

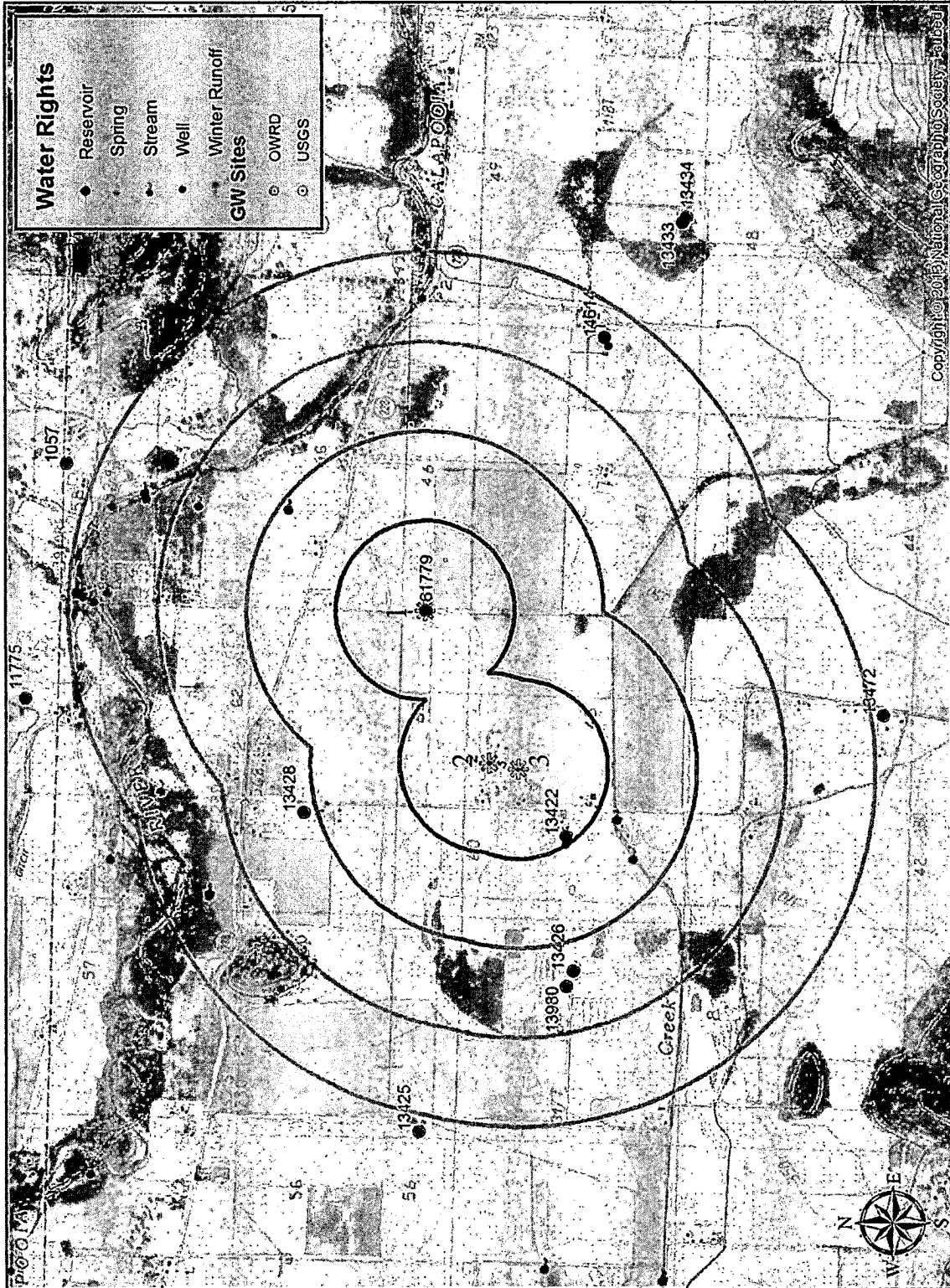
D3. **THE WELL construction deficiency or other comment is described as follows:** _____

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 #: 76		CALAPOOIA R > WILLAMETTE R - AB MOUTH			Exceedance Level: 80	
Time: 2:32 PM		Basin: WILLAMETTE			Date: 04/22/2019	
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	592.00	3.37	589.00	0.00	20.00	569.00
FEB	650.00	3.32	647.00	0.00	20.00	627.00
MAR	575.00	2.25	573.00	0.00	20.00	553.00
APR	423.00	2.03	421.00	0.00	20.00	401.00
MAY	234.00	18.80	215.00	0.00	20.00	195.00
JUN	111.00	14.00	97.00	0.00	20.00	77.00
JUL	49.00	21.70	27.30	0.00	20.00	7.33
AUG	26.00	15.70	10.30	0.00	20.00	-9.75
SEP	22.70	8.17	14.50	0.00	20.00	-5.47
OCT	29.60	1.98	27.60	0.00	20.00	7.62
NOV	133.00	2.39	131.00	0.00	20.00	111.00
DEC	499.00	3.33	496.00	0.00	20.00	476.00
ANN	404,000	5,900	398,000	0	14,500	384,000

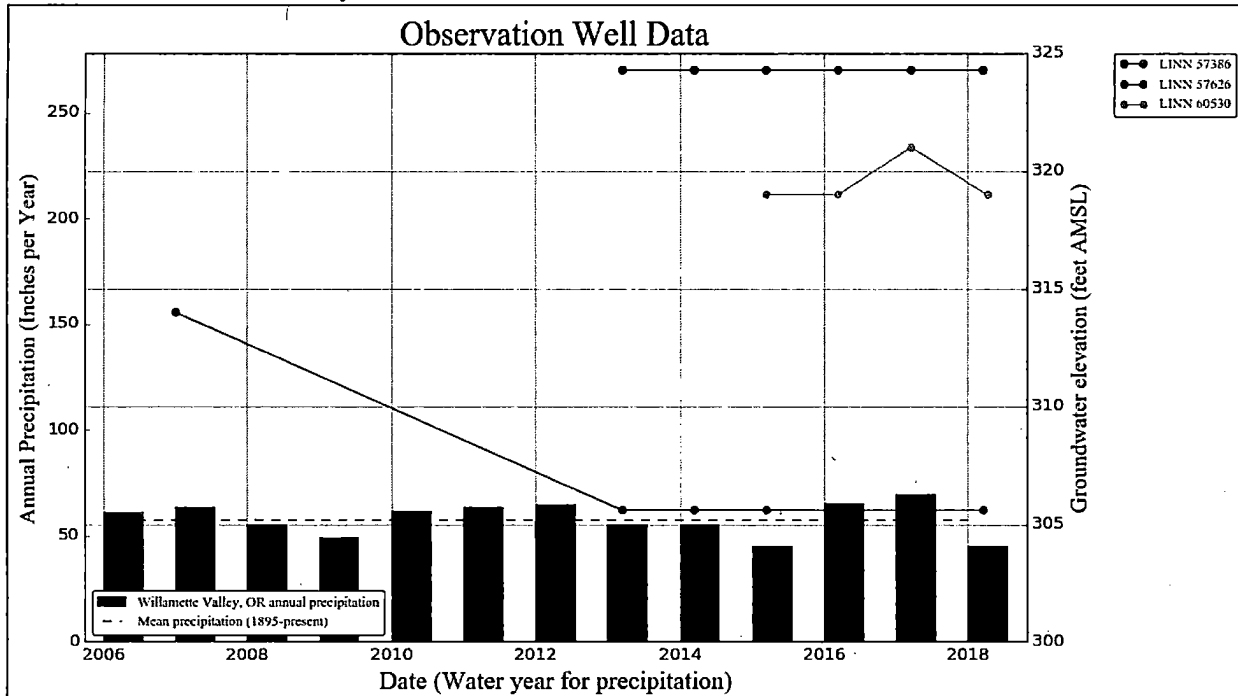
Well Location Map



1:24,000

0 0.125 0.25 0.5 0.75 1 Miles

Water-Level Trends in Nearby Wells



Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units	
Total pumping time	t		245		d	
Radial distance from pumped well:	r		1200.00		ft	Q conversions
Pumping rate	Q		27		cfs	1,202.78 gpm
Hydraulic conductivity	K	10	15	30	ft/day	2.68 cfs
Aquifer thickness	b		60		ft	160.80 cfm
Storativity	S_1		0.01000			231,552.00 cfd
	S_2		0.00100			5.32 afd
Transmissivity Conversions	T_ftpd	600	900	1,800	ft ² /day	
	T_ft2pm	0.4167	0.6250	1.2500	ft ² /min	
	T_gpdft	4,488	6,732	13,464	gpd/ft	

Recalculate Use the Recalculate button if recalculation is set to manual

