

Groundwater Application Review Summary Form

Application # G- 19317

GW Reviewer Phillip I. Marcy Date Review Completed: 06/29/2023

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).

WATER RESOURCES DEPARTMENT

MEMO

June 29, 2023

TO: Application G- 19317

FROM: GW: Phillip I. Marcy
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

- ☐ YES The source of appropriation is hydraulically connected to a State Scenic Waterway or its tributaries
- ☒ 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 [Enter] 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

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section
 FROM: Groundwater Section Phillip I. Marcy
 Date 06/28/2023
 SUBJECT: Application G- 19317 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) 0.99 cfs from 2 well(s) in the Willamette Basin,
 _____ subbasin

A2. Proposed use Irrigation (204.6 acres) Seasonality: May 1st – September 30th (153 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	0.99	14S/3W-5 NE-NW	160'S, 60'W fr N1/4 cor S 5
2	LINN 13561	2	Alluvium	0.99	14S/3W-5 NE-NW	630'S, 60'W fr N1/4 cor S 5
3						
4						

* 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	285	NA	NA	NA	100	>18	~0-100	Unknown	Unknown	NA	NA	NA
2	283	53	6	09/09/1971	120	0-18	0-53; 58-64; 69-100	NA	53-58; 64-69; 100-112	100	4	Bailer

Use data from application for proposed wells.

A4. **Comments:** The applicant proposes to develop groundwater from one existing well (LINN 13561) and one well yet to be constructed for the purpose of primary irrigation of 204.6 acres.

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 ¼ mile of a perennial stream reach, and the well will produce from a confined aquifer. Thus, the pertinent rules (OAR 690-502-0240) do 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) 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:** Most wells within the area of the proposed POA wells produce from unconsolidated sediments, here divided into those above and below the Willamette Silt into "Older Alluvium" and "Younger Alluvium" (Frank, 1976). Older deposits reported in some deeper wells in the area include Little Butte Volcanics and marine siltstone, shale, and tuffaceous sandstone. Both POA wells are likely to produce from Older Alluvium, noted for sand and gravel mixtures with subordinate silt and clay. This poor sorting, in addition to the lenticular geometry of more conductive deposits limits the bulk transmissivity from this aquifer, despite the presence of gravels.

LINN 13558 is 800' from proposed POA 1, and also produces from alluvium under Certificate 42305. Data from nearby pump tests submitted to the department report values for transmissivity of 230-11,000 ft²/day in the sand and gravel aquifer here, with median values falling near 750 ft²/day. This parameter can vary greatly with uneven distribution of coarse-grained sediments within the alluvial sequence with highly variable effective aquifer thicknesses. Using the most likely range of input parameters, a time-drawdown calculation anticipates drawdown experienced at LINN 13558 to range from less than 10' to greater than 29' after 153 days of continuous pumping at the proposed rate at proposed POA 1.

The anticipated drawdown may be offset somewhat by a recharge boundary to the west in the form of Spoon Creek, with which the proposed POA wells will be hydraulically connected.

Available water level data indicate year over year stability (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	Sand and gravel	☒	☐
2	Sand and gravel	☒	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Well logs in the area report static water level rising well above the level at which groundwater was first encountered during well construction.

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	Spoon Creek	~269	~275	1120	☒	☐	☐	☒	☐
2	1	Spoon Creek	269	~275	890	☒	☐	☐	☒	☐
1	2	Courtney Creek	~269	~277	4630	☒	☐	☐	☐	☒
2	2	Courtney Creek	269	~277	4900	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: There is no evidence of a significant barrier to vertical migration of groundwater between the productive aquifer and local surface waters, which are coincident in elevation. Upper fine-grained deposits provide a degree of confinement that slows discharge in the basin-fill sequence, but surface water discharge and groundwater produced by wells emerge from the same recharge sources.

Water Availability Basin the well(s) are located within: CALAPOOIA R> WILLAMETTE R- AB MOUTH

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 (SW) source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that SW source, 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?	Q _w > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Q _w > 1% ISWR?	80% Natural Flow (cfs)	Q _w > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
1	1	☒	☐	MF76A	20.0	☒	22.7	☒	<<25%	☒
2	1	☒	☐	MF76A	20.0	☒	22.7	☒	<<25%	☒
1	2	☐	☐	MF76A	20.0	☒	22.7	☒	<<25%	☒
2	2	☐	☐	MF76A	20.0	☒	22.7	☒	<<25%	☒

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 #		Q _w > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Q _w > 1% ISWR?	80% Natural Flow (cfs)	Q _w > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: _____

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													
(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: _____

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:
- ☐ The permit should contain condition #(s) _____;
 - ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:** Both proposed POA wells are located within ¼ mile of a surface water source (Spoon Creek), and within one mile of a second surface water source (Courtney Creek). According to our conceptual framework of local hydrogeology, the target aquifer for groundwater production is hydraulically connected to these local surface waters, and therefore the proposed use has triggered PSI due to: A) hydraulic connection to a surface water source within ¼ mile B) proposed pumping rate greater than 1% of the instream water right for the given WAB while being within one mile of connected surface waters, and C) the proposed pumping rate is also greater than 1% of the 80% exceedance value for the given WAB (in months July-October).

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.

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.

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.

Frank, F.J., 1976. *Ground Water in the Harrisburg-Halsey Area, Southern Willamette Valley, Oregon*. USGS Water Supply Paper 2040.

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.

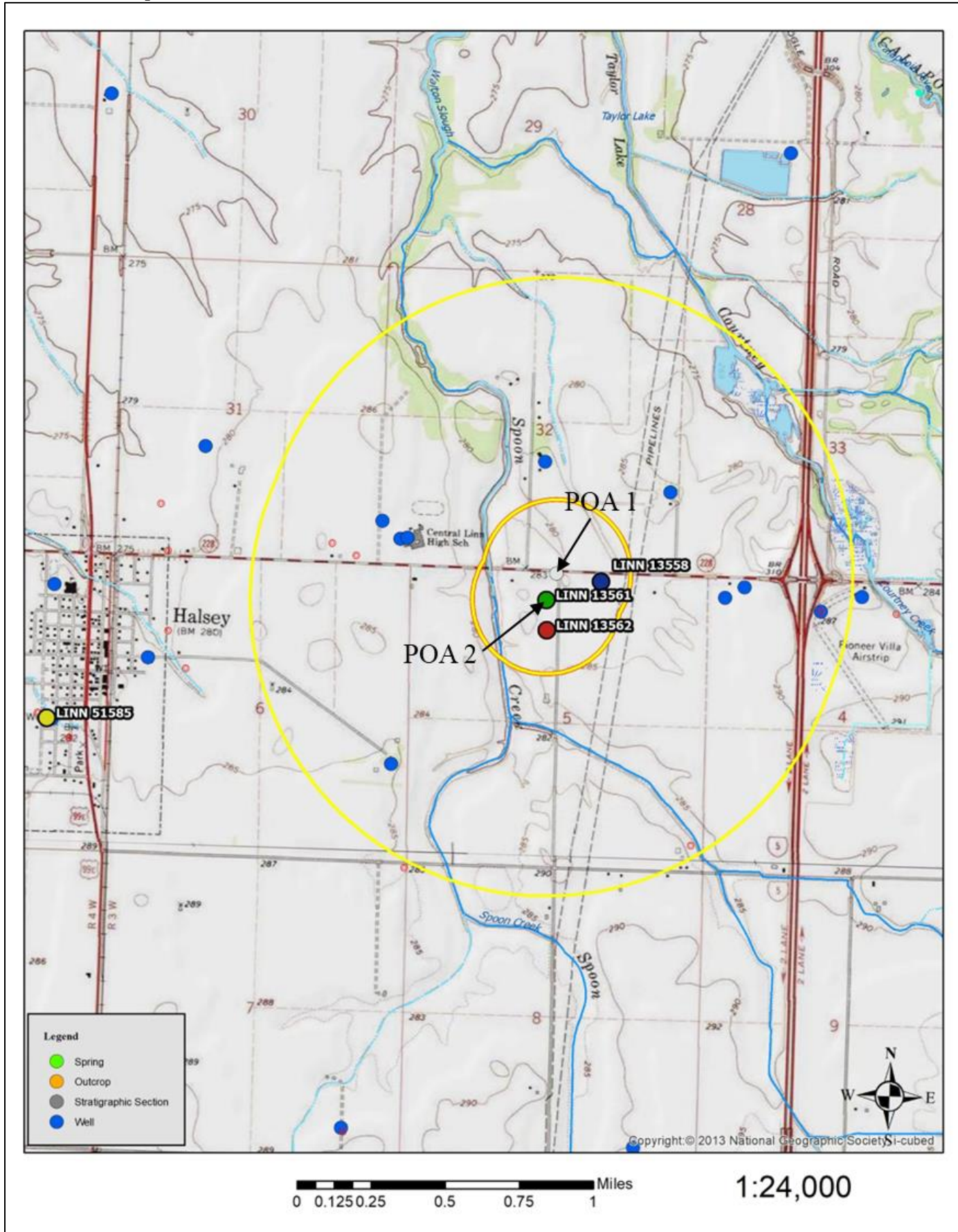
D. WELL CONSTRUCTION, OAR 690-200

- 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.**

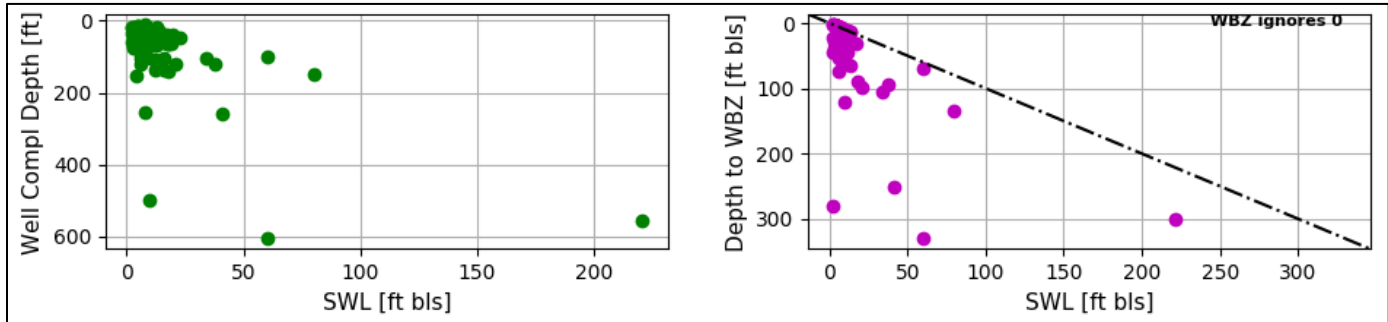
Water Availability Tables

Watershed ID #: 76		CALAPOOIA R > WILLAMETTE R - AB MOUTH			Exceedance Level: 80	
Time: 8:48 AM		Basin: WILLAMETTE			Date: 06/28/2023	
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	3.94	588.00	0.00	20.00	568.00
FEB	650.00	3.87	646.00	0.00	20.00	626.00
MAR	575.00	2.69	572.00	0.00	20.00	552.00
APR	423.00	2.37	421.00	0.00	20.00	401.00
MAY	234.00	19.60	214.00	0.00	20.00	194.00
JUN	111.00	15.40	95.60	0.00	20.00	75.60
JUL	49.00	23.90	25.10	0.00	20.00	5.10
AUG	26.00	17.20	8.77	0.00	20.00	-11.20
SEP	22.70	8.89	13.80	0.00	20.00	-6.19
OCT	29.60	2.02	27.60	0.00	20.00	7.58
NOV	133.00	2.53	130.00	0.00	20.00	110.00
DEC	499.00	3.89	495.00	0.00	20.00	475.00
ANN	404,000	6,460	397,000	0	14,500	383,000

Well Location Map

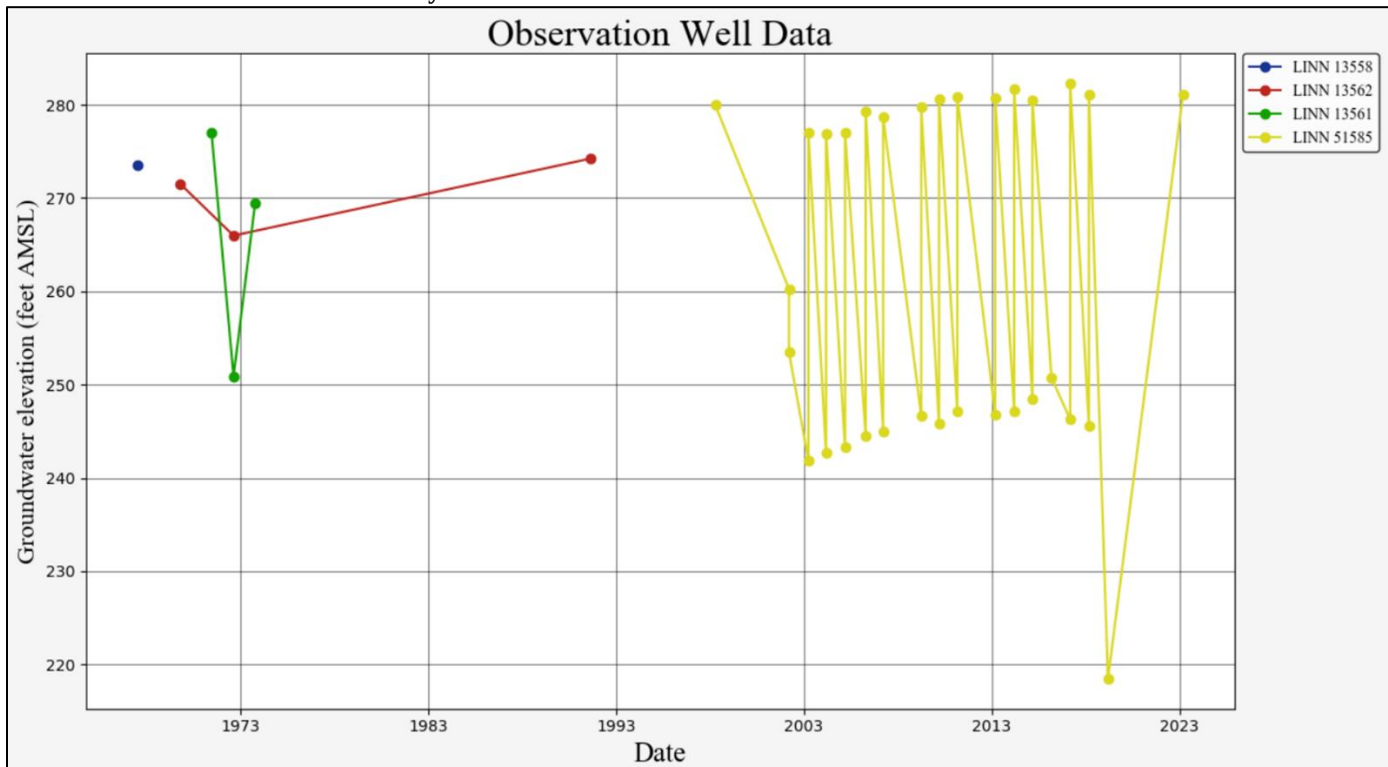


Well Statistics



Statistics from wells constructed in this and surrounding sections report static water levels consistently above the depth of the water-bearing zone (WBZ) within each borehole, which suggests some degree of local confinement.

Water-Level Measurements in Nearby Wells



Sparse groundwater data available for this area indicate water levels are generally stable. The hydrograph for LINN 51585 includes pumping values, showing drawdown within the well to be on the order of nearly 40 feet.

Theis Interference Analysis

Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units
Total pumping time	t		153		d
Radial distance from pumped well:	r		800.00		ft
Pumping rate	Q		1.0		cfs
Hydraulic conductivity	K	15	30	60	ft/day
Aquifer thickness	b		60		ft
Storativity	S 1		0.01000		
	S 2		0.01000		
Transmissivity Conversions	T f2pd	900	1,800	3,600	ft ² /day
	T ft2pm	0.6250	1.2500	2.5000	ft ² /min
	T_gpdpft	6,732	13,464	26,928	gpd/ft

