

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 4/20/2015  
 FROM: Groundwater Section Michael J. Thoma  
Reviewer's Name  
 SUBJECT: Application G- 18010 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: Gary L. Burton Living Trust County: LINN

A1. Applicant(s) seek(s) 1.79 cfs from 3 well(s) in the Willamette Basin,  
McCarthy Slough subbasin Quad Map: Albany

A2. Proposed use Irrigation (143.15 ac; Primary) Seasonality: March 1 – October 31

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 58202	1	Alluvium	1.48	10S/03W-08 SENW	1200'N, 1710'E of W1/4 cor. S 8
2	No Log <sup>a</sup>	2	Alluvium	0.31	10S/03W-08 SWNW	980'N, 250'E of W1/4 cor. S 8
3	Proposed <sup>a</sup>	3	Alluvium	1.48 <sup>b</sup>	10S/03W-08 SWSW	1560'S, 1050'E of W1/4 cor. S 8

\* 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	190	16	9	03/06/2008	60	0-19	1-60		20-60	1000		A
2	190	16 <sup>c</sup>	3-17 <sup>c</sup>		24.5							
3	205											

Use data from application for proposed wells.

A4. **Comments:** <sup>a</sup> Applicant's Well #2 is an existing shallow well likely drilled around 1950 for which there is no available well log. Similar wells under the original GR claim (GR-2960/2961) underlying the proposed POU (LINN 4610/4620) have Well Record sheets associated with them (i.e., no driller's logs).

<sup>b</sup> The reviewer assumes that the applicant's Well #3 will be drilled and used only if the full 1.79 cfs production cannot be achieved from the existing wells LINN 58202 or Well #2. The well log for LINN 58202 lists a yield of 1000 gpm (2.2 cfs).

<sup>c</sup> First Water and SWL for Well #2 are based on Well Record forms from LINN 4610 and 4620 which are of similar construction and depth as Well #2 and < 1/4 mi away. A range is given that reflects the seasonality of the water table in this area.

A5.  **Provisions of the Willamette (OAR 690-502-0240)** 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 listed wells are > 1/4 mi from surface water sources.

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) 7c (7 year); "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 alluvial 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 applicant's proposed POAs are located in the low-relief valley floor near the confluence of the Willamette and Santiam Rivers. The existing wells (LINN 58202 and NLOG from Table A3) are completed within shallow alluvial deposits adjacent to elevated hills of older marine sediments (Spencer or Eugene Formations). The alluvium underlying the area is generally < 100 ft thick and composed of productive sand and gravel zones, mostly in the upper 50 ft, and fine-grained clay in the deeper portions. These deeper clay zones may be up to 100 ft thick and some driller's logs describe thin, coarse-grained zones interbedded within it. Several driller's logs list continuous clay from ~50 ft to the full depth drilled, which is often < 100 ft. The transition between the alluvial clay and the underlying marine sediments is often indistinguishable in driller's logs.

Most existing wells in the area produce from the coarse-grained zones in the upper 50 ft of the aquifer and yield from 50 to several-hundred gpm. There are no water level observation wells in the immediate area (Figure 1) but what records exist in similar environments within the central Willamette Valley floodplain sediments (i.e., similar aquifers) show seasonal fluctuations in water level that strongly coincide with river stage and precipitation cycles. Long-term water levels do not show declines (Figure 2).

**Regarding Injury:**  
There are numerous groundwater claims near the applicant's proposed POU (including the applicant's claims GR 2960 and GR 2961 which underlie part of the proposed POU) that have not yet been certificated (Figure 1). Most POAs for these claims are shallow wells (< 50 ft total depth) that produce from the same coarse-grained sediments as the applicant proposes. The coarse-grained material is likely highly transmissive and the aquifer is unconfined with relatively high specific yields. This conceptual hydrologic model leads to the determination that there will likely not be substantial interference between users – especially since most of these claims have likely been exercised for several years/decades without conflict.

**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	Alluvial sediments	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Alluvial sediments	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Alluvial sediments	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Basis for aquifer confinement evaluation:** Driller's logs in nearby wells show static water levels (SWL) at or above the water bearing zones (WBZ) suggesting unconfined to semi-confined conditions. Helm and Leonard (1977) describe seasonal confinement in some areas of the Central Willamette Valley alluvium but generally an unconfined aquifer system. SWLs are similar for wells over a wide range of depths (SWLs generally < 20ft and depths between 20 and 100 ft) and observation wells nearby show SWLs that fluctuate with river stage. These conditions are generally evidence of unconfined conditions.

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	Santiam River	180	180	8700	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Santiam River	180	180	9300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1	Santiam River	190	180	11500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Willamette River	180	165	13300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	2	Willamette River	180	165	12100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	2	Willamette River	190	165	11100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Basis for aquifer hydraulic connection evaluation:** The wells in this area respond to seasonal and sub-seasonal changes in river stage and precipitation and the aquifer is coarse, unconfined alluvium with high transmissivity so hydraulic connection is likely very efficient, even at distances > 1 mi.

**Water Availability Basin the well(s) are located within:** Willamette R > Columbia R – AB Mill Cr (ID# 183) but will also be impacting Santiam R > Willamette R at mouth (ID# 167).

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"/>

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: \_\_\_\_\_

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													
(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 listed streams were not modeled because the applicant's full proposed rate of 1.79 cfs is below the 1% of the natural flow of the Santiam River and the Willamette River WABs under any months. Cumulative impacts will not exceed 1% of the minimum flows.

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 alluvial aquifer in the area of the applicant's proposed POAs is shallow and generally unconfined and nearby wells that have long records of SWL show clear correlation to river stage – implying very efficient hydraulic connection. However, the applicant's proposed use is far below the 1% of either WAB and so there is no chance of PSI under ORS 690-009 conditions from any of the proposed POAs for either river.

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**References Used:** Helm, D. C. and A. R. Leonard. 1977. Ground-water Resources of the Lower Santiam River Basin, Middle Willamette Valley, Oregon. Water Resources Department Ground-water Report No. 25

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Gannett, Marshall W., and Caldwell, Rodney R., 1998, Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U. S. Geological Survey Professional Paper 1424-A, 32p, 8 plates

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Woodward and others, 1998, Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B

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**D. WELL CONSTRUCTION, OAR 690-200**

D1. Well #: 2 Logid: No Log

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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) There is no existing well log for the proposed well #2 and it is likely an older well that does not meet current well construction standards.

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D3. **THE WELL construction deficiency or other comment is described as follows:** No likely seal.

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

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**Water Availability Tables**

WILLAMETTE R > COLUMBIA R - AB MILL CR AT GAGE 14191000						
WILLAMETTE BASIN						
Water Availability as of 4/9/2015						
Watershed ID #: 183 <a href="#">(Map)</a>			Exceedance Level: 80% ▾			
Date: 4/9/2015			Time: 11:40 AM			
<b>Water Availability Calculation</b>		<b>Consumptive Uses and Storages</b>	<b>Instream Flow Requirements</b>	<b>Reservations</b>		
<b>Water Rights</b>			<b>Watershed Characteristics</b>			
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	18,400.00	2,240.00	16,200.00	0.00	1,300.00	14,900.00
FEB	20,100.00	7,420.00	12,700.00	0.00	1,300.00	11,400.00
MAR	19,600.00	7,210.00	12,400.00	0.00	1,300.00	11,100.00
APR	18,000.00	6,870.00	11,100.00	0.00	1,300.00	9,830.00
MAY	15,500.00	4,170.00	11,300.00	0.00	1,300.00	10,000.00
JUN	8,310.00	1,690.00	6,620.00	0.00	1,300.00	5,320.00
JUL	4,710.00	1,450.00	3,260.00	0.00	1,300.00	1,960.00
AUG	3,620.00	1,330.00	2,290.00	0.00	1,300.00	987.00
SEP	3,680.00	1,160.00	2,520.00	0.00	1,300.00	1,220.00
OCT	4,650.00	747.00	3,900.00	0.00	1,300.00	2,600.00
NOV	9,400.00	853.00	8,550.00	0.00	1,300.00	7,250.00
DEC	16,700.00	910.00	15,800.00	0.00	1,300.00	14,500.00
ANN	13,500,000.00	2,160,000.00	11,300,000.00	0.00	942,000.00	10,400,000.00

SANTIAM R > WILLAMETTE R - AT MOUTH						
WILLAMETTE BASIN						
Water Availability as of 4/9/2015						
Watershed ID #: 167 <a href="#">(Map)</a>			Exceedance Level: 80% ▾			
Date: 4/9/2015			Time: 11:40 AM			
<b>Water Availability Calculation</b>		<b>Consumptive Uses and Storages</b>	<b>Instream Flow Requirements</b>	<b>Reservations</b>		
<b>Water Rights</b>			<b>Watershed Characteristics</b>			
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	5,860.00	1,050.00	4,810.00	0.00	320.00	4,490.00
FEB	6,590.00	3,320.00	3,270.00	0.00	320.00	2,950.00
MAR	5,870.00	2,890.00	2,980.00	0.00	320.00	2,660.00
APR	5,370.00	2,880.00	2,490.00	0.00	320.00	2,170.00
MAY	5,020.00	1,930.00	3,090.00	0.00	320.00	2,770.00
JUN	2,600.00	1,080.00	1,520.00	0.00	320.00	1,200.00
JUL	1,380.00	1,020.00	358.00	0.00	320.00	37.80
AUG	1,030.00	962.00	68.00	0.00	320.00	-252.00
SEP	923.00	852.00	70.90	0.00	320.00	-249.00
OCT	1,020.00	770.00	250.00	0.00	320.00	-70.30
NOV	2,820.00	723.00	2,100.00	0.00	320.00	1,780.00
DEC	5,940.00	715.00	5,230.00	0.00	320.00	4,910.00
ANN	4,380,000.00	1,090,000.00	3,280,000.00	0.00	232,000.00	3,060,000.00

Figure 1: Groundwater Review Map showing proposed POAs and nearby existing groundwater POAs (most are groundwater claims).

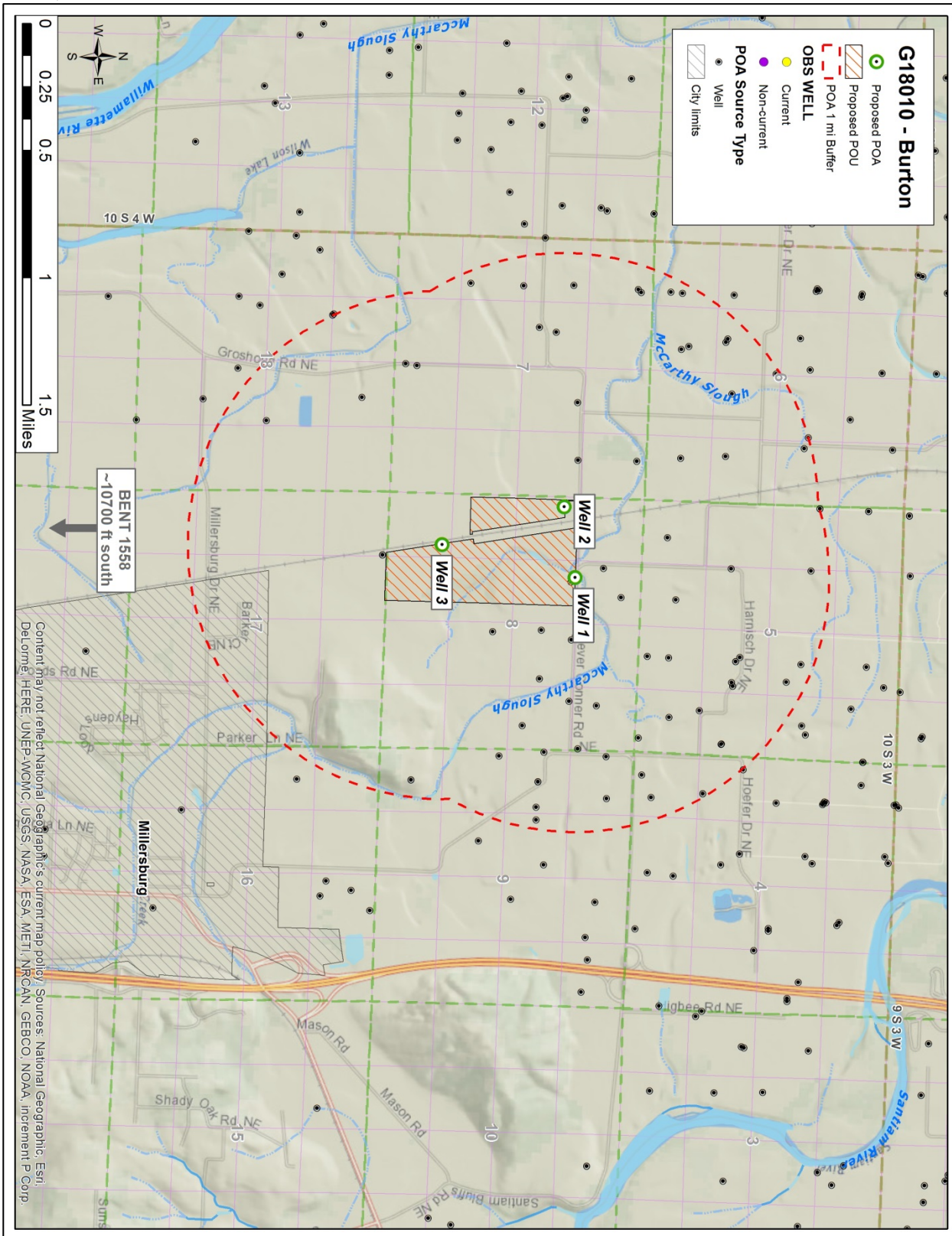




Figure 2: Plot of water level in nearby wells in the Willamette Valley and Willamette River stage

