

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 11/10/2015

FROM: Groundwater Section Michael J. Thoma
Reviewer's Name

SUBJECT: Application G- 18138 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: Leroy Spurlin County: Linn

A1. Applicant(s) seek(s) 0.75 cfs from 2 well(s) in the Willamette Basin,
Calapooia subbasin

A2. Proposed use Irrigation (60 ac. primary) Seasonality: May 1 – Sept. 30 (152 d)

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 956	1	Bedrock	0.75	13S/03W-23 SWNE	75'N, 1000'E of center S 23
2	PROP ^a	2	Bedrock	0.75	13S/03W-23 SWNE	75'N, 700'E of center S 23
3						

* 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	295	95	4.5	8/4/1976	175		0-117			50	150	
2	295				175 ^a							

Use data from application for proposed wells.

A4. **Comments:** ^aWell #2 is proposed and the applicant proposes a similar construction to Well #1

A5. ☐ **Provisions of the** Willamette (OAR 690-504) 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 (Annual SWL); 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:** There are no current groundwater observation wells in the immediate vicinity of the proposed POAs but there also very few permitted groundwater POAs. It is unlikely that the proposed use will have significant negative impacts to the groundwater resource in the area.

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	Volcanoclastic material of Western Cascades	☒	☐
2	Volcanoclastic material of Western Cascades	☒	☐
		☐	☐

Basis for aquifer confinement evaluation: SWL reported on the well log for LINN 956 is much higher than reported first water-bearing zones. Additionally, the well log lists several zones of clay between the land surface and the water-bearing zones.

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 R.	290	285-300	5780 ^b	☒	☐	☐	☐	☒
2	1	Calapooia R.	290	285-300	5700 ^b	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: ^bThe distance given above is the shortest distance between the proposed POAs and the Calapooia River. However, Powell Hills – a large mass of consolidated bedrock rising > 200 ft above the valley floor – lies between the proposed POAs and the river. Powell Hills has many domestic wells on it that show groundwater elevations above the elevations of both the river to the south and the valley floor to the north, suggesting that it is acting partially as a local groundwater divide. Therefore it is likely that the most efficient point of hydraulic connection to the Calapooia River is much further downstream and farther away from the proposed POAs – likely at distances > 2 miles (see C4a).

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?
		☐	☐			☐		☐		☐

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?
			☐			☐		☐		☐

Comments: No proposed POAs are within 1 mile of surface water

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
		See comments below											
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 surface water caused by pumping of the proposed POAs were not evaluated because several assumptions of the analytical models used to estimate impacts (e.g., Hunt 2003) could not be met. The proposed POAs are separated from the Calapooia River by the Powell Hills and the bedrock aquifer which the proposed POAs would be producing from is overlain by alluvial sediments that thicken from near 0 at the base of Powell Hills (and near the proposed POAs) to > 200 ft near the Calapooia River west of Powell Hills. The Calapooia River is incised into these alluvial sediments and so hydraulic connection between the proposed POAs and the river is indirect (through the interface between the bedrock and alluvium) and likely very inefficient at these distances. Ultimately, it is the decision of the Department that hydraulic connection is inefficient and there is no potential for substantial interference between the proposed POAs and the Calapooia River.

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:** see comments under C4a

References Used: _____

McClaghry, J. D., T. J. Wiley, M. L. Ferns, and I. P. Madin. 2010. *Digital Geologic Map of the Southern Willamette Valley, Benton, Lane, Linn, Marion, and Polk Counties, Oregon*. Oregon Dept. of Geology and Mineral Industries. Open-file Report O-10-03.

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. 2003. *Unsteady Stream Depletion When Pumping from Semiconfined Aquifer*. Journal of Hydrologic Engineering, Vol 8(1). 12-19.

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

CALAPOOIA R > WILLAMETTE R - AB MOUTH
WILLAMETTE BASIN

Water Availability as of 11/10/2015

Watershed ID #: 76 ([Map](#))

Exceedance Level: 80% ▾

Date: 11/10/2015

Time: 11:57 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	592.00	2.84	589.00	0.00	20.00	569.00
FEB	650.00	2.78	647.00	0.00	20.00	627.00
MAR	575.00	2.11	573.00	0.00	20.00	553.00
APR	423.00	1.81	421.00	0.00	20.00	401.00
MAY	234.00	6.82	227.00	0.00	20.00	207.00
JUN	111.00	12.50	98.50	0.00	20.00	78.50
JUL	49.00	19.30	29.70	0.00	20.00	9.69
AUG	26.00	13.80	12.20	0.00	20.00	-7.82
SEP	22.70	7.25	15.40	0.00	20.00	-4.55
OCT	29.60	1.38	28.20	0.00	20.00	8.22
NOV	133.00	1.87	131.00	0.00	20.00	111.00
DEC	499.00	2.80	496.00	0.00	20.00	476.00
ANN	404,000.00	4,560.00	399,000.00	0.00	14,500.00	385,000.00

Well Location Map



Area Overview Map



