

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 12/05/2016

FROM: Groundwater Section Phillip I. Marcy
Reviewer's Name

SUBJECT: Application G- 18299 Supersedes review of 08/31/2016
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: Kiprian & Anna Tipikin County: Clackamas

A1. Applicant(s) seek(s) 1.66 cfs from 2 well(s) in the Willamette Basin,
Pudding River subbasin

A2. Proposed use Irrigation (37.4 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	Proposed	1	Alluvium		5S/1E-11 NW-SE	745'S, 1240'E fr C1/4 cor S 11
2	Proposed	2	Alluvium		5S/1E-11 NW-SE	50'S, 100'E fr C1/4 cor S 11
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	277	NA	NA	NA	470	0-135	0-170	?	170-470	?	NA	NA
2	267	NA	NA	NA	470	0-135	0-170	?	170-470	?	NA	NA

Use data from application for proposed wells.

A4. **Comments:** This review supersedes the review of 08/31/2016, in which the instream water right on the Pudding River was evaluated against in section C3. This review shall only consider the potential impacts to nearby Bear Creek, tributary to the Pudding River.

Both POA wells are proposed to produce groundwater from alluvium, and their construction is based upon an existing well owned by the applicant (CLAC 64676).

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) 7C, 7T**;
 - 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 135 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:** Area wells with similar head elevations in the alluvial aquifer system show relatively stable water levels for the past two decades (see attached hydrograph). The closest nearby groundwater POA (CLAC 2460 on permit G-15132) is about 250 feet from the proposed location of "Well 2", but develops from a much shallower portion of the aquifer system. This is evidenced on the well log, in addition to a vast difference in head elevations between CLAC 2460 and the applicant's well on which construction of the proposed POA wells is based (~235' AMSL for CLAC 2460 versus ~175' AMSL for CLAC 64676).

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	Troutdale Formation	☐	☒
2	Troutdale Formation	☐	☒
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Wells developed into the local alluvial aquifer show some degree of head elevation above that of the water-bearing zone. The alluvial aquifer here overlies Columbia River Basalt (~650' below land surface, as reported on CLAC 62624), and likely represents a discharge zone for baseflow from higher elevations to the east. Some degree of confinement may slow the upward migration of groundwater, and connections to local streams may be inefficient if the proposed wells are constructed to produce from beneath thick sections of clay and/or silt. The well log for CLAC 64676 reports multiple clay horizons, totaling greater than 80 feet of fine-grained sediments above the proposed production zone.

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	Bear Creek	~175	215-265	4450	☒	☐	☐	☐	☒
2	1	Bear Creek	~175	215-265	3950	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Bear Creek is the only perennial stream with a reach located within 1 mile of the proposed POA well locations. As stated above, this appears to be an area of regional groundwater discharge, from sediments sitting above relatively impermeable Columbia River Basalt. Groundwater pumped from this aquifer system likely results in reduced discharge to local streams.

Water Availability Basin the well(s) are located within: Pudding R > Molalla R – Above Mill Creek (ID# 151)

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	☐	☐			☐	67.3	☒	6.30	☒
2	1	☐	☐			☐	67.3	☒	6.63	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: Transient stream depletion was calculated using the model of Hunt (2003) to include the effects of fine-grained aquitards overlying the production zone of the proposed POA wells, in addition to fine-grained sediments deposited within the stream channel. Using a range of transmissivity values (50-5000 ft²/day), stream depletion at Bear Creek is expected to be less than 25% at 30 days of pumping at the mean requested rate (0.19 cfs). The proposed pumping rate, however, is greater than 1% of 80% of the minimum perennial streamflow in Bear Creek, triggering PSI under OAR 690-009-0040 (4c).

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

C6. **SW / GW Remarks and Conditions:** Conditions 7C, 7N, and "Large Water Use Reporting" are recommended, as noted above. In addition, if a permit is issued, a special condition shall apply, requiring that proposed POA wells be constructed as proposed, with continuous casing and continuous seal to no less than 135' below land surface.

References Used:

Gannett, M.W., and Caldwell, R.R. 1998. Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U.S. Geological Survey PP-1424-A, scale 1:250,000.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Local well logs, local pump tests.

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 #: 151
 Time: 11:26 AM
 PUDDING R > MOLALLA R - AB MILL CR
 Basin: WILLAMETTE
 Exceedance Level: 80
 Date: 08/31/2016

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	1,040.00	124.00	916.00	0.00	36.00	880.00
FEB	1,180.00	114.00	1,070.00	0.00	36.00	1,030.00
MAR	1,010.00	78.90	931.00	0.00	36.00	895.00
APR	787.00	54.80	732.00	0.00	36.00	696.00
MAY	425.00	51.80	373.00	0.00	36.00	337.00
JUN	224.00	72.90	151.00	0.00	36.00	115.00
JUL	109.00	113.00	-4.01	0.00	36.00	-40.00
AUG	71.00	93.30	-22.30	0.00	36.00	-58.30
SEP	67.30	54.50	12.80	0.00	36.00	-23.20
OCT	91.60	14.00	77.60	0.00	36.00	41.60
NOV	363.00	48.00	315.00	0.00	36.00	279.00
DEC	957.00	118.00	839.00	0.00	36.00	803.00
ANN	706,000	56,500	649,000	0	26,100	626,000

[illegible]

1:24,000

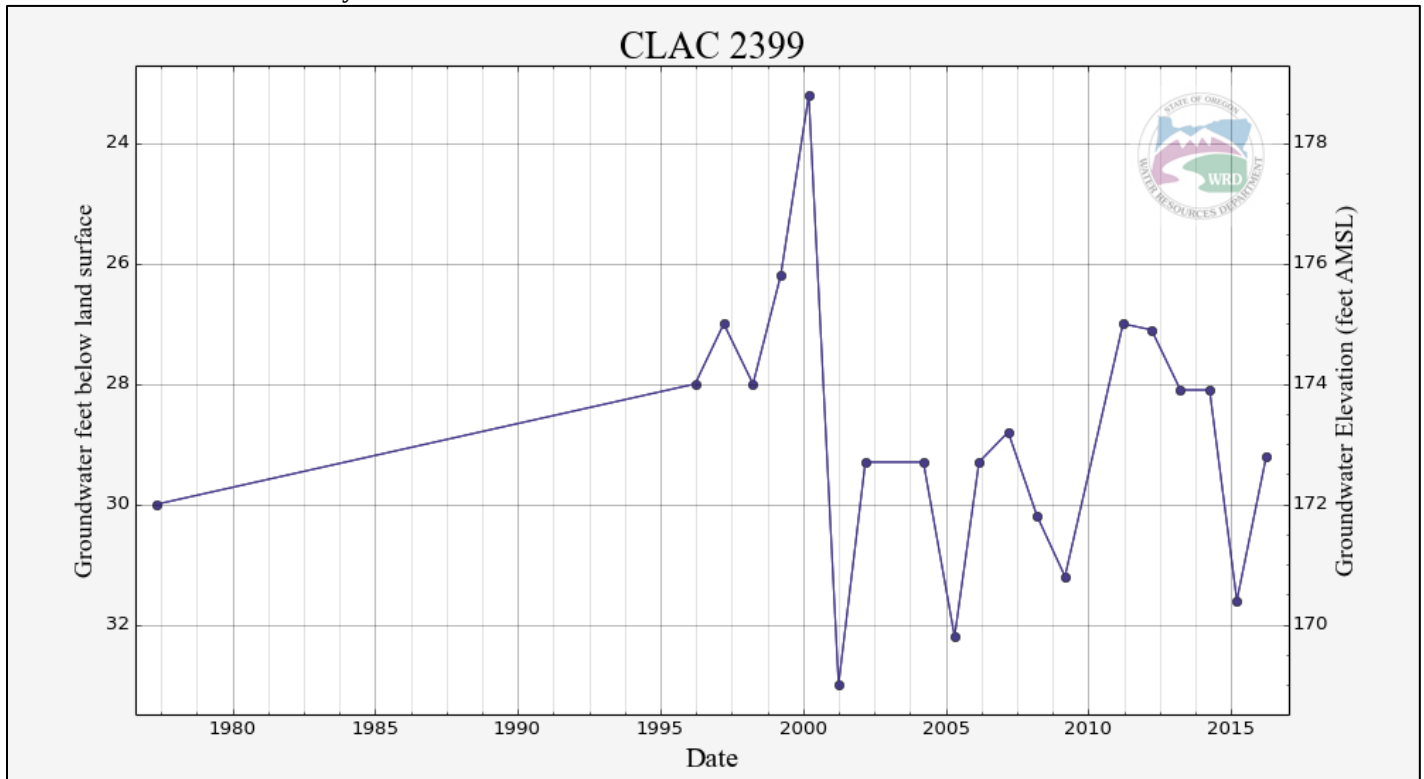
Water-Level Trends in Nearby Wells

Figure 1: Water level data for a nearby well showing similar head elevations to that expected within proposed POA wells.