

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section

Date **February 23, 2017**FROM: Groundwater Section **Aurora C Bouchier**

Reviewer's Name

SUBJECT: Application G- **18258**Supersedes review of **May 9, 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: **John Hickey** County: **Clackamas**

A1. Applicant(s) seek(s) **0.089** cfs from **1** well(s) in the **Willamette** Basin,
Molalla-Pudding subbasin

A2. Proposed use **Nursery (6.6 acres)** Seasonality: **year round**

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
+	PROPOSED	+	Bedrock	0.16	5S/3E-8 SE-NE	720' N, 752' W fr E 1/4 Cor Se 8
1	CLAC 10757	1	Bedrock	0.089	5S/3E-8 SE-NE	1300' N, 815' W fr E1/4 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
+	-730	—	-680-720	—	Est 300	Est 0-25	Est 0-300	—	Est 275-300		—	—
1	745	307	139	6/27/1979	321	0-20	+1-20	Na	Na	20	170	A

Use data from application for proposed wells.

A4. **Comments:** The applicant's requested rate has been reduced from 0.16 to 0.089 (assumed cfs), or approximately 40 gpm from an existing well (CLAC 10757). The proposed well produces from a sandstone bedrock layer at the base of the well.

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: The geology of this region is low-yield bedrock, with the majority of wells within the section display some degree of artesian pressure, indicating confined conditions, so the pertinent basin 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) 7N, 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 _____ 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 applicant's proposed well (CLAC 10757) is located in an area that contains volcanic and volcanoclastic materials of the Sardine Formation from land surface to a depth of several hundred feet (Hampton, 1972). In this area, the Sardine Formation consists mainly of lava flows, breccia, and andesite-tuffs.

The OWRD well log database shows 49 wells in Sections 8 and 9 which tap this formation. The drillers estimated flow rates for these 49 wells is generally limited to less than 50 gallons per minute, with a median yield of 13 gpm. Out of the 49 wells within Sections 8 and 9, a subset of 27 wells had total depths greater than 200 feet, as does Well 1. Of this subset of deeper wells, the static water levels listed on the well logs range from 8 to 184 feet below land surface with median values of 76 and 80 feet below land surface. Of the subset of deeper wells, the yields range from 3 to 40 gpm with a median of 10 gpm.

There is little available information to assess the stability of the ground water resource in the area. This indicates the need for long term water level monitoring.

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	Low-yield bedrock	☒	☐

Basis for aquifer confinement evaluation:

The well log inventory shows 48 wells within Sections 8 and 9, with the majority of well logs reporting static water levels which rise above the productive zones, indicating confined conditions. This is true for the proposed well (CLAC 10757).

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	Unnamed trib to Bull Creek to north	~600	487-865	1850	☒	☐	☐	☐	☒
1	2	Unnamed trib to Bull Creek to south	~600	487-960	1440	☒	☐	☐	☐	☒
1	3	Application R-75912	~600	687	820	☐	☒	☐	☐	☒
1	4	Application S-28461	~600	687	1630	☐	☒	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: The USGS topographic maps show the Bull Creek tributaries as intermittent along the adjacent reaches. Using the SWL listed on the well log, the groundwater elevation at the proposed well (CLAC 10757) is approximately 600 feet. Although the well is 820 feet distant from the stream at the adjacent reach, the distance where hydraulic connection is likely to occur is where the stream is at an elevation of 600 feet, which is at a distance of approximately 1850 feet from the well.

Water Availability Basin the well(s) are located within: 131: Milk Cr > Molalla R – at 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 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	☐	☐	n/a		☐	8.92	☐	See below	☐
1	2	☐	☐	n/a		☐	8.92	☐	See below	☐
		☐	☐			☐		☐		☐

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: There is no readily available tool to model stream interference in fractured bedrock systems, therefore interference at 30 days was not estimated.

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: _____

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:** _____

References Used:

Application files: G-18258, plus the revised information provided in June 2016, and nearby G-16991.

Hampton, E.R., 1972, Geology and Ground Water of the Molalla-Salem Slope Area, Northern Willamette Valley, Oregon: U.S. Geological Survey Water-Supply Paper 1997, 83p.

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

Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland Aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82p.

D. WELL CONSTRUCTION, OAR 690-200D1. Well #: 1 Logid: CLAC 10757D2. **THE WELL does not appear to meet current well construction standards based upon:**

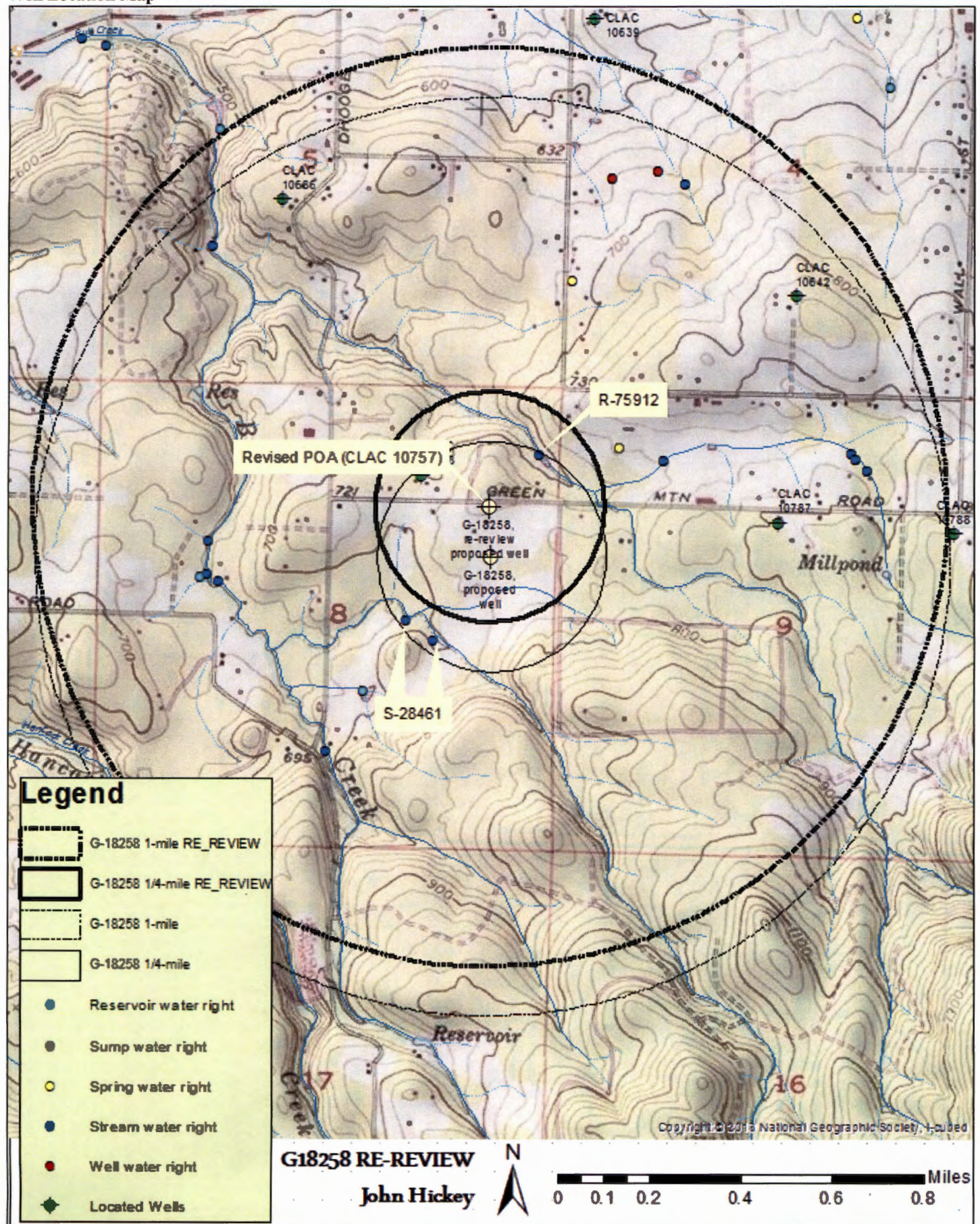
- a. ☒ review of the well log;
 b. ☐ field inspection by _____;
 c. ☐ report of CWRE _____;
 d. ☐ other: (specify) _____

D3. **THE WELL construction deficiency or other comment is described as follows:** The well is cased and sealed from land surface to a depth of 20 feet. The well log indicates that it is producing from a confined sandstone layer from 307 to 321 feet below land surface. The log lists multiple layers of hard basalt with thickness greater than 50 feet overlying the sandstone.

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 #: 131		MILK CR > MOLALLA R - AT MOUTH			Exceedance Level: 80	
Time: 3:11 PM		Basin: WILLAMETTE			Date: 05/09/2016	
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	124.00	2.01	122.00	0.00	85.00	37.00
FEB	117.00	1.90	115.00	0.00	85.00	30.10
MAR	121.00	1.61	119.00	0.00	85.00	34.40
APR	91.50	1.85	89.70	0.00	85.00	4.65
MAY	59.20	5.02	54.20	0.00	85.00	-30.80
JUN	26.50	7.49	19.00	0.00	60.00	-41.00
JUL	10.80	12.70	-1.91	0.00	40.00	-41.90
AUG	8.92	10.50	-1.54	0.00	20.00	-21.50
SEP	8.95	4.64	4.31	0.00	20.00	-15.70
OCT	15.20	1.68	13.50	0.00	40.00	-26.50
NOV	32.20	1.53	30.70	0.00	85.00	-54.30
DEC	92.00	2.11	89.90	0.00	85.00	4.89
ANN	93,600	3,220	90,400	0	46,700	48,800

Well Location Map



Well Statistics (T 5S/R 3E Sections 8 & 9)

