

WATER RESOURCES DEPARTMENT

MEMO

Oct 21, 2016

TO: Application G- 18321

FROM: GW: Arora Boucher
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

- ☐ YES
The source of appropriation is within or above a Scenic Waterway
- ☒ 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 _____ Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

[illegible]

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date October 21, 2016
 FROM: Groundwater Section Aurora C Bouchier
 SUBJECT: Application G- 18321 Reviewer's Name
 Supersedes review of na 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: Jan H. Enterprises County: Marion

A1. Applicant(s) seek(s) 0.27 cfs from 1 well(s) in the Willamette Basin,
Molalla-Pudding subbasin

A2. Proposed use Nursery (150.15 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
1	MARI 66235	Leo's West Well	CRB	0.27	T7S/R1E-21 NE-NW	1095' S, 1815' E fr NW cor S 21
2						
3						
4						
5						

* 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	1345	480	360	4/28/2016	670	0-35, 35-458	+1.5-458	Na	Na	80	Na	Air

Use data from application for proposed wells.

A4. **Comments:** The applicant is requesting a maximum rate of 0.27 cfs (~121 gpm), or a well specific rate of 80-120 gpm.

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 well produces from a confined basalt aquifer, 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, 7I;
 - 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:** _____

In the vicinity of the well, the basalt aquifers are truncated by local stream drainages which have eroded through the basalt layers. Because the aquifer is confined (storativity is estimated to be 0.0001 for the CRBG), pumping impacts will propagate outward at rapid rates and will likely to reach aquifer boundaries (streams, faults, and truncated basalt flow margins) within a few hours. The presence of local aquifer boundaries will increase the degree of interference with nearby wells that are completed in the same water-bearing zones.

In general, water levels in nearby basalt irrigation wells show stable water levels over the last twenty years, with the exception of a cluster of wells located approximately 2.6 miles to the southeast in the vicinity of Drake Crossing (see hydrograph below). At the Drake Crossing location the wells are close to the edge of Abiqua Creek drainage which truncates the basalt aquifer.

It is unlikely the well can produce at the maximum requested rate of 0.27 cfs (~121 gpm). The well log lists a rate of 80 gpm estimated from an air test. There are 12 wells in the section, with a median yield of 10 gpm.

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	CRB	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: In general, the Columbia River Basalt aquifers are confined by the dense interflow zones which restrict vertical movement of groundwater. The well log for MARI 66235 lists a static water level of 360 feet below land surface, some 120 feet above the zone at which it was encountered, corroborating the confined nature of the water-bearing zone of the CRBG at this location.

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	Trib. To Silver Creek	985	765-1400	4100	☒	☐	☐	☐	☐
1	2	Davis Creek	985	1095-1160	4100	☐	☒	☐	☐	☐
1	3	Powers Creek	985	1135-1390	4115	☐	☒	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: The April static water level provided by the driller indicates a water elevation of approximately 985 feet amsl. At the nearest reach (~1530 feet), the unnamed tributary to Silver Creek has an elevation of approximately 1300 feet, within a mile of the well the elevation ranges from ~770-1400 feet amsl. The distance listed on the table is to the location where the elevation of the tributary is equal to the groundwater elevation.

Water Availability Basin the well(s) are located within: 169: SILVER CR> PUDDING 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	☐	☐	na	na	☐	8.47	☒	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: An appropriate model for calculating stream interference is not readily available for the basalt aquifer system. Therefore, no estimate of stream interference at 30 days was included in table C3a.

- 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:

In the vicinity of the well, the basalt aquifers are truncated by local stream drainages which have eroded through the basalt layers. The unnamed tributary to Silver Creek is shown on USGS 7.5-minute topographic maps as perennial. The tributary and Silver Creek are likely hydraulically connected with the basalt aquifer. Once the cone of depression reaches nearby streams, ground water discharge to the streams, whether it occurs via spring discharge or diffuse seepage, will decrease. Also, the rate of decrease in discharge to streams will increase over time. If pumping lowers the head (water level elevation) in the aquifer below the elevation of nearby springs, spring discharge will cease.

References Used:

Application file: G-18321, and nearby G-16080 and G-16090

Conlon and Others, 2005, Ground-Water Hydrology of the Willamette Basin, Oregon, Scientific Report 2005-5168, USGS.

Gannett and Caldwell, 1998, Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington, USGS Professional Paper 1424-A

Woodward, Gannett and Vaccaro, 1998, Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington, USGS Professional Paper 1424-B.

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: _____ Logid: _____

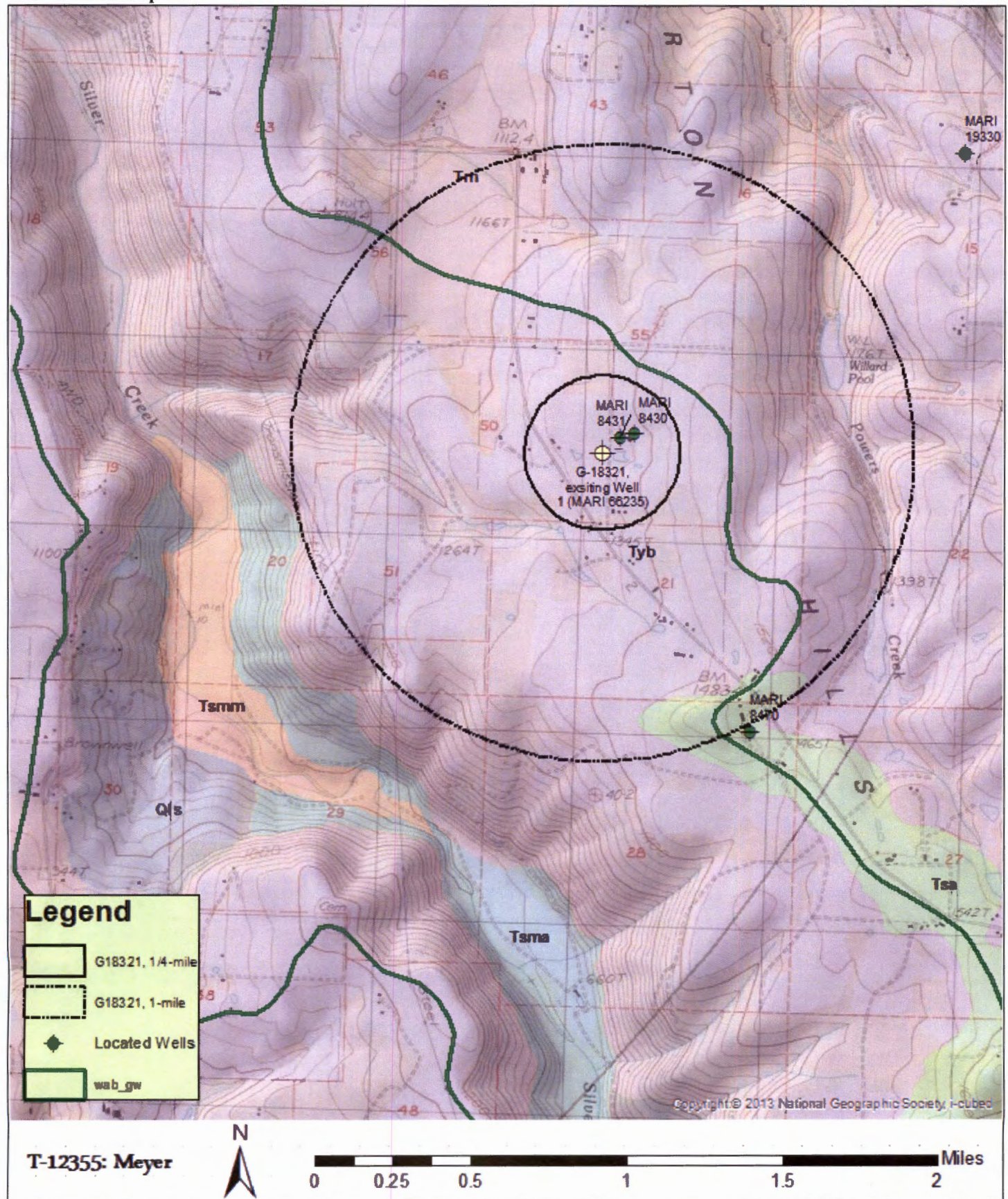
D2. **THE WELL does not appear to meet current well construction standards based upon:**

- 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 #: 169		SILVER CR > PUDDING R - AT MOUTH			Exceedance Level: 80	
Time: 2:35 PM		Basin: WILLAMETTE			Date: 10/21/2016	
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	179.00	7.58	171.00	0.00	60.00	111.00
FEB	173.00	7.42	166.00	0.00	60.00	106.00
MAR	173.00	1.28	172.00	0.00	60.00	112.00
APR	135.00	1.39	134.00	0.00	60.00	73.60
MAY	75.90	2.46	73.40	0.00	60.00	13.40
JUN	36.70	5.28	31.40	0.00	50.00	-18.60
JUL	16.60	7.27	9.33	0.00	23.00	-13.70
AUG	8.47	6.31	2.16	0.00	23.00	-20.80
SEP	10.80	4.42	6.38	0.00	23.00	-16.60
OCT	13.60	1.24	12.40	0.00	60.00	-47.60
NOV	71.10	4.86	66.20	0.00	60.00	6.24
DEC	176.00	8.27	168.00	0.00	60.00	108.00
ANN	120,000	3,480	117,000	0	36,100	83,900

Well Location Map



Water-Level Trends in Nearby Wells

