Groundwater Application Review Summary Form

Application # G- 18779

GW Reviewer J Woody **Date Review Completed:** 8-21-2019

Summary of GW Availability and Injury Review:

[X] Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

Summary of Potential for Substantial Interference Review:

[X] There is the potential for substantial interference per Section C of the attached review form.

Summary of Well Construction Assessment:

[ ] The well does not appear to meet current well construction standards per Section D of the attached review form. Route through Well Construction and Compliance Section.

JJ 8/26/19

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).

WATER RESOURCES DEPARTMENT

MEMO 8-21, 2019

TO: **Application G-** 18779

FROM: **GW:** J Woody
(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.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager

From: Joel Jeffery, Well Construction Program Coordinator

Subject: Review of Water Right Application G-18779

Date: August 28, 2019

The attached application was forwarded to the Well Construction and Compliance Section by Water Rights. Jen Woody reviewed the application. Please see Jen's Groundwater Review and the Well Log.

Applicant's Well #1 (YAMH 54039): Based on a review of the Well Report, Applicant's Well #1 appears to protect the groundwater resource.

The construction of Applicants Well #1 may not satisfy hydraulic connection issues.

Applicant's Well #2 is a proposed well and has not been construction. Therefore a review cannot be conducted.

YAMH 54039

State of Oregon
WATER WELL REPORT (as required by ORS 537.765) Page 1 of 1

State Well ID L76203
Start Card # 170105

(1) OWNER: Well No. 2351
Name BERNARDS FARM
Address 18755 SW HWY 18
City MCMINNVILLE St OR Zip 97128

(2) TYPE OF WORK: NEW WELL

(3) DRILL METHOD: ROTARY AIR

(4) PROPOSED USE: DOMESTIC

(5) BORE HOLE CONSTRUCTION:
Special Construction Approval NO Depth of Compl. Well 128 ft
Explosives used NO Type _____ Amount _____

	HOLE			SEAL		
Diam.	From	To	Material	From	To	Amount
10	0	43	BENTONITE CHIP	0	43	21 SAX
6	43	140				

Seal placement method POURED/HYDRATED
Backfill: from 128 ft to 140 ft Material CAVING SLOUGH
Gravel: from ___ ft to ___ ft Size _____

(6) CASING/LINER:

	Diam.	From	To	Gauge	Material	Connection
Casing	6	+1.5	43	.25	STEEL	WELDED
Liner	4	2	128	.25	PLASTIC	WELDED

Final Location of shoe(s) 43

(7) PERFORATIONS/SCREENS:
[X] Perf. Method CIRCULAR SAW
[_] Screens Type _____ Material _____

From	To	Slot Size	Number	Tele/pipe Diam.	Tele/pipe Size	Casing/liner
88	108	.1X7	40			LINER
118	128	.1X7"	20			LINER

(8) WELL TESTS: Minimum testing time is 1 hour
Test type AIR

Yield GPM	Draw-down	Drill stem at	Time
100		140	1 hr.
100		120	1

Temperature of water 53F Depth Artesian Flow Found ____
Was water analysis done? YES By whom TDS125PPM
Reason for water not suitable for use _____
Depth of strata ___

(9) LOCATION OF WELL by legal description:
County YAMHILL Lat. ° ' " Long. ° ' "
Township 5 S Range 5 W WM.
Section 21 SE 1/4 SW 1/4
Tax Lot 400 Lot Block Subdivision
Street Address of Well (or nearest Address)
18755 SW HWY 18 MCMINNVILLE, OR

(10) STATIC WATER LEVEL:
9 ft. below land surface. Date 02/23/05
Artesian pressure _____ lb per square in. Date _____

(11) WATER BEARING ZONES:
Depth at which water was first found 105

From	To	Est Flow Rate	SWL
105	140	100	9

(12) WELL LOG:
Ground elevation ___

Material	From	To	SWL
TOP SOIL	0	5	
CLAY, BROWN	5	15	
CLAY, GRAY	15	25	
MARINE ROCK, BROWN COARSE	25	29	
MARINE ROCK, GRAY COARSE HARD	29	105	
MARINE ROCK, GRAY/GRN/WHI,FRACT/BRKN	105	128	9
MARINE ROCK, GRAY/GREEN W/THIN GRAY/GREEN CLAY/CLAYSTONE STRATS, LOOSE	128	140	9

DAVE PAYSINGER, BLUE WATER DRILLING CO.
(503) 868-7878

Date started 02/22/05 Completed 02/23/05

(unbonded) Water Well Constructor Certification: I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to my best knowledge and belief.
WWC Number ____
Signed _____ Date _____

(bonded) Water Well Constructor Certification: I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 1438
Signed Date 02/24/05

ORIGINAL & FIRST COPY - WATER RESOURCES DEPTARTMENT SECOND COPY - CONSTRUCTOR THIRD COPY - CUSTOMER 9809C 10/91

RECEIVED
MAR 10 2005
WATER RESOURCES DEPT
SALEM, OREGON

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 8/21/2019

FROM: Groundwater Section Jen Woody
Reviewer's Name

SUBJECT: Application G- 18779 Supersedes review of N/A
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: **Michael Bernards** County: **Yamhill**

A1. Applicant(s) seek(s) 0.446 cfs from 2 well(s) in the Willamette Basin, Coast Range subbasin

A2. Proposed use nursery use: 150 acre feet/yr 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	YAMH 54039	1	Marine Sedimentary Rock Aquifer	0.223	5S/5W-21 NW SE	2370' N, 1950' W fr SE cor S 21
2	proposed	2	Marine Sedimentary Rock Aquifer	0.223	5S/5W-21 SW NE	2795' N, 1760' W fr SE cor S 21
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	178	105	9	02/23/2005	140	0-43	0-43	2-128	88-108, 118-128	100		air
2	178	*	*	*	140	0-43	0-43	2-128				

Use data from application for proposed wells.

A4. **Comments:** *Well 2 is not yet drilled, but the application proposes construction similar to well 1/YAMH 54039.

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: **690-502-0240** classifies use from unconfined alluvial aquifers. This application proposes use from a confined aquifer, so this rule is not activated.

A6. ☐ **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: **N/A**
Comments: N/A

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) _____;
   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 proposes to develop 0.446 cfs (approximately 200 gpm) from 2 wells completed in the Tertiary marine volcanic and sedimentary rock aquifer, specifically the Nestucca Formation (Yeats et al., 1996). These marine sedimentary rocks are generally fine-grained, well cemented and provide low well yields (Gannett and Caldwell, 1998). Approximately 40 feet of Willamette silt overlie the marine sedimentary rock, and the water table resides in the silt. Groundwater flow in the marine sedimentary rock aquifers is predominantly through fractures with variable connectivity.

There are no nearby, long-term static water level data available in the subject aquifer. Therefore, the groundwater resource cannot be determined to be over-appropriated. There are a total of 15 new water well logs on file within Sections 21, 22, 27, 28, indicating low-density groundwater development. These wells describe sandstone, claystone, shale and occasionally basalt. The median reported yield is 10 gpm, which suggests that the requested rate of 100 gpm per well is likely more than a single well can produce over the long-term.

Well-to-well interference is unpredictable in fractured rock aquifers because fractures are not continuous or consistently connected. The nearest home sites with exempt wells appear to be approximately ¼ mile from the proposed POAs. The proximity to neighboring wells raises the potential for significant interference and injury to senior groundwater users, especially given the proposed pumping rate (200 gpm). Additionally, the proposed volume of water per year (150 AF/year) is likely more than the fractured rock aquifer system can sustain without long-term declines.

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	**Marine Sedimentary Rock Aquifer**	☒	☐
2	**Marine Sedimentary Rock Aquifer**	☒	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Nearby well logs of similar depth report static water levels that rise tens of feet above water-bearing zones, indicating the aquifer is more confined than unconfined.

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? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Muddy Creek**	**169**	**150**	**2200**	☒	☐	☐	☐	☒
2	**1**	**Muddy Creek**	**169**	**150**	**1750**	☒	☐	☐	☐	☒
1	**2**	**Unnamed tributary to Deer Cr**	**169**	**155**	**1200**	☒	☐	☐	☐	☒
2	**2**	**Unnamed tributary to Deer Cr**	**169**	**155**	**1680**	☒	☐	☐	☐	☒
1	**3**	**Deer Creek**	**169**	**150**	**3500**	☒	☐	☐	☐	☒
2	**3**	**Deer Creek**	**169**	**150**	**4350**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Muddy Creek has incised through approximately 200 feet of marine sedimentary rocks. The subject wells have or are proposed to have a shallow seal (0-43 feet below land surface). Therefore, the potential for hydraulic connection is examined at the elevation of the estimated static groundwater level. The groundwater level is coincident with or above perennial reaches of nearby creeks within one mile, indicating hydraulic connection.

Water Availability Basin the well(s) are located within: Watershed ID #91: DEER CR > S YAMHILL 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**	☐	☐	**MF91A**	**6.0**	☒	**5.25**	☒	*	☒
2	**1**	☐	☐	**MF91A**	**6.0**	☒	**5.25**	☒	*	☒
1	**2**	☒	☐	**MF91A**	**6.0**	☒	**5.25**	☒	*	☒
2	**2**	☐	☐	**MF91A**	**6.0**	☒	**5.25**	☒	*	☒
1	**3**	☐	☐	**MF91A**	**6.0**	☒	**5.25**	☒	*	☒
2	**3**	☐	☐	**MF91A**	**6.0**	☒	**5.25**	☒	*	☒
		☐	☐			☐		☐		☐

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: The natural stream flow at 80% exceedance is 5.25 cfs. 1% of 5.25 cfs is 0.0525 cfs. The requested rate of 0.443 cfs is greater than 0.0525 cfs, triggering PSI. The maximum instream water right is 6.0 cfs, which applies to Deer Creek. The requested rate is greater than 0.06 cfs, which also triggers PSI.

* Interference at 30 days could not be estimated because the terrain (high-relief slopes) and geology (fractured bedrock aquifer) do not meet model assumptions of the widely accepted technique for determining stream depletion (i.e. Hunt 1999, 2003).

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													
		%	%	%	%	%	%	%	%	%	%	%	%
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: N/A

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:** Under OAR 690-009 the proposed use produces the finding of potential for substantial interference with nearby surface water.

References Used: Conlon, Terrence D., Wozniak, Karl C., Woodcock, Douglas, Herrera, Nora B., Fisher, Bruce J., Morgan, David S., Lee, Karl K., and Hinkle, Stephen R., 2005, Ground-Water Hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

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.

OWRD groundwater level database, accessed 8/22/2019.

US Geologic Survey Topographic maps, Muddy Valley and Ballston Quadrangles.

Yeats, R.S., Werner, K.S., Popowski, T.A., 1996, Geologic map of the northern Willamette Valley, Clackamas, Marion, Multnomah, Polk, Tillamook, Washington and Yamhill counties, Oregon: U.S. Geological Survey, Reston, VA., Professional Paper PP-1560, map

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** _____ **Logid:** N/A

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

Water Availability Analysis

Detailed Reports

DEER CR > S YAMHILL R - AT MOUTH

WILLAMETTE BASIN

Water Availability as of 8/20/2019

Watershed ID #: 91 (Map) Exceedance Level: 80%

Date: 8/20/2019 Time: 2:32 PM

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	104.00	2.55	101.00	0.00	80.00	21.40
FEB	125.00	2.53	122.00	0.00	80.00	42.50
MAR	101.00	2.48	98.50	0.00	80.00	18.50
APR	60.90	2.49	58.40	0.00	80.00	-21.60
MAY	31.40	3.61	27.80	0.00	80.00	-52.20
JUN	15.60	4.96	10.60	0.00	25.00	-14.40
JUL	8.47	6.96	1.51	0.00	15.00	-13.50
AUG	6.06	6.00	0.06	0.00	8.00	-7.94
SEP	5.25	4.10	1.15	0.00	6.00	-4.85
OCT	5.36	2.42	2.94	0.00	40.00	-37.10
NOV	16.20	2.29	13.90	0.00	80.00	-66.10
DEC	77.70	2.41	75.30	0.00	80.00	-4.71
ANN	62,400.00	2,590.00	59,800.00	0.00	39,400.00	28,700.00

Well Location Map