

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 11/08/2013

FROM: Groundwater Section Jen Woody
Reviewer's Name

SUBJECT: Application G- 17731 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 ground water 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: William L Morris III and Shelley Ann Morris
County: Columbia

A1. Applicant(s) seek(s) 2.02 cfs from 1 well(s) in the North Coast Basin,
Columbia River subbasin Quad Map: Marshland

A2. Proposed use Aquatic Life 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	SUMP 999999		alluvium	2.02	7N/5W-4 NE NE	200' N, 0' W fr SW cor of NE NE QQ S 4
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	5	~2 feet	~2 feet	Estimated SWL		none	none	none	none			

Use data from application for proposed wells.

A4. **Comments:** Well is not drilled. Application describes a proposed excavation to expose groundwater that is 2 feet deep. Site specific data or construction details not provided with application.
For the purposes of evaluation, assumed the proposed POA is a sump.

A5. ☐ **Provisions of the North Coast** Basin rules relative to the development, classification and/or management of ground water hydraulically connected to surface water ☐ are, or ☒ are not, activated by this application. (Not all basin rules contain such provisions.)
Comments: North Coast Basin rules have no such provision.

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

B. GROUND WATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that ground water* 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 ground water 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 ground water portion of the injury determination as prescribed in OAR 690-310-130;
- c. ☐ will not or ☐ will likely be available within the capacity of the ground water resource; or
- d. ☐ will, if properly conditioned, avoid injury to existing ground water rights or to the ground water 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 ground water production from no deeper than _____ ft. below land surface;
 - b. ☐ **Condition** to allow ground water production from no shallower than _____ ft. below land surface;
 - c. ☒ **Condition** to allow ground water production only from the _____ **alluvial** _____ ground water 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 Ground Water 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. **Ground water availability remarks:** According to Atwater (1994), nearby sediment cores from Wallace Island showed on the up to 2 meters of mud, underlain by sand with clay lenses. The geology on the applicant's site is likely similar. There are no nearby groundwater level data on file with WRD. The nearest groundwater use authorizations are several miles away. Interference with other authorized groundwater users is unlikely; the cone of depression will intersect surface water before impacting those groundwater users.

C. GROUND WATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040**C1. 690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	Alluvium	☐	☒
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Proposed construction indicates the water table aquifer is the targeted groundwater source.

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	Westport Slough	0-5	0-5	830	☐	☐	☒	☒	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Assumed groundwater elevation is coincident with surface water, indicating hydraulic connection. There is no known geologic feature providing a barrier to efficient hydraulic connection at this distance in the alluvial aquifer. The POA is located in an unconfined aquifer less than ¼ mile from Westport Slough, triggering a PSI finding per 690-09-040 (2) (3).

Water Availability Basin the well(s) are located within: No WAB. Columbia River Basin water availability will apply.

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	☒	☐			☐		☐	0.7%	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: Using the Hunt (2003) model, streamflow depletion at 30 days is roughly estimated at 0.7 % . The clay layer assumed to exist in the streambed creates a delayed effect; at 360 days interference increases to 20.4%.

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 ground water 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: Atwater, Brian F. 1994. Geology of Holocene Liquefaction Features Along the Lower Columbia River At Marsh, Brush, Price, Hunting, and Wallace Islands, Oregon and Washington. U.S. Geological Survey Open-File Report 94-209.

Hunt, B., 1999, Unsteady stream depletion from ground water pumping: *Ground Water*, v. 37, no. 1, p. 98-102.

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) _____

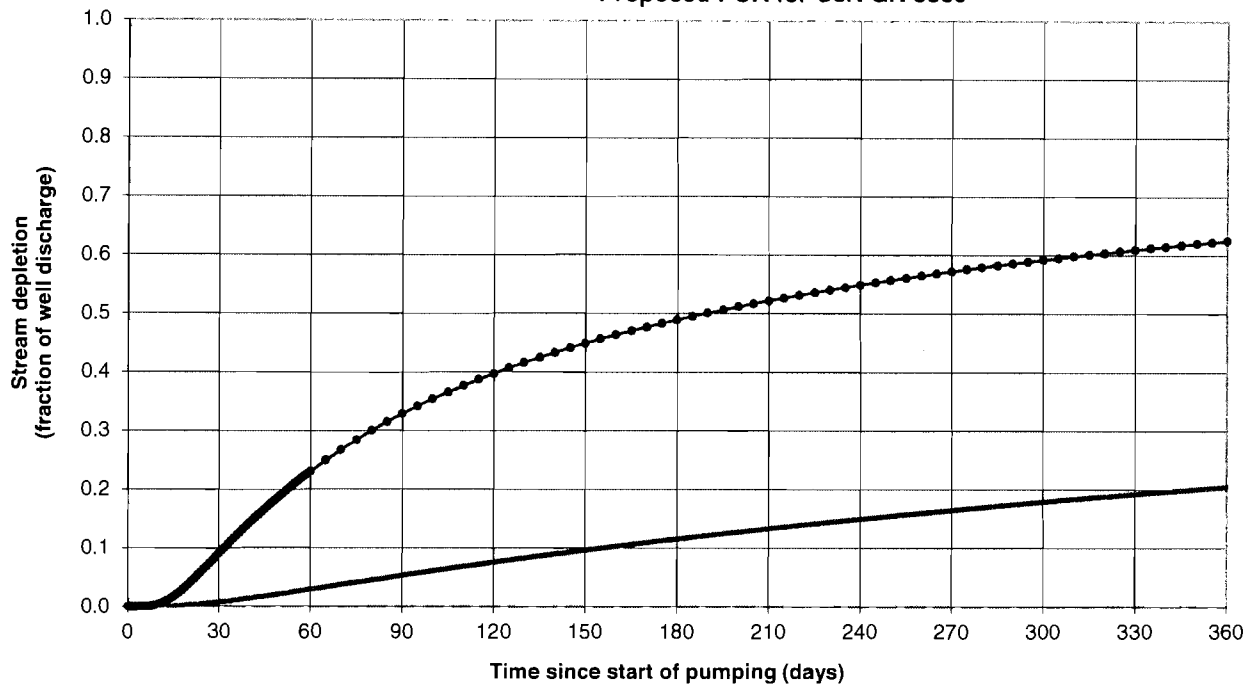
D3. **THE WELL construction deficiency or other comment is described as follows:** _____

D4. ☐ Route to the Well Construction and Compliance Section for a review of existing well construction.

Water Availability Tables

Transient Stream Depletion (Jenkins, 1970; Hunt, 1999)

Proposed POA for Cert GR 3860



• Jenkins s2

— Hunt s2

—• Jenkins s2 residual

— Hunt s2 residual

Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 365 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	2.020	2.020	2.020	2.020	2.020	2.020	2.020	2.020	2.020	2.020	2.020	2.020
Jenk SD %	0.090	0.231	0.328	0.397	0.449	0.489	0.522	0.549	0.572	0.592	0.609	0.625
Jen SD cfs	0.182	0.466	0.663	0.802	0.906	0.988	1.054	1.109	1.156	1.196	1.231	1.262
Hunt SD %	0.007	0.029	0.053	0.075	0.096	0.115	0.133	0.149	0.165	0.179	0.192	0.204
Hunt SD cfs	0.014	0.058	0.107	0.152	0.194	0.233	0.269	0.302	0.332	0.361	0.388	0.413

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	2.02	2.02	2.02	cfs
Distance to stream	a	830	830	830	ft
Aquifer hydraulic conductivity	K	1	10	5	ft/day
Aquifer thickness	b	40	40	40	ft
Aquifer transmissivity	T	40	400	200	ft*ft/day
Aquifer storage coefficient	S	0.1	0.1	0.1	
Stream width	ws	100	100	100	ft
Streambed hydraulic conductivity	Ks	1	0.01	0.1	ft/day
Streambed thickness	bs	3	3	3	ft
Streambed conductance	sbc	33.33333333	0.333333333	3.333333333	ft/day
Stream depletion factor (Jenkins)	sdf	1722.25	172.225	344.45	days
Streambed factor (Hunt)	sbf	691.6666667	0.691666667	13.83333333	

