

Water Right Conditions
Tracking Slip

Groundwater/Hydrology Section

FILE # # 6-17774

ROUTED TO: Water Rights

TOWNSHIP/
RANGE-SECTION: 5N/29E-15

CONDITIONS ATTACHED?: Yes no

REMARKS OR FURTHER INSTRUCTIONS:
see conditions on p 3.

Reviewer: J. Hackett

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date December 11, 2014
 FROM: Groundwater Section Josh Hackett / Mike Thoma
 SUBJECT: Application G- 17774 Reviewer's Name Supersedes review of
 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: Hat Rock Water Co. County: Umatilla

- A1. Applicant(s) seek(s) 1.0 cfs from 1 well(s) in the Umatilla Basin,
Columbia-Umatilla Plateau subbasin Quad Map: Hat Rock
- A2. Proposed use Quasi-Municipal 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	Proposed	#1	Basalt - CRBG	1.0	05N/29E-15 SWNE	1220' N, 685' E from center of S 15
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	429	254*	50*		< 800	100	100			450		

Use data from application for proposed wells.

- A4. **Comments:** * Estimated from nearby basalt well UMAT 55889 (log attached).
Applicant is proposing a new well into CRBG aquifer because existing source of water, a spring on Permit S-52968, contains high concentrations of nitrate. Any new well should be conditioned to be open to only one aquifer within the CRBG which will require much deeper case and seal than what is proposed – see B3.
- A5. **Provisions of the Umatilla Basin – Columbia-Umatilla Sub.** 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 proposed well, if properly cased and sealed into a single CRBG aquifer as conditioned below, will not be hydraulically connected to surface water.
- 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 _____;
 - 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 **a single aquifer within the Columbia River Basalt Group** 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 is located in an area that contains basalt flows of the Columbia River Basalt Group (CRBG) from land surface to depths of several thousand feet. Within the CRBG, most water occurs in confined aquifers that occupy thin rubble zones (interflow zones) at the contacts between lava flows. The interiors of the basalt flows generally have low porosity and permeability and act as confining beds. This geometry generally produces a stack of thin aquifers (interflow zones) separated by thick confining beds (flow interiors). The low permeability of the basalt flow interiors probably limits the natural vertical connection between overlying aquifers.

Surficial geologic mapping (Madin and Geitgy, 2007) and geologic cross-sections (Wozniak, 1995) indicate that the proposed well should encounter the Umatilla Member of the Saddle Mountains Basalt Formation from land surface to a depth of approximately 90 feet (elevation 430 to 340 feet above mean sea level (msl)). Beneath the Umatilla Member, the well will likely encounter multiple flows of the Frenchman Springs Member of the Wanapum Basalt Formation. Locally, the total thickness of the Frenchman Springs Member is approximately 700 feet and is found between elevations of 340 feet above msl and 270 feet below msl.

Driller's logs for nearby wells report multiple water-bearing zones (WBZs) in the Frenchman Springs Member (see logs for UMAT 5255, UMAT 55889, and UMAT 57027). An upper WBZ is found between elevations of 100 and 200 feet above msl and a lower WBZ is found between elevations of 100 and 200 feet below msl. Production from the upper WBZ is limited to 10-40 gallons per minute (gpm), while wells producing from the lower WBZ report yields ranging from 150-400 gpm.

The applicant has proposed a well that will be cased and sealed to a depth of 100 feet and will not exceed a total depth of 800 feet and requested maximum pumping rate is 450 gpm (~1 cubic foot per second). Both the proposed construction and the requested rate raise several concerns. First, the proposed construction will not meet current OWRD well construction standards as it will allow commingling of the upper and lower WBZs. Also, the requested maximum pumping rate will not likely be available from the upper WBZ as no wells currently completed in the upper WBZ report yields greater than 40 gpm, and some wells report yields of less than 10 gpm. In order to protect the groundwater resource and nearby groundwater users, I recommend the following conditions:

Special Condition #1:

Groundwater production in any well drilled under this permit shall be limited to a single aquifer in the Columbia River Basalt Group lavas. The well(s) shall be cased and sealed into hard basalt below an elevation of approximately 100 feet below mean sea level or cased and sealed to sufficient depth to ensure that the open interval is no shallower than the deeper water-bearing zone in the Frenchman Springs Member of the Columbia River Basalt Group. The open interval in the well(s) shall be no greater than 100 feet except as noted below. Open interval means the total length of borehole that is not behind sealed casing. The borehole above the open interval shall be continuously cased and sealed to land surface. A larger open interval may be approved by the Department if the applicant can demonstrate, using packer tests or other suitable methods, that the hydraulic heads of water-bearing zones in the proposed open interval are equivalent or if the applicant can demonstrate that the open interval is part of a continuous zone of interconnected porous materials such as a sequence of pillow lavas or a hyaloclastite complex.

Special Condition #2:

The permittee shall instruct the well constructor to contact the Ground Water Section of the Water Resources Department prior to drilling the well to arrange for the collection of drill cuttings.

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	Columbia River Basalt*	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: CRBG aquifers are generally under confined conditions in this area, particularly aquifers in deeper basalt flows that do not outcrop nearby. Well logs from nearby CRBG wells show static water levels much higher than depths where water is encountered (see UMAT 55889) indicating confined conditions.

* This evaluation assumes that the well will be constructed as listed in the conditions B2(c).

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	Columbia River	360	340	1000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: The proposed well will be conditioned to pump from a single CRBG aquifer that will be several hundred feet below the base of the Columbia River and so not hydraulically connected.

Water Availability Basin the well(s) are located within: None

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?
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
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		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

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?
	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
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Comments: _____

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												
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	Well Q as CFS												
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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

Well Location Map

G-17774, Hat Rock Water Co.

1:24,000 scale

