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PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 4/12/2016

FROM: Groundwater Section Darrick E. Boschmann
Reviewer's Name

SUBJECT: Application G- 18193 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: 3J Cattle Co. County: Harney

A1. Applicant(s) seek(s) 2.0 cfs from 1 well(s) in the Malheur Basin,
Upper South Fork Malheur River subbasin

A2. Proposed use Irrigation (160 acres primary) Seasonality: May 1st – October 31st

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	*HARN 52466	1	*Unknown	2	27S/34E-36 SW-NW	1393' S, 1280' E FR NW COR, S 36
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	4158	?	?	?	275	?	?	?	?	1200	?	?

Use data from application for proposed wells.

A4. **Comments:** _____

The proposed well is located in Anderson Valley near the headwaters of the South Fork Malheur River about 8 miles southeast of Princeton. The area is mapped by Green and others (1972) as Qs (sedimentary deposits) underlain at an unknown depth by Qb (basalt), which is likely correlative with the Voltage lava field of Piper (1939) and the Voltage Flow of Camp (2003).

The driller's well log for HARN 1557 located ~1 mile to the southeast describes 31 feet of boulders underlain by cinders and lava rock to 128 feet (TD).

***Note:** A well log was never submitted to the department at the time of construction for this proposed well. The well ID application form submitted by the owner indicates the well was constructed in 1977 to a depth of 275 feet. Casing and seal depth are unknown. Consequently, it is unknown if this well develops groundwater from both the basin fill sediment and the underlying volcanic rocks, or if the basin fill sediment is sealed off and groundwater is produced exclusively from the underlying volcanic rocks. The file will be routed to the Well Construction and Compliance Section.

Note: The well yield cited above for HARN 52466 is taken from the Well ID Application Form submitted by the owner.

- A5. ☐ **Provisions of the** Malheur 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: _____

- 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) 7B, 7F, 7N, 7P, 7T, Flow meter,;
 - 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 proposed well is located near an area of observed groundwater level declines in the Harney Basin – The Greater Harney Valley Groundwater Area of Concern (GHVGAC), located ~ 5 miles to the west. A surface water divide exists between the proposed well and the Harney Basin/GHVGAC, however it is not known with certainty if a groundwater divide is coincident with this surface water divide, or if pumping at the proposed location would contribute to regional declines in the GHVGAC.

Given the proximity to a known area of groundwater level declines and the uncertainty regarding the hydraulic relationship between the proposed location and the GHVGAC the following conditions are recommended if the permit is issued:

7B: Interference Condition

7F: Proposed Well location Condition

7N: Annual Measurement and Decline Condition

7P: Well Tag Condition

7T: Dedicated Measuring Tube Condition for all POA wells

Flow meter condition: Use the water rights “large” permit condition requiring a totalizing flow meter and reporting

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	Unknown	☐	☒
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Available data for the nearby Malheur Lake Basin indicates a predominantly volcanic/volcaniclastic unit occurs beneath a predominantly basin fill sediment unit. Reports for the Malheur Lake Basin indicate groundwater occurs in both the basin fill and underlying rocks. The groundwater is likely hydraulically connected, making a single groundwater system occurring in different geologic units. Available data, including Piper and others (1939), Leonard (1970), and water well reports indicate ground water in the basin fill is generally unconfined. Some local confinement can occur where discontinuous low permeability layers are present. Leonard (1970) indicates confined ground water occurs at depth in the deep basin fill sediments and underlying Tertiary volcanic and sedimentary rocks. Leonard (1970) found that near the edges of the valley there is likely good interconnection between individual water-bearing beds in the valley fill and those in the adjacent and underlying tertiary rocks.

It is unknown if this well develops groundwater from both the basin fill sediment and the underlying volcanic rocks, or if the basin fill sediment is sealed off and groundwater is produced exclusively from the underlying volcanic rocks. Regardless, based on available data the well produces groundwater from an unconfined aquifer.

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	Paul Creek	4103	4780	39,448	☐	☒	☐	☐	☒
1	2	Riddle Creek	4103	4214	42,114	☐	☒	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation:

The nearest perennial surface water sources to the proposed well are nearly 8 miles away. Previous analyses under similar circumstances indicate that at these distances the proposed use will not trigger PSI. Additionally, the GW elevation at the proposed location is well below the surface water elevation at the nearest perennial reaches of these surface water sources, suggesting groundwater does not provide baseflow to these perennial reaches.

Note: the GW elevation cited above is derived from the 3/3/2016 static water level measurement made at nearby well HARN 1557 which is located ~1.15 miles to the southeast of the proposed well.

Water Availability Basin the well(s) are located within: S FK MALHEUR R > MALHEUR R – AB INDIAN CR 31011633

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?
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: _____

C3a./C3b. No analysis here. The well is more than 1 mile from perennial reaches of hydraulically connected surface water. _____

C4a. **690-09-040 (5):** 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:

C4a. No analysis here. The nearest perennial surface water sources to the proposed well are nearly 8 miles away. Previous analyses under similar circumstances indicate that at these distances the proposed use will not trigger PSI. Additionally, the GW elevation at the proposed location is well below the surface water elevation at the nearest perennial reaches of these surface water sources, suggesting groundwater does not provide baseflow to these perennial reaches.

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: _____

C1. 690-09-040 (1)

It is determined that all wells will produce water from an unconfined aquifer.

C2. 690-09-040 (2) (3)

The nearest perennial surface water source to the proposed well is over 8 miles away. Previous analyses under similar circumstances indicate that at these distances the proposed use will not trigger PSI.

C3a./C3b.

No analysis here. The well is more than 1 mile from perennial reaches of hydraulically connected surface water.

C4a. 690-09-040 (5)

No analysis here. The nearest perennial surface water source to the proposed well is over 8 miles away. Previous analyses under similar circumstances indicate that at these distances the proposed use will not trigger PSI. Additionally, the GW elevation at the proposed location is well below the surface water elevation at the nearest perennial reaches of these surface water sources, suggesting groundwater does not provide baseflow to these perennial reaches.

If a permit is issued, the following conditions are recommended:

7B: Interference Condition

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7N: Annual Measurement and Decline Condition

7P: Well Tag Condition

7T: Dedicated Measuring Tube Condition for all POA wells

Flow meter condition: Use the water rights "large" permit condition requiring a totalizing flow meter and reporting

References Used: _____

Piper, A.M., Robison, T.W., and Park C.F. 1939. Geology and Ground Water Resources of the Harney Basin, Oregon. USGS Water Supply Paper 841.

Camp, V.E., Ross, M.E. and Hanson, W.E., 2003. Genesis of flood basalts and Basin and Range volcanic rocks from Steens Mountain to the Malheur River Gorge, Oregon. *Geological Society of America Bulletin*, 115(1), pp.105-128.

Leonard, A.R. 1970. Ground-Water Resources in Harney Valley, Harney County, Oregon. Ground Water Report 16, Oregon Water Resources Department, Salem, Oregon.

Greene, R.C., Walker, G.W., and Corcoran, R.E., 1972, Geologic map of the Burns quadrangle, Oregon: U.S. Geological Survey, Miscellaneous Geologic Investigations Map I-680, scale 1:250,000

OWRD water well reports, water level data, and/or hydrographs

D. WELL CONSTRUCTION, OAR 690-200D1. Well #: 1 Logid: HARN 52466D2. **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:** No original well log available - casing and seal depth unknown.D4. ☒ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

