PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 5/15/2015

FROM: Groundwater Section Gerald H. Grondin (Darrick E. Boschmann)
Reviewer's Name

SUBJECT: Application G- 18011 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: Paul Davis County: Harney

A1. Applicant(s) seek(s) 4.8 cfs from 1 well(s) in the Malheur Lake Basin, Big Alvord Creek subbasin Quad Map: Alvord Hot Springs

A2. Proposed use: Irrigation (383 acres supplemental) Seasonality: April 1 to October 31

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	5	Basin Fill OR Bedrock	4.8	34/34-3 NE-NW	835' S, 3935' W fr NE cor S 3
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	4337	?	?	?	450	?	?	?	?	?	?	?

Use data from application for proposed wells.

A4. **Comments:**

The proposed well is located in the Alvord Basin, at the base of Steens Mountain along Big Alvord Creek. The area is surficially mapped as Qal (Holocene alluvium) by Evans (2001). There are few water well reports for wells drilled in the vicinity of the proposed well. The water well report for HARN 1712 located in section 10 shows unconsolidated basin fill sediment including clay and gravel to a depth of 337 feet (TD). The water well report for HARN 1713 located in section 15 shows unconsolidated basin fill sediment to 135 feet underlain by interbedded volcanic and sedimentary bedrock deposits to 300 feet (TD). Based on these well logs it is uncertain whether or not the proposed well will penetrate through the predominantly basin fill unit into the underlying predominantly volcanic/sedimentary bedrock unit.

A5. ☒ **Provisions of the** Malheur Lake 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:

OAR 690-512-0040
The rule states: "(1) Except as provided in section (3) of this rule, the Department shall not accept an application for permit, or issue a permit, for any use of surface water, or of groundwater the use of which has the potential to substantially interfere with surface water, in the Malheur Lake Basin unless the applicant shows, by a preponderance of evidence, that unappropriated water is available to supply the proposed use at the times and in the amounts requested. The evidence provided shall be prepared by a qualified hydrologist or other water resources specialist and shall include:

(a) Streamflow measurements of gage records from the source or, for use of groundwater, the stream in hydraulic connection with the source; or

(b) An estimate of water availability from the source or, for use of groundwater, the stream in hydraulic connection with the source which includes correlations with streamflow measurements or gage records on other, similar streams and considers current demands for water affecting the streamflows."

This review does not find a potential for substantial interference with surface water.

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

Currently no administrative area.

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 to 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) 7B, 7F, 7N, 7P, 7T, Flow meter, 7K;
   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 _____ 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:**

There are two state observation wells in the general vicinity of the proposed well. The state observation well with long term data (1962-2014) closest to the proposed well is state observation well 191 (HARN 1713) located in 34/34-15, about two miles south of the proposed well. The other is state observation well 191 (HARN 1690) located in 33/34-23, about 3.5 miles northeast of the proposed well, which has a period of record from 1965-2014. Neither of these state observation wells indicate a sustained decline over the period of record.

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

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

7K: The proposed well shall be constructed to develop groundwater from either the predominantly basin fill unit or the

underlying predominantly volcanic/sedimentary bedrock unit, but not both.

If the well is to develop groundwater from the predominantly volcanic/sedimentary bedrock unit, the well shall be continuously cased and continuously sealed a minimum of five (5) feet into the predominantly volcanic/basalt bedrock beneath the predominantly basin fill unit. The well may not be completed in such a manner that it allows ground water to be developed from the overlying basin fill. If during well construction, it becomes apparent that the well can be constructed to eliminate interference with nearby shallow wells or hydraulically connected streams in a manner other than specified in this permit, the permittee can contact the Department Hydrogeologist for this permit or the Ground Water/Hydrology Section Manager to request approval of such construction. The request shall be in writing, and shall include a rough well log and a proposed construction design for approval by the Department. The request can be approved only if it is received and reviewed prior to placement of any permanent casing and sealing material. If the well is constructed first and then the request made, requested modification will not be approved. The new well depth and construction specifications will be incorporated into any certificate issued for this permit.

If the well is to develop groundwater from the predominantly basin fill unit, it may not be completed in such a manner that it allows groundwater to be developed from the underlying predominantly volcanic/sedimentary bedrock unit. If, during the course of drilling, the well penetrates through the predominantly basin fill unit into the predominantly volcanic/sedimentary bedrock unit, the lower part of the well below the basin fill shall be properly abandoned (sealed).

Special Permit Condition:

The permittee shall construct one (1) minimum six-inch diameter observation well to penetrate the same aquifer as the production wells. The well shall meet the Department's minimum well construction standards and shall be cased and sealed to the same depth as the production wells. The well shall be constructed at a location approved by the Department for the purpose of instrumentation with continuous water-level monitoring equipment. The landowner or permittee shall provide access to Department staff to install and maintain the monitoring equipment. The well shall not be used for any other purpose while the Department is monitoring water levels. The well shall be completed prior to water use under the terms of any permit issued.

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	Basin Fill OR Bedrock	☐	☒
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation:

Some local well logs report static water levels that are somewhat above the depth that groundwater was first encountered; and locally some wells have a history of flowing artesian conditions. The regional aquifer is likely unconfined to poorly confined.

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	Big Alvord Creek	?	4565	2650	☐	☒	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation:

This evaluation considers perennial reaches of surface water only (see Memo by Ivan Gall, 1/15, 2008). Additional perennial surface water sources exist in the uplands to the north, up hydraulic gradient from the proposed wells. The effect of groundwater use in the valley on upland steams is currently unclear, so the upland streams reaches are not evaluated for PSI.

Surface water flow in Big Alvord Creek is sourced from springs discharging from the flank of the Steens Mountain escarpment ~2-3 miles west of the location of the proposed well. These springs are located well above any water bearing zones that may be encountered in the proposed well.

Water Availability Basin the well(s) are located within: No WAB data available.

C3a. **690-09-040 (4):** Evaluation of stream impacts for <u>each well</u> 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 <u>by total appropriation</u> 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. All wells are located at a distance greater than 1 mile from perennial reaches of hydraulically connected surface water.

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: ______________________________

No calculations were performed here, due to the large uncertainty of where hydraulic connection likely occurs with surface water. However, it is likely that the proposed use will eventually have a negative impact on down gradient spring discharge to the Alvord Valley.

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**

C1. 690-09-040 (1)
It is determined that all wells will produce water from an unconfined aquifer.

C2. 690-09-040 (2) (3)
It is determined that the proposed well is not hydraulically connected with Big Alvord Creek.

C3a./C3b. 690-09-040 (4)
No analysis here. All wells are located at a distance greater than 1 mile from perennial reaches of hydraulically connected surface water.

C4a. 690-09-040 (5)
No calculations were performed here, due to the large uncertainty of where hydraulic connection likely occurs with surface water. However, it is likely that the proposed use will eventually have a negative impact on down gradient spring discharge to the Alvord Valley.

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References Used:

Evans, J. G., & Geisler, T. M. (2001). Geologic field-trip guide to Steens Mountain Loop Road. Harney County, Oregon: US Geological Survey and US Department of the Interior.

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

Oregon Administrative Rules

Waring, Gerald Ashley, 1909, Geology and water resources of the Harney Basin region, Oregon: Govt. Print. Off., Water Supply Paper 231, 93 p.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #**: _____ **Logid:** _____

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

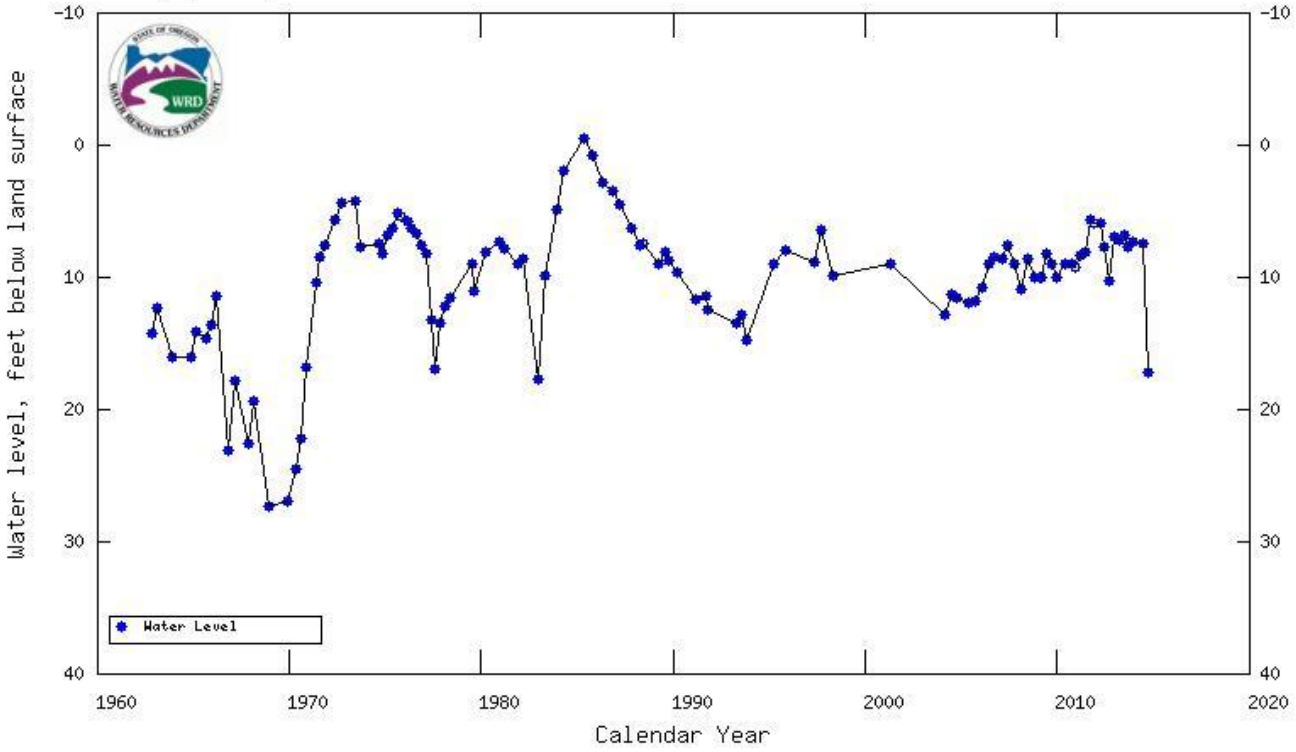
a. ☐ review of the well log;
b. ☐ field inspection by _____;
c. ☐ report of CWRE _____;
d. ☐ other: (specify) _____

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

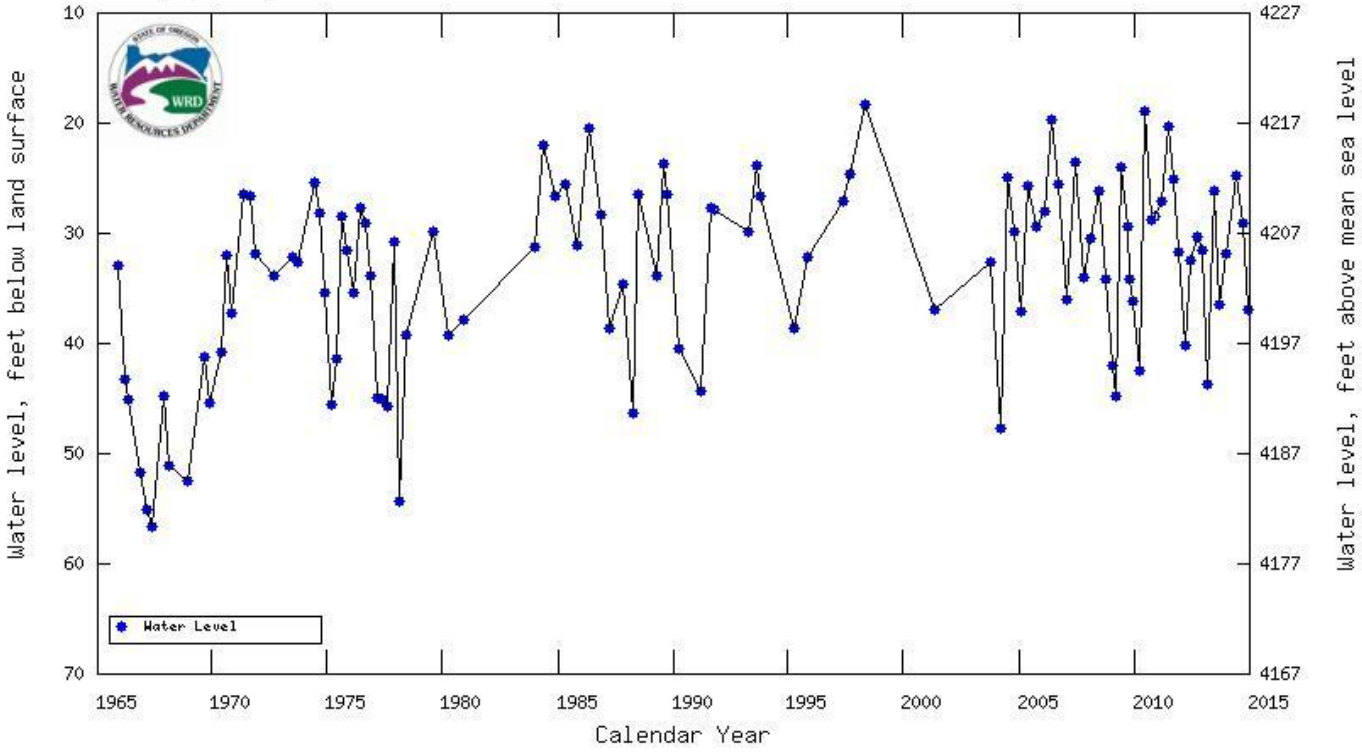
D4. ☐ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

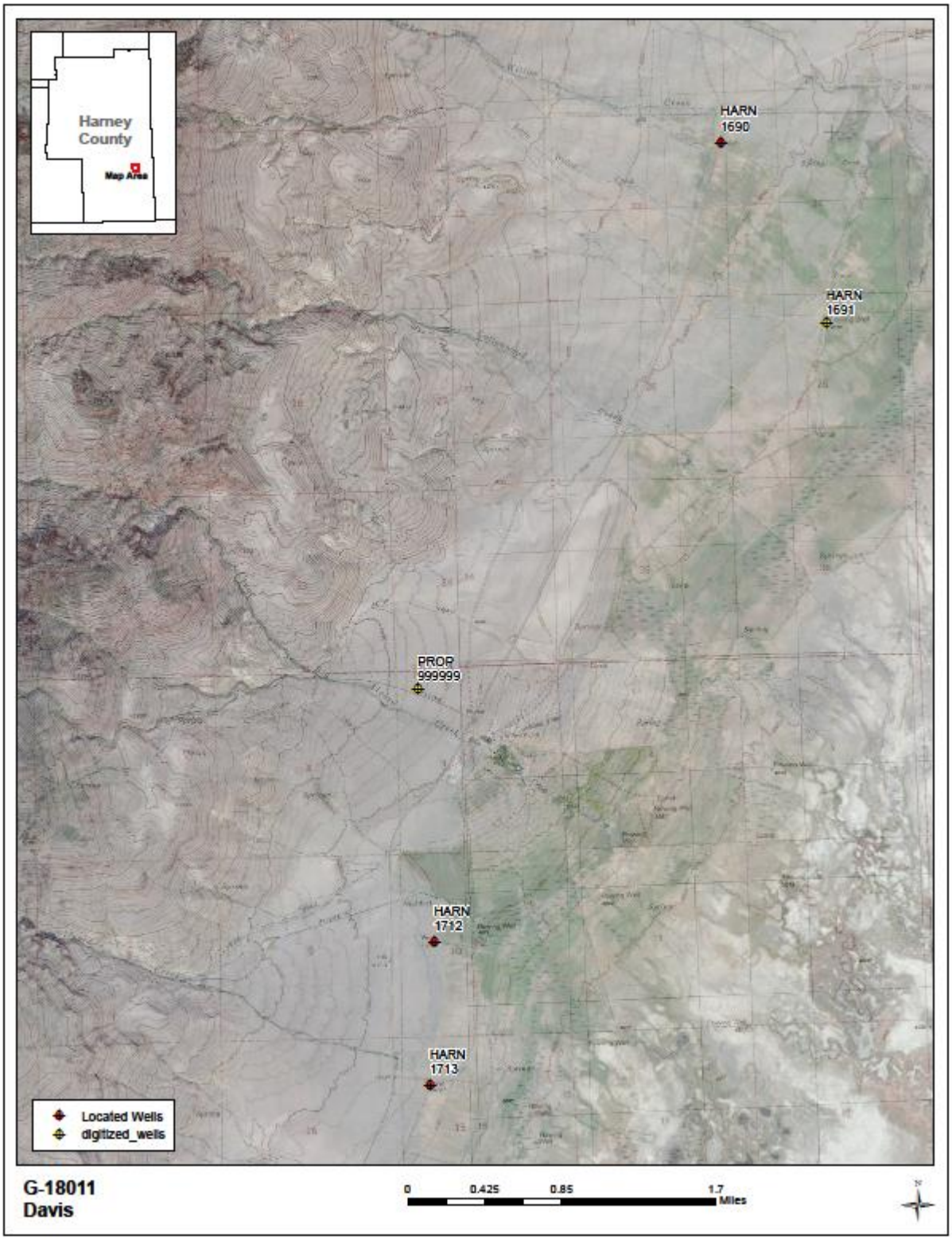
Water Availability Tables – No WAB data available.

Oregon Water Resources Department (OWRD) Well Location	34.00S/34.00E-15BCX
OWRD Logid	HARN 1713
OWRD Well Tag (Well ID)	----
OWRD State Observation Well Number	191
Total well depth (feet below land surface)	300
Land surface elevation (feet above mean sea level)	----
Primary use of well	IRRIGATION
Primary aquifer system	----



Oregon Water Resources Department (OWRD) Well Location	33.00S/34.00E-23aad
OWRD Logid	HARN 1690
OWRD Well Tag (Well ID)	----
OWRD State Observation Well Number	190
Total well depth (feet below land surface)	310
Land surface elevation (feet above mean sea level)	4237
Primary use of well	IRRIGATION
Primary aquifer system	----




Harney County
Map Area
HARN 1690
HARN 1691
PROP 999999
HARN 1712
HARN 1713
Located Wells
digitized_wells
G-18011
Davis
0
0.425
0.85
1.7
Miles