PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section Date **8 June 2009**

FROM: Ground Water/Hydrology Section **Gerald H. Grondin**
Reviewer's Name

SUBJECT: Application G- **17215** 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: **Julie Moore** County: **Jackson**

A1. Applicant(s) seek(s) **(11 gpm) 0.025*** cfs from **1** well(s) in the **Rogue Drainage** Basin, **Upper Rogue** subbasin Quad Map: **Boswell Mountain**

A2. Proposed use: **Irrigation (4 acres primary)** Seasonality **1 May to 31 October (184 days)**

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	**Not drilled**	**1**	**Claystone**	**0.025**	**35S/02W-sec 13 ABD**	**1040' S, 1960' W fr NE cor S 13**
2						
3						
4						

* 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	**1380**	**70?**	**30?**	**N.A.**	**175?**	**0 to 20?**	**+1 to 20?**	**0 to 175?**	**100 to 175?**	**25?**	**N.A.**	**N.A.**

Use data from application for proposed wells.

A4. **Comments:**

The application requests 11 gpm (0.025 cfs) maximum to irrigate 4 acres, less than the 22 gpm (0.05 cfs) maximum that can be allowed (1/80 cfs per acre).

Well construction based upon example water well reports submitted with application.

A5. ☐ **Provisions of the Rogue Basin Program** 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: **The proposed use is in the Constance Creek drainage within the Upper Rogue River Basin. The Rogue River Basin Program applies (see OAR 690-515-0000). There are various classifications for the upper basin, but irrigation is apparently allowed for the area identified in this ground water right application.**

A6. ☐ **Well(s) #** _____ , _____ , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.
Name of administrative area:
Comments: **Not Applicable**

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, 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 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:** _____

If a permit is issued, condition with 7B, 7N, and a condition that requires the applicant to install and maintain a properly functioning, totalizing flow meter on the well, record monthly water use totals, and submitted the water use data annually to OWRD.

Water Use Measurement, Recording And Reporting Conditions

A. Before water use may begin under this permit, the permittee shall install a properly functioning totalizing flow meter. The permittee shall maintain the meter in good working order, shall keep a complete record of the amount of water used each month and shall submit a report which includes the recorded water use measurements to the Department annually or more frequently as may be required by the Director. Further, the Director may require the permittee to report general water use information, including the place and nature of use of water under the permit.

B. The permittee shall allow the watermaster access to the meter; provided however, where the meter is located within a private structure, the watermaster shall request access upon reasonable notice.

The geologic map by Wiley and Hladky (1991) and Hladky (1992) and the water well reports (well log) for wells near the proposed well indicate the proposed well site is located where the Payne Cliffs Formation (Tpcu) is exposed. Wiley and Hladky (1991) and Hladky (1992) note the formation is composed of conglomerate, sandstone, siltstone, mudstone, and coal in non-marine fluvial deposits locally derived. The formation is likely fractured (secondary permeability) with low storage and yield. The water well reports noted record various claystones and some sandstone with well yields generally less than 50 gpm.

The proposed well may obtain the yield proposed (desired).

State observation well 1157 (JACK 34195) is about 4.3 miles southwest of the proposed well site in the same township (T35S/R2W) as the proposed well site, but in a different section (section 33). The water well report for JACK 34195 indicates the well obtains ground water from claystone. The ground water level measurement data is from 1975 to 2007. The hydrograph for the well shows seasonal fluctuations and annual (year to year) trends. The annual trend appears related to climate related with higher peak annual water levels during wet years and lower peak water levels during dry years. The difference between annual peaks during wet years versus dry years can exceed 10 feet. The difference between the seasonal winter-spring ground water level high versus the summer-fall ground water level low in a given year ranges from less than 10 feet to more than 60 feet. This annual and seasonal variability is somewhat large and indicates low storage.

Very limited ground water level measurement data for four wells (JACK 3466, JACK 55776, JACK 3509, and JACK 3427) less than 0.3 miles from the proposed well site were found. Graphs of the limited data do not indicate a ground water level decline.

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	**Payne Cliffs Formation (Tpcu)**	☐	☒
		☐	☐

Basis for aquifer confinement evaluation:

Water well reports for wells near the proposed well site indicate a static water level above the first water bearing zone. This does not imply confined ground water given the ground water occurs in likely interconnected fractured rock. The depth where a well encounters fractures yielding water varies. Often, the various fractures are interconnected laterally and vertically.

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**	**Un-named creek**	**1365**	**1370**	**200**	☐	☒	☐	☐	☒
1	**2**	**Constance Creek**	**1365**	**1370**	**1200**	☐	☒	☐	☐	☒
1	**3**	**Snider Creek**	**1365**	**1370**	**9500**	☐	☒	☐	☐	☒
1	**4**	**Rogue River**	**1365**	**1260**	**10,400**	☐	☒	☐	☐	☒

Basis for aquifer hydraulic connection evaluation:

The ground water level is based upon nearby well JACK 3466 less than 400 feet from the proposed well site, and the surface water elevations were based upon the Boswell Mountain and Shady Cove quadrangle maps (1:24,000 scale). The nearest reaches of the three creeks have approximately the same elevation.

No hydraulic connection with the un-named creek is noted in the table above given the creek is identified as intermittent or seasonal, dry during certain times of the year.

The proposed well site is in the same drainage as Constance Creek, less than 0.25 miles from the creek. One information source indicates the creek is perennial. However, OWRD staff surface water flow evaluation of Constance Creek during 2003-2004 observed the creek flow as intermittent rather than perennial, dominated by precipitation with very little, if any, ground water contribution (see attached Ivan Gall memo dated 28 June 2004 written for ground water right application files G-15794 and G-15943). Given that memo, a hydraulic connection can not be established at this time.

Snider Creek is in the next drainage west of Constance Creek. It is possible that a small ground water divide (mound) may exist between Constance Creek and Snider Creek. If present, a divide would make a hydraulic connection between the proposed well and Snider Creek indirect.

No potential for substantial interference can be assumed for the three creeks identified given there is no apparent hydraulic connection, and additionally for Snider reek the distance from the well to the creek is more than 0.25 miles.

The Rogue River is a regional ground water discharge area. The nearest river reach is near Dodge Bridge (Hwy 234) between river mile 138 and 139. However, no potential for substantial interference can be assumed given the distance from the well to the river is more than 0.25 miles. Additionally, establishing a hydraulic connection can not be established for the reach at this time given ground water – surface water observations by Young (1961) for the Dodge Bridge vicinity.

Water Availability Basin the well(s) are located within:
ROGUE R > PACIFIC OCEAN - AB CURRY G AT GAGE 14359000

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:

The proposed well does not appear to be hydraulically connected with a stream less than one-mile from the well site.

The un-named creek is less than one-mile from the proposed well site, but it is identified as intermittent or seasonal, dry during certain times of the year.

The proposed well site is in the same drainage as Constance Creek located less than one-mile from the proposed well site. However, OWRD staff surface water flow evaluation of Constance Creek during 2003-2004 observed the creek flow as intermittent rather than perennial, dominated by precipitation with very little, if any, ground water contribution (see attached Ivan Gall memo dated 28 June 2004 written for ground water right application files G-15794 and G-15943). Given that memo, a hydraulic connection can not be established at this time.

Snider Creek is more than one-mile from the proposed well site.

The Rogue River is more than one-mile from the proposed well site.

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													
(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:

There is no evaluation in this section for the un-named creek and Constance Creek given they are less than one-mile from the proposed well site and at this time both are identified as intermittent flow .

There is no evaluation in this section for Snider Creek given the possibility that a small ground water divide (mound) exists between Constance Creek and Snider Creek. A divide would make a hydraulic connection between the proposed well and Snider Creek indirect. That makes interference calculations problematic with current tools for analysis.

The Rogue River is a regional ground water discharge area. However, there is no evaluation in this section for the Rogue River given the following. Treating the fractured rock as a porous media for the interference calculations may or may not be valid (see attached for range of transmissivity values derived from specific capacity data for wells in the section 13, same section as the proposed well). Additionally, establishing with confidence a hydraulic connection with the nearby Rogue River reach (Dodge Bridge vicinity) is currently problematic given the ground water – surface water observations by Young (1961) for the Dodge Bridge vicinity.

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**_____

If a permit is issued, condition with 7B, 7N, 7J and a condition that requires the applicant to install and maintain a properly functioning, totalizing flow meter on the well, record monthly water use totals, and submitted the water use data annually to OWRD.

Water Use Measurement, Recording And Reporting Conditions

A. Before water use may begin under this permit, the permittee shall install a properly functioning totalizing flow meter. The permittee shall maintain the meter in good working order, shall keep a complete record of the amount of water used each month and shall submit a report which includes the recorded water use measurements to the Department annually or more frequently as may be required by the Director. Further, the Director may require the permittee to report general water use information, including the place and nature of use of water under the permit.

B. The permittee shall allow the watermaster access to the meter; provided however, where the meter is located within a private structure, the watermaster shall request access upon reasonable notice.

References Used:

Gall, I. 2004. Observed Constance Creek Flows, Jackson, County, Oregon: OWRD memo from Ivan Gall to OWRD ground water application files G-15794 and G-15943 dated June 28, 2004, 2 p.

Hladky, F.R. 1992. Geology and mineral resources of the Shady Cove quadrangle, Jackson County, Oregon: Oregon Department of Geology and Mineral Industries Geologic Map Series map GMS-52, 1 plate.

McFarland, W.D. 1983. A description of aquifer units in western Oregon: U.S. Geological Survey Open File Report 82-165, 35 p., 8 plates.

Theis, C.V. 1935. The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using ground water storage. American Geophysical Union Transactions, 16 annual meeting, vol. 16, pg. 519-524.

Vorhis, R.C. 1979. Transmissivity from pumped well data. Well Log, National Water Well Association newsletter, vol. 10, no. 11, Dec. 1979, pg. 50-52.

Wiley, T.J. and Hladky, F.R. 1991. Geology and mineral resources of the Boswell Mountain quadrangle, Jackson County, Oregon: Oregon Department of Geology and Mineral Industries Geologic Map Series map GMS-70, 1 plate.

Wells, F.G. and Peck, D.L. 1961. Geologic map of Oregon west of the 121st meridian: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-325.

Young, R.A. 1961. Hydrogeologic evaluation of streamflow records in the Rogue River basin, Oregon: U.S. Geological Survey Open File Report 61-176, 119 p., 2 plates.

Young, R.A. 1959. Ground-water resources of the Rogue River basin, Oregon: U.S. Geological Survey unpublished report, 158 p.

OWRD water availability analyses

Rogue Basin Program rules (OAR 690-515)

USGS Quadrangel Maps: Boswell Mtn and Shady Cove (1:24,000 scale)

Water well reports submitted as examples for the proposed well. Submitted were JACK 3456, JACK 55199, JACK 34626

Water well reports with specific capacity data for wells in T35S/R02W-sec 13

Wells with water level data: State observation well 1157 (JACK 34195), and nearby wells JACK 3466, JACK 55776, JACK 3509, and JACK 3427

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #**: **1** **Logid: proposed, not yet constructed**

D2. **THE WELL does not 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**:
- a. ☐ constitutes a health threat under Division 200 rules;
- b. ☐ commingles water from more than one ground water reservoir;
- c. ☐ permits the loss of artesian head;
- d. ☐ permits the de-watering of one or more ground water reservoirs;
- e. ☐ other: (specify) _____

D4. **THE WELL construction deficiency is described as follows:** _____

D5. **THE WELL**
- a. ☐ **was**, *or* ☐ **was not** constructed according to the standards in effect at the time of original construction or most recent modification.
- b. ☐ I don't know if it met standards at the time of construction. **(See well casing and seal)**

D6. ☐ **Route to the Enforcement Section.** I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Enforcement Section and the Ground Water Section.

THIS SECTION TO BE COMPLETED BY ENFORCEMENT PERSONNEL

D7. ☐ Well construction deficiency has been corrected by the following actions: _____

_____ _____, 200____.
(Enforcement Section Signature)

D8. ☐ **Route to Water Rights Section (attach well reconstruction logs to this page).**

Oregon
Theodore R. Kulongoski, Governor

Water Resources Department
942 SW 6th Street
Suite E
Grants Pass, OR 97526
(541) 471-2886
FAX (541) 471-2876

TO: ***File G-15794 Decker***
File G-15943 Blandau

FROM: Ivan Gall I. K. G.

COPY: Larry Menteer – Jackson County Watermaster

DATE: June 28, 2004

SUBJECT: Observed Constance Creek Flows, Jackson County, Oregon

This memo summarizes the results of several field visits that were conducted to observe Constance Creek stream flows. The purpose of the observations was to estimate the groundwater contribution to stream flow by looking for the presence or absence of flow following periods of time without precipitation. If groundwater was noticeably contributing to stream flow it would be necessary to consider Constance Creek hydraulically connected to the aquifer under a Division 9 review.

Constance Creek is a seasonal stream, generally going dry each year during the summer and fall months. Constance Creek flows generally south towards the Rogue River, and is composed of several small tributaries that flow across relatively gentle topography. Anecdotal information from staff and residents in the area indicates that Constance Creek generally flows following extended periods of precipitation. Following days or weeks of no rain, Constance Creek flows diminish significantly or stop.

The subject properties are located north and south of Beagle Road in Jackson County, Oregon, west of the Rogue River and southwest of Shady Cove. Topography slopes to the south towards Upper and Lower Table Rock. The bedrock in the area is composed of upper Eocene siltstone, mudstone, sandstone, conglomerate, and coal of the Payne Cliffs Formation. The original sediments were river deposited with the provenance believed to be local. The main stem of Constance Creek west of the site has deposited older quaternary alluvium. The subject well log notes "blue claystone" from 2 to 82 feet bgs. Overlying the bedrock are 2 feet of "black soil". Well logs in the vicinity of the subject site suggest that the depth to bedrock is approximately 2 to 10 feet. Ground water appears to be encountered in fractures ranging from 30 to 150 feet bgs.

Groundwater levels in area wells are generally shallow during the wet months, suggesting the potential for groundwater to discharge into the creek. The overlying soil has a high clay content and soil permeability is likely to be very low. This would minimize connection between the stream and underlying aquifer. However, at some locations in Constance Creek, bedrock is visible in the streambed.

Constance Creek flows were observed on the following dates, generally in several locations (three tributaries along Beagle Road, Dodge Road, and Glass Road). Stream flow measurements were not taken due to staff time limitations.

Date:	Observation:	Staff:
October 30, 2003	No flow	Stanford
December 10, 2003	No flow	Gall, Stanford, Haynes
January 2, 2004	Flowing	Chapman, Stanford
January 30, 2004	Flowing	Chapman, Stanford
March 17, 2004	Flowing	Chapman
April 4, 2004	Flowing	Chapman
April 13, 2004	Flowing, very limited	Gall

No visits were conducted after April 13, 2004, as precipitation was negligible, and the stream flow on April 13 was nearly zero.

A summary of monthly precipitation totals as measured at the Medford Airport is provided below. Daily precipitation values are available.

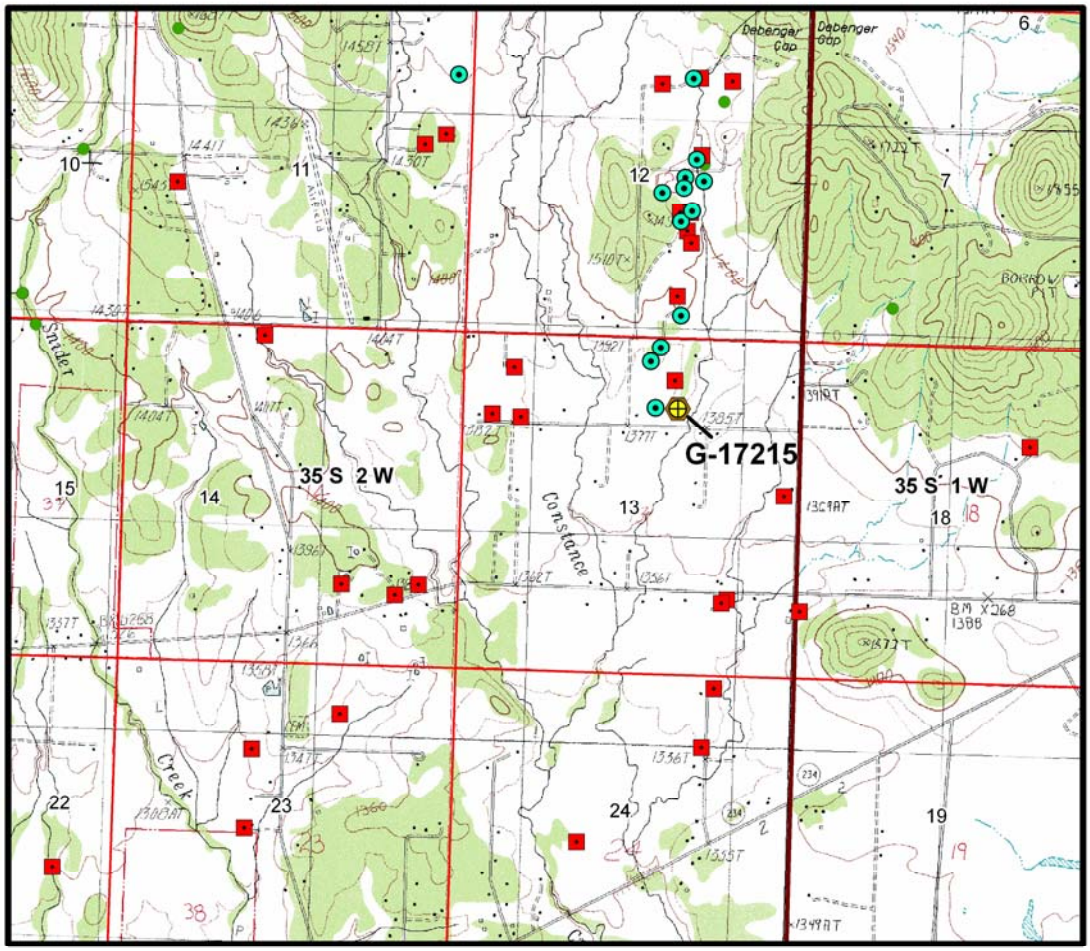
Month:	*Precipitation* (inches):*	*Departure from Normal* (inches):*
September 2003	0.86	0.08
October 2003	0.05	-1.26
November 2003	2.38	-0.55
December 2003	4.67	1.77
January 2004	2.98	0.51
February 2004	3.35	1.25
March 2004	1.27	-0.58
April 2004	0.75	-0.56
May 2004	1.27	0.06

*Data Source Oregon Climate Service Web Page

Staff field observations between October 2003 and April 2004 suggest that stream flow in Constance Creek is dominated by precipitation. Any groundwater contribution to stream flow is minimal and of a short-term nature. No groundwater discharge occurs into Constance Creek near the applicants' properties during the dry months, as the stream is dry.

Limitations on staff resources did not allow location of wells and collection of water level elevation data to assess aquifer responses to precipitation, hydraulic gradients, and compare stream stage with aquifer levels. Quantitative stream flow measurements also were not collected due to staff limitations. These data would provide a more comprehensive evaluation of aquifer and stream interaction. However, I feel that the staff field observations are sufficient to remove Constance Creek from consideration in Division 9 reviews for groundwater rights in this area. If future data are gathered that change the conceptual model of the area, or indicate that surface and groundwater have a greater degree of interaction, then Constance Creek may need to be considered for a Division 9 review for future groundwater rights.

Ground Water Application G-17215
Julie Moore



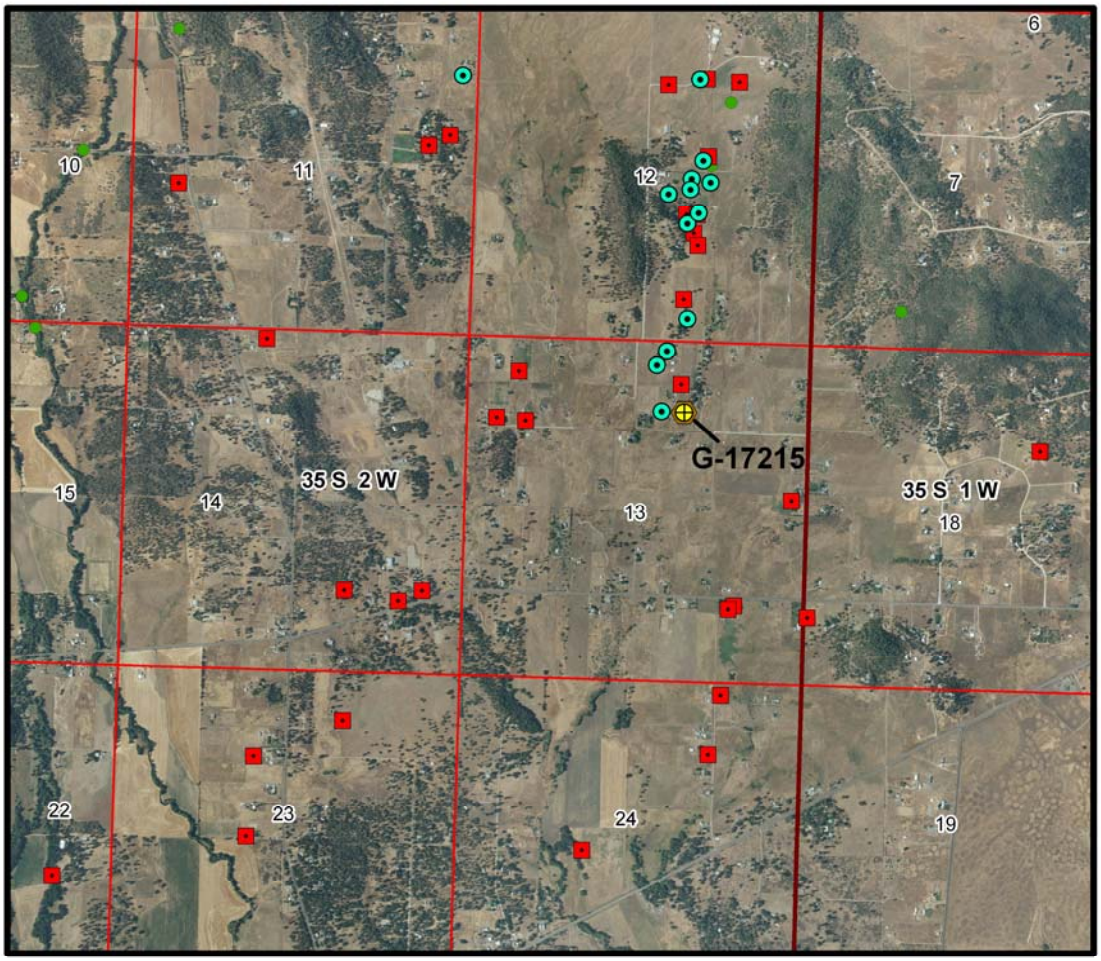
0 0.5 1 2
Miles

Yellow = Proposed Well
Red & Blue = Other Wells

Green = Surface Water Rights

N

Ground Water Application G-17215
Julie Moore



0 0.5 1 2
Miles

Yellow = Proposed Well
Red & Blue = Other Wells

Green = Surface Water Rights

N

Log_County	Log_Num	Pump Rate	Drawdown Total	Time Total	Specific_Capacity	Transmissivity	Transmissivity	Method
		gpm	feet	hours	gpm/foot	ft2/day	gpd/ft	
JACK	3509	50	33	1	1.52	302.26	2,261.04	Bailer
JACK	55508	30	10	1	3.00	51.74	387.00	Bailer
JACK	3487	20	53	1	0.38	66.53	497.67	Bailer
JACK	3490	15	60	1	0.25	42.35	316.77	Bailer
JACK	3492	15	37	0.5	0.41	67.24	502.95	Bailer
JACK	3493	30	30	2	1.00	204.09	1,526.71	Bailer
JACK	3495	19	74	1	0.26	43.61	326.19	Bailer
JACK	3494	16	30	1	0.53	97.12	726.50	Bailer
JACK	3496	20	73	1	0.27	46.83	350.30	Bailer
JACK	3497	60	60	1	1.00	192.58	1,440.63	Bailer
JACK	3498	50	95	1	0.53	95.72	716.07	Bailer
JACK	3499	12	51	0.5	0.24	36.86	275.80	Bailer
JACK	3500	100	13	2	7.69	1,828.30	13,676.64	Bailer
JACK	3501	100	22	1	4.55	989.34	7,400.74	Bailer
JACK	3504	15	36	1	0.42	74.15	554.69	Bailer
JACK	3502	30	65	1	0.46	82.93	620.35	Bailer
JACK	3503	80	55	1	1.45	289.18	2,163.23	Bailer
JACK	3505	10	36	0.5	0.28	44.29	331.33	Bailer
JACK	3506	10	28	1	0.36	62.64	468.54	Bailer
JACK	3507	20	70	1.5	0.29	50.98	381.37	Bailer
JACK	3508	13	61	1	0.21	35.52	265.74	Bailer
JACK	3510	80	17	1.5	4.71	1,058.34	7,916.95	Bailer
JACK	3511	25	120	1.5	0.21	36.07	269.82	Bailer
JACK	3512	7	110	2	0.06	10.05	75.20	Bailer
JACK	3513	15	27	0.5	0.56	95.09	711.30	Bailer
JACK	3515	14	65	0.5	0.22	33.41	249.95	Bailer
JACK	3516	17.5	75	0.5	0.23	36.52	273.16	Bailer
				Maximum	**7.69**	**1,828.30**	**13,676.64**	
				Minimum	**0.06**	**10.05**	**75.20**	
				Mean/Average	**1.15**	**221.25**	**1,655.06**	
				Median	**0.41**	**66.53**	**497.67**	