PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 07/07/2015

FROM: Groundwater Section **Phillip I. Marcy / Ivan K. Gall**
Reviewer's Name

SUBJECT: Application G- **18006** 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: **Diamond Farms LLC** County: **Baker**

A1. Applicant(s) seek(s) **1.84** cfs from **1** well(s) in the **Powder** Basin, _____ subbasin

A2. Proposed use **Irrigation (156.7 acres)** Seasonality: **March 1st to 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	Proposed	1	Basalt	1.84	8S/40E-2 SW-SW	875'N, 1320'E fr SW cor S 2
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	3404	?	?	?	500 (est)	?	0-500	?	?	?	?	?

Use data from application for proposed wells.

A4. **Comments:** POA well is proposed to be 500' deep and produce from fractured volcanic rocks mapped as Tertiary basalt and andesite flows by Brooks and others (1976) that is encountered in some nearby wells at various depths. There is some uncertainty of the completion depth required to produce from these volcanics, as many nearby wells do not encounter any volcanic rock, while others (BAKE 51823) encounter volcanic rock at very shallow depths.

A5. ☒ **Provisions of the** Powder (690-509) 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) **7N; "Large water use reporting"; 7K (see B2)**;
   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 200 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): Production from shallow portions of fractured volcanic rock is likely to interfere with nearby senior water right holders, most of whom produce from shallower zones.

B3. **Groundwater availability remarks:** Groundwater elevations in wells within several miles to the west of the proposed POA location have remained stable since the year 2000 (see attached). These measurements were made in wells producing from alluvial wells in which basalts or other volcanic units were not encountered and so may not represent the same aquifer system as proposed on this application. The proposed POA location is within 200 feet southwest of the mapped contact with Tertiary basalt (Tb) of Brooks and others (1976) on the northeast side of a fault. Wells within 1 mile have encountered volcanic units at very shallow depths on this side of the fault (see attached log for BAKE 51823).

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	**Basalt (Tb of Brooks and others)**	☐	☒
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Static water levels of wells completed within the local basalt aquifer system are the same or similar to the depths at which first water was encountered. Driller's logs from local wells indicate that these volcanic rocks are extensively fractured, and are described by Brooks and others (1976) as containing beds of palagonite tuff and flow breccia. The proximity of the proposed POA to a mapped fault to the northeast may explain some of the fracturing described on the well logs. As these basalts are expected to be very near the surface at the proposed POA location, there will likely be no confining layer above the production zone.

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	**Baldock Slough**	?	3343	5775	☐	☒	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: The proposed POA location lies to the north of a mapped fault (Brooks and others, 1976) that likely limits communication between the fractured volcanic aquifer here and the alluvial valley-fill aquifer to the southwest. Baldock Slough incises into the surficial sediments at the top of the alluvial fill sequence in the valley, in which vertical permeability is likely quite low, owing to thick deposits of fine-grained materials observed in well log reports from nearby wells. Based on the slope of exposed volcanics adjacent to the valley and lithologic information from local well logs, it is estimated that the alluvial fill is greater than 600 feet thick beneath Baldock Slough. In 2014, the groundwater elevation at nearby well BAKE 51823 with similar construction as the proposed POA was measured at 3277 feet ALSD, compared with 3343 feet elevation of surface waters in Baldock Slough. This further suggests that if a hydraulic connection exists, it is quite inefficient.

Water Availability Basin the well(s) are located within: Baldock Sl > Powder R – At mouth (30920330)

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: This section does not apply.

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: This section does not apply.

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:**

Special condition:

The applicant shall coordinate with the driller to ensure that drill cuttings are collected at 10-foot intervals and at changes in formation in each well whenever possible. A split of each sampled interval shall be provided to the Department.

References Used:

Brooks, H.C., McIntyre, J.R., Walker, G.W., 1976. Geology of the Oregon Part of the Baker 1^0 by 2^0 Quadrangle. Oregon Department of Geology and Mineral Industries Geological Map Series 7.

OWRD Ground Water Report #6.

Ground Water Resources of Baker Valley, Baker County, Oregon, by Frederick D. Trauger, 1951.

Ground Water of Baker Valley, Baker County, Oregon, by Lystrom, Nees and Hampton, 1967.

Nearby well logs and application reviews.

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

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

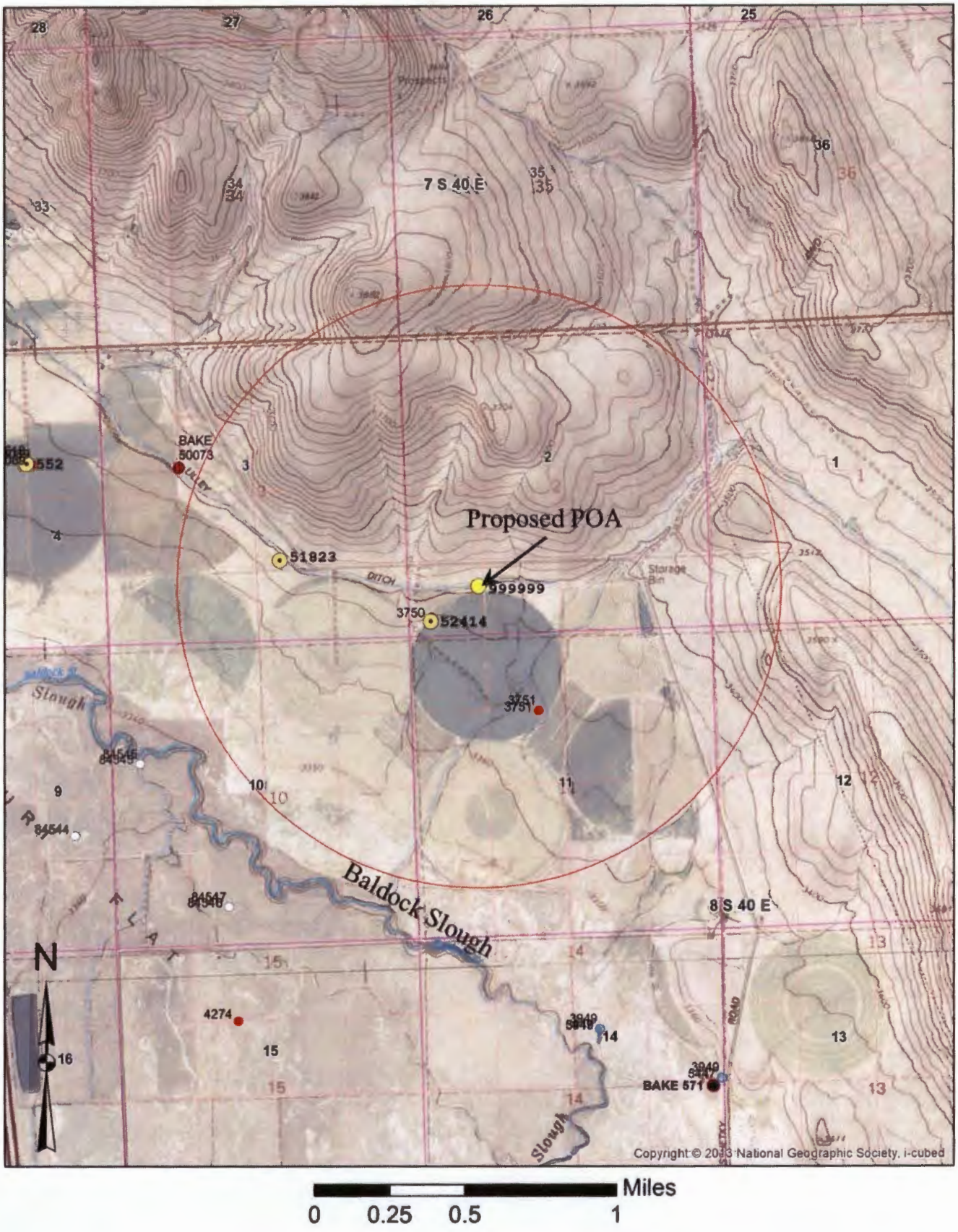
BALDOCK SL > POWDER R - AT MOUTH
Watershed ID #: 30920330 Basin: POWDER Exceedance Level: 80
Time: 2:30 PM Date: 06/22/2015

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
	Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.					
JAN	0.58	0.24	0.34	0.00	0.00	0.34
FEB	2.18	0.24	1.94	0.00	0.00	1.94
MAR	4.32	0.28	4.04	0.00	0.00	4.04
APR	10.90	1.53	9.37	0.00	0.00	9.37
MAY	3.49	4.70	-1.21	0.00	0.00	-1.21
JUN	0.75	5.31	-4.56	0.00	0.00	-4.56
JUL	0.17	3.02	-2.85	0.00	0.00	-2.85
AUG	0.07	1.30	-1.23	0.00	0.00	-1.23
SEP	0.06	0.83	-0.77	0.00	0.00	-0.77
OCT	0.06	0.49	-0.43	0.00	0.00	-0.43
NOV	0.17	0.24	-0.07	0.00	0.00	-0.07
DEC	0.35	0.24	0.11	0.00	0.00	0.11
ANN	3,770	1,120	3,180	0	0	3,180

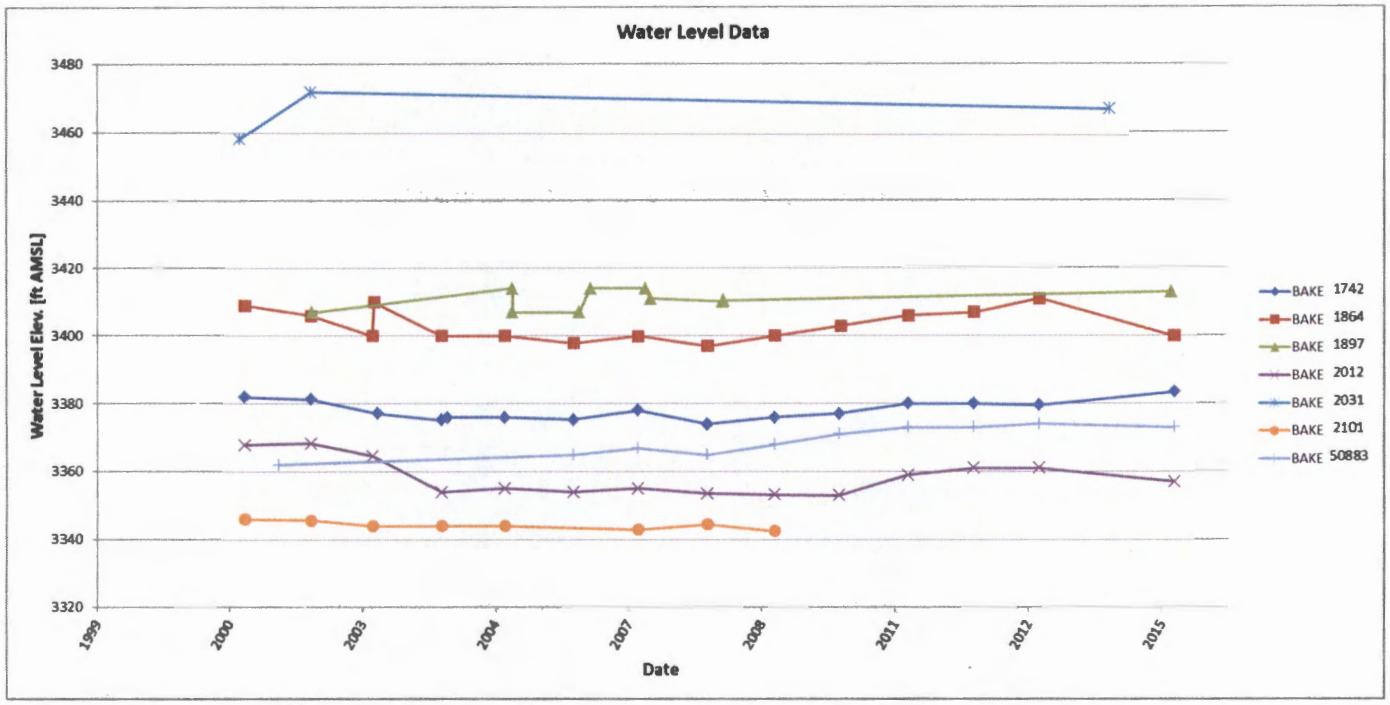
Well logs attached:

BAKE 51823 (Well 3500 feet away, along strike of same fault as POA)
BAKE 52350 (deepening of BAKE 51823)

Well Location Map



Water-Level Trends in Nearby Wells



BAKE 51823

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form.

WELL I.D. # L 91390
START CARD # 198126

(1) LAND OWNER Well Number 1
Name Kody Justus
Address 20539 Hwy 203
City Baker City State OR Zip 97814

(2) TYPE OF WORK
☒ New Well ☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD:
☒ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger
☐ Other

(4) PROPOSED USE:
☒ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 120 ft.
Explosives used ☐ Yes ☒ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10"	0	18	Bentonite	0	18	8
6"	18	120				

How was seal placed: Method ☐A ☐B ☐C ☐D ☐E
☒ Other Dry Bentonite 3/8 Poured
Backfill placed from ft. to ft. Material
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	+2	18	250	☒	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:	4½"	10	120	SDR26	☐	☒	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☒ None
Final location of shoe(s)

(7) PERFORATIONS/SCREENS:
☒ Perforations Method Slotted pipe
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
80	120	8"	84	1/8"	4½"	☐	☒
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
25	40	120	1 hr

Temperature of water 53° Depth Artesian Flow Found
Was a water analysis done? ☐ Yes By whom
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

(9) LOCATION OF WELL by legal description:
County Baker Latitude Longitude
Township 8 N or ☒ S Range 40 ☐ E or W WM
Section 3 NW 1/4 SE 1/4
Tax Lot 8709 Lot Block Subdivision
Street Address of Well (or nearest address) 45508 Schetky Ln
Baker City, OR 97814

(10) STATIC WATER LEVEL:
80 ft. below land surface Date 10/12/07
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES:
Depth at which water was first found 80

From	To	Estimated Flow Rate	SWL
80	120	25	80

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
Gravel	0	1	
Topsoil	1	2	
Brn basalt fractured	2	80	
Red basalt fractured WB	80	82	80
Tan basalt fractured WB	82	116	80
Brn basalt fractured WB	116	120	80

RECEIVED
NOV 07 2007
WATER RESOURCES DEPT
SALEM, OREGON

Date started 10/9/07 Completed 10/12/07

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
WWC Number
Signed Date

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 1937
Signed Lone Lussell Date 11/1/07

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

Page 1 of 1

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

BAKE 52350
8/8/2014

WELL I.D. LABEL# L 91390
START CARD # 1023865
ORIGINAL LOG #

(1) LAND OWNER
Owner Well I.D.
First Name LESTER Last Name ODELL
Company
Address 45508 SCHETKY RD.
City BAKER CITY State OR Zip 97814

(2) TYPE OF WORK
☐ New Well ☒ Deepening ☐ Conversion ☐ Alteration (complete 2a & 10) ☐ Abandonment (complete 5a)

(2a) PRE-ALTERATION

	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
Casing:	6	☒	2	18	0.25	◉	○	☒	☐

	Material	From	To	Amt	sacks/lbs
Seal:	Bentonite Chips	0	18	8	Sacks

(3) DRILL METHOD
☒ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger ☐ Cable Mud
☐ Reverse Rotary ☐ Other

(4) PROPOSED USE
☒ Domestic ☐ Irrigation ☐ Community ☐ Industrial/ Commercial ☐ Livestock ☐ Dewatering ☐ Thermal ☐ Injection ☐ Other

(5) BORE HOLE CONSTRUCTION
Special Standard ☐ (Attach copy)
Depth of Completed Well 250.00 ft.

BORE HOLE

Dia	From	To
6	0	120
6	120	250

SEAL

Material	From	To	Amt	sacks/lbs

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☐ Other
Backfill placed from ft. to ft. Material
Filter pack from ft. to ft. Material Size
Explosives used: ☐ Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE
Proposed Amount Actual Amount

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
○	◉	5		7	247	0.188	◉	○	☒	☐

Shoe ☒ Inside ☐ Outside ☐ Other Location of shoe(s) 247
Temp casing ☐ Yes Dia From To

(7) PERFORATIONS/SCREENS
Perforations Method TORCH
Screens Type Material

Perf/ Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Perf	Liner	5	167	247	.3	12	80	

(8) WELL TESTS: Minimum testing time is 1 hour
◉ Pump ○ Bailer ○ Air ○ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
45		248	1
65	131	210	0.8

Temperature 59 °F Lab analysis ☐ Yes By
Water quality concerns? ☐ Yes (describe below) TDS amount

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
County BAKER Twp 8.00 S N/S Range 40.00 E E/W WM
Sec 3 NW 1/4 of the SE 1/4 Tax Lot 8709
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
◉ Street address of well ○ Nearest address
45508 SCHETKY RD.
BAKER CITY, OR 97814

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration	7/31/2014			120
Completed Well	8/4/2014			121

Flowing Artesian? ☐ Dry Hole? ☐

WATER BEARING ZONES Depth water was first found 148.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
7/31/2014	148	161	2			121
7/31/2014	172	224	40			121
7/31/2014	224	250	10			121

(11) WELL LOG
Ground Elevation

Material	From	To
ORIGINAL HOLE	0	120
FRACTURED BASALT, BROWN	120	148
FRACTURED BASALT, GRAY	148	161
FRACTURED BASALT, BROWN	161	172
FRACTURED BASALT, GRAY	172	187
FRACTURED BASALT, BLACK	187	206
FRACTURED BASALT, GREEN, GRANITE GRA	206	211
FRACTURED BASALT, BROWN, GRANITE GRA	211	219
FRACTURED BASALT, TAN, GRANITE GRAVEL	219	224
FRACTURED BASALT, GREEN	224	232
FRACTURED BASALT, TAN	232	250

Date Started 7/31/2014 Complete 8/4/2014

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
License Number Date
Signed

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
License Number 1775 Date 8/8/2014
Signed JASON ACQUISTAPACE (E-filed)
Contact Info (optional)

ORIGINAL - WATER RESOURCES DEPARTMENT
THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK Form Version: