



**PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS**

TO: Water Rights Section Date 02/06/2015  
 FROM: Groundwater Section Michael J. Thoma / Gerald H. Grondin  
Reviewer's Name  
 SUBJECT: Application G- 17960 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: Stuart & Meggan Hills County: Baker

A1. Applicant(s) seek(s) 1.85 cfs from 2 well(s) in the Powder Basin,  
Old Settlers Slough subbasin Quad Map: Wingville

A2. Proposed use Irrigation (28 ac Prim.; 121.5 ac Suppl.) Seasonality: May 1 – October 31 (183 d)

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	PROP	1	Bedrock <sup>†</sup>	1.85	09S/39E-11 SW-NW	430' N, 300' E of SW cor of NW qtr of S11
2	PROP	2	Bedrock <sup>†</sup>	1.85	09S/39E-10 SE-NE	955' N, 80' W of SE cor of NE qtr of S10
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 <sup>‡</sup>	3920	170-180	0-100		350	0-20			100-350	830 <sup>p</sup>		
2 <sup>‡</sup>	2480	170-180	0-100		350	0-20			100-350	830 <sup>p</sup>		

Use data from application for proposed wells.

A4. **Comments:** <sup>†</sup>The applicant seeks to develop from a "bedrock" aquifer, but nearby well logs indicate that bedrock may or may not be encountered at the proposed depth of 350 ft. The proposed POAs will likely penetrate several hundred feet of alluvial material (sand-clay-gravel) which is generally low-yielding due to the high percentage of clay (see B3). The proximity to a large-offset fault separating older, Paleozoic-Mesozoic rocks from the more recent Quaternary sediments and lack of deep wells that penetrate bedrock make it difficult to determine the depth where bedrock will be encountered.

<sup>‡</sup>Both wells are proposed; "first water" and "SWL" are based on nearby well logs BAKE 912, BAKE 52051, and BAKE 51624 (attached) which list "first water" between 140 and 180 ft bls and SWL depths from flowing to 80 ft bls.

<sup>p</sup>This is the proposed rate. Most wells in these material yield < 100 gpm, however yields > 400 gpm have been demonstrated in some wells during pumping tests.

A5.  **Provisions of the** Powder (OAR 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 (annual meas.); 7T (measuring tube); 7B (interference); 7F (location); "Large" flowmeter condition;
  - 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 100 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 locations of the proposed POAs are along the south-western edge of the Baker Valley, a large sedimentary basin bounded by high-angle normal faults to the west and east (Brooks et al., 1976). One of these faults lies immediately southwest of the propose POA locations and separates Quaternary alluvial material from dense, consolidated bedrock of Paleozoic-Mesozoic age. It is not clear how deep the alluvial material is below the proposed POAs but driller’s logs nearby indicate the thickness is potentially > 350 ft (see BAKE 51624 – attached). The sediments appear to be dominated by clay and other fine-grained material with occasional zones of sandy-clay, sand, and occasionally gravel. The fine-grained nature of this material leads to generally confined conditions with depth, and low-yielding wells (well yields reported from 10 driller’s logs in sections 10 and 11 range from 6-60 gpm).  
There are two wells nearby that are/have reported annual water levels (BAKE 853 from 1949-1990 and BAKE 51383 from 2007-2014). Both show stable WL trends (Figure 2). Although WLs do not show declines in these two wells, it is not sufficient evidence to declare that groundwater is not over-appropriated.

**Regarding Injury:** There are few permitted groundwater users in the immediate vicinity of the proposed POAs but one such user, Certificate 45455 for 1.3 acres, lists a 75 ft well on the permit (G5761) and a 1973 priority date. The POA for this certificate is located ~1000 ft from the applicants proposed well #1 so there is concern for interference with this senior user. Restricting production to deeper zones in the aquifer, as proposed by the applicant and conditioned in B2b, should help reduce interference, however, standard interference conditions (i.e., 7C) should apply. There are also numerous permitted spring diversions along the edge of the hills to the south of the proposed POAs, but as these are at higher elevations than the proposed production zones, there is not likely to be significant interference.

**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	Quaternary Sediments	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Quaternary Sediments	<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"/>

**Basis for aquifer confinement evaluation:** Most of the deeper wells in the area show SWLs well above water bearing zones and some logs even indicate artesian conditions from wells drilled to similar depths as the proposed POAs.

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	Salmon Creek	3400-3500	3380-3480	7500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Salmon Creek	3400-3500	3380-3480	6900	<input checked="" type="checkbox"/>	<input 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"/>

**Basis for aquifer hydraulic connection evaluation:** The wells in this area and at the depths proposed by the applicant are confined, but wells near Salmon Creek show “first water” depths within 10 ft of land surface (see **Figure 1**) implying hydraulic connection between the creek and the shallow portion of the aquifer, and saturation of the aquifer from near the surface through the full thickness. Additionally, there are several surface water diversions on Salmon Creek and as it has low flows in the summer months (< 5 cfs), even small impacts could have considerable effects. Despite the finding of hydraulic connection, however, the presence of thick, shallow clay layers reported in driller’s logs and the distance between the proposed POAs and Salmon Creek should greatly reduce the efficiency of hydraulic connection and the overall impact to Salmon Cr. (see C4a and **Figure 3**).

**Water Availability Basin the well(s) are located within:** Powder R > Snake R – AB Rock Cr (ID# 30920327) but will have impact to and are evaluated on the WAB: **Salmon Cr > Powder R – At Mouth (ID# 30920329)**

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

**Comments:** The proposed POAs are > 1 mi from surface water sources so tables C3a and C3b do 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.

<b>Non-Distributed Wells</b>													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>1</b>	<b>1</b>	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1.85</b>	<b>1.85</b>	<b>1.85</b>	<b>1.85</b>	<b>1.85</b>	<b>1.85</b>	<b>0</b>	<b>0</b>
Interference CFS						<b>0.000</b>	<b>0.001</b>	<b>0.003</b>	<b>0.005</b>	<b>0.006</b>	<b>0.008</b>	<b>0.010</b>	<b>0.010</b>
Interference CFS		<b>0.011</b>	<b>0.011</b>	<b>0.011</b>	<b>0.010</b>								
<b>Distributed Wells</b>													
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													
(A) = Total Interf.		<b>0.011</b>	<b>0.011</b>	<b>0.011</b>	<b>0.010</b>	<b>0.000</b>	<b>0.001</b>	<b>0.003</b>	<b>0.005</b>	<b>0.006</b>	<b>0.008</b>	<b>0.010</b>	<b>0.010</b>
(B) = 80 % Nat. Q		<b>6.50</b>	<b>7.32</b>	<b>9.70</b>	<b>17.20</b>	<b>29.30</b>	<b>24.50</b>	<b>7.72</b>	<b>3.80</b>	<b>2.75</b>	<b>2.84</b>	<b>5.27</b>	<b>6.56</b>
(C) = 1 % Nat. Q		<b>0.065</b>	<b>0.073</b>	<b>0.097</b>	<b>0.172</b>	<b>0.293</b>	<b>0.245</b>	<b>0.072</b>	<b>0.038</b>	<b>0.028</b>	<b>0.028</b>	<b>0.053</b>	<b>0.066</b>
(D) = (A) > (C)													
(E) = (A / B) x 100		<b>0.16%</b>	<b>0.15%</b>	<b>0.11%</b>	<b>0.06%</b>	<b>0.00%</b>	<b>0.01%</b>	<b>0.04%</b>	<b>0.12%</b>	<b>0.23%</b>	<b>0.29%</b>	<b>0.18%</b>	<b>0.16%</b>

(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:** The Hunt (2003) model was used to evaluate potential impacts to Salmon Creek due to pumping the full rate from the nearest proposed POA (Wells #2) and to represent the thick clay layers in the near-surface that are often reported on driller's logs and lead to the determination of confined to semi-confined conditions. Although the POAs are not within the Salmon Creek WAB it is the nearest perennial surface water feature. Model parameters used in the model (see Figure 3) were determined from: 1) assessment of the aquifer dimension based on driller's logs and geologic maps; 2) results from pumping test data in nearby wells; and 3) typical parameters for these types of materials. The presence of major faults to the immediate south of the proposed POAs may increase the impacts to Salmon Creek beyond what the model predicts (model assumes aquifer is of infinite lateral extent), but this additional impact still should not increase interference beyond 1% of the 80% natural flows.

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:**

Although the proposed POAs will be penetrating a confined aquifer located > 1 mi from nearest perennial surface water feature, wells near Salmon Creek indicate that the creek is likely hydraulically connected to the upper part of the aquifer. Although some driller's logs show different SWLs between shallow and deeper zone, the fact that the aquifer is fully saturated to near the surface indicates hydraulic connection throughout the aquifer. However, the presence of thick clay layers identified in driller's logs will greatly reduce the efficiency of this connection – as shown by the analysis in C4a.

**References Used:** OWRD Well Logs Database – Accessed February, 2015.

Trauger, F. D. 1951. "Ground Water Resources of Baker Valley, Baker County, Oregon". U.S. Geological Survey Open File Report.

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

Hunt, B. 2003. Unsteady stream depletion when pumping a semi-confined aquifer. Journal of Hydrologic Engineering. Jan/Feb, 2003

**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						
Watershed ID #: 30920329		SALMON CR > POWDER R - AT MOUTH			Exceedance Level: 80	
Time: 10:30 AM		Basin: POWDER			Date: 02/05/2015	
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	6.50	32.80	-26.30	0.00	0.00	-26.30
FEB	7.32	32.90	-25.60	0.00	0.00	-25.60
MAR	9.70	33.20	-23.50	0.00	0.00	-23.50
APR	17.20	48.70	-31.50	0.00	0.00	-31.50
MAY	29.30	128.00	-98.20	0.00	0.00	-98.20
JUN	24.50	145.00	-121.00	0.00	0.00	-121.00
JUL	7.72	82.60	-74.90	0.00	0.00	-74.90
AUG	3.80	46.70	-42.90	0.00	0.00	-42.90
SEP	2.75	39.80	-37.00	0.00	0.00	-37.00
OCT	2.84	32.50	-29.70	0.00	0.00	-29.70
NOV	5.27	32.70	-27.40	0.00	0.00	-27.40
DEC	6.56	32.70	-26.10	0.00	0.00	-26.10
ANN	12,600	41,600	0	0	0	0

Figure 1: Application overview map showing proposed POAs, existing PODs, and nearby wells (some wells placed in center of quarter-quarter based on location provided on driller's log); values of "0" in "Completed Depth" and "First Water" indicate no data.

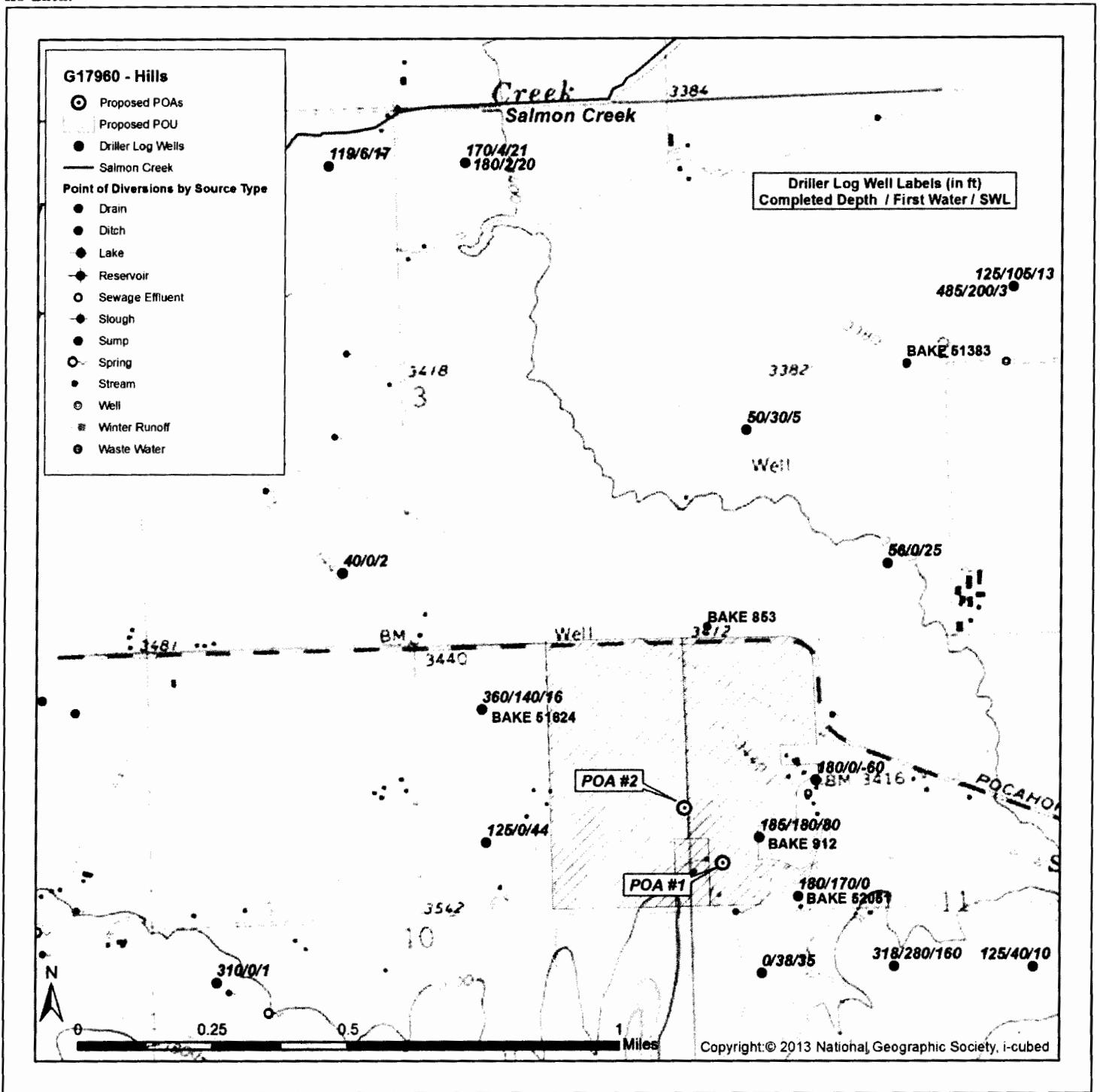




Figure 2: Temporal water level data from two nearby wells: BAKE 51383 and BAKE 853

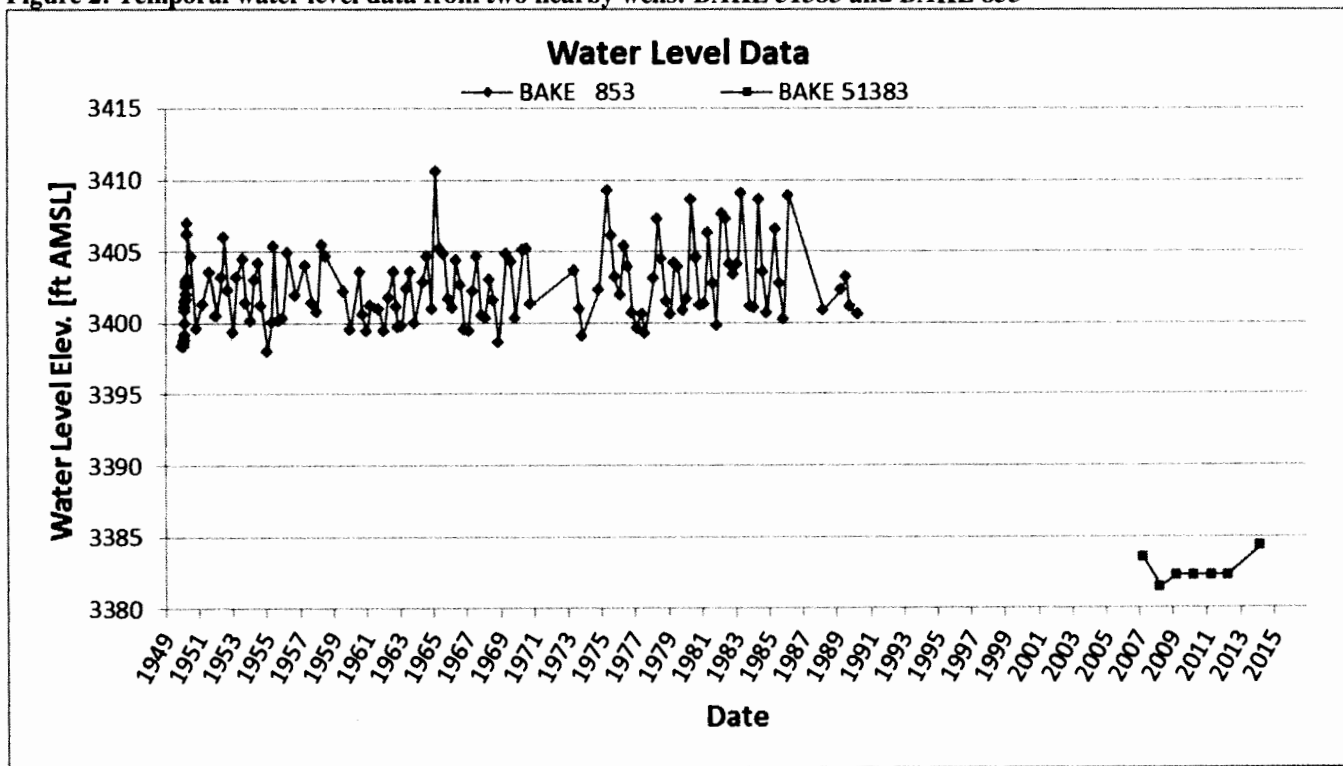
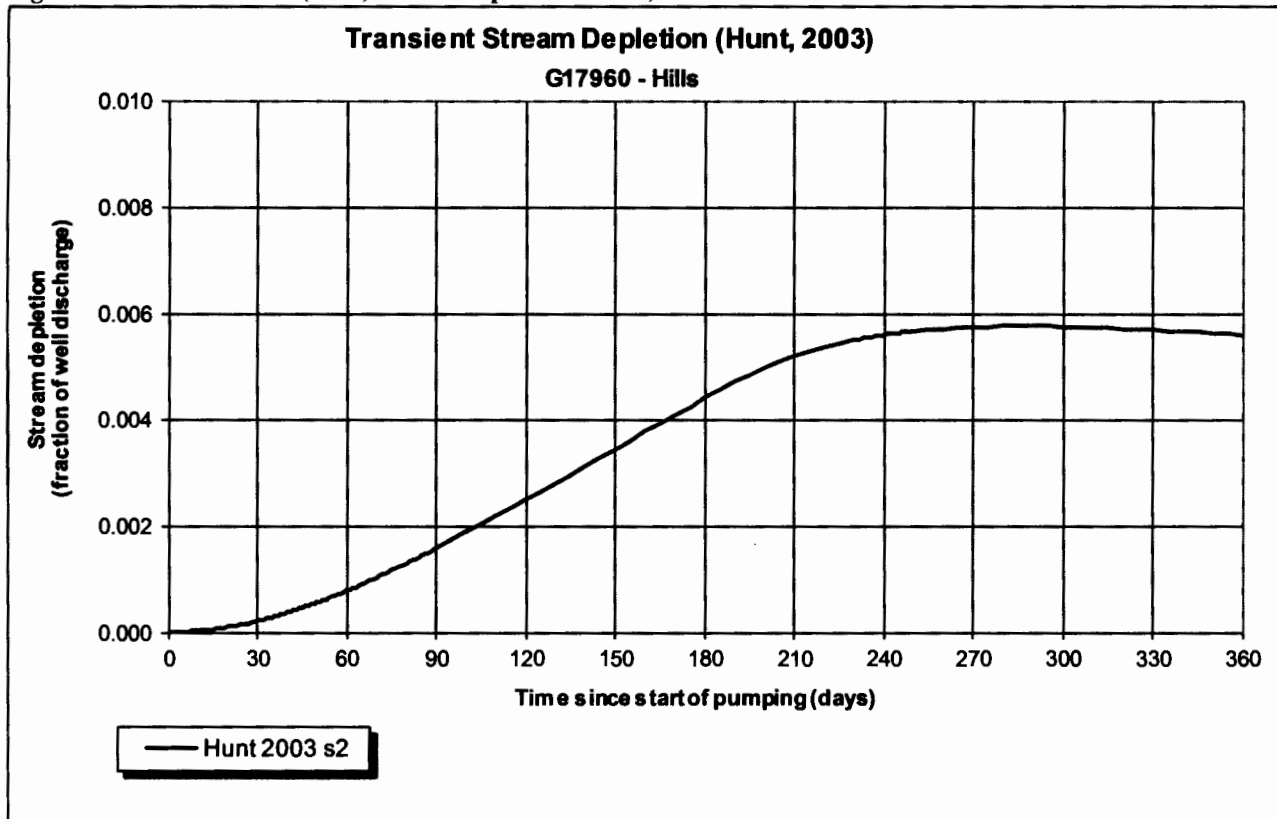


Figure 3: Results of Hunt (2003) stream depletion model; Scenario 2 was used in table C4a



Output for Stream Depletion, Scenerio 2 (s2):						Time pump on (pumping duration) = 183 days						
Month	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Days	30	60	90	120	150	180	210	240	270	300	330	360
H SD 2003	0.02%	0.08%	0.16%	0.25%	0.34%	0.44%	0.52%	0.56%	0.57%	0.58%	0.57%	0.56%
Qw, cfs	1.850	1.850	1.850	1.850	1.850	1.850	0.000	0.000	0.000	0.000	0.000	0.000
H SD 03, cfs	0.000	0.001	0.003	0.005	0.006	0.008	0.010	0.010	0.011	0.011	0.011	0.010

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	1.85	1.85	1.85	cfs
Time pump on (pumping duration)	tpon	183	183	183	days
Perpendicular from well to stream	a	6900	6900	6900	ft
Well depth	d	300	300	300	ft
Aquifer hydraulic conductivity	K	100	100	100	ft/day
Aquifer saturated thickness	b	300	300	300	ft
Aquifer transmissivity	T	30000	30000	30000	ft*ft/day
Aquifer storativity or specific yield	S	0.01	0.01	0.01	
Aquitard vertical hydraulic conductivity	Kva	1	1	1	ft/day
Aquitard saturated thickness	ba	30	30	30	ft
Aquitard thickness below stream	babs	25	25	25	ft
Aquitard porosity	n	0.2	0.2	0.2	
Stream width	ws	5	5	5	ft
Streambed conductance (lambda)	sbc	0.20	0.20	0.20	ft/day
Stream depletion factor	sdf	15.87	15.87	15.87	days
Streambed factor	sbf	0.05	0.05	0.05	
input #1 for Hunt's Q_4 function	t'	0.06	0.06	0.06	
input #2 for Hunt's Q_4 function	K'	52.90	52.90	52.90	
input #3 for Hunt's Q_4 function	epsilon'	0.05	0.05	0.05	
input #4 for Hunt's Q_4 function	lamda'	0.05	0.05	0.05	

Attachment: Nearby Driller's Logs (1 of 3)

WATER WELL REPORT  
STATE OF OREGON

*Boke  
912*

RECEIVED 9/39-11 eb

FEB 16 1982  
WATER RESOURCES DEPT  
SALEM, OREGON

(1) OWNER:

Name CLAYDY GRAN  
Address \_\_\_\_\_  
City HASTING State OR

(2) TYPE OF WORK (check):

New Well  Deepening  Reconditioning  Abandon   
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary Air  Driven  Domestic  Industrial  Municipal   
Rotary Mud  Dug  Irrigation  Test Well  Other   
C  Bored  Thermal  Withdrawal  Reinjection

(4) PROPOSED USE (check):

(5) CASING INSTALLED: Steel  Threaded  Plastic  Welded   
6" Diam from 1 ft. to 134 ft. Gauge 2.57

(6) LINER INSTALLED:  
" Diam from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Gauge \_\_\_\_\_

(6) PERFORATIONS: Perforated?  Yes  No  
Type of perforator used slotted pipe  
Size of perforations 3/4 in. by 4 in.  
30 perforations from 1.47 ft. to 1.94 ft.

(7) SCREENS: Well screen installed?  Yes  No  
Manufacturer's Name \_\_\_\_\_  
Type \_\_\_\_\_ Model No. \_\_\_\_\_  
Diam. \_\_\_\_\_ Slot Size \_\_\_\_\_ Set from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Diam. \_\_\_\_\_ Slot Size \_\_\_\_\_ Set from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

(8) WELL TESTS: Drawdown is amount water level is lowered below static level  
Was a pump test made?  Yes  No. If yes, by whom?  
ft. \_\_\_\_\_ gal/min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Air test 30 gal/min. with drill stem at 160 ft. 1 hrs.  
Packer test \_\_\_\_\_ gal/min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Artesian flow \_\_\_\_\_ g.p.m.  
Temperature of water 52 Depth artesian flow encountered \_\_\_\_\_ ft.

(9) CONSTRUCTION: Special standards: Yes  No   
Well seal—Material used CEMENT  
Well sealed from land surface to 20 ft.  
Diameter of well bore to bottom of seal 10 in.  
Diameter of well bore below seal 6 in.  
Number of sacks of cement used in well seal 12 sacks  
How was cement grout placed? GROUT PUMP  
Was pump installed? NO Type \_\_\_\_\_ HP \_\_\_\_\_ Depth \_\_\_\_\_ ft.  
Was a drive shoe used?  Yes  No Flange \_\_\_\_\_ Size location \_\_\_\_\_ ft.  
Did any strata contain unusable water?  Yes  No  
Type of Water? \_\_\_\_\_ depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_  
Was well gravel packed?  Yes  No Size of gravel: \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

(10) LOCATION OF WELL:

County Baker Driller's well number \_\_\_\_\_  
NW 4 Sec 11 T 9 R 39 E W.M.  
Tax Lot # \_\_\_\_\_ Lot \_\_\_\_\_ Blk \_\_\_\_\_ Subdivision \_\_\_\_\_  
Address at well location: JAMES

(11) WATER LEVEL: Completed well.

Depth at which water was first found 130 ft.  
Static level 30 ft. below land surface. Date 9-6-81  
Artesian pressure \_\_\_\_\_ lbs. per square inch. Date \_\_\_\_\_

(12) WELL LOG: Diameter of well below casing \_\_\_\_\_ ft.  
Depth drilled 145 ft. Depth of completed well 135 ft.  
Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
TOP SOIL	0	1	
CLAY BROWN	1	60	
CLAY BLUE	60	160	
CLAY BROWN	160	198	
SHALE MIXED COLOR	178	195	30

Work started 7-21 1981 Completed 8-6 1981  
Date well drilling machine moved off of well 8-6 1981

Drilling Machine Operator's Certification:  
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.  
[Signed] J. M. [Signature] Date 8-6 1981  
(Drilling Machine Operator)  
Drilling Machine Operator's License No. 957

Water Well Contractor's Certification:  
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
Name D. G. N. S. (Type or print)  
Address 50. N. P. E. ST. A. G. E.  
[Signed] J. M. [Signature] (Water Well Contractor)  
Contractor's License No. 571 Date 8-6 1981

NOTICE TO WATER WELL CONTRACTOR  
The original and first copy of this report are to be filed with the

WATER RESOURCES DEPARTMENT,  
SALEM, OREGON 97310  
within 30 days from the date of well completion.

(2 of 3)

BAKE 51624

#184983  
187439

STATE OF OREGON  
WATER WELL REPORT  
(as required by ORS 837.766)

(1) OWNER: Well Number \_\_\_\_\_  
Name Thomas Land Company  
Address 92734 Old Trail Rd  
City Baker State OR Zip 97814

(2) TYPE OF WORK:  
 New Well  Deepen  Recurdition  Abandon

(3) DRILL METHOD  
 Rotary Air  Rotary Mud  Cable  
 Other \_\_\_\_\_

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

(5) BORE HOLE CONSTRUCTION:  
Special Construction approval Yes  No  Depth of Completed Well 360 ft.  
Explosives used  Yes  No  Type \_\_\_\_\_ Amount \_\_\_\_\_

MOLE SEAL Amount  
Diameter From To Material From To Pounds  
10 0 19 Redcrete 0 19 10  
6 19 360

How was seal placed. Method  A  B  C  D  E  
 Other pour and dry  
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 12 358 250      
Liner \_\_\_\_\_

Final location of shoe(s) 358

(7) PERFORATIONS/SCREENS:  
 Perforations Method Hotte Perf.  
 Screens Type \_\_\_\_\_ Material steel

From To Slot size Number Diameter Telephone size Casing Liner  
120 140 1x1/4 570 6" 25   
200 260 1x3/4 570 6" 25   
300 360 1x3/4 570 6" 25

(8) WELL TESTS: Minimum testing time is 1 hour  
 Pump  Boiler  Air  Flowing  Artesian  
Yield gal/min 25 Drawdown 346 Drill stem at 340 Time 1 hr

Temperature of water 50° Depth Artesian Flow Found \_\_\_\_\_  
Was a water analysis done?  Yes By whom \_\_\_\_\_  
Did any water 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 9 N or S Range 39 E or W, W.M.  
Section 10 NW NE SW SE  
Tax Lot 200 Lot \_\_\_\_\_ Block \_\_\_\_\_ Subdivision \_\_\_\_\_  
Street Address of Well (or nearest address) 41019 Parkantas Rd. Baker City OR 97814

(10) STATIC WATER LEVEL:  
16 ft below land surface Date 9-15-06  
Artesian pressure \_\_\_\_\_ lb per square inch. Date \_\_\_\_\_

(11) WATER BEARING ZONES:  
Depth at which water was first found 140

From	To	Estimated Flow Rate	SWL
<u>140</u>	<u>180</u>	<u>8</u>	<u>16</u>
<u>200</u>	<u>260</u>	<u>10</u>	<u>16</u>
<u>300</u>	<u>360</u>	<u>7</u>	<u>16</u>

(12) WELL LOG: Ground elevation \_\_\_\_\_

Material	From	To	SWL
<u>Top Soil</u>	<u>0</u>	<u>4</u>	
<u>Brown Clay Gravel sand</u>	<u>4</u>	<u>90</u>	
<u>Dark Gray Clay gravel sand</u>	<u>90</u>	<u>140</u>	
<u>Dark Brown Clay Gravel sand</u>	<u>140</u>	<u>160</u>	<u>16</u>
<u>Blue Clay Gravel sand</u>	<u>220</u>	<u>300</u>	
<u>Gravel Blue Clay Sand</u>	<u>300</u>	<u>360</u>	

RECEIVED  
OCT 05 2006  
WATER RESOURCES DEPT  
SALEM, OREGON

Date started 9-8-06 Completed 9-15-06

(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 well construction standards. Materials used and information reported above are true to my best knowledge and belief.  
Signed \_\_\_\_\_ WWC Number \_\_\_\_\_  
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 well construction standards. This report is true to the best of my knowledge and belief.  
Signed \_\_\_\_\_ WWC Number 1816  
Date 9-15-06

(3 of 3)

STATE OF OREGON WATER SUPPLY WELL REPORT

BAKE 52051

WELL LABEL # L 163012 START CARD # 20162616 ORIGINAL LOG #

Instructions for completing this report are on the last page of this form.

(1) LANDOWNER Owner Well I.D. First Name Robert Last Name Palmer Company Address 2975 5th St City Baker State OR Zip 97814

(2) TYPE OF WORK [X] New [ ] Conversion [ ] Deepening [ ] Alteration (complete Sections 2a & 10) [ ] Abandonment (complete Section 5a)

(2a) PRE-ALTERATION: Well Depth ft. Seal Material Casing Type: [ ] Steel [ ] Plastic [ ] Other Casing Gauge Casing Diameter

(3) DRILL METHOD [X] Rotary Air [ ] Rotary Mud [ ] Auger [ ] Cable [ ] Cable Mud [ ] Reverse Rotary [ ] Other

(4) PROPOSED USE [X] Domestic [ ] Irrigation [ ] Community [ ] Industrial/Commercial [ ] Livestock [ ] Dewatering [ ] Injection [ ] Thermal [ ] Other

(5) BORE HOLE CONSTRUCTION Depth of Completed Well 180 ft. Special Standard: [ ] Yes (attach copy)

Table with columns: Dia, From, To, Material, From, To, Amount, lbs. Rows: 10 0 18 Cement 8 15 4; 0 0 5 Bent 0 5 5

How was seal placed: Method [ ] A [ ] B [X] C [ ] D [ ] E [ ] Other 3/4 gravel dry Backfill placed from ft. to ft. Material Filter pack from ft. to ft. Material Size

(5a) ABANDONMENT USING UNHYDRATED BENTONITE: Calculated Amount Proposed to be Used: sacks/lbs Actual Amount Used: sacks/lbs

(6) CASING/LINER Table with columns: Casing/Liner, Dia, From, To, Gauge, Steel, Plastic, Welded, Thrd. Rows: 6 2 18 1.50 18; 4.5 9 169 SDR36

Shoe [ ] Inside [X] Outside [ ] Other Location of shoe(s) Temporary casing [X] Yes Diameter 10 From 0 To 18

(7) PERFORATIONS/SCREENS Perforations Method Slotted Pipe Screens Type Material P.V.C.

Table with columns: Perf, Screen, Casing, Liner, Screen Dia, From, To, Screen slot width, Slot length, # of slots, Tele/pipe size. Row: 125 165 74 6 95

(8) WELL TESTS: Minimum testing time is 1 hour [ ] Pump [ ] Bailor [ ] Air [X] Flowing Artesian

Yield gal/min 60 Drawdown Drill stem/Pump depth 3AC Duration (hr)

Temperature 58 F Lab analysis [ ] Yes [ ] No By

Water quality concerns? [ ] Yes (describe below) TDS ppm Table with columns: From, To, Description, Amount, Units

(9) LOCATION OF WELL (legal description) County Baker Twp 9 N or S Range 39 E or W W.M. Sec 11 SW 1/4 of the NW 1/4 Tax Lot 800 Tax Map Number Lat Long Street Address of Well (or nearest address) 42250 Washington Canby Rd Baker City OR

(10) STATIC WATER LEVEL. Existing Well/Pre-Alteration Completed Well 7-8-10 1125. Date SWL (psi) + SWL (ft) Flowing Artesian? [X] Yes Dry Hole? [ ] Yes WATER BEARING ZONES Depth water was first found 170 SWL Date From To Est Flow SWL (psi) + SWL (ft) 7-8-10 170 180 60 1125

(11) WELL LOG Ground Elevation Material From To Top Soil 0 3; Brown Clay 5 3; Blue Clay 36 160; Grey Clay 140 170; Tan Clay 140 170; Broken Rock 170 180

RECEIVED JUL 29 2010 WATER RESOURCES DEPT SALEM, OREGON Date Started 7-6-10 Completed 7-8-10 (bonded) Water Well Constructor Certification I certify that the work I performed on the construction, deepening, 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 1816 Date 7-27-10 Signed Contact info (optional)

541-59-0618

ORIGINAL - WATER RESOURCES DEPARTMENT ONE COPY FOR CONSTRUCTOR ONE COPY FOR CUSTOMER SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK

01-02-2009