PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO:		Wate	r Rights S	ection				Date	e <u>11</u>	/23/2015		
FROM	/ 1:	Grou	ndwater S	ection		Philli	p I. Marc	y / Ivan K. (Gall			
SUBJ	ECT:	Appli	cation G-	<u>18107</u>		Reviewer's Name Supersedes review of Date of Review(s)						
PUBI OAR (welfard to dete the pre	LIC INTI 590-310-1 <i>e, safety at</i> rmine who sumption	EREST 30 (1) 7 and heal ether the criteria.	T PRESU The Depart th as descr e presumpt This revi	MPTION; ment shall p ibed in ORS ion is establi ew is based	GROUNI resume that 537.525. D shed. OAR upon avail	DWATE t a propose epartment . 690-310- able infor	<u>R</u> ed groundv staff revie 140 allows mation an Brent Fr	water use will a w groundwate the proposed ad agency poli	ensure the p or applicatio use be mod icies in place	preservation of ns under OA ified or cond ce at the time	of the pub R 690-31 itioned to e of evalu Baker	olic 0-140 meet nation.
A1.	Applica	nt(s) se	ek(s) <u>0.3</u>	2 cfs from	n <u>1</u>	well((s) in the	Powder		County	Dakci	_Basin,
A2. A3.	Propose Well an	ed use <u>1</u> d aquife	Primary] er data (at f	Irrigation (o <u>f 19.17 ac</u> mber logs f	e <u>res</u> Sea f <mark>or existin</mark>	sonality: <u> </u>	<u>March 1st – (</u> ark proposed	October 3 wells as su	1 st (245 day 1ch under log	<u>s)</u> gid):	
Well 1 2 3 4	Logic BAKE 52	1 2397	Applicant Well # 1	's Propose	ed Aquifer* luvium	Prop Rate 0.2	osed (cfs) 32	Location (T/R-S QQ 9S/40E-2 SE	I I -Q) I -NE	Location, mete 2250' N, 1200' 1935'S, 615'	es and bou E fr NW W fr NE co	nds, e.g. cor S 36 or S 2
5	: CDD	D 1 1										
Well	Well Elev ft msl 3400	First Water ft bls 120	SWL ft bls 33	SWL Date 02/04/2015	Well Depth (ft) 185	Seal Interval (ft) 0-19	Casing Intervals (ft) +2-139	Liner Intervals (ft)	Perforatio Or Screen (ft)	ns Well 1s Yield (gpm) 115	Draw Down (ft)	Test Type Air
Use dat A4.	a from app Comme the requ	lication : ents: <u>W</u> lested p	for proposed /ell comple umping rat	d wells. eted into clay te.	vstone and g	gravels and	d log states	a yield of 115	5 GPM (0.2	6 CFS), signi	ficantly 1	ess than
Use dat A4.	a from app Comme the requ	lication ents: <u>W</u> lested p	for proposed /ell comple umping rat	d wells. eted into clay te.	vstone and g	gravels and	d log states	a yield of 115	5 GPM (0.2	6 CFS), signi	ficantly 1	ess

A5. A5. Provisions of the <u>Powder (690-509)</u> 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: _____

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B. GROUNDWATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

- B1. **Based upon available data**, I have determined that <u>groundwater</u>* for the proposed use:
 - a. **is** over appropriated, **is not** over appropriated, *or* **is 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. \Box will not or \boxtimes 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)
 - ii. The permit should be conditioned as indicated in item 2 below.
 - iii.
 The permit should contain special condition(s) as indicated in item 3 below;
- B2. a. Condition to allow groundwater production from no deeper than ______ ft. below land surface;
 - b. Condition to allow groundwater production from no shallower than ______ ft. below land surface;
 - c. Condition to allow groundwater production only from the groundwater reservoir between approximately ft. and ft. below land surface;
 - d. **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc):

B3. **Groundwater availability remarks:** Considering the best available data, groundwater elevations locally appear to be fairly stable.

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	Silts and gravels (likely unit Qtg of Brooks, 1976)		\boxtimes

Basis for aquifer confinement evaluation: <u>Well is likely completed into alluvial fan and terrace deposits (Qtg of Brooks, et al., 1976) that are composed of laterally discontinuous facies of units of varying permeability. Therefore, isolation of one waterbearing strata from another is unlikely, even at depth within the alluvial sequence.</u>

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 ¹/₄ 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	3367	3379	3650	\boxtimes \Box \Box	\square

Basis for aquifer hydraulic connection evaluation: <u>The terrace and alluvial fan deposits within the Baker Valley contain no</u> <u>laterally continuous barrier that would inhibit the vertical flow migration of groundwater. There is likely an inefficient</u> <u>hydraulic connection between lenses of relatively high permeability materials and surface waters. This connection likely</u> <u>becomes less efficient with depth, however, as the tortuosity of the path groundwater must travel to reach the surface increases.</u>

Water Availability Basin the well(s) are located within: <u>Baldock Slough > Powder River – At Mouth (30920330)</u>

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?
1	1			-	-		.06	\boxtimes	12.53	\boxtimes

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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.

		11 2	Instracm	Instroom		800/	$O_{\rm H} > 10/$		Dotontial
			mstream	mstream	Ow >	80%	QW > 1%	Interference	Potential
5	SW	Qw >	Water	Water	10/	Natural	of 80%	@ 20 days	for Subst.
	#	5 cfs?	Right	Right Q	1% ISWD9	Flow	Natural	@ 50 days	Interfer.
			ID	(cfs)	15 W K !	(cfs)	Flow?	(%)	Assumed?

Comments: <u>Analytical model of Hunt (1999) predicts 0.097 CFS of interference to Baldock Slough at 240 days of pumping.</u> Parameters for the model run include local pump tests, showing transmissivity values of 5,000 ft²/day to 10,000 ft²/day, a storativity of 0.01, commonly used for unconfined aquifers, in addition to empirical data relating to water table elevations and horizontal distance between the well and Baldock Slough.</u>

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-Di	istributed	Wells											
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q	as CFS												
Interfer	ence CFS												
		-											
Distrib	uted Well	ls T	F 1	14			Ŧ	T 1		G	0 /	N	D
Well	SW#	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q	as CFS												
Interfer	ence CFS												
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q	as CFS												
Interfer	ence CFS												
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q	as CFS												
Interfer	ence CFS												
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q) as CFS												
Interfer	ence CFS												
		%	%	%	%	%	%	%	%	%	%	%	%
Well C) as CFS												
Interfer	ence CFS												
		%	%	%	%	%	%	%	%	%	%	%	%
Well C) as CFS		,.	,.			,,	,,,	,.	,,,	,,,	,,,	,,,
Interfer	ence CFS												
$(\mathbf{A}) = \mathbf{T}\mathbf{a}$	otal Interf.												
(B) = 80	% Nat. Q												
(C) = 1	% Nat. Q												
	(L) (C)												
(D) = ($ \mathbf{A}\rangle > (\mathbf{C})$	V	V	V	V	V	V	V	V	V	V	V	V
$(\mathbf{E}) = (\mathbf{A}$	/ 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:** Groundwater in the unconfined alluvial aquifer in the Baker Valley is hydraulically connected to surface waters, including those of nearby Baldock Slough. Given the low flows seen in the summer months (0.06 cfs), even a



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. \Box 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, the following conditions should apply:

"Large Water Use Reporting";

Special Condition (Modified 7N): The permittee shall follow the guidelines and measurement schedule set forth by condition 7N. The water user shall discontinue the use of, or reduce the rate or volume of withdrawal from, the well if any of the following events occur:

- A. <u>Annual water-level measurements reveal an average water-level decline of two or more feet per year for five consecutive years.</u>
- B. Annual water-level measurements reveal a water-level decline of 10 or more feet in fewer than five consecutive years.
- C. Annual water-level measurements reveal a total water-level decline of 15 or more feet.
- D. <u>Hydraulic interference leads to a total decline of 15 or more feet in any neighboring well with senior priority.</u>

References Used:

Brooks, H.C., McIntyre, J.R., Walker, G.W., 1976. Geology of the Oregon Part of the Baker 1⁰ by 2⁰ Quadrangle. Oregon Department of Geology and Mineral Industries Geological Map Series 7.

OWRD Ground Water Report #6.

Hunt, B., 1999, Unsteady stream depletion from ground water pumping: Ground Water, v. 37, no. 1, p. 98-102.

Nearby well logs, pump test data, and application reviews.

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D. WELL CONSTRUCTION, OAR 690-200

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

Water Avai	lability Tables	DETAILED REPORT	ON THE WATER AVAILA	BILITY CALCULATIO	N	
Watershed I Time: 10:33	D #: 30920330	BALD	Exceedance Level: 8 Date: 11/23/201			
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
		Storage is 1	Monthly values a the annual amount at	re in cfs. 50% exceedance i	n ac-ft.	
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC ANN	0.58 2.18 4.32 10.90 3.49 0.75 0.17 0.07 0.06 0.06 0.06 0.17 0.35 3,770	0.24 0.24 0.28 1.53 4.70 5.31 3.02 1.30 0.83 0.49 0.24 0.24 1,120	0.34 1.94 4.04 9.37 -1.21 -4.56 -2.85 -1.23 -0.77 -0.43 -0.07 0.11 3,180	$\begin{array}{c} 0.00\\$	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	0.34 1.94 4.04 9.37 -1.21 -4.56 -2.85 -1.23 -0.77 -0.43 -0.07 0.11 3,180



0 0.25 0.5 1 1.5

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Water-Level Trends in Nearby Wells



——Hunts2 residual

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Transferit Su cam Depica vir to cirkins, 1570, frant, 155	tion (Jenkins. 1970: Hunt. 1999)	Transient Stream Depletion
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Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 245 days												
Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
Jenk SD s2 %	97.34	98.12	98.47	98.67	98.81	98.91	99.00	99.06	2.03	1.12	0.78	0.59
Jen SD s2 cfs	0.311	0.314	0.315	0.316	0.316	0.317	0.317	0.317	0.006	0.004	0.002	0.002
Hunt SD s2 %	12.53	17.18	20.48	23.11	25.31	27.20	28.88	30.39	20.26	16.47	14.17	12.53
Hunt SD s2 cfs	0.040	0.055	0.066	0.074	0.081	0.087	0.092	0.097	0.065	0.053	0.045	0.040

---- Jenkins s2 residual

-Hunts2

→ Jenkins s2

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.32	0.32	0.32	cfs
Distance to stream	а	3650	3650	3650	ft
Aquifer hydraulic conductivity	ĸ	5000	10000	15000	ft/day
Aquifer thickness	b	200	200	200	ft
Aquifer transmissivity	Т	1000000	2000000	3000000	ft*ft/day
Aquifer storage coefficient	S	0.01	0.01	0.01	
Stream width	WS	20	20	20	ft
Streambed hydraulic conductivity	Ks	1	1	1	ft/day
Streambed thick ness	bs	3	3	3	ft
Streambed conductance	sbc	6.666666667	6.666666667	6.666666667	ft/day
Stream depletion factor (Jenkins)	sdf	0.133225	0.0666125	0.044408333	days
Streambed factor (Hunt)	sbf	0.024333333	0.012168667	0.008111111	

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						Page 1 of 1
STATE OF OREGON	BAKE 52	2397	WELL I.D. LAE	EL# L 116	485	
WATER SUPPLY WELL REPORT			START CA	RD # 102	5510	
(as required by ORS 537.765 & OAR 690-205-0210)		2/25/2015	ORIGINAL L	DG#		
(1) LAND OWNER Owner Well I D						
First Name BRENT & TERESA Last Name FREESE			ON OF WELL A	agal dasar	intion)	
Company		(9) LOCAIL	ON OF WELL (I	egai desci		
Address PO BOX 1122		County BAKER	1wp 9.00 S	N/S	Range 40.00	E E/W WM
City BAKER CITY State OR Zip 978	14	Sec 2 NE	5 1/4 of the _NI	<u> </u>	Tax Lot 40	0
(2) TYPE OF WORK	Conversion	Tax Map Number			Lot	
Alteration (complete 2a & 10) Abando	nment(complete 5a)	Lat°	10 "			DMS or DD
(2a) PRE-ALTERATION		Long°	10	-		DMS or DD
Dia + From To Gauge Stl Plstc Wlo	Thrd	Stree	et address of well	O Nearest a	address	
		42940 SUNNYSI	LOPE RD			
Material From To Amt sacks/lbs		BAKER CITY, O	OR 97814			
Seal:		(IN) STATIC	WATED I EVE	r		
(3) DRILL METHOD		(10) STATIC	WATEKLEVE	Date o		CTUT (A)
Rotary Air Rotary Mud Cable Auger Cat	ole Mud	Existing Well	/ Pre-Alteration	Date 3	WL(psi) +	SWL(II)
Reverse Rotary Other		Completed W	/ell 2/4	2015		33
(4) PROPOSED USE X Domestic Irrigation Co	mmunity		Flowing Artesian	? D	ry Hole?	
Industrial/Commercial X Livestock Depratering		WATER DEADING	G ZONES D			5.00
		WATER BEARING	D D D	epui water w		
		SWL Date	riom 10	LST FIOW	own(bar)	- SWL(ff)
(5) BORE HOLE CONSTRUCTION Special Stand	ard (Attach copy	2/3/2015	5 6	3		4
Depth of Completed Well 185.00 ft.		2/4/2015	120 185	115		33
BORE HOLE SEAL	sacks/					
Dia From To Material From	To Amt lbs					
12 0 19 Bentonite Chips 0	19 10 S	J []				
8 19 185 Caic	ulated 10.77	<u></u> ا				
Calc	ulated	(11) WELL L(OG Ground F	levation		
Hore was seal placed: Method A B C			Vatorial		From	To
X Other POURED DRY		CLAY	Alateria:		0	5
Backfill placed from ft. to ft. Material		SAND, CLAY			5	6
Filter pack from ft to ft Material	Size	CLAY			6	10
		HARD CLAYSTO	ONE		10	120
Explosives used: Yes Type Amount		CLAYSTONE, CE	EMENTED GRAVEL	s	120	185
(5a) ABANDONMENT USING UNHYDRATED BEN	TONITE					
Proposed Amount Actual Amount						↓ → ↓
(6) CASING/LINER						<u> </u>
Casing Liner Dia + From To Gauge St	Plstc Wld Thrd		AFT			<u> </u>
	2 의 의 니		(AFI			
	∠ян н					
	- H H H					
	- Н Н					
Shan I Javida Montrida I Other I certian of th						
	De(5) 138					<u> </u>
Temp casing Yes Dia From	10				-	+
(7) PERFORATIONS/SCREENS						
Perforations Method		D . C 100		a 14	1	••
Darf/ Casing/Screen Screens Lype Material	# of Tele/	Date Started 2/3	5/2015	Complete	ed 2/4/2015	
Screen Liner Dia From To width length	slots pipe size	(unbonded) Wat	er Well Constructor	Certificatio	n	
		I certify that the	work I performed or	the constru	ction, deepeni	ng, alteration, or
		abandonment of	this well is in con	npliance wit	th Oregon wa	ter supply well
		construction stand	dards. Materials used	and informa	ation reported	above are true to
		the best of my kno	owledge and belief.	_		
		License Number		Date		
(8) WELL TESTS: Minimum testing time is 1 hour		Signed				
OPump OBailer ⊙Air OF	lowing Artesian	orgaeu				
Yield gal/min Drawdown Drill stem/Pump depth D	uration (hr)	(bonded) Water	Well Constructor Ce	rtification		
115 185	1.5	I accept responsib	bility for the construc	tion, deepen	ning, alteration	, or abandonment
		work performed o	n this well during the	construction	dates reported	above. All work
		performed during	g this time is in con-	npliance wi	th Oregon wa	ner supply well
Temperature 55 °F Lab analysis Yes By			autos. Trais report is u	ae to die oes	tor my known	cage and benef.
Water quality concerns? Yes (describe below) TDS amount from To Description	nt Amount Linuts	License Number	1816	Date 2/	25/2015	
	Carlo Carlo	Signed STRUE	NICOLEY (E-filed)			
		Contact Info (onti	ional) 541-519-0618			
OPICPIAL W	100 0000102000	TEDAPTMENT				

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