PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section **Date** 25 June 2010

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

SUBJECT: Application **G-17307** 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 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: **George Jaska** County: **Lake**

A1. Applicant(s) seek(s) **0.78 (350 gpm)** cfs from **1** well(s) in the **Goose and Summer Lakes** Basin, **Thomas Creek watershed in Goose Lake** sub basin Quad Map: **Lakeview NW**

A2. Proposed use: **Irrigation (31.5 primary acres)** 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**	**Basin Fill**	**0.78**	**39S/19E-sec 01 CAB**	**2450' N, 1393' E fr SW cor S 01**
2						
3						

* 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	**4770**	**Prop 60**	**Prop 25**	**N.A.**	**Prop 300**	**Prop 0-100**	**Prop 0-300**		**Prop 200**	**Prop 350**		
2												
3												

Use data from application for proposed wells.

A4. **Comments:**

The proposed rate is 350 gpm (0.78 cfs) for primary irrigation of 31.5 acres. The proposed rate is higher than typically allowed for 31.5 acres (0.39 cfs, 177 gpm). The proposed annual volume is 26 million gallons (79.79 ac-ft, 2.53 feet of water per acre).

The proposed aquifer is identified as basin fill sediments. Walker (1963) mapped the site as alluvium (Qal) that includes unconsolidated fluviatile gravel, sand, and silt. Water well reports for wells in the same section (LAKE 2146, LAKE 2150 and LAKE 2153) indicate sand, gravel, and clay deposits in the area.

A5. ☐ **Provisions of the Goose & Summer Lakes** 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: **OAR 690-513-0040 (Goose Lake Subbasin) does not apply. The proposed well appears to be outside the reach of Thomas Creek and tributaries where groundwater is classified for domestic and stockwater use only OAR 690-513-0030 2(c) and (d).**

A6. ☐ **Well(s) # N.A.** , _____ , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.
Name of administrative area:
Comments: **Currently, no administrative area.**

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) **7B, 7N, and 7T**
   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:**

Recommend conditions 7B, 7N, and 7T.

Reports for the Goose and Summer Lakes Basin indicate groundwater occurs in alluvium, basin fill sediments, and different basalt units. The proposed well will likely obtain groundwater from basin fill sediments. Walker (1963) mapped the site as alluvium (Qal) that includes unconsolidated fluviatile gravel, sand, and silt. Water well reports for wells in the same section (LAKE 2146, LAKE 2150 and LAKE 2153) indicate sand, gravel, and clay deposits in the area.

The nearest state observation well found is state observation well 379 (well LAKE 1979). It is located about 3.3 miles north of the proposed well. The groundwater level data is from 1976 through 2009. The data show both seasonal fluctuations and annual climate trends with no apparent long term groundwater level decline or rise.

The second closest state observation well found is state observation well 381 (well LAKE 2424). It is located about 3.7 miles east of the proposed well. The groundwater level data is from 1965 through 2009. The annual trend prior to and after 1990 is different and an explanation for the difference is not yet known by this reviewer. The data from 1965 to 1990 shows an annual decline. In the early 1990s, the groundwater level rose above the original 1965 level and the subsequent annual trend appears climate influenced with no apparent decline.

The third closest state observation well found is state observation well 380 (well LAKE 2320). It is located about 5.0 miles east of the proposed well. The groundwater level data is from 1962 through 2009. The data show both seasonal fluctuations and annual climate trends with a possible long term groundwater level rise.

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	**Basin Fill Sediments**	☐	☒
2		☐	☐
3		☐	☐
4		☐	☐

Basis for aquifer confinement evaluation:

The system is identified as generally unconfined with discontinuous low permeability layers causing local (discontinuous, limited) confinement.

The proposed aquifer is identified as basin fill sediments. Walker (1963) mapped the site as alluvium (Qal) that includes unconsolidated fluviatile gravel, sand, and silt. Water well reports for wells in the same section (LAKE 2146, LAKE 2150 and LAKE 2153) indicate sand, gravel, and clay deposits in the area.

Morgan (1988) notes for the Goose Lake subbasin that groundwater flow is generally from upland recharge areas to lowland discharge areas. However, local subsystems discharge to lakes, reservoirs, meadows, and streams. Large quantities of groundwater move through complexly interbedded, discontinuous, unconsolidated sand, gravel, silt, and clay deposits. Morgan characterizes the upper portion of groundwater as unconfined with confined-like conditions increasing with depth. This appears related to anisotropic hydraulic conductivities with horizontal hydraulic conductivity much greater than vertical hydraulic conductivity. For one site noted, the estimated ratios ranged from 2:1 to 179:1. There is no indication of shallower groundwater being separated from deeper groundwater by a confining layer.

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**	**Thomas Creek**	**4760**	**4750**	**6500**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation:

The proposed well location is more than 1-mile west from Thomas Creek., about 1.2 miles.

The proposed well location is more than 2.5 miles east from the closest reach of Cottonwood Creek. The hydraulic connection with Cottonwood Creek was not evaluated due to uncertainties where the hydraulic connection occurs.

The groundwater elevation is based upon the static water level reported on water well reports LAKE 2146, LAKE 2150, and LAKE 2153 (2 to 27 feet below land surface) and the land elevation at the proposed well site derived from the Lakeview NW, Oregon USGS topographic map (1:24,000 scale).

Groundwater is determined to be hydraulically connected to Thomas Creek due to Morgan (1988) map showing groundwater flow, discharge to the creek.

Water Availability Basin the well(s) are located within: THOMAS CR > GOOSE L - AT MOUTH

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 is more than 1.0 mile from Thomas Creek.

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
1	**1**	**8.0 %**	**7.3 %**	**6.7 %**	**6.2 %**	**1.9 %**	**4.2 %**	**6.1 %**	**7.8 %**	**9.2 %**	**10.5 %**	**10.2 %**	**9.0 %**
Well Q as CFS		**0.00**	**0.00**	**0.00**	**0.00**	**0.2186**	**0.2186**	**0.2186**	**0.2186**	**0.2186**	**0.2186**	**0.00**	**0.00**
Interference CFS		**0.017**	**0.016**	**0.015**	**0.013**	**0.004**	**0.009**	**0.013**	**0.017**	**0.020**	**0.023**	**0.022**	**0.020**
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.		**0.017**	**0.016**	**0.015**	**0.013**	**0.004**	**0.009**	**0.013**	**0.017**	**0.020**	**0.023**	**0.022**	**0.020**
(B) = 80 % Nat. Q		**16.70**	**38.70**	**76.60**	**151.0**	**111.0**	**41.70**	**13.10**	**8.24**	**8.98**	**10.40**	**14.50**	**19.10**
(C) = 1 % Nat. Q		**0.167**	**0.387**	**0.766**	**1.510**	**1.110**	**0.417**	**0.131**	**0.082**	**0.090**	**0.104**	**0.145**	**0.191**
(D) = (A) > (C)		**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
(E) = (A / B) x 100		**0.102**	**0.041**	**0.020**	**0.009**	**0.004**	**0.022**	**0.099**	**0.206**	**0.223**	**0.221**	**0.152**	**0.105**

(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 proposed well is more than 1.0 mile from Thomas Creek.

Hunt (1999) was used to calculate the interference with Thomas Creek. The parameters used were a horizontal hydraulic conductivity of 1.6 feet/day (transmissivity = 800 ft2/day based on specific capacity data for LAKE 2146, LAKE 2150 and LAKE 2153), an intermediate value of 0.001 for the storage coefficient, stream width of 15 feet average, a streambed conductivity of 0.016 feet/day (aquifer horizontal conductivity/100), and a streambed thickness of 10 feet. These parameters are within the ranges found in Morgan (1988) and somewhat less than the range found in Gonthier (1985). A pro-rated pumping rate of 0.2186 cfs (98.13 gpm) was used. It was derived from the total annual volume (26 million gallons) divided by total annual minutes.

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**_____

If a permit is issued, include conditions 7B, 7N, and 7T..

The system is identified as generally unconfined with discontinuous low permeability layers causing local (discontinuous, limited) confinement.

The proposed aquifer is identified as basin fill sediments. Walker (1963) mapped the site as alluvium (Qal) that includes unconsolidated fluviatile gravel, sand, and silt. Water well reports for wells in the same section (LAKE 2146, LAKE 2150 and LAKE 2153) indicate sand, gravel, and clay deposits in the area.

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References Used:

Gonthier, J.B. 1985, A description of aquifer units in eastern Oregon: USGS Water Resources Investigations Report 84-4095, 39 p., 4 plates.

Morgan, D.S., 1988, Geohydrology and numerical model analysis of ground-water flow in the Goose Lake Basin, Oregon and California: USGS Water Resources Investigations Report 87-4058, 92 p.

Oregon Water Resources Department, 1989, Goose and Summer Lakes Basin report: OWRD Basin Report, 112 p.

Peterson, N.V. and McIntyre, J.R., 1970, The reconnaissance geology and mineral resources of eastern Klamath County and western Lake County, Oregon: DOGAMI Bulletin 66, 70 p.

Peterson, N.V., and Brown, D.E., 1980, Preliminary geology and geothermal resource potential of the Lakeview area, Oregon: DOGAMI Open-File_Report O-80-09, 57 p., 1:62,500 maps.

Phillips, K.N. and VanDenburgh, A.S., 1971, Hydrology and geochemistry of Abert, Summer, and Goose Lakes, and other closed-basin lakes in south-central Oregon: USGS Professional Paper 502-B, 86p.

Walker, G.W., 1963, Reconnaissance geologic map of the eastern half of the Klamath Falls (AMS) quadrangle, Lake and Klamath Counties, Oregon: USGS Mineral Investigations Field Studies Map MF-260.

Walker, G.W. and Reppening, C.A., 1965, Reconnaissance geologic map of the Adel quadrangle, Lake, Harney, and Malheur Counties, Oregon: USGS Miscellaneous Geologic Investigations Map I-446.

Waring, G.A., 1908, Geology and water resources of a portion of south-central Oregon: USGS Water Supply Paper 220, 85 p.

Goose and Summer Lakes Basin Program rules (OAR 690-513).

State observation wells SOW 379 (well LAKE 1979), SOW 381 (well LAKE 2424), and SOW 380 (well LAKE 2320).

Water well reports LAKE 2146, LAKE 2150 and LAKE 2153.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #**: **1** **Logid:** **Not Drilled Yet**

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 groundwater reservoir;
- c. ☐ permits the loss of artesian head;
- d. ☐ permits the de-watering of one or more groundwater 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.

D6. ☐ **Route to the Enforcement Section.**

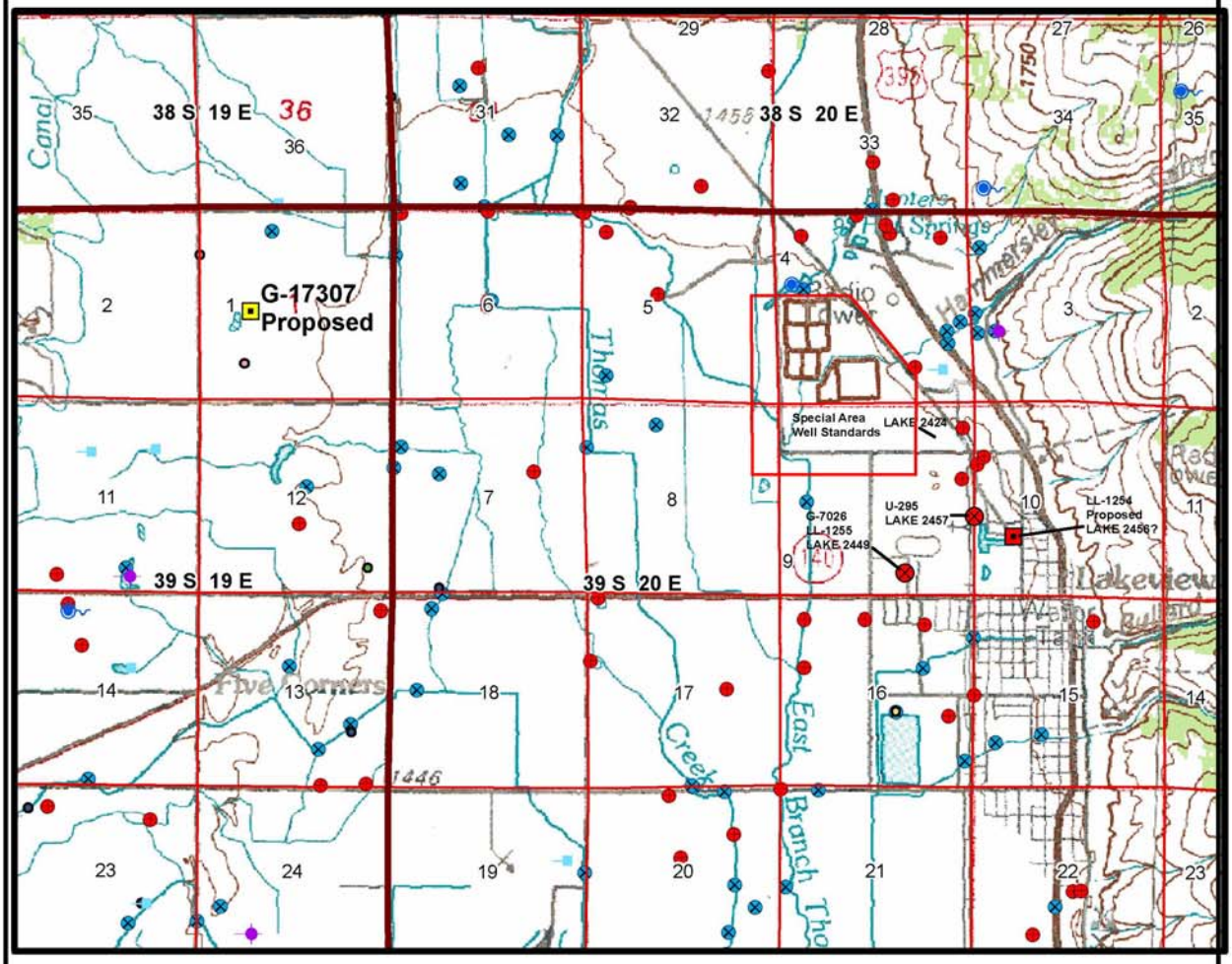
THIS SECTION TO BE COMPLETED BY ENFORCEMENT PERSONNEL

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).**

Groundwater Permit Application G-17307
George Jaska



Yellow = Proposed Well
Red = Other Wells

Blue and Other = surface water rights

Groundwater Permit Application G-17307
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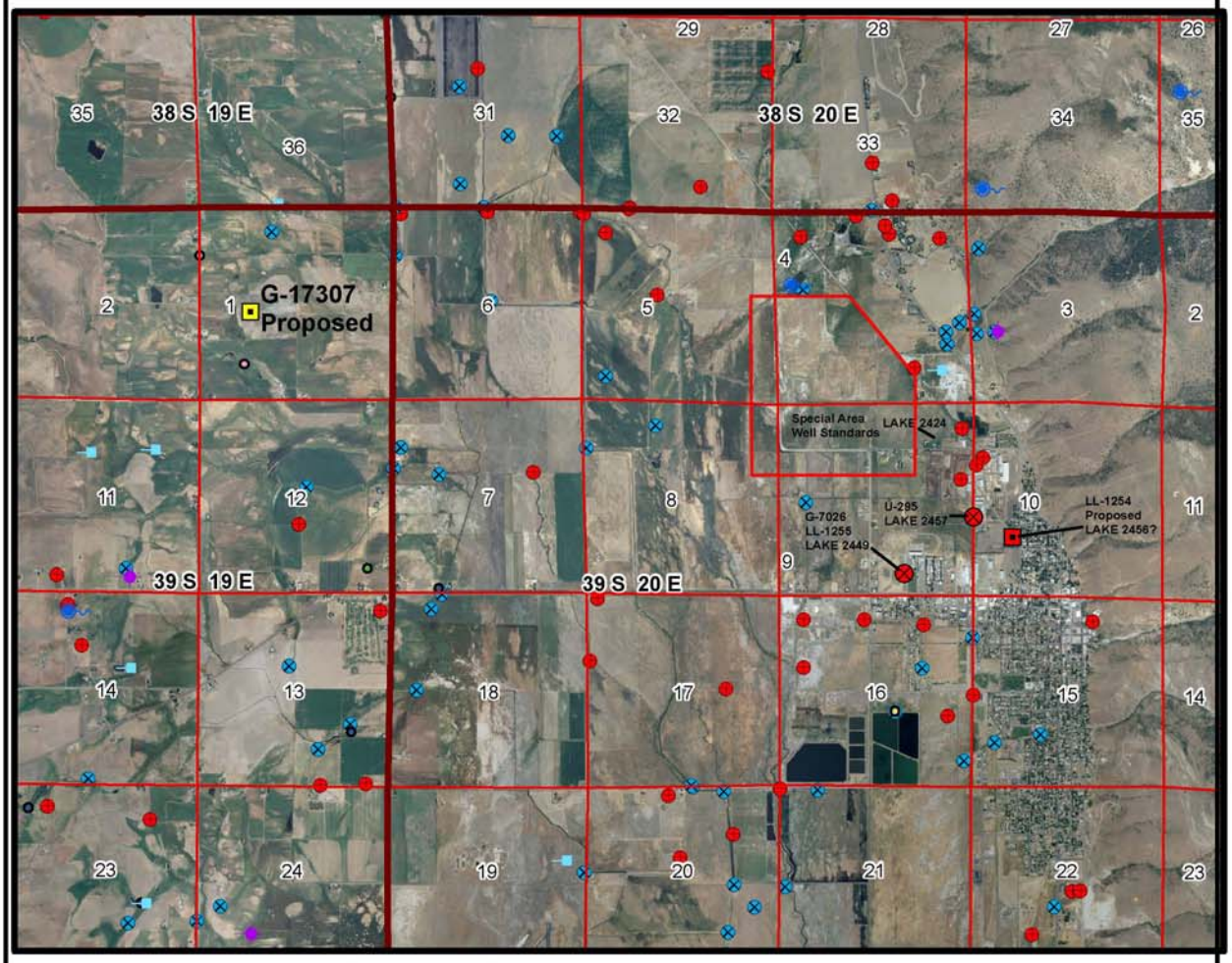
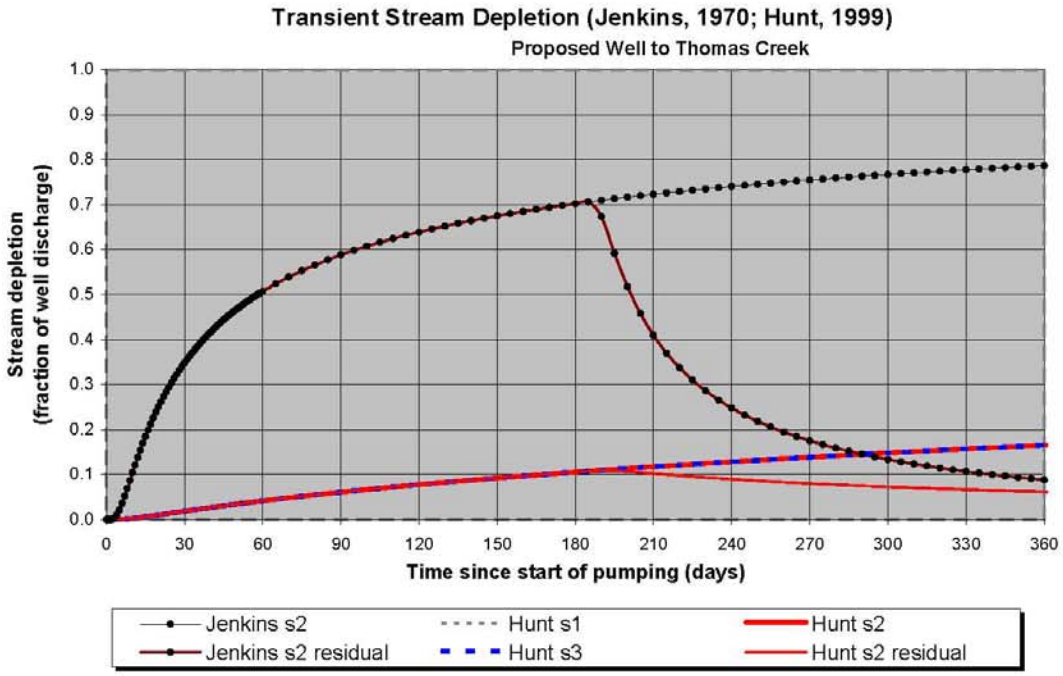


0 0.25 0.5 1 1.5 2
Miles

Yellow = Proposed Well
Red = Other Wells

Blue and Other = surface water rights

N



Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 184 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.219	0.219	0.219	0.219	0.219	0.219	0.219	0.219	0.219	0.219	0.219	0.219
Jenk SD %	0.348	0.507	0.588	0.639	0.675	0.702	0.409	0.248	0.175	0.133	0.107	0.088
Jen SD cfs	0.076	0.111	0.129	0.140	0.148	0.153	0.089	0.054	0.038	0.029	0.023	0.019
Hunt SD %	0.019	0.042	0.061	0.078	0.092	0.105	0.102	0.090	0.080	0.073	0.067	0.062
Hunt SD cfs	0.004	0.009	0.013	0.017	0.020	0.023	0.022	0.020	0.017	0.016	0.015	0.013

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.2186	0.2186	0.2186	cfs
Distance to stream	a	6500	6500	6500	ft
Aquifer hydraulic conductivity	K	1.6	1.6	1.6	ft/day
Aquifer thickness	b	500	500	500	ft
Aquifer transmissivity	T	800	800	800	ft*ft/day
Aquifer storage coefficient	S	0.001	0.001	0.001	
Stream width	ws	15	15	15	ft
Streambed hydraulic conductivity	Ks	0.016	0.016	0.016	ft/day
Streambed thickness	bs	10	10	10	ft
Streambed conductance	sbc	0.024	0.024	0.024	ft/day
Stream depletion factor (Jenkins)	sdf	52.8125	52.8125	52.8125	days
Streambed factor (Hunt)	sbf	0.195	0.195	0.195	

G_17307_Jaska_Lakeview_Hunt_1999_depletion.xls