

Groundwater Application Review Summary Form

Application # G- 18392

GW Reviewer Gerald H. Grondin

Date Review Completed: 1 December 2017

Summary of GW Availability and Injury Review:

Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

Summary of Potential for Substantial Interference Review:

There is the potential for substantial interference per Section C of the attached review form.

Summary of Well Construction Assessment:

The well does not appear to meet current well construction standards per Section D of the attached review form. Route through Well Construction and Compliance Section.

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).

PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section Date 1 December 2017

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

SUBJECT: Application G-18392 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 ground water applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation.**

A. GENERAL INFORMATION: Applicant's Name: Lytle, Tamara, Dustin, & Caitlin Simms
 County: Lake

- A1. Applicant(s) seek(s) (897.7 gpm) 2.00 cfs from 1 well(s) in the Goose and Summer Lakes Basin,
Crooked Creek watershed in the Lake Abert sub basin Quad Map Valley Falls
- A2. Proposed use: Irrigation (160.04 acre primary) Seasonality: 1 April to 15 October (198 days)
- A3. Well and aquifer data (attach and number logs for existing wells; mark proposed wells as such under logid):

Well I	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 Yet	1	Basalt	2.00	36S/21E-sec 07 ADA	1825'S, 23'W fr NE cor S 07

* 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	4360	*75?	*15?	*See Comment	P 700	P 0-600	P 0-600	P None	P None	P 1200	?	?

Use data from application for proposed wells.

A4. Comments: _____

Note: * first water (ft bls) and static water level (ft bls) are based on well driller reports for wells in T36S/R21E-sections 5 and 7 (northeast and southwest of the proposed well site).

Note: "P" in above table means proposed construction.

Note: the proposed POA well location is more than 0.25 miles from Crooked Creek and in hydraulic connection with the creek (See section C).

Note: under OAR 690-009, a potential for substantial interference is automatically found given: available data indicating Crooked Creek is a perennial creek; groundwater in the area is unconfined and hydraulically connected to surface water; the proposed POA well is less than 1-mile from Crooked Creek; and the proposed maximum pumping rate is greater than one-percent of the natural flow (80% exceedance). See section C3.

The proposed maximum pumping rate of 2.00 cfs (897.7 gpm) is what is typically allowed for 160.04 acres. The proposed total maximum annual volume of 480.12 ac-ft is the maximum typically allowed for 160.04 acres (3 acre-feet per acre).

The proposed aquifer is the predominantly basalt/volcanic rock and sediment unit below the predominantly basin-fill sediments unit. Geologic mapping (Walker 1963) indicates the surface geology at the proposed well site is sedimentary deposits (Qts). These deposits are described as lacustrine, fluvatile, and aeolian sedimentary rocks, interstratified tuff, ashy diatomite, and unconsolidated clay, sand, silt, and gravel. West of the proposed POA well site are exposures of tuff (Ttf) and basalt (Tb). The tuff may be tuff of rhyolitic and dacitic composition, and/or tuffaceous sedimentary rocks, and/or areally restricted rhvodicitic and andesitic flows. Immediately east of the proposed POA well site is alluvium (Qal) described as unconsolidated fluvial gravel, sand, and silt.

Well driller reports for wells in T36S/R21E-sections 5 and 7 (northeast and southwest of the proposed well site) indicate the thickness of the predominantly basin-fill sediments unit overlying the predominantly basalt/volcanic rock and sediment unit below may exceed 400 feet. The proposed well will need to have continuous casing and seal from land surface, through the predominantly basin-fill sediments unit and into the predominantly basalt/volcanic rock and sediment unit below to obtain groundwater solely from "basalt" as proposed in the application. The proposed 600 feet of casing and 600 feet of seal may or may not sufficient. The sufficiency will not be known until the well is drilled.

A5. Provisions of the Goose & Summer Lakes Basin rules relative to the development, classification and/or management of ground water hydraulically connected to surface water are, or are not, activated by this application. (Not all basin rules contain such provisions.)

Comments: OAR 690-513-0050 (Chewaucan Subbasin) applies. Groundwater and surface water are classified. Agricultural use is allowed.

A6. Well(s) # N.A., _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.

Name of administrative area: _____

Comments: Currently, no administrative area.

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

B1. **Based upon available data**, I have determined that ground water* for the proposed use:

- a. is over appropriated, is not over appropriated, or cannot be determined to be over appropriated during any period of the proposed use. * This finding is limited to the ground water portion of the over-appropriation determination as prescribed in OAR 690-310-130;
- b. will not or will likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the ground water portion of the injury determination as prescribed in OAR 690-310-130;
- c. will not or will likely to be available within the capacity of the ground water resource; or
- d. will, if properly conditioned, avoid injury to existing ground water rights or to the ground water resource:
 - i. The permit should contain condition #(s) 7B, 7F, 7N, 7P, 7T, and special conditions (see below)
 - ii. The permit should be conditioned as indicated in item 2 below.
 - iii. The permit should contain special condition(s) as indicated in item 3 below;

- B2. a. Condition to allow ground water production from no deeper than _____ ft. below land surface;
- b. Condition to allow ground water production from no shallower than _____ ft. below land surface;
- c. Condition to allow ground water production only from the _____ ground water reservoir between approximately _____ ft. and _____ ft. below land surface;
- d. Well reconstruction is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Ground Water Section.

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

B3. Ground water availability remarks: _____

Multiple reports for the Goose and Summer Lakes Basin indicate ground water occurs within the alluvium within stream drainages, the predominantly basin-fill sediment unit generally found in valleys, and the predominantly basalt/volcanic rock and sediment unit below the basin-fill in the valleys and exposed in surrounding uplands. The water well report (well log) for well LAKE 52274 about 2.25 miles north of the proposed POA well indicate multiple water bearing zones in the predominantly basin-fill sediment unit as well as water in the predominantly basalt/volcanic rock and sediment unit below. The static water level for each water bearing zone is reported as being the same indicating vertical hydraulic connection.

Due to limited data, groundwater level trend and availability cannot be determined for this area.

If a permit is issued, recommend conditions 7B, 7F, 7N, 7P, 7T, and special conditions (see below)

Special condition 1: water rights “large” permit condition that requires a flow meter. Please add that the flow meter must be located within 50 feet of the well with a clearly visible sign adjacent to the flow meter identifying the flow meter.

Special condition 2: well construction

“Each permitted well shall obtain groundwater solely from the predominantly basalt/volcanic rock and sediment unit (which may contain some sedimentary layers) that underlies the predominantly basin-fill sediment unit (which may contain some basalt layers). Each well shall have continuous casing and continuous seal from land surface, through the predominantly basin-fill unit, and 5 feet into the predominantly basalt/volcanic rock and sediment unit at minimum. Note: the depth to the predominantly basalt unit varies with location.”

C. GROUND WATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

C1. 690-09-040 (1): Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	Basalt (Predominantly basalt/volcanic rock and sediment unit)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer confinement evaluation: _____

System is identified as generally unconfined with discontinuous low permeability layers causing local (discontinuous, limited) confinement. Generally, low transmissivity (low permeability) predominantly basin-fill sediments of varying thickness overlies a higher transmissivity (higher permeability) predominantly basalt unit. Available data indicates ground water occurs in both the sediment and basalt. Additionally, the data indicates groundwater is also vertically hydraulically connected.

The water well report (well log) for well 52274 indicates multiple water bearing zones in the predominantly basin-fill sediment unit as well as water in the predominantly basalt/volcanic rock and sediment unit below. The reported static water level for each water bearing zone is reported as the same indicating vertical hydraulic connection.

The proposed aquifer is the predominantly basalt/volcanic rock and sediment unit below the predominantly basin-fill sediments unit. Geologic mapping (Walker 1963) indicates the surface geology at the proposed well site is sedimentary deposits (Qts). These deposits are described as lacustrine, fluvatile, and aeolian sedimentary rocks, interstratified tuff, ashy diatomite, and unconsolidated clay, sand, silt, and gravel. West of the proposed POA well site are exposures of tuff (Ttf) and basalt (Tb). The tuff may be tuff of rhyolitic and dacitic composition, and/or tuffaceous sedimentary rocks, and/or areally restricted rhyodacitic and andesitic flows. Immediately east of the proposed POA well site is alluvium (Qal) described as unconsolidated fluvial gravel, sand, and silt.

Well driller reports for wells in T36S/R21E-sections 5 and 7 (northeast and southwest of the proposed well site) indicate the thickness of the predominantly basin-fill sediments unit overlying the predominantly basalt/volcanic rock and sediment unit below may exceed 400 feet. The proposed well will need to have continuous casing and seal from land surface, through the predominantly basin-fill sediments unit and into the predominantly basalt/volcanic rock and sediment unit below to obtain groundwater solely from “basalt” as proposed in the application. The proposed 600 feet of casing and 600 feet of seal may or may not sufficient. The sufficiency will not be known until the well is drilled.

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	Crooked Creek	4345	4350	1,385	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
						<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: _____

Available data indicates Crooked Creek is a perennial creek; groundwater in the area is unconfined and hydraulically connected to surface water; and the distance from the proposed POA well to the creek is more than 0.25 miles (more than 1,320 feet). Consequently under OAR 690-009, a potential for substantial interference is NOT automatically found in this review section.

Water Availability Basin the well(s) are located within: CROOKED CR > CHEWAUCAN R - 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?
1	1	<input type="checkbox"/>	<input type="checkbox"/>	N.A.		<input type="checkbox"/>	6.05	<input checked="" type="checkbox"/>	0.20%	<input checked="" 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"/>

Comments: _____

The proposed POA well location is MORE than 0.25 mile from Crooked Creek.

Hunt (2003) was used to calculate the groundwater pumping interference with Crooked Creek. The calculation used a transmissivity of 2,490 ft²/day derived from specific capacity data for nearby well LAKE 1769, an intermediate storage coefficient of 0.001, a 0.0498 ft/day vertical hydraulic conductivity for the basin fill (horizontal conductivity divided by 100), and a pro-rated pumping rate of 1.22 cfs (548 gpm) derived by dividing the proposed maximum annual volume (480.12 ac-ft) by the proposed total days of pumping (198 days).

Under OAR 690-009, a potential for substantial interference is automatically found given: available data indicating Crooked Creek is a perennial creek; groundwater in the area is unconfined and hydraulically connected to surface water; the proposed POA well is less than 1-mile from Crooked Creek; and the proposed maximum pumping rate is greater than one-percent of the natural flow (80% exceedance).

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													
(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: _____

No analysis. The proposed POA well is less than one-mile from Crooked Creek.

C4b. 690-09-040 (5) (b) The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.

- C5. If properly conditioned, the surface water source(s) can be adequately protected from interference, and/or ground water use under this permit can be regulated if it is found to substantially interfere with surface water:
 - i. The permit should contain condition #(s) 7B, 7F, 7N, 7P, 7T, and special conditions (see below);
 - ii. The permit should contain special condition(s) as indicated in "Remarks" below;

C6. SW / GW Remarks and Conditions _____

Groundwater and surface water in the area is hydraulically connected.

System is identified as generally unconfined with discontinuous low permeability layers causing local (discontinuous, limited) confinement. Generally, low transmissivity (low permeability) predominantly basin-fill sediments of varying thickness overlies a higher transmissivity (higher permeability) predominantly basalt unit. Available data indicates ground water occurs in both the sediment and basalt. Additionally, the data indicates groundwater is also vertically hydraulically connected.

The water well report (well log) for well 52274 indicates multiple water bearing zones in the predominantly basin-fill sediment unit as well as water in the predominantly basalt/volcanic rock and sediment unit below. The reported static water level for each water bearing zone is reported as the same indicating vertical hydraulic connection.

The proposed aquifer is the predominantly basalt/volcanic rock and sediment unit below the predominantly basin-fill sediments unit. Geologic mapping (Walker 1963) indicates the surface geology at the proposed well site is sedimentary deposits (Qts). These deposits are described as lacustrine, fluvatile, and aeolian sedimentary rocks, interstratified tuff, ash diatomite, and unconsolidated clay, sand, silt, and gravel. West of the proposed POA well site are exposures of tuff (Ttf) and basalt (Tb). The tuff may be tuff of rhyolitic and dacitic composition, and/or tuffaceous sedimentary rocks, and/or areally restricted rhyodacitic and andesitic flows. Immediately east of the proposed POA well site is alluvium (Qal) described as unconsolidated fluvial gravel, sand, and silt.

Well driller reports for wells in T36S/R21E-sections 5 and 7 (northeast and southwest of the proposed well site) indicate the thickness of the predominantly basin-fill sediments unit overlying the predominantly basalt/volcanic rock and sediment unit below may exceed 400 feet. The proposed well will need to have continuous casing and seal from land surface, through the predominantly basin-fill sediments unit and into the predominantly basalt/volcanic rock and sediment unit below to obtain groundwater solely from "basalt" as proposed in the application. The proposed 600 feet of casing and 600 feet of seal may or may not sufficient. The sufficiency will not be known until the well is drilled.

Under OAR 690-009, a potential for substantial interference is automatically found given: available data indicating Crooked Creek is a perennial creek; groundwater in the area is unconfined and hydraulically connected to surface water; the proposed POA well is less than 1-mile from Cooked Creek; and the proposed maximum pumping rate is greater than one-percent of the natural flow (80% exceedance).

If a permit is issued, recommend conditions 7B, 7F, 7N, 7P, 7T, and special conditions (see below)

Special condition 1: water rights "large" permit condition that requires a flow meter. Please add that the flow meter must be located within 50 feet of the well with a clearly visible sign adjacent to the flow meter identifying the flow meter.

Special condition 2: well construction

"Each permitted well shall obtain groundwater solely from the predominantly basalt/volcanic rock and sediment unit (which may contain some sedimentary layers) that underlies the predominantly basin-fill sediment unit (which may contain some basalt layers). Each well shall have continuous casing and continuous seal from land surface, through the predominantly basin-fill unit, and 5 feet into the the predominantly basalt/volcanic rock and sediment unit at minimum. Note: the depth to the predominantly basalt unit varies with location."

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: 1 Logid: Not Drilled Yet

Special condition 2: well construction

“Each permitted well shall obtain groundwater solely from the predominantly basalt/volcanic rock and sediment unit (which may contain some sedimentary layers) that underlies the predominantly basin-fill sediment unit (which may contain some basalt layers). Each well shall have continuous casing and continuous seal from land surface, through the predominantly basin-fill unit, and 5 feet into the the predominantly basalt/volcanic rock and sediment unit at minimum. Note: the depth to the predominantly basalt unit varies with location.”

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) _____

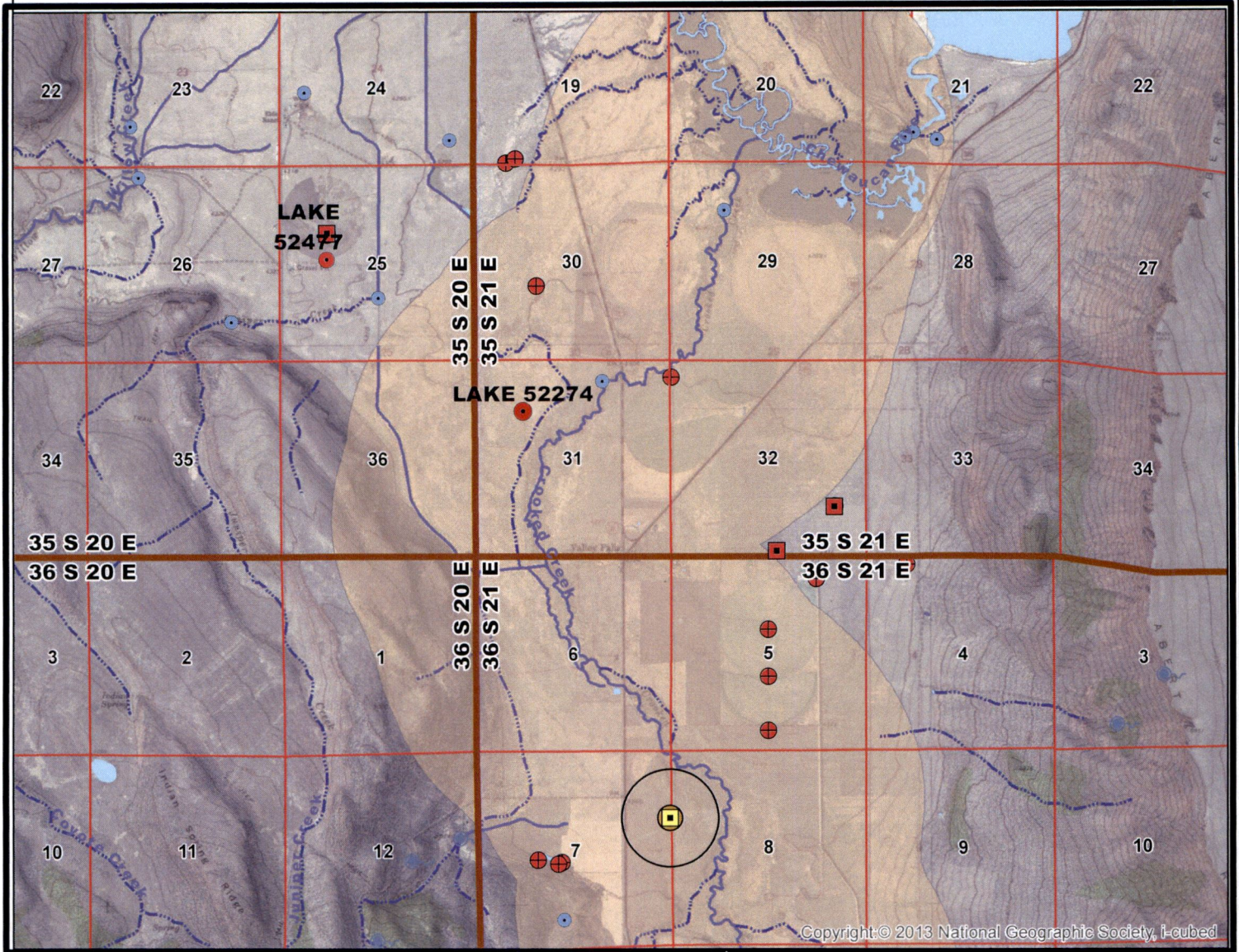
D3. THE WELL construction deficiency or other comment is described as follows: _____

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

Water Availability Tables

See attached

Groundwater Permit Application G-18392 Lytle, Tamara, Dustin, & Caitlin Simms

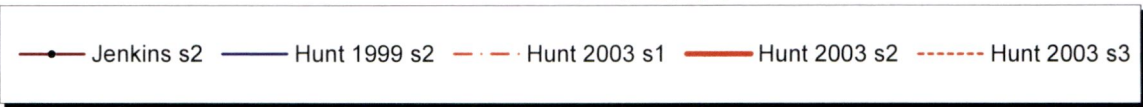
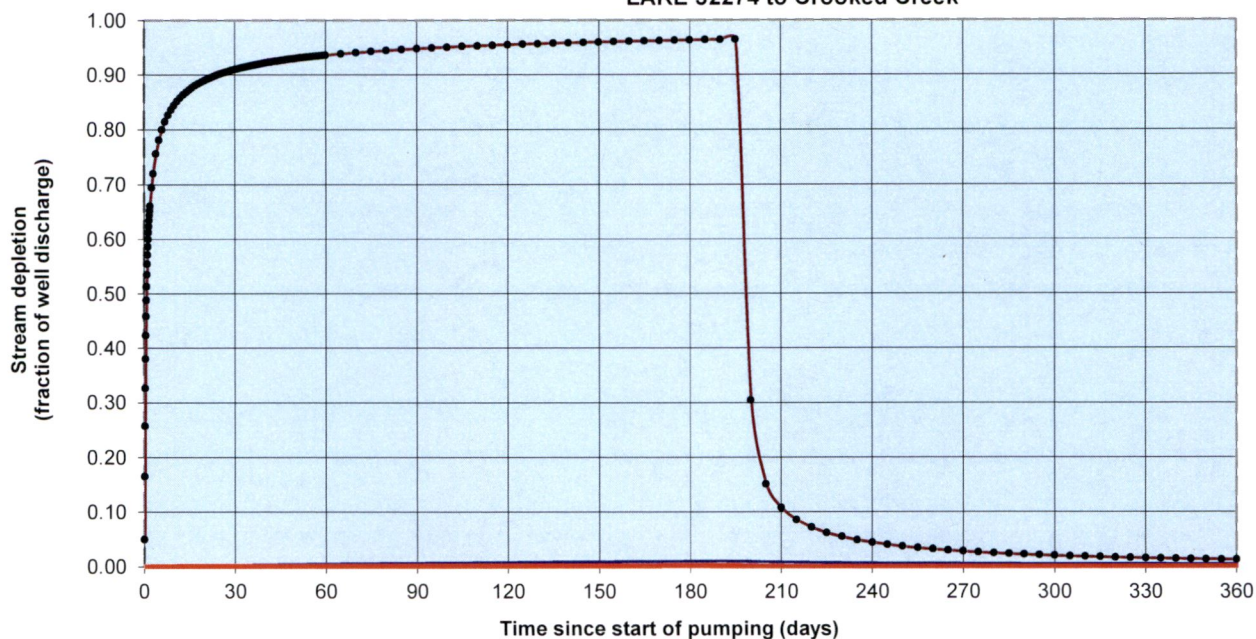


Yellow = Application Noted Well(s)
Red = Other Existing or Proposed Wells
Blue and Other = surface water rights



Transient Stream Depletion (Jenkins, 1970; Hunt, 1999, 2003)

LAKE 52274 to Crooked Creek



Output for Stream Depletion, Scenerio 2 (s2):						Time pump on (pumping duration) = 198 days						
Days	30	60	90	120	150	180	210	240	270	300	330	360
J SD	91.0%	93.6%	94.8%	95.5%	96.0%	96.3%	10.8%	4.4%	2.8%	2.0%	1.6%	1.3%
H SD 1999	0.4%	0.6%	0.7%	0.8%	0.9%	1.0%	0.9%	0.7%	0.6%	0.6%	0.5%	0.5%
H SD 2003	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Qw, cfs	1.220	1.220	1.220	1.220	1.220	1.220	1.220	1.220	1.220	1.220	1.220	1.220
H SD 99, cfs	0.005	0.007	0.008	0.010	0.011	0.012	0.010	0.009	0.008	0.007	0.006	0.006
H SD 03, cfs	0.002	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	1.22	1.22	1.22	cfs
Time pump on (pumping duration)	tpon	198	198	198	days
Perpendicular from well to stream	a	1385	1385	1385	ft
Well depth	d	700	700	700	ft
Aquifer hydraulic conductivity	K	4.98	4.98	4.98	ft/day
Aquifer saturated thickness	b	500	500	500	ft
Aquifer transmissivity	T	2490	2490	2490	ft*ft/day
Aquifer storativity or specific yield	S	0.001	0.001	0.001	
Aquitard vertical hydraulic conductivity	Kva	0.0498	0.0498	0.0498	ft/day
Aquitard saturated thickness	ba	450	450	450	ft
Aquitard thickness below stream	babs	450	450	450	ft
Aquitard porosity	n	0.2	0.2	0.2	
Stream width	ws	20	20	20	ft
Streambed conductance (lambda)	sbc	0.002213	0.002213	0.002213	ft/day
Stream depletion factor	sdf	0.770371	0.770371	0.770371	days
Streambed factor	sbf	0.001231	0.001231	0.001231	
input #1 for Hunt's Q_4 function	t'	1.298075	1.298075	1.298075	
input #2 for Hunt's Q_4 function	K'	0.085254	0.085254	0.085254	
input #3 for Hunt's Q_4 function	epsilon'	0.005000	0.005000	0.005000	
input #4 for Hunt's Q_4 function	lamda'	0.001231	0.001231	0.001231	

Theis_Equation_specific_capacity_to_transmissivity				
Basin Fill				
Well County	Well Num	Transmissivity ft ² /day	Open Interval feet	Conductivity ft/day
LAKE	1761	884.88	590	1.50
LAKE	1813	365.55	404	0.90
LAKE	1814	197.37	399	0.49
LAKE	1815	1,218.86	46.00	26.50
		666.67	Average of All	7.35
		482.60	Average of 1st 3	0.97
Basin Fill & Basalt				
Well County	Well Num	Transmissivity ft ² /day	Open Interval feet	Conductivity ft/day
LAKE	1769	2,490.16	475.00	5.24
		2,490.16	Average	5.24



Water Availability Analysis

CROOKED CR > CHEWAUCAN R - AT MOUTH
GOOSE & SUMMER LAKE BASIN
Water Availability as of 12/1/2017

Watershed ID #: 31300603 ([Map](#))
Date: 12/1/2017

Exceedance Level:
Time: 9:31 AM

[Download Data](#)

Water Availability

Select any Watershed for Details

Nesting Watershed Order	Stream Name ID #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Sto
1	31300602 CHEWAUCAN R> L ABERT- AT MOUTH	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes
2	31300603 CROOKED CR> CHEWAUCAN R- AT MOUTH	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes

Limiting Watersheds

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Limiting Watershed ID #	Stream Name	Water Available?	Net Water Available
JAN	31300603	CROOKED CR > CHEWAUCAN R - AT MOUTH	Yes	7.49
FEB	31300603	CROOKED CR > CHEWAUCAN R - AT MOUTH	Yes	13.10
MAR	31300603	CROOKED CR > CHEWAUCAN R - AT MOUTH	Yes	19.30
APR	31300603	CROOKED CR > CHEWAUCAN R - AT MOUTH	Yes	32.00
MAY	31300602	CHEWAUCAN R > L ABERT - AT MOUTH	Yes	14.40
JUN	31300602	CHEWAUCAN R > L ABERT - AT MOUTH	No	-15.70
JUL	31300602	CHEWAUCAN R > L ABERT - AT MOUTH	No	-1.62
AUG	31300602	CHEWAUCAN R > L ABERT - AT MOUTH	No	-0.81
SEP	31300602	CHEWAUCAN R > L ABERT - AT MOUTH	Yes	1.41
OCT	31300603	CROOKED CR > CHEWAUCAN R - AT MOUTH	Yes	4.45
NOV	31300603	CROOKED CR > CHEWAUCAN R - AT MOUTH	Yes	6.70
DEC	31300603	CROOKED CR > CHEWAUCAN R - AT MOUTH	Yes	6.96
ANN	31300603	CROOKED CR > CHEWAUCAN R - AT MOUTH	Yes	17,700.00

Detailed Reports for Watershed ID #31300602

CHEWAUCAN R > L ABERT - AT MOUTH
GOOSE & SUMMER LAKE BASIN
Water Availability as of 12/1/2017

Watershed ID #: 31300602 ([Map](#))
Date: 12/1/2017

Exceedance Level:
Time: 9:31 AM

Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second

Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	33.80	0.87	32.90	0.00	0.00	32.90
FEB	64.90	1.15	63.80	0.00	0.00	63.80
MAR	103.00	23.80	79.20	0.00	0.00	79.20
APR	161.00	113.00	48.00	0.00	0.00	48.00
MAY	314.00	300.00	14.40	0.00	0.00	14.40
JUN	234.00	250.00	-15.70	0.00	0.00	-15.70
JUL	81.90	83.50	-1.62	0.00	0.00	-1.62
AUG	47.40	48.20	-0.81	0.00	0.00	-0.81
SEP	42.30	40.90	1.41	0.00	0.00	1.41
OCT	42.20	22.60	19.60	0.00	0.00	19.60
NOV	34.40	0.68	33.70	0.00	0.00	33.70
DEC	32.80	0.73	32.10	0.00	0.00	32.10
ANN	120,000.00	53,600.00	66,400.00	0.00	0.00	66,400.00

Detailed Report of Consumptive Uses and Storage

Consumptive Uses and Storages in Cubic Feet per Second

Month	Storage	Irrigation	Municipal	Industrial	Commercial	Domestic	Agricultural	Other	Total
JAN	0.62	0.00	0.00	0.23	0.00	0.02	0.01	0.00	0.87
FEB	0.89	0.00	0.00	0.23	0.00	0.02	0.01	0.00	1.15
MAR	1.27	22.30	0.00	0.23	0.00	0.02	0.01	0.00	23.80
APR	2.29	110.00	0.00	0.23	0.00	0.02	0.01	0.00	113.00
MAY	3.69	296.00	0.00	0.23	0.00	0.02	0.01	0.00	300.00
JUN	1.88	248.00	0.00	0.17	0.00	0.02	0.01	0.00	250.00
JUL	0.55	82.80	0.00	0.17	0.00	0.02	0.01	0.00	83.50
AUG	0.30	47.70	0.00	0.17	0.00	0.02	0.01	0.00	48.20
SEP	0.32	40.30	0.00	0.23	0.00	0.02	0.01	0.00	40.90
OCT	0.32	22.00	0.00	0.23	0.00	0.02	0.01	0.00	22.60
NOV	0.42	0.00	0.00	0.23	0.00	0.02	0.01	0.00	0.68
DEC	0.47	0.00	0.00	0.23	0.00	0.02	0.01	0.00	0.73

Detailed Report of Reservations for Storage and Consumptive Uses

Reserved Streamflow in Cubic Feet per Second

No reservations were found for this watershed.

Detailed Report of Instream Flow Requirements

Instream Flow Requirements in Cubic Feet per Second

No instream flow requirements were found for this watershed.

Detailed Reports for Watershed ID #31300603

CROOKED CR > CHEWAUCAN R - AT MOUTH
 GOOSE & SUMMER LAKE BASIN
 Water Availability as of 12/1/2017

Watershed ID #: 31300603 ([Map](#))
 Date: 12/1/2017

Exceedance Level:
 Time: 9:31 AM

Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second
 Annual Volume at 50% Exceedance in Acre-Feet

Month

	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	8.03	0.54	7.49	0.00	0.00	7.49
FEB	13.90	0.77	13.10	0.00	0.00	13.10
MAR	22.60	3.31	19.30	0.00	0.00	19.30
APR	44.50	12.50	32.00	0.00	0.00	32.00
MAY	55.40	30.00	25.40	0.00	0.00	25.40
JUN	26.90	23.40	3.53	0.00	0.00	3.53
JUL	9.06	7.41	1.65	0.00	0.00	1.65
AUG	6.09	4.79	1.30	0.00	0.00	1.30
SEP	6.05	4.07	1.98	0.00	0.00	1.98
OCT	6.65	2.20	4.45	0.00	0.00	4.45
NOV	7.08	0.38	6.70	0.00	0.00	6.70
DEC	7.43	0.47	6.96	0.00	0.00	6.96
ANN	23,100.00	5,440.00	17,700.00	0.00	0.00	17,700.00

Detailed Report of Consumptive Uses and Storage

Consumptive Uses and Storages in Cubic Feet per Second

Month	Storage	Irrigation	Municipal	Industrial	Commercial	Domestic	Agricultural	Other	Total
JAN	0.52	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.54
FEB	0.75	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.77
MAR	1.28	2.01	0.00	0.01	0.00	0.01	0.00	0.00	3.31
APR	2.43	10.10	0.00	0.01	0.00	0.01	0.00	0.00	12.50
MAY	3.19	26.80	0.00	0.01	0.00	0.01	0.00	0.00	30.00
JUN	1.33	22.00	0.00	0.01	0.00	0.01	0.00	0.00	23.40
JUL	0.36	7.02	0.00	0.01	0.00	0.01	0.00	0.00	7.41
AUG	0.20	4.57	0.00	0.01	0.00	0.01	0.00	0.00	4.79
SEP	0.23	3.81	0.00	0.01	0.00	0.01	0.00	0.00	4.07
OCT	0.26	1.92	0.00	0.01	0.00	0.01	0.00	0.00	2.20
NOV	0.36	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.38
DEC	0.45	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.47

Detailed Report of Reservations for Storage and Consumptive Uses

Reserved Streamflow in Cubic Feet per Second

No reservations were found for this watershed.

Detailed Report of Instream Flow Requirements

Instream Flow Requirements in Cubic Feet per Second

No instream flow requirements were found for this watershed.