

Approved:



MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager
From: Travis Kelly, Well Construction Compliance Coordinator
Subject: Review of Water Right Application G-19218
Date: February 9, 2022

The attached application was forwarded to the Well Construction and Compliance Section by the Groundwater Section. Gerald Grondin reviewed the application. Please see Gerald's Groundwater Review.

Applicant's Well #1 (Proposed Well): Applicant's Well #1 is a proposed well, therefore it cannot be reviewed for construction. Construction of this proposed well shall be completed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240. During construction of this well, specific attention should be paid to ensure sealing requirements are met and that the well does not commingle aquifers.

The construction of applicant's proposed Well #1 may not satisfy hydraulic connection issues.

Groundwater Application Review Summary Form

Application # G- G-19218

GW Reviewer Gerald H. Grondin Date Review Completed: 12/10/2021

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. A previous video log indicates the well has collapsed. 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).

WATER RESOURCES DEPARTMENT

MEMO

12/10/2021

TO: Application G- 19218

FROM: GW: Gerald H. Grondin
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

- ☐ YES The source of appropriation is hydraulically connected to a State Scenic Waterway or its tributaries
- ☒ NO
-
- ☐ YES Use the Scenic Waterway Condition (Condition 7J)
- ☒ NO
-
- ☐ Per ORS 390.835, the Groundwater Section is **able** to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below
- ☒ Per ORS 390.835, the Groundwater Section is **unable** to calculate ground water interference with surface water that contributes to a scenic waterway; **therefore, the Department is unable to find that there is a preponderance of evidence that the proposed use will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway**

DISTRIBUTION OF INTERFERENCE

Calculate the percentage of consumptive use by month and fill in the table below. If interference cannot be calculated, per criteria in 390.835, do not fill in the table but check the "unable" option above, thus informing Water Rights that the Department is unable to make a Preponderance of Evidence finding.

Exercise of this permit is calculated to reduce monthly flows in [Enter] Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section

Date 10 December 2021

FROM: Groundwater Section Gerald H. Grondin

Reviewer's Name

SUBJECT: Application G- 19218

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: Coleman Valley Ranch LLC County: Lake

A1. Applicant(s) seek(s) 898 gpm / 2.00 cfs from 1 well(s) in the Goose & Summer Lakes Basin, Warner Lake subbasin, Middle Chewaucan River watershed

A2. Proposed use Irrigation (supplemental) (160.0 acres) Seasonality: Irrigation Season (1 March through 31 October)

A3. Well and aquifer data (attach and number logs for existing wells; mark proposed wells as such under logid):

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	Proposed Not drilled	Well #1	Not identified	2.00	41 S / 25 E - sec 17 bda	6409.87' N, 2815.59' W fr SE cor S 20 Section 20 SE corner = E qtr. corner on Oregon-Nevada border
2						
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	4501	11*	8*	8/3/2018*	Prop 700	Prop 0-150	Prop 0-700	N.A.	Prop 200-700	Prop 898	N.A.	N.A.
2												
3												
4												

Use data from application for proposed wells.

A4. Comments:

This application requests up to 898 gpm (2.00 cfs), 480 ac-ft maximum per year of groundwater for supplemental irrigation of 160.0 acres under the primary surface water right certificate 40432. That certificate authorizes 3,034 gpm (6.73 cfs) to irrigate 538 acres.

The proposed POD well is not drilled yet. The application does not identify a proposed aquifer. The thickness of the predominantly basin-fill sedimentary unit overlying the predominantly volcanic rock and sediment unit in Coleman Valley is not determined yet. This review includes a recommended permit condition limiting GW use from a single unit if drilling encounters both units.

The static groundwater level is based on well LAKE 52850 (80 feet total depth). A static groundwater level of 10 to 50 feet below land surface is anticipated by this review based on groundwater level data at wells within similar environments.

Walker and Repenning (1965) shows the proposed well location on the Coleman Valley floor mapped as alluvium (Qal). The Colman Lake bed to the north is mapped as playa lake deposits (Qp). The valley is bounded by escarpments on the east and west that include: sedimentary deposits (QTs) that are mixed grained pluvial lake valley deposits; landslide debris (QTIs); tuffaceous sedimentary rocks, tuffs, and silicic flows (Tts); High Lava Plains volcanic rocks, basalt (Tb); and Steens Basalt flows and flow breccias (Tbf);

- 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 (Warner Lakes Subbasin) does not apply. The proposed well and use appear to be within the allowable groundwater classifications for the subbasin OAR 690-513-0040 (2).

- 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;

Currently, groundwater in Coleman Valley has not been developed yet. A single well (LAKE 52850) was drilled in the valley in August 2018 for livestock use.

Currently, there is no groundwater level data for Coleman Valley to determine groundwater level trend.

- 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 (interference), 7N (annual measurement), 7P (well tag), 7T (dedicated measuring tube),

"large" (totalizing flow meter at each well, recording, and reporting),

Well construction: "All wells shall be drilled greater than 675 feet total depth and shall obtain groundwater from the predominantly basin-fill sedimentary unit only or the predominantly volcanic rock and sediment unit only, not both. If the well drilled never penetrates through the predominantly basin-fill sedimentary unit, the casing and seal shall be continuous from land surface to 200 feet below land surface or greater. If the well drilled does penetrate through the predominantly basin-fill sedimentary unit into the predominantly

volcanic and rock sediment unit, the casing and seal shall be continuous from land surface to a depth below the predominantly basin-fill sedimentary unit if the predominantly volcanic and rock sediment unit is to be the groundwater source, or the predominantly volcanic and rock sediment unit shall be properly abandoned and the casing and seal shall be continuous from land surface to 200 feet below land surface or greater in the predominantly basin-fill sedimentary unit if the predominantly basin-fill sedimentary unit is to be the groundwater source."

- 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:** _____

If a permit is issued, recommend 7B (interference), 7N (annual measurement), 7P (well tag), 7T (dedicated measuring tube),

"large" (totalizing flow meter at each well, recording, and reporting),

Well construction: "All wells shall be drilled to greater than 675 feet total depth and shall obtain groundwater from the predominantly basin-fill sedimentary unit only or the predominantly volcanic rock and sediment unit only, not both. If the well drilled never penetrates through the predominantly basin-fill sedimentary unit, the casing and seal shall be continuous from land surface to 200 feet below land surface or greater. If the well drilled does penetrate through the predominantly basin-fill sedimentary unit into the predominantly volcanic and rock sediment unit, (1) the casing and seal shall be continuous from land surface to a depth below the predominantly basin-fill sedimentary unit if the predominantly volcanic and rock sediment unit is to be the groundwater source, or (2) the predominantly volcanic and rock sediment unit shall be properly abandoned and the casing and seal shall be continuous from land surface to 200 feet below land surface or greater in the predominantly basin-fill sedimentary unit if the predominantly basin-fill sedimentary unit is to be the groundwater source."

Reports regarding Goose and Summer Lakes Basin groundwater indicate groundwater occurs in a predominantly basin-fill sediment unit and an underlying predominantly volcanic rocks and sediments unit. The two units are hydraulically connected.

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 or Volcanic rock and sediment	☒	☒
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. This appears consistent with observations Miller (1984 and 1986) made for the Fort Rock Basin and with observations Morgan (1988) made for the Goose Lake subbasin.

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 ground water 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 ground water by a confining layer.

Miller (1984 and 1986) notes the main groundwater reservoir in the Fort Rock Basin occurs as a single flow system under both unconfined and confined conditions. The unconfined-confined variability reflects the permeability variation of the overlying units.

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	Un-named spring	4493	4483	7725	☒	☐	☐	☐	☒
2						☐	☐	☐	☐	☐
3						☐	☐	☐	☐	☐
4						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: _____

The un-named spring (no water right) is the closest perennial surface water. It is located near the west escarpment base and is likely in hydraulic connection with groundwater at the proposed POD/POA well location. Other springs are further away and located above the valley floor within the east and west escarpments. They are likely stratigraphically controlled.

Other surface water is intermittent Coleman Creek (the closest reach is 1,840 feet west of the proposed POD/POA well) and playa lake Coleman Lake (12,640 feet north of the proposed POD/POA well). They are not included in the table above given they are intermittent.

Water Availability Basin the well(s) are located within: N.A.: Coleman Valley is outside water availability basins

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 (SW) source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that SW source, 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 un-named spring (no water right) is the closest perennial surface water. It is more than one mile from the proposed POD/POA well location.

Coleman Lake is a playa lake and more than one mile from the proposed POD/POA well location.

Coleman Creek is less than one mile from the proposed POD/POA well location but is intermittent.

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													
(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:

The un-named spring (no water right) is the closest perennial surface water. It is more than one mile from the proposed POD/POA well location. Data needed to calculate interference with the spring discharge rate is insufficient. Instead, groundwater level drawdown at the spring was calculated using hydraulic property values from the south end of Warner Valley (see attached). The calculated groundwater level drawdown at the un-named spring (no water right) ranges from 3.0 feet (pro-rated pumping at the end of 30 days pumping) to 14.3 feet (full rate pumping at the end of 245 days). That potential range of seasonal groundwater level decline risks drying the spring.

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:
- ☐ The permit should contain condition #(s) _____;
 - ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. SW / GW Remarks and Conditions: _____

If a permit is issued, recommend the following conditions

7B (interference), 7N (annual measurement), 7P (well tag), 7T (dedicated measuring tube),

"large" (totalizing flow meter at each well, recording, and reporting),

Well construction: "All wells shall be drilled greater than 675 feet total depth and shall obtain groundwater from the predominantly basin-fill sedimentary unit only or the predominantly volcanic rock and sediment unit only, not both. If the well drilled never penetrates through the predominantly basin-fill sedimentary unit, the casing and seal shall be continuous from land surface to 200 feet below land surface or greater. If the well drilled does penetrate through the predominantly basin-fill sedimentary unit into the predominantly volcanic and rock sediment unit, the casing and seal shall be continuous from land surface to a depth below the predominantly basin-fill sedimentary unit if the predominantly volcanic and rock sediment unit is to be the groundwater source, or the predominantly volcanic and rock sediment unit shall be properly abandoned and the casing and seal shall be continuous from land surface to 200 feet below land surface or greater in the predominantly basin-fill sedimentary unit if the predominantly basin-fill sedimentary unit is to be the groundwater source."

Reports regarding Goose and Summer Lakes Basin groundwater indicate groundwater occurs in a predominantly basin-fill sediment unit and an underlying predominantly volcanic rocks and sediments unit. The two units are hydraulically connected.

The system is identified as generally unconfined with discontinuous low permeability layers causing local (discontinuous, limited) confinement. This appears consistent with observations Miller (1984 and 1986) made for the Fort Rock Basin and with observations Morgan (1988) made for the Goose Lake subbasin.

The calculated groundwater level drawdown at the un-named spring (no water right) ranges from 3.0 feet (pro-rated pumping at the end of 30 days pumping) to 14.3 feet (full rate pumping at the end of 245 days). That potential range of seasonal groundwater level decline risks drying the spring.

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.

Miller, D.W., 1984, Appraisal of ground-water conditions in the Fort Rock Basin, Lake County, Oregon: Oregon Water Resources Department, Open File Report, 157 p.

Miller, D.W., 1986, Appraisal of ground-water conditions in the Fort Rock Basin, Lake County, Oregon: Oregon Water Resources Department, Ground Water Report No. 31, 196 p and 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.

Wells, F.G., and Peck, D.L., 1961, Geologic map of Oregon west of the 121st meridian: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-325.

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

Water well reports for well LAKE 2659, LAKE 2878, LAKE 51971, and LAKE 52850.

USGS Coleman Lake, Oregon quadrangle map (1:24,000)

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: 1 Logid: Not constructed yet

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.**

Well Location Map

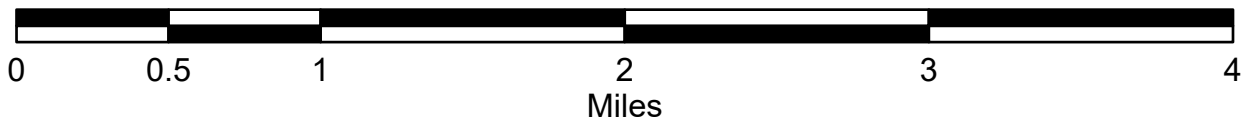
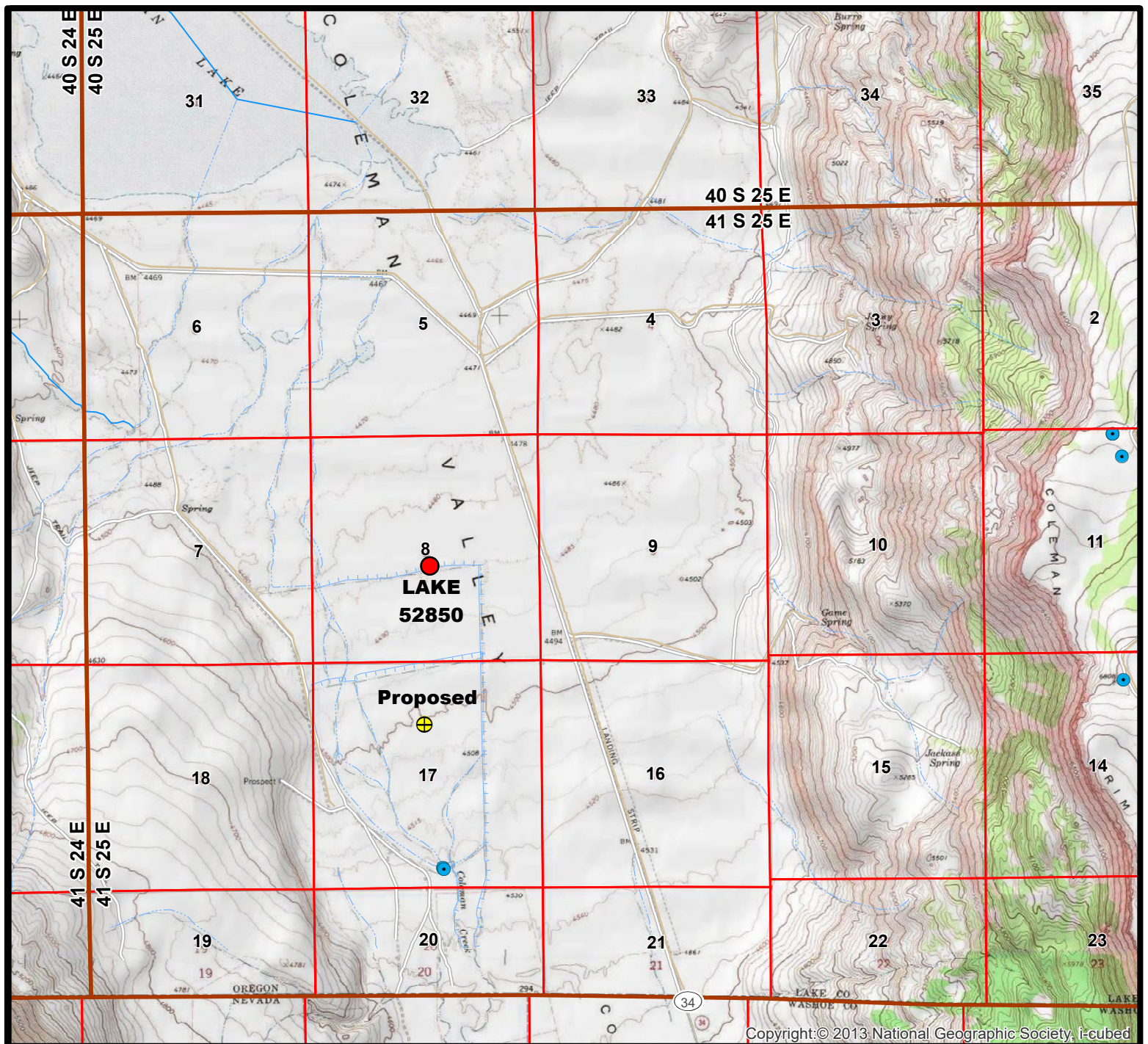
Theis Groundwater Level Drawdown Calculation

Specific Capacity to Transmissivity Calculation Summary Table

Water Well Reports

Groundwater Permit Application G-19218

Coleman Valley Ranch LLC

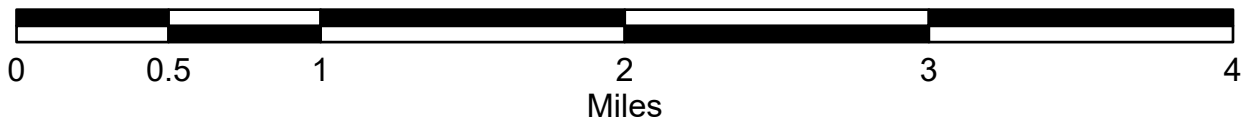
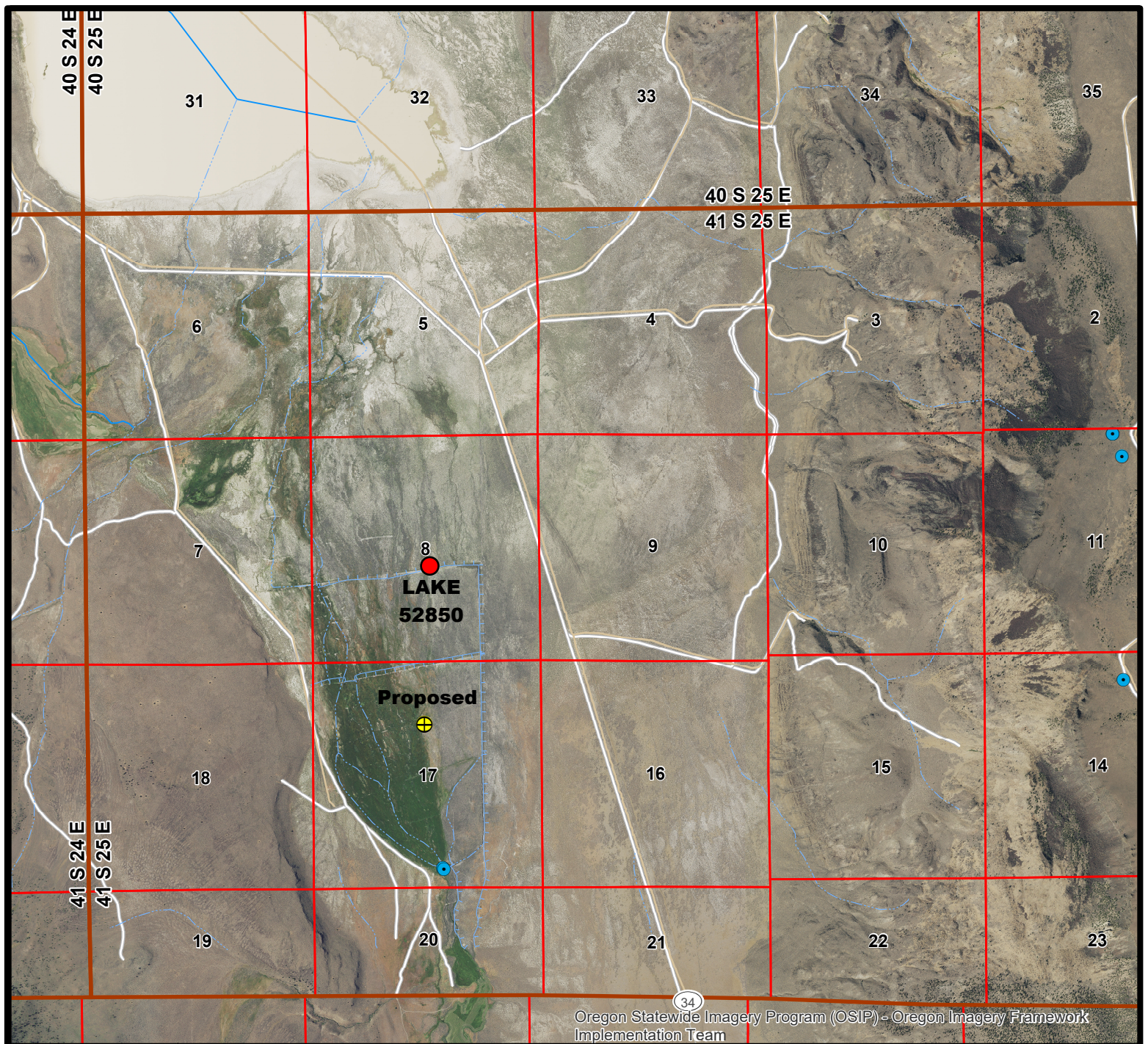


Yellow = Proposed Well
Red = Groundwater PODs or Other Wells
Blue & Green = Surface Water PODs



Groundwater Permit Application G-19218

Coleman Valley Ranch LLC



Yellow = Proposed Well
Red = Groundwater PODs or Other Wells
Blue & Green = Surface Water PODs



Drawdown Calculations Using Theis Equation

Theis Equation: $s = [Q/(4 \cdot T \cdot \pi)] [W(u)]$
 $u = (r^2 \cdot S)/(4 \cdot T \cdot t)$
 $W(u) = (-\ln u) - (0.5772157) + (u/1 \cdot 1!) - (u^2/2 \cdot 2!) + (u^3/3 \cdot 3!) - (u^4/4 \cdot 4!) + \dots$

s = drawdown (L) r = radial distance (L)
 T = transmissivity (L²/T) t = time (T)
 S = storage coefficient (dimensionless) u = dimensionless
 π = 3.141592654 $W(u)$ = well function

Transmissivity T (gpd/ft)	Transmissivity T (ft ² /day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft ³ /sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Comments
								Note : W(u) calculation valid when u < 7.1			
								7.0000	1.1545E-04		W(u) calculation test
Proposed POA Well to un-named springs (Transmissivity from south Warner Lake Valley basin-fill specific capacity data)											
24,685.72	3,300.00	0.00100	897.66	2.00	30.00	7,725.00	3.14	0.1507	1.4605	6.0857	Continuous Pumping at Full Rate
24,685.72	3,300.00	0.00100	897.66	2.00	245.00	7,725.00	3.14	0.0185	3.4337	14.3081	Continuous Pumping at Full Rate
24,685.72	3,300.00	0.00100	443.34	0.99	30.00	7,725.00	3.14	0.1507	1.4605	3.0057	Pro-Rated Pumping Rate
24,685.72	3,300.00	0.00100	443.34	0.99	245.00	7,725.00	3.14	0.0185	3.4337	7.0665	Pro-Rated Pumping Rate

Theis_Equation_specific_capacity_to_transmissivity					
Basin_Fill					
Well County	Well Num	Transmissivity	Transmissivity	Open Interval	Conductivity
		ft2/day	gpd/ft	feet	ft/day
LAKE	2878	700.42	5,239.51	5.00	140.08
LAKE	2659	1,157.46	8,658.40	300.00	3.86
LAKE	51971	8,041.48	60,154.45	117.00	68.73
		3,299.79	24,684.12	Average	70.89

NOTICE TO WATER WELL CONTRACTOR

The original and first copy
of this report are to be
filed with the

STATE ENGINEER, SALEM, OREGON 97310
within 30 days from the date
of well completion.

RECEIVED
JUL 20 1967
STATE OF OREGON
STATE ENGINEER
SALEM, OREGON

(Please type or print)
(Do not write above this line)

State Well No.

State Permit No.

39/24-16 K

(1) OWNER:

Name O'Keefe & Son, c/o Henry O'Keefe
Address Adel, Oregon

(2) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary ☒ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

CASING INSTALLED:

Threaded ☐ Welded ☒
16" Diam. from 0 ft. to 126 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

PERFORATIONS:

Perforated? ☒ Yes ☐ No.

Type of perforator used torch
Size of perforations 1/8 in. by 4 in.
1148 perforations from 60 ft. to 108 ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to 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) WATER LEVEL: Completed well.

Static level artesian ft. below land surface Date 7/6/67
Artesian pressure 0 lbs. per square inch Date 7/6/67

(9) WELL TESTS:

Drawdown is amount water level is
lowered below static level

Was a pump test made? ☒ Yes ☐ No If yes, by whom? contractor

Yield: 400 gal./min. with 80 ft. drawdown after 15 hrs.

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m. Date 7/7/67

Temperature of water 64 Was a chemical analysis made? ☐ Yes ☒ No

(10) CONSTRUCTION:

Well seal—Material used cement pipe
Depth of seal 20' 24" conductor ft.
Diameter of well bore to bottom of seal 32 in.
Were any loose strata cemented off? ☐ Yes ☒ No Depth _____
Was a drive shoe used? ☐ Yes ☒ No
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: 1/4 to 3/4
Gravel placed from 0 ft. to 150 ft.

(11) LOCATION OF WELL:

County Lake Driller's well number _____
NW 1/4 SE 1/4 Section 16 T. 39 R. 24E W.M.
Bearing and distance from section or subdivision corner
Approx. 1 mi. north of Adel, Oregon

(12) WELL LOG:

Diameter of well below casing 10"

Depth drilled 360 ft. Depth of completed well 126 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 as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
soil zone, sandy	0	2	
clay, brn.	2	20	
clay & gravel, blue	20	32	
gravel & sand, med.			
water zone	32	40	
clay & gravel, blue	40	48	
gravel to fine sand,			
blue	48	72	
hard-packed gravel &			
sandstone	72	83	
basalt rock	83	84	
clay & gravel, brn.	84	110	
clay & basalt bldrs.,			
blue	110	360	

Work started 6/16/ 1967 Completed 7/6/ 19 67

Date well drilling machine moved off of well _____ 19 _____

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] Jack Stooksberry, Jr. Date 7/7, 1967
(Drilling Machine Operator)

Drilling Machine Operator's License No. 45

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 Jack Stooksberry, Jr.
(Person, firm or corporation) (Type or print)

Address Rte. 2, Box 47, Lakeview, Ore.

[Signed] Jack Stooksberry, Jr.
(Water Well Contractor)

Contractor's License No. 211 Date 7/7, 19 67

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

WATER WELL REPORT

STATE OF OREGON
(Please type or print)

SEP 20 1977

(Do not write above this line) OCT 27 1977

State Well No.

State Permit No.

WATER RESOURCES DEPT.

(1) OWNER:

SALEM, OREGON

Name James Grover Dyke

Address P.O. Box 20

Adel, Oregon 97620

(2) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

CASING INSTALLED:

Threaded ☐ Welded ☒
12" Diam. from 0 ft. to 80' ft. Gage 1.1
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

PERFORATIONS:

Perforated? ☐ Yes ☒ No.

Type of perforator used

Size of perforations	in.	by	in.
perforations from	ft.	to	ft.
perforations from	ft.	to	ft.
perforations from	ft.	to	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? J. G. Dyke

Yield: 200 gal./min. with 70 ft. drawdown after 36 hrs.

" " " "

" " " "

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m.

Temperature of water 70° Depth artesian flow encountered ft.

(9) CONSTRUCTION:

Well seal—Material used Cement

Well sealed from land surface to 25' ft.

Diameter of well bore to bottom of seal 18" in.

Diameter of well bore below seal 12" in.

Number of sacks of cement used in well seal II sacks

How was cement grout placed? wheelbarrow and
hand tamped II sacks cement. I 3/4
cubic yards. I to 6 mix

Was a drive shoe used? ☒ Yes ☐ No Plugs Size: location ft.

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? depth of strata 80'

Method of sealing strata off

Was well gravel packed? ☐ Yes ☒ No Size of gravel:

Gravel placed from ft. to ft.

WATER RESOURCES DEPT.

LOCATION OF WELL:

County CLATSOP

Driller's well number

S.W. 1/4 S.E. 1/4 Section 24 T. 40S. R. 23 E. W.M.

Bearing and distance from section or subdivision corner I090'
on 39° to the N.E. corner of the S.W. 1/4
of the S.E. 1/4 of S. 24 T. 40S. R. 23 E.

(11) WATER LEVEL: Completed well.

Depth at which water was first found 80' ft.

Static level 12' ft. below land surface. Date 9/1/77.

Artesian pressure lbs. per square inch. Date

(12) WELL LOG:

Diameter of well below casing 11"

Depth drilled 85' ft. Depth of completed well 85' 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
Soil sandy loam brown	0	12	
Med. gravel coarse sand br.	12	16	
Med. sand fine gravel br.	16	27	19
blue clay	19	27	
clay sand fine gravel br.	27	33	
blue clay sand fine	33	35	
Med gravel coarse sand br.	35	46	
coarse gravel brown	46	47	
Med. sand fine gravel br.	47	58	
black sand fine	58	61	
clay Med. gravel grey	61	64	
clay sand fine gravel green	64	67	
Med. gravel coarse sand br.	67	79	12
coarse gravel & boulders br.	79	80	12
boulders brown	80	85	12
caseing end 80'			

Work started July 15 1977 Completed sept. 1 1977

Date well drilling machine moved off of well Aug. 26 1977

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] X J. G. Dyke Date 9-20, 1977
(Drilling Machine Operator)

Drilling Machine Operator's License No.

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 (Person, firm or corporation) (Type or print)

Address

[Signed] X J. G. Dyke (Water Well Contractor)

Contractor's License No. Date 9-20, 1977

STATE OF OREGON
WATER SUPPLY WELL REPORT

(as required by ORS 537.765 & OAR 690-205-0210)

RECEIVED 51971

MAR 25 2008

WELL LABEL # L 95205

START CARD # 175626
192955

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

1) LAND OWNER

First Name Sylvia Last Name Cleland
Company Cleland Ranch
Address PO Box
City Astoria State OR Zip 97120

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

(3) DRILL METHOD

☐ Rotary Air ☐ Rotary Mud ☒ Cable ☐ Auger ☐ Cable Mud
☐ Reverse Rotary ☐ Other

(4) PROPOSED USE

☐ Domestic ☒ Irrigation ☐ Community
☐ Industrial/Commercial ☐ Livestock ☐ Dewatering ☐ Injection
☐ Thermal ☐ Other

(5) BORE HOLE CONSTRUCTION Special Standard: ☐ Yes (attach copy)

Depth of Completed Well 307 ft.

BORE HOLE			SEAL			Amount	(Scks/lbs)
Dia	From	To	Material	From	To		
12	0	28	3/4 Berntech	0	28		52
10	28	270					

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E

☒ Other Poured

Backfill placed from ft. to ft. Material

Filter pack from ft. to ft. Material Size

Explosives used: ☐ Yes Type Amount

(6) CASING/LINER

Casing	Linr	Dia	+	From	To	Gauge	Steel	Plastic	Welded	Thrd
X		10'		0	270'	24"	X		X	

Shoe ☐ Inside ☒ Outside ☐ Other Location of shoe(s)

Temporary casing ☐ Yes Diameter WATER RESOURCES DEPT

(7) PERFORATIONS/SCREENS

Perforations Method Torch

Screens Type Material

Perf	Scrn	Casing	Linr	Screen Dia	From	To	Screen slot width	Slot length	# of slots	Tele/pipe size
X	X				190'	270'				

(8) WELL TESTS: Minimum testing time is 1 hour From 80' to 108'

☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
800	40' 28"	170	22 hr

Temperature 60 °F Lab analysis ☐ Yes By

Water quality concerns? ☐ Yes (describe below)

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County Lake Twp 39 N or S Range 24 (E or W W.M.)
Sec 22 NW 1/4 of the NW 1/4 Tax Lot 700
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD

Street Address of Well (or nearest address) 21169 Hwy
140 East

(10) STATIC WATER LEVEL

	Date	SWL (psi)	+	SWL (ft)
Existing Well/Predeepening				
Completed Well	Aug 31 2007			80

Flowing Artesian? ☐ Yes Dry Hole? ☐ Yes

WATER BEARING ZONES

Depth water was first found 80

SWL Date	From	To	Est Flow	SWL (psi)	+	SWL (ft)
May 17 2007	86'	87'				80
May 18 2007	230	240				80
May 18 2007	260	267				80
May 31 2007	300	307				80

(11) WELL LOG

Ground Elevation 0

Material	From	To
Sandy soil	0'	4'
Tan clay	4	62
Green clay	62	86
Coarse sand (WB)	86	87
Green clay	87	113
Sand	113	115
Clay	115	165
fine sand	165	168
Clay	168	203
fine sand	203	216
Clay (green)	216	230
Coarse sand	230	240
Clay	240	260
fine sand coarse	260	267
fine clay (green)	267	300
C. sand + gravel	300	307

Date Started May 2 2007 Completed Aug. 31 2007

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number Date

Signed

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

License Number Date 9-24-07

Signed Bill Cleland

Contact Info. (optional)

RECEIVED

MAR 03 2008

The well was completed
May 31st. I sealed it sometime
in June upon approval from
the Lake County water Master.

I didnt get my pump
installed and wired to use until
around the completion date indicated.

I couldnt test the draw down
until that time.

I drilled this well
myself. (I am the landowners son)

RECEIVED

SEP 28 2007

WATER RESOURCES DEPT
SALEM, OREGON

Thank You
Bill Cleland

PO Box 57

Adel, Or 97620

(541) 219-1946



Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

Application for Well ID Number

Do not complete if the well already has a Well I.D. Number.

I. OWNER INFORMATION

Current Owner Name (please print): BILL + SYLVIA CLELAND
Mailing Address: PO BOX 57
City, State, Zip: ADEL, OR 97620
Mailing Address (to send Well I.D.): _____
City, State, Zip: _____

LAKE 51971

II. WELL INFORMATION (Do not complete this section if the well report is attached.)

Township: 39 (North/South) Range: 24 (East/West) Section: 22
Tax Lot: 700 County: LAKE NW 1/4 NW 1/4
Street Address of Well, City: _____
Owner at time the well was constructed, (if known): 21169 HWY 140 EAST
If the property had a different street address in the past: _____

III. GENERAL WELL INFORMATION (Do not complete this section if the well report is attached)

Use of Well (domestic, irrigation, commercial, industrial, monitoring): _____
Date Well Constructed: _____ Total Well Depth: _____ Casing Diameter: _____
Other Information: _____

SUBMITTED BY (please print): _____
PHONE: _____ FAX: _____

Send application to Oregon Water Resources Department; 725 Summer Street NE, Suite A; Salem, Oregon 97301-1266; fax (503) 986-0902. Applications are processed and Well I.D. Numbers are mailed every Wednesday.

For Official Use Only by the Oregon Water Resources Department:

Received Date:

Well Log Number:

Well Identification #:

3-26-08

LAKE 51971

95474

(2a) PRE-ALTERATION

Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
								
								
								

Material	From	To	Amt	sacks/lbs

(5) BORE HOLE CONSTRUCTION

BORE HOLE			SEAL				sacks/
Dia	From	To	Material	From	To	Amt	lbs
					Calculated		
					Calculated		
					Calculated		
					Calculated		

FILTER PACK

From	To	Material	Size

(6) CASING/LINER

Casing Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									

(7) PERFORATIONS/SCREENS

[illegible]

(8) WELL TESTS: Minimum testing time is 1 hour

[illegible]

Water Quality Concerns

[illegible]

(10) STATIC WATER LEVEL

[illegible]

(11) WELL LOG

[illegible]

Comments/Remarks

Well was drilled to 80 but filled back in to the bottom of the casing.