Groundwater Transfer Review Summary Form

Transfer/PA # T- **13908**

GW Reviewer **Gerald H. Grondin** **Date Review Completed:** **17 June 2022**

Summary of Same Source Review:

☐ The proposed change in point of appropriation is not within the same aquifer as per OAR 690-380-2110(2).

Summary of Injury Review:

☐ The proposed transfer will result in another, existing water right not receiving previously available water to which it is legally entitled or result in significant interference with a surface water source as per 690-380-0100(3).

Summary of GW-SW Transfer Similarity Review:

☐ The proposed SW-GW transfer doesn't meet the definition of "similarly" as per OAR 690-380-2130.

☒ **None of the Above**

Note: The proposed transfer is within the Fort Rock groundwater limited area.

Note: The proposed POA well change will redistribute groundwater pumping among 7 wells allowing a maximum pumping rate up to 7.86 cfs to occur at any single well to being distributed in various ways at all 7 wells. Depending how the proposed post-transfer pumping is distributed, there is a potential for reduced to minimal increase in seasonal interference.

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations.

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Ground Water Review Form:

- ☒ **Water Right Transfer**
- ☐ **Permit Amendment**
- ☐ **GR Modification**
- ☐ **Other**

Application: **T-13908** Applicant Name: **JR Simplot / JRS Properties**

Proposed Changes: ☐ POA ☒ APOA ☐ SW→GW ☐ RA ☐ USE ☒ POU ☐ OTHER

Reviewer(s): **Gerald H. Grondin** Date of Review: **17 June 2022**

Date Reviewed by GW Mgr. and Returned to WRSD: jti 2/16/23

The information provided in the application is insufficient to evaluate whether the proposed transfer may be approved because:

☐ The water well reports provided with the application do not correspond to the water rights affected by the transfer.

☐ The application does not include water well reports or a description of the well construction details sufficient to establish the ground water body developed or proposed to be developed.

☐ Other _____

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1. Basic description of the changes proposed in this transfer:

This transfer application relates to 12 water right certificates and 7 wells located within adjoining sections within T28S/R15E-section 13 & 14 and T28S/R16E-section 19. The 7 wells are from 1,300 to 5,550 feet from the center of section 13 (see map). The application proposes:

1. Moving 632.19 of 1,100.19 authorized POU acres total and

2. Additional points of appropriation (APOA) that authorizes use of all 7 wells for all 12 certificates (currently each certificate authorizes a single well only) and

3. Transferring 7.77 of 13.75 cfs authorized maximum pumping.

The proposed changes are summarized in the attached table. Note: the currently authorized POA/POD well for each certificate identified in the application text and the application maps differ (see attached table). The currently authorized POA/POD well for each certificate identified in the application maps agree with the OWRD water right database (WRIS).

2. Will the proposed POA develop the same aquifer (source) as the existing authorized POA?
☒ Yes ☐ No Comments:

Essentially yes, the "same aquifer" (source) given the same groundwater system will likely be tapped despite the authorized and proposed APOA wells are constructed to varying depths and tap varying geologic units (see attached well logs). Long term groundwater level data indicates groundwater levels at wells in the vicinity of the currently authorized and proposed POA locations have similar elevations, seasonally fluctuate similarly, and show the same long-term trends (see attached hydrograph) despite being completed at varying depths and different geologic units.

Additionally, groundwater in the Fort Rock Valley-Christmas Valley area (Fort Rock Classified Area) is identified as a single groundwater system. Groundwater is found in both a shallower predominantly basin-fill sediment unit and a deeper predominantly volcanic rocks and sediments unit below. The predominantly basin fill sediment unit and the predominantly volcanic rocks and sediment unit both readily yield groundwater and the two units are hydraulically connected.

Miller (1984 and 1986) describes the groundwater source as the main groundwater reservoir. That reservoir includes groundwater in different geologic units. The reservoir has three characteristics. First, the "natural" groundwater level changes less than 1.5 feet annually, indicating the system is highly modulated. Second, the 1980s potentiometric surface was approximately 4292 feet elevation amsl basin-wide with Silver Lake an exception. Third, the reservoir consists of numerous water producing zones in several formations, all having an essentially common potentiometric level, and all being very transmissive in general.

3. a) Is there more than one source developed under the right (e.g., basalt and alluvium)?
☐ Yes ☒ No

Essentially no. Single hydraulically connected groundwater system. See discussion in part 2 above.

b) If yes, estimate the portion of the right supplied by each of the sources and describe any limitations that will need to be placed on the proposed change (rate, duty, etc.):

No estimate made and no limitation recommended. Single groundwater system. See item 2 and 3a above.

4. a) Will this proposed change, at its maximum allowed rate of use, likely result in an increase in interference with **another ground water right**?

☒ Yes ☐ No Comments:

Currently each of the 12 certificates assign a maximum pumping rate to a single POA well (6 wells total). The proposed POA well change will redistribute groundwater pumping among 7 wells allowing a maximum pumping rate up to 7.86 cfs to occur at any single well to being distributed in various ways at all 7 wells. The calculated minimum and maximum additional seasonal groundwater level drawdown at the well closest to the proposed 7 wells is from a decrease in drawdown of 0.68 feet to an increase of drawdown of 7.50 feet. That closest well should be able to accommodate the seasonal drawdown change. The change in seasonal groundwater level drawdown change at other wells further away will be less.

The long-term impact on the groundwater system should be the same. That impact is to continue contributing to the ongoing annual Fort Rock Classified Area groundwater level decline (see the attached hydrograph…it shows an annual decline rate of about 0.30 feet per year).

b) If yes, would this proposed change, at its maximum allowed rate of use, likely result in another groundwater right not receiving the water to which it is legally entitled?

☐ Yes ☒ No If yes, explain:

See discussion in part 4a above.

5. a) Will this proposed change, at its maximum allowed rate of use, likely result in an increase in interference with **another surface water source**?

☒ Yes ☐ No Comments:

Yes. The proposed POA well change would allow redistributing groundwater pumping among 7 wells. The proposed change could result in an increased or decreased seasonal interference with Silver Lake, Paulina Marsh, and Silver Creek. The increase or decrease depends on how pumping is distributed among the 7 wells.

The proposed POA well change would allow a maximum pumping rate up to 7.86 cfs to occur at any single well or to be distributed in various ways from 2 to 7 wells. The calculated minimum and maximum additional seasonal groundwater level drawdown at Silver Lake (closest shore) is from a decrease in drawdown of 1.60 feet to an increase of drawdown of 7.03 feet. The calculated minimum and maximum additional seasonal groundwater level drawdown at Paulina Marsh (closest shore) is from a decrease in drawdown of 1.27 feet to an increase of drawdown of 3.24 feet. The calculated minimum and maximum additional seasonal groundwater level drawdown at Silver Creek (closest reach) is from a decrease in drawdown of 1.23 feet to an increase of drawdown of 3.38 feet.

The pumping and calculated drawdowns noted above are determined to occur within a highly permeable, high well yield "main groundwater reservoir" as defined by Miller (1986). There is local evidence that saturated lower permeability, lower well yield deposits up to 150 feet thick locally occurs between the land and water surfaces and the "main groundwater reservoir" below. Some domestic and stock wells access groundwater from the lower permeability deposits. The few static groundwater levels representing the lower permeability deposits can be 20 to 30 feet above the static groundwater levels representing the "main groundwater reservoir" indicating a downward hydraulic gradient and downward component of groundwater flow through the lower permeability deposits to the "main groundwater reservoir."

The Darcy equation was used to calculate a potential maximum increase in seasonal vertical volumetric downward flow below Silver Lake and Paulina Marsh respectively. The calculation used a Theis equation derived maximum additional seasonal groundwater level drawdown below the respective surface area centers. The assumption is the increased drawdown at the surface area center approximates the averaged increased drawdown below the entire surface area of the lake and marsh respectively from which an averaged change in vertical volumetric downward flow below Silver Lake and Paulina Marsh can be calculated using the Darcy equation. The Darcy equation results reported here used a vertical hydraulic conductivity (K_v) of 0.30 ft/day which is the median horizontal hydraulic conductivity (K_{xy}) for the lower permeability deposits determined from specific capacity data.

Silver Lake (full surface area): The calculated downward groundwater flow rate when all well pumps are off is 624.16 ac-ft/day. The calculated downward flow rate as a result seasonal drawdown by pre-transfer well pumping for 30 days is 726.94 ac-ft/day (102.78 ac-ft/day, 16.47% increase from no pumping) and for 245 days pumping is 873.62 ac-ft/day (249.46 ac-ft/day, 39.97% increase from no pumping). The calculated downward flow rate as a result seasonal drawdown by proposed post-transfer well pumping for 30 days is 741.92 ac-ft/day (117.76 ac-ft/day, 18.87% increase from no pumping) and for 245 days pumping is 891.09 ac-ft/day (266.93 ac-ft/day, 42.77% increase from no pumping).

Silver Lake (2017 surface area): The calculated downward groundwater flow rate below the smaller surface area when all well pumps are off is 133.98 ac-ft/day. The calculated downward flow rate as a result seasonal drawdown by pre-transfer well pumping for 30 days is 159.21 ac-

ft/day (25.23 ac-ft/day, 18.83% increase from no pumping) and for 245 days pumping is 191.19 ac-ft/day (57.21 ac-ft/day, 42.70% increase from no pumping). The calculated downward flow rate as a result seasonal drawdown by proposed post-transfer well pumping for 30 days is 166.36 ac-ft/day (32.38 ac-ft/day, 24.17% increase from no pumping) and for 245 days pumping is 199.05 ac-ft/day (65.07 ac-ft/day, 48.57% increase from no pumping).

Paulina Marsh (mapped surface area): The calculated downward groundwater flow rate when all well pumps are off is 699.34 ac-ft/day. The calculated downward flow rate as a result seasonal drawdown by pre-transfer well pumping for 30 days is 724.52 ac-ft/day (25.18 ac-ft/day, 3.60% increase from no pumping) and for 245 days pumping is 850.87 ac-ft/day (151.52 ac-ft/day, 21.67% increase from no pumping). The calculated downward flow rate as a result seasonal drawdown by proposed post-transfer well pumping for 30 days is 734.08 ac-ft/day (34.73 ac-ft/day, 4.97% increase from no pumping) and for 245 days pumping is 870.22 ac-ft/day (170.87 ac-ft/day, 24.43% increase from no pumping).

The Hunt (2003) groundwater depletion model was used to calculate the potential change in seasonal groundwater interference with Silver Creek. The calculated interference under existing (pre-transfer) pumping is 0.0005 cfs and 0.0037 cfs at the end of 30 and 240 days of groundwater pumping respectively. The calculated interference under proposed post-transfer pumping with all pumping occurring at the most distant well (LAKE 1405) is 0.0002 cfs and 0.0017 cfs at the end of 30 and 240 days of groundwater pumping respectively, a decrease in seasonal interference. The calculated interference under proposed post-transfer pumping with all pumping occurring at the closest well (LAKE 1336) is 0.0026 cfs and 0.0122 cfs at the end of 30 and 240 days of groundwater pumping respectively, an increase in seasonal interference.

The ongoing long-term groundwater level decline at Silver Lake, Paulina Marsh, and Silver Creek should be the same. The proposed POA changes will continue contributing to the ongoing annual Fort Rock Classified Area groundwater level decline at Silver Lake, Paulina Marsh, and Silver Creek (see the attached hydrograph…it shows an annual decline rate of about 0.30 feet per year).

b) If yes, at its maximum allowed rate of use, what is the expected change in degree of interference with any **surface water sources** resulting from the proposed change?

Stream: **Silver Lake** ☒ Minimal ☐ Significant

Stream: **Paulina Marsh** ☒ Minimal ☐ Significant

Stream: **Silver Creek** ☒ Minimal ☐ Significant

Provide context for minimal/significant impact**:**

Silver Lake: the calculated downward groundwater flow increase under pumping conditions (pre-transfer and worst case post-transfer) divided by the calculated downward groundwater flow with no pumping expressed as a percent are different by less than 3 percent (full lake) and by less than 6 percent (2017 lake surface).

Paulina Marsh: the calculated downward groundwater flow increase under pumping conditions (pre-transfer and worst case post-transfer) divided by the calculated downward groundwater flow with no pumping expressed as a percent is different by less than 3 percent.

Silver Creek: the groundwater pumping interference with the creek is calculated to increase from 1.67 gpm (0.0037 cfs) pre-transfer pumping to 5.50 gpm (0.012 cfs) worst case post-transfer pumping after 240 days pumping.

6. For SW-GW transfers, will the proposed change in point of diversion affect the surface water source similarly (as per OAR 690-380-2130) to the authorized point of diversion specified in the water use subject to transfer?

☐ Yes ☒ No Comments:

Not Applicable. No SW-GW transfer.

7. What conditions or other changes in the application are necessary to address any potential issues identified above:

Note: the proposed transfer is within the Fort Rock groundwater limited area.

The following are technical groundwater review recommendations. It is recognized that one or more technically recommended conditions may or may not be allowed under the transfer process rules and statutes. This technical groundwater review relies on other appropriate and authorized Department staff to make that determination.

"Large" flow meter condition for any proposed "To" POA and/or APOA well. Require the flow meter for any POA and/or APOA well to be properly installed and maintained. Each meter shall be either within 50 feet of the well head with a clearly visible monument adjacent to the meter or a surveyed location shall be provided and a clearly visible monument adjacent to the meter shall be installed for each meter more than 50 feet from the well head.

Condition 7P (well tag condition) for all the "To" and "From" POA wells.

Condition 7T (modified) for all "To" POA wells: "Prior to use, all POA wells shall be configured to allow a strictly clean water (no oil) static water level measurements with an electric-tape. That can include measurement access via an unobstructed vertical discharge pipe that allows the groundwater level to fluctuate freely within the discharge pipe (no valves, etc.). Otherwise, a dedicated measuring tube must be installed prior to use. The tube must be unobstructed, have a diameter of ¾ inch (0.75 inch) or greater, and pursuant to figure 200-5 in OAR 690-200."

8. Any additional comments:

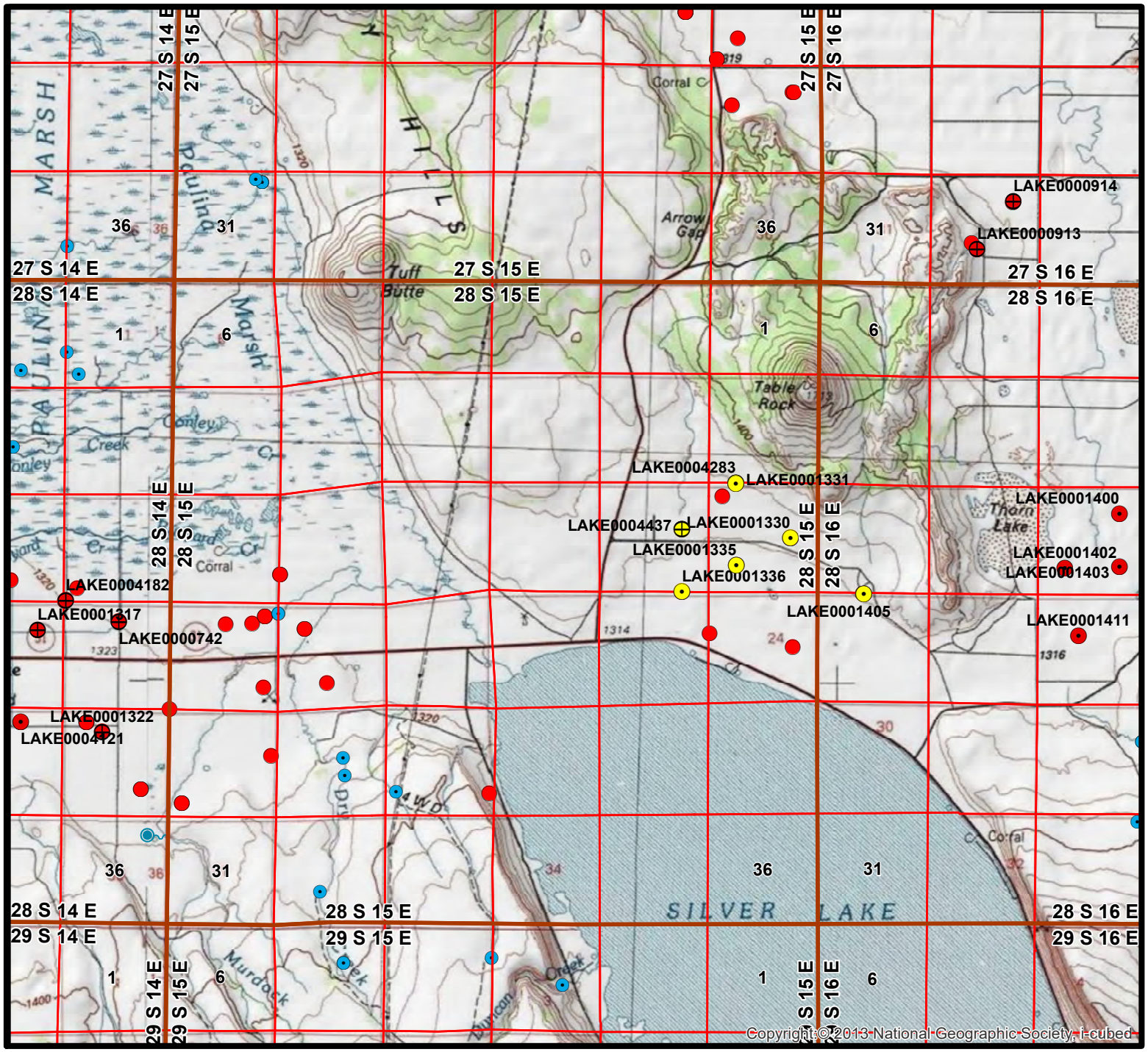
No additional comments.

References:

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

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.

Groundwater Transfer Application T-13908
JR Simplot / JRS Properties

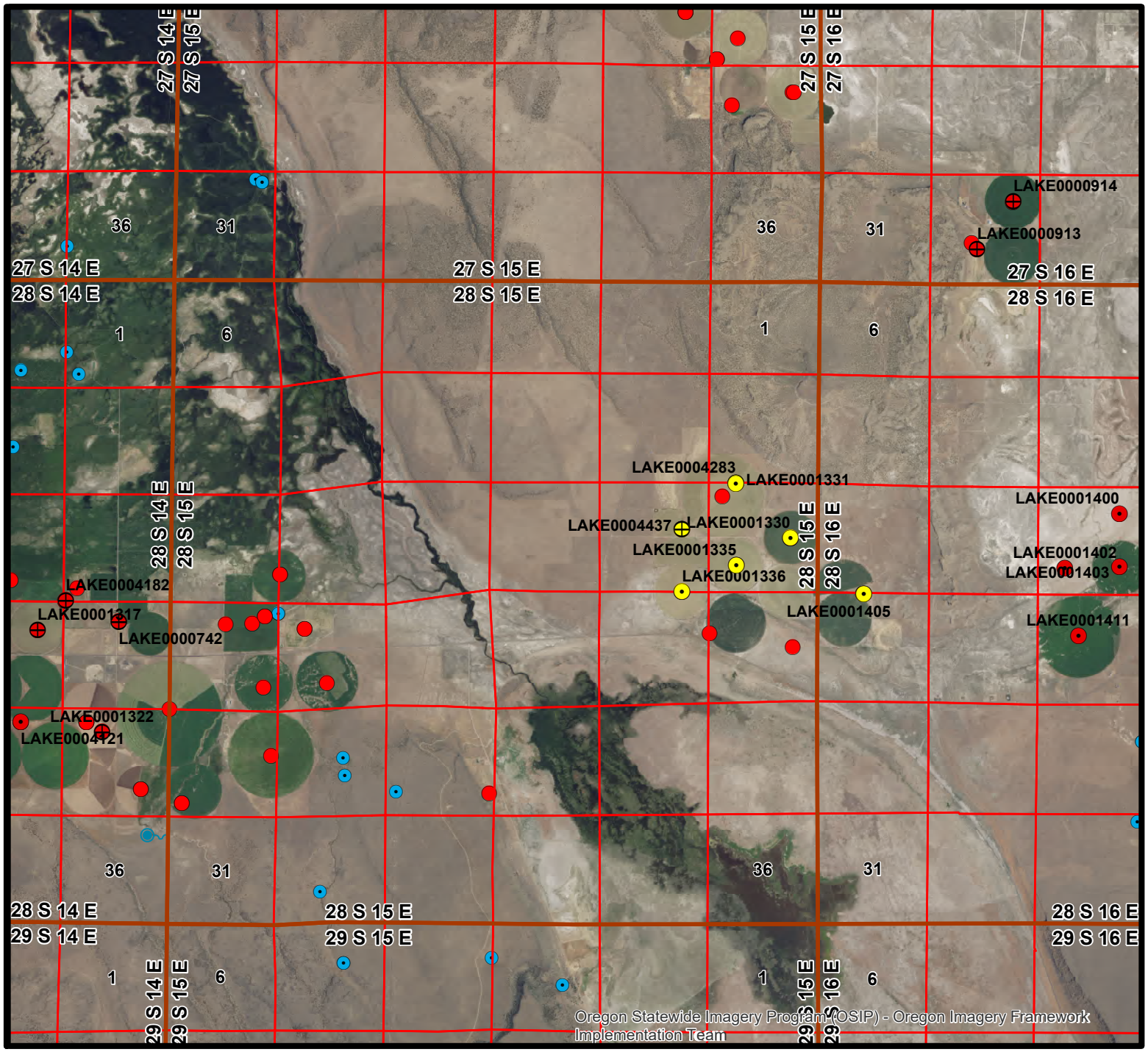


0 0.5 1 2 3 4
Miles

Yellow = Authorized & Proposed Wells
Red = Groundwater PODs & Obs Well
Blue = Surface Water PODs

N

Groundwater Transfer Application T-13908
JR Simplot / JRS Properties



0 0.5 1 2 3 4
Miles

Yellow = Authorized & Proposed Wells
Red = Groundwater PODs & Obs Well
Blue = Surface Water PODs

N

Item	Certificates																																	Totals
Wells	**26991**			**27013**			**46198**			**48889**			**48890**			**50758**			**65757**			**65760**			**76036**			**76037**			**76043**			**91057**			
(OWRD LogID)	T_A	M_A	WR	T_A	M_A	WR	T_A	M_A	WR	T_A	M_A	WR	T_A	M_A	WR	T_A	M_A	WR	T_A	M_A	WR	T_A	M_A	WR	T_A	M_A	WR	T_A	M_A	WR	T_A	M_A	WR	T_A	M_A	WR	
LAKE 1330 (original) LAKE 1333 (deepen)	P			P			P			P			P	A	A	P			P			P			P			P			P			P			
LAKE 4283	P			P			P			P			P			P			P	A	A	P			P	A	A	P	A	A	P	A	A	P	A	A	
LAKE 1335	A	A	A	A			A			A			A			A			A			A			A			A			A			A			
LAKE 1336	P			P			P			P			P			P	A	A	P			P			P			P			P			P			
LAKE 4437	P			P			P	A	A	P			P			P			P			P	A	A	P			P			P			P			
LAKE 1331 (original) LAKE 4279 (alteration)	P			P			P			P			P			P			P			P			P			P			P			P			
LAKE 1405	P			P	A	A	P			P	A	A	P			P			P			P			P			P			P			P			
POU Acres																																					
Authorized	156.90			128.80			127.20			136.20			125.00			134.40			115.00			8.00			10.30			20.20			60.00			78.19			1,100.19
Proposed Transfer	39.90			128.80			23.20			136.20			5.00			7.40			115.00			8.00			10.30			20.20			60.00			78.19			632.19
Maximum Rate (cfs)																																					
Authorized	1.96			1.61			1.59			1.70			1.56			1.68			1.44			0.10			0.13			0.25			0.75			0.98			13.75
Proposed Transfer	0.46			1.61			0.29			1.70			0.06			0.21[a]			1.44			0.10			0.13			0.25			0.75			0.98			7.77

T_A = as found in T-13908 application text

M_A = as found in T-13908 application maps

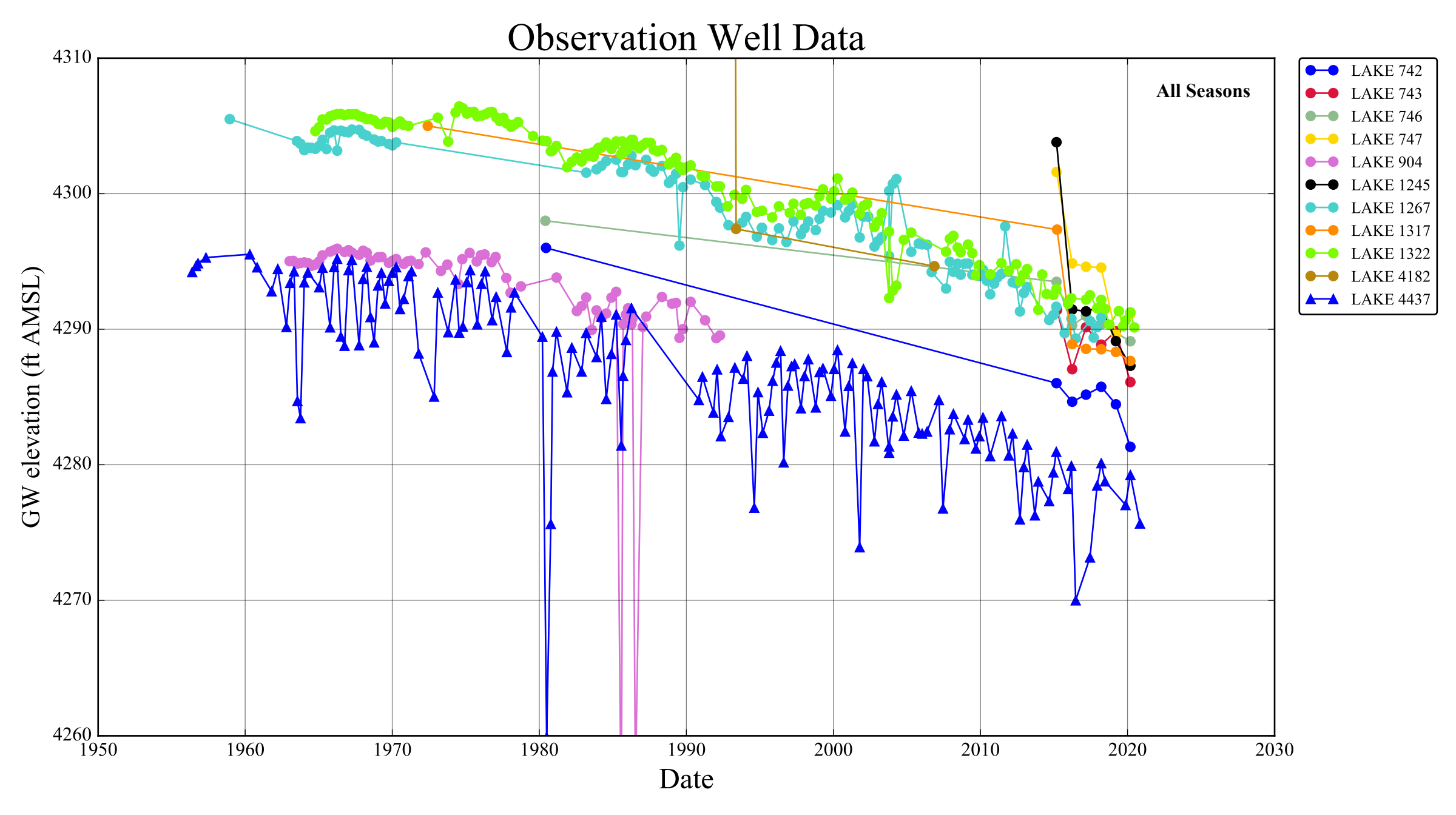
WR = as found in OWRD wtaer right database (WRIS)

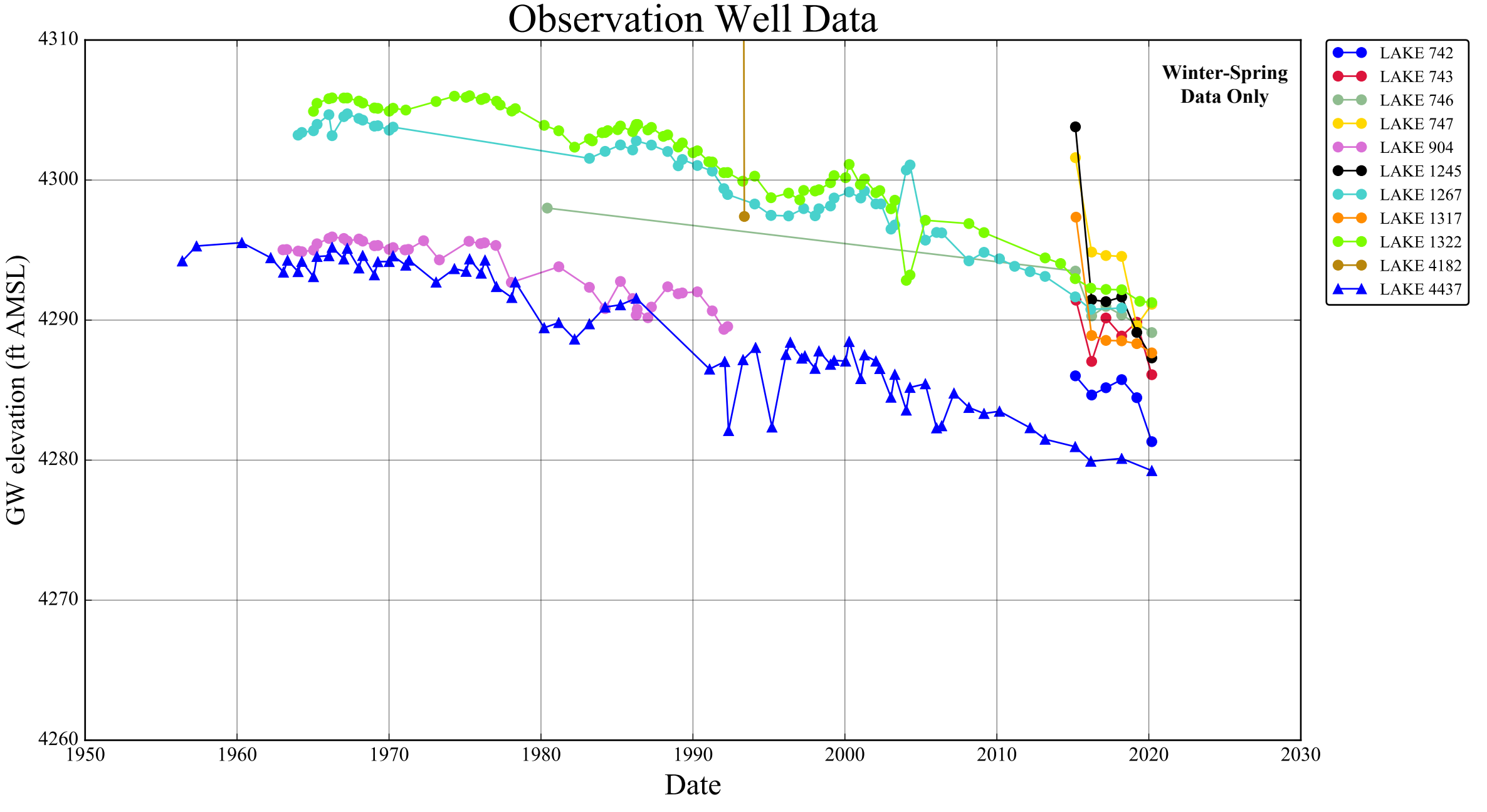
A = current authorized well for the certificate (note: the authorized well found in the application text (T_A) does not always match the authorized well found in the application maps (M_A) or the OWRD water right database (WR). It appears the application text (TA) is incorrect for many certificates. The application maps agree with the OWRD water right database (WR).)

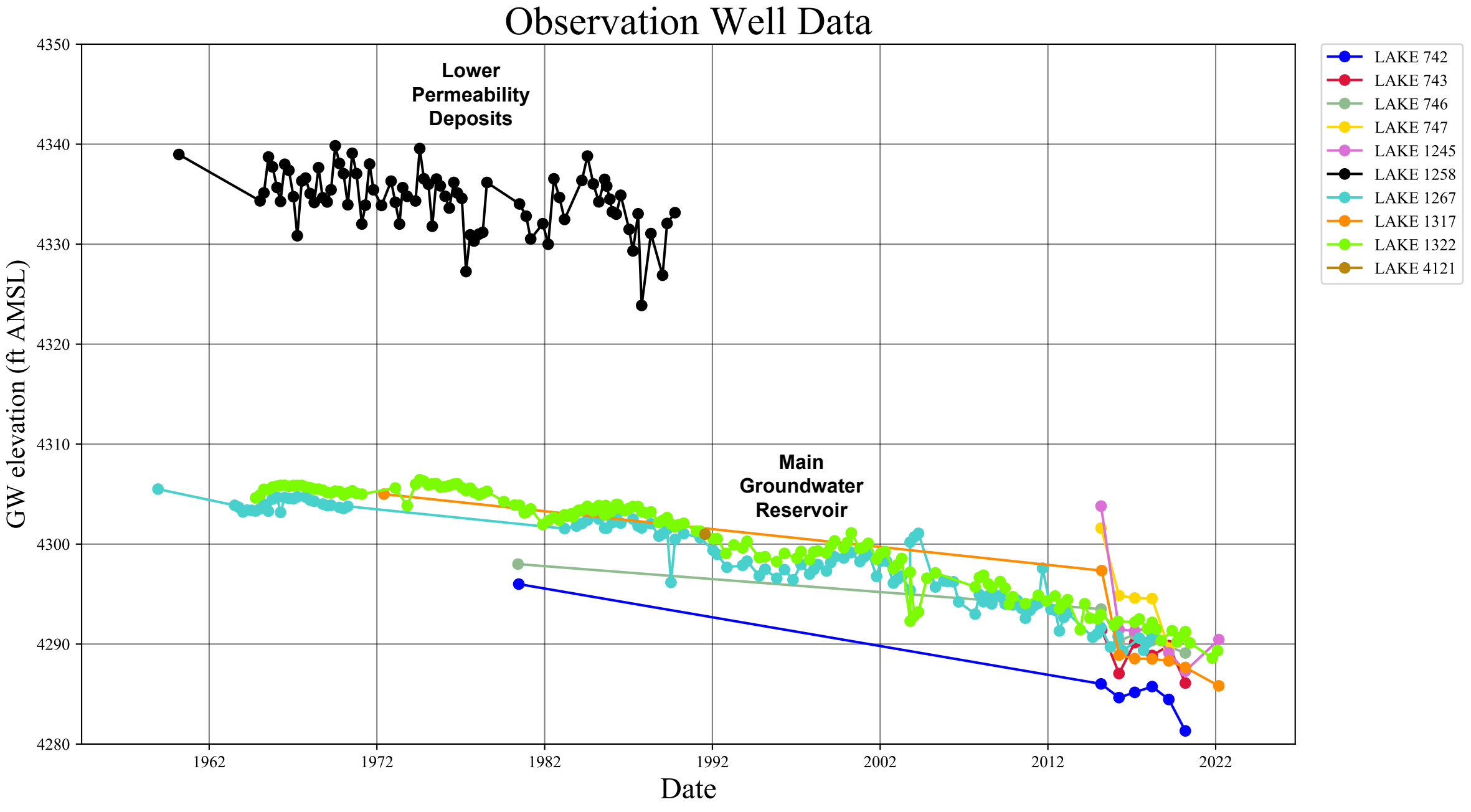
P = proposed well for additional point of appropriation (APOA)

[a]The proposed maximum rate for the proposed transfer related to this certificate is greater than generally allowed for the POU acreage proposed to be transferred

Wells (OWRD LogID)	Land Elevation (feet)	GW Level (ft blsd)	GW Level (ft elev.)	GW Level Date
LAKE 1330 (original) LAKE 1333 (deepen)	4,346.92	51.00	4,295.92	05/09/1974
LAKE 4283	4,394.96	101.00	4,293.96	07/28/1993
LAKE 1335	4,315.94	20.00	4,295.94	11/21/1957
LAKE 1336	4,311.67	17.00	4,294.67	05/30/1978
LAKE 4437	4,341.57	47.35	4,294.22	05/25/1956
LAKE 1331 (original) LAKE 4279 (alteration)	4,394.20	96.00	4,298.20	01/31/1976
LAKE 1405	4,333.91	41.00	4,292.91	12/07/1953


Observation Well Data
All Seasons
LAKE 742
LAKE 743
LAKE 746
LAKE 747
LAKE 904
LAKE 1245
LAKE 1267
LAKE 1317
LAKE 1322
LAKE 4182
LAKE 4437
GW elevation (ft AMSL)
4310
4300
4290
4280
4270
4260
1950
1960
1970
1980
1990
2000
2010
2020
2030
Date


Observation Well Data
Winter-Spring Data Only
LAKE 742
LAKE 743
LAKE 746
LAKE 747
LAKE 904
LAKE 1245
LAKE 1267
LAKE 1317
LAKE 1322
LAKE 4182
LAKE 4437
GW elevation (ft AMSL)
4310
4300
4290
4280
4270
4260
1950
1960
1970
1980
1990
2000
2010
2020
2030
Date


Observation Well Data
Lower Permeability Deposits
Main Groundwater Reservoir
GW elevation (ft AMSL)
Date
4350
4340
4330
4320
4310
4300
4290
4280
1962
1972
1982
1992
2002
2012
2022
LAKE 742
LAKE 743
LAKE 746
LAKE 747
LAKE 1245
LAKE 1258
LAKE 1267
LAKE 1317
LAKE 1322
LAKE 4121

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	yellow grid areas are where values are calculated							7.0000	1.1545E-04				W(u) calculation test
"From" Authorized POA wells to closest Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	30.00	7,425.00	3.14	0.0306	2.9390	4.7824		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	7,370.00	3.14	0.0302	2.9534	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	30.00	5,220.00	3.14	0.0151	3.6284	0.6486		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	30.00	6,065.00	3.14	0.0204	3.3336	0.0917		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	30.00	3,560.00	3.14	0.0070	4.3858	0.9247		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	30.00	2,465.00	3.14	0.0034	5.1173	0.2170		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	30.00	7,680.00	3.14	0.0328	2.8736	4.3598		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**11.02**			
"To" Proposed POA well LAKE 1405 furthest from Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	30.00	7,680.00	3.14	0.0328	2.8736	10.3561		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**10.36**	**-0.6680**		
"To" Proposed POA well LAKE 1336 closest to Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	30.00	2,465.00	3.14	0.0034	5.1173	18.4423		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**18.44**	**7.4181**		
"From" Authorized POA wells to closest Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	30.00	7,425.00	3.14	0.0306	2.9390	2.3593		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	7,370.00	3.14	0.0302	2.9534	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	30.00	5,220.00	3.14	0.0151	3.6284	0.3203		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	30.00	6,065.00	3.14	0.0204	3.3336	0.0472		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	30.00	3,560.00	3.14	0.0070	4.3858	0.4952		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	30.00	2,465.00	3.14	0.0034	5.1173	0.1071		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	30.00	7,680.00	3.14	0.0328	2.8736	2.1548		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**5.48**			
"To" Proposed POA well LAKE 1405 furthest from Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	30.00	7,680.00	3.14	0.0328	2.8736	5.1406		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**5.14**	**-0.3434**		
"To" Proposed POA well LAKE 1336 closest to Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	30.00	2,465.00	3.14	0.0034	5.1173	9.1544		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**9.15**	**3.6704**		

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	**yellow grid areas are where values are calculated**							**7.0000**	**1.1545E-04**				**W(u) calculation test**
"From" Authorized POA wells to closest Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	245.00	7,425.00	3.14	0.0038	5.0124	8.1562		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	7,370.00	3.14	0.0037	5.0272	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	245.00	5,220.00	3.14	0.0019	5.7152	1.0216		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	245.00	6,065.00	3.14	0.0025	5.4158	0.1489		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	245.00	3,560.00	3.14	0.0009	6.4797	1.3662		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	245.00	2,465.00	3.14	0.0004	7.2144	0.3059		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	245.00	7,680.00	3.14	0.0040	4.9452	7.5027		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**18.50**			
"To" Proposed POA well LAKE 1405 furthest from Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	245.00	7,680.00	3.14	0.0040	4.9452	17.8218		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**17.82**	**-0.6798**		
"To" Proposed POA well LAKE 1336 closest to Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	245.00	2,465.00	3.14	0.0004	7.2144	26.0000		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**26.00**	**7.4983**		
"From" Authorized POA wells to closest Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	245.00	7,425.00	3.14	0.0038	5.0124	4.0238		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	7,370.00	3.14	0.0037	5.0272	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	245.00	5,220.00	3.14	0.0019	5.7152	0.5046		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	245.00	6,065.00	3.14	0.0025	5.4158	0.0766		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	245.00	3,560.00	3.14	0.0009	6.4797	0.7316		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	245.00	2,465.00	3.14	0.0004	7.2144	0.1510		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	245.00	7,680.00	3.14	0.0040	4.9452	3.7082		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**9.20**			
"To" Proposed POA well LAKE 1405 furthest from Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	245.00	7,680.00	3.14	0.0040	4.9452	8.8464		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**8.85**	**-0.3494**		
"To" Proposed POA well LAKE 1336 closest to Water Right Well (T26S/R15E-sec 24 bc) (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	245.00	2,465.00	3.14	0.0004	7.2144	12.9059		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**12.91**	**3.7101**		

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	yellow grid areas are where values are calculated							7.0000	1.1545E-04				W(u) calculation test
"From" Authorized POA wells to Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	30.00	8,255.00	3.14	0.0379	2.7342	4.4491		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	8,225.00	3.14	0.0376	2.7412	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	30.00	5,440.00	3.14	0.0164	3.5471	0.6341		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	30.00	7,055.00	3.14	0.0277	3.0383	0.0836		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	30.00	4,780.00	3.14	0.0127	3.8021	0.8017		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	30.00	2,490.00	3.14	0.0034	5.0972	0.2161		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	30.00	5,725.00	3.14	0.0182	3.4468	5.2294		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**11.41**			
"To" Proposed POA well LAKE 4283 furthest from Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	30.00	8,255.00	3.14	0.0379	2.7342	9.8537		LAKE 4283	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**9.85**	**-1.5602**		
"To" Proposed POA well LAKE 1336 closest to Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	30.00	2,490.00	3.14	0.0034	5.0972	18.3698		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**18.37**	**6.9559**		
"From" Authorized POA wells to Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	30.00	8,255.00	3.14	0.0379	2.7342	2.1949		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	8,225.00	3.14	0.0376	2.7412	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	30.00	5,440.00	3.14	0.0164	3.5471	0.3132		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	30.00	7,055.00	3.14	0.0277	3.0383	0.0430		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	30.00	4,780.00	3.14	0.0127	3.8021	0.4293		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	30.00	2,490.00	3.14	0.0034	5.0972	0.1067		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	30.00	5,725.00	3.14	0.0182	3.4468	2.5846		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**5.67**			
"To" Proposed POA well LAKE 4283 furthest from Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	30.00	8,255.00	3.14	0.0379	2.7342	4.8912		LAKE 4283	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**4.89**	**-0.7805**		
"To" Proposed POA well LAKE 1336 closest to Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	30.00	2,490.00	3.14	0.0034	5.0972	9.1184		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**9.12**	**3.4467**		

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	yellow grid areas are where values are calculated							7.0000	1.1545E-04				W(u) calculation test
"From" Authorized POA wells to Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	245.00	8,255.00	3.14	0.0046	4.8014	7.8128		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	8,225.00	3.14	0.0046	4.8086	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	245.00	5,440.00	3.14	0.0020	5.6328	1.0069		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	245.00	7,055.00	3.14	0.0034	5.1143	0.1407		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	245.00	4,780.00	3.14	0.0016	5.8911	1.2421		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	245.00	2,490.00	3.14	0.0004	7.1942	0.3051		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	245.00	5,725.00	3.14	0.0022	5.5309	8.3915		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**18.90**			
"To" Proposed POA well LAKE 4283 furthest from Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	245.00	8,255.00	3.14	0.0046	4.8014	17.3037		LAKE 4283	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**17.30**	**-1.5953**		
"To" Proposed POA well LAKE 1336 closest to Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	245.00	2,490.00	3.14	0.0004	7.1942	25.9273		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**25.93**	**7.0283**		
"From" Authorized POA wells to Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	245.00	8,255.00	3.14	0.0046	4.8014	3.8544		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	8,225.00	3.14	0.0046	4.8086	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	245.00	5,440.00	3.14	0.0020	5.6328	0.4973		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	245.00	7,055.00	3.14	0.0034	5.1143	0.0723		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	245.00	4,780.00	3.14	0.0016	5.8911	0.6652		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	245.00	2,490.00	3.14	0.0004	7.1942	0.1506		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	245.00	5,725.00	3.14	0.0022	5.5309	4.1475		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**9.39**			
"To" Proposed POA well LAKE 4283 furthest from Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	245.00	8,255.00	3.14	0.0046	4.8014	8.5892		LAKE 4283	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**8.59**	**-0.7980**		
"To" Proposed POA well LAKE 1336 closest to Silver Lake (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	245.00	2,490.00	3.14	0.0004	7.1942	12.8698		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**12.87**	**3.4826**		

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	yellow grid areas are where values are calculated							7.0000	1.1545E-04				W(u) calculation test
"From" Authorized POA wells to Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	30.00	14,065.00	3.14	0.1099	1.7379	2.8279		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	14,035.00	3.14	0.1094	1.7417	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	30.00	10,775.00	3.14	0.0645	2.2273	0.3982		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	30.00	15,590.00	3.14	0.1350	1.5557	0.0428		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	30.00	12,675.00	3.14	0.0893	1.9264	0.4062		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	30.00	9,775.00	3.14	0.0531	2.4111	0.1022		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	30.00	18,420.00	3.14	0.1885	1.2714	1.9290		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**5.71**			
"To" Proposed POA well LAKE 1405 furthest from Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	30.00	18,420.00	3.14	0.1885	1.2714	4.5821		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**4.58**	**-1.1242**		
"To" Proposed POA well LAKE 1336 closest to Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	30.00	9,775.00	3.14	0.0531	2.4111	8.6892		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**8.69**	**2.9830**		
"From" Authorized POA wells to Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	30.00	14,065.00	3.14	0.1099	1.7379	1.3951		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	14,035.00	3.14	0.1094	1.7417	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	30.00	10,775.00	3.14	0.0645	2.2273	0.1966		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	30.00	15,590.00	3.14	0.1350	1.5557	0.0220		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	30.00	12,675.00	3.14	0.0893	1.9264	0.2175		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	30.00	9,775.00	3.14	0.0531	2.4111	0.0505		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	30.00	18,420.00	3.14	0.1885	1.2714	0.9534		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**2.84**			
"To" Proposed POA well LAKE 1405 furthest from Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	30.00	18,420.00	3.14	0.1885	1.2714	2.2745		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**2.27**	**-0.5607**		
"To" Proposed POA well LAKE 1336 closest to Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	30.00	9,775.00	3.14	0.0531	2.4111	4.3131		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**4.31**	**1.4780**		

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	yellow grid areas are where values are calculated							7.0000	1.1545E-04				W(u) calculation test
"From" Authorized POA wells to Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	245.00	14,065.00	3.14	0.0135	3.7444	6.0929		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	14,035.00	3.14	0.0134	3.7486	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	245.00	10,775.00	3.14	0.0079	4.2718	0.7636		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	245.00	15,590.00	3.14	0.0165	3.5416	0.0974		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	245.00	12,675.00	3.14	0.0109	3.9500	0.8328		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	245.00	9,775.00	3.14	0.0065	4.4652	0.1893		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	245.00	18,420.00	3.14	0.0231	3.2145	4.8770		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**12.85**			
"To" Proposed POA well LAKE 1405 furthest from Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	245.00	18,420.00	3.14	0.0231	3.2145	11.5846		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**11.58**	**-1.2685**		
"To" Proposed POA well LAKE 1336 closest to Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	245.00	9,775.00	3.14	0.0065	4.4652	16.0922		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**16.09**	**3.2391**		
"From" Authorized POA wells to Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	245.00	14,065.00	3.14	0.0135	3.7444	3.0059		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	14,035.00	3.14	0.0134	3.7486	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	245.00	10,775.00	3.14	0.0079	4.2718	0.3771		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	245.00	15,590.00	3.14	0.0165	3.5416	0.0501		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	245.00	12,675.00	3.14	0.0109	3.9500	0.4460		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	245.00	9,775.00	3.14	0.0065	4.4652	0.0935		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	245.00	18,420.00	3.14	0.0231	3.2145	2.4104		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**6.38**			
"To" Proposed POA well LAKE 1405 furthest from Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	245.00	18,420.00	3.14	0.0231	3.2145	5.7504		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**5.75**	**-0.6326**		
"To" Proposed POA well LAKE 1336 closest to Paulina Marsh (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	245.00	9,775.00	3.14	0.0065	4.4652	7.9878		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**7.99**	**1.6048**		

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	yellow grid areas are where values are calculated							7.0000	1.1545E-04				W(u) calculation test
"From" Authorized POA wells to Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	30.00	13,255.00	3.14	0.0976	1.8449	3.0019		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	14,145.00	3.14	0.1112	1.7277	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	30.00	10,725.00	3.14	0.0639	2.2361	0.3997		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	30.00	14,900.00	3.14	0.1233	1.6352	0.0450		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	30.00	11,965.00	3.14	0.0795	2.0323	0.4285		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	30.00	9,040.00	3.14	0.0454	2.5599	0.1085		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	30.00	17,280.00	3.14	0.1659	1.3785	2.0914		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**6.08**			
"To" Proposed POA well LAKE 1405 furthest from Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	30.00	17,280.00	3.14	0.1659	1.3785	4.9679		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**4.97**	**-1.1072**		
"To" Proposed POA well LAKE 1336 closest to Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	30.00	9,040.00	3.14	0.0454	2.5599	9.2256		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**9.23**	**3.1505**		
"From" Authorized POA wells to Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	30.00	13,255.00	3.14	0.0976	1.8449	1.4810		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	14,145.00	3.14	0.1112	1.7277	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	30.00	10,725.00	3.14	0.0639	2.2361	0.1974		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	30.00	14,900.00	3.14	0.1233	1.6352	0.0231		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	30.00	11,965.00	3.14	0.0795	2.0323	0.2295		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	30.00	9,040.00	3.14	0.0454	2.5599	0.0536		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	30.00	17,280.00	3.14	0.1659	1.3785	1.0337		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**3.02**			
"To" Proposed POA well LAKE 1405 furthest from Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	30.00	17,280.00	3.14	0.1659	1.3785	2.4660		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**2.47**	**-0.5523**		
"To" Proposed POA well LAKE 1336 closest to Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	30.00	9,040.00	3.14	0.0454	2.5599	4.5794		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**4.58**	**1.5612**		

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	yellow grid areas are where values are calculated							7.0000	1.1545E-04				W(u) calculation test
"From" Authorized POA wells to Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	245.00	13,255.00	3.14	0.0120	3.8616	6.2835		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	14,145.00	3.14	0.0136	3.7332	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	245.00	10,725.00	3.14	0.0078	4.2810	0.7653		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	245.00	14,900.00	3.14	0.0151	3.6307	0.0999		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	245.00	11,965.00	3.14	0.0097	4.0641	0.8569		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	245.00	9,040.00	3.14	0.0056	4.6206	0.1959		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	245.00	17,280.00	3.14	0.0203	3.3395	5.0667		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**13.27**			
"To" Proposed POA well LAKE 1405 furthest from Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	245.00	17,280.00	3.14	0.0203	3.3395	12.0352		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**12.04**	**-1.2329**		
"To" Proposed POA well LAKE 1336 closest to Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	245.00	9,040.00	3.14	0.0056	4.6206	16.6522		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**16.65**	**3.3841**		
"From" Authorized POA wells to Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	245.00	13,255.00	3.14	0.0120	3.8616	3.0999		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	14,145.00	3.14	0.0136	3.7332	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	245.00	10,725.00	3.14	0.0078	4.2810	0.3780		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	245.00	14,900.00	3.14	0.0151	3.6307	0.0514		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	245.00	11,965.00	3.14	0.0097	4.0641	0.4589		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	245.00	9,040.00	3.14	0.0056	4.6206	0.0967		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	245.00	17,280.00	3.14	0.0203	3.3395	2.5042		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**6.59**			
"To" Proposed POA well LAKE 1405 furthest from Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	245.00	17,280.00	3.14	0.0203	3.3395	5.9740		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**5.97**	**-0.6150**		
"To" Proposed POA well LAKE 1336 closest to Silver Creek (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	245.00	9,040.00	3.14	0.0056	4.6206	8.2658		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**8.27**	**1.6768**		

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	**yellow grid areas are where values are calculated**							**7.0000**	**1.1545E-04**				**W(u) calculation test**
"From" Authorized POA wells to Silver Lake center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	30.00	19,600.00	3.14	0.2134	1.1698	1.9035		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	20,145.00	3.14	0.2255	1.1258	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	30.00	18,370.00	3.14	0.1875	1.2759	0.2281		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	30.00	17,500.00	3.14	0.1701	1.3571	0.0373		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	30.00	16,220.00	3.14	0.1462	1.4868	0.3135		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	30.00	15,450.00	3.14	0.1326	1.5715	0.0666		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	30.00	15,430.00	3.14	0.1323	1.5737	2.3876		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**4.94**			
"To" Proposed POA well LAKE 1336 closest to Silver Lake center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	30.00	15,450.00	3.14	0.1326	1.5715	5.6633		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**5.66**	**0.7267**		
"From" Authorized POA wells to Silver Lake center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	30.00	19,600.00	3.14	0.2134	1.1698	0.9391		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	20,145.00	3.14	0.2255	1.1258	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	30.00	18,370.00	3.14	0.1875	1.2759	0.1126		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	30.00	17,500.00	3.14	0.1701	1.3571	0.0192		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	30.00	16,220.00	3.14	0.1462	1.4868	0.1679		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	30.00	15,450.00	3.14	0.1326	1.5715	0.0329		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	30.00	15,430.00	3.14	0.1323	1.5737	1.1801		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**2.45**			
"To" Proposed POA well LAKE 1336 closest to Silver Lake center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	30.00	15,450.00	3.14	0.1326	1.5715	2.8112		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**2.81**	**0.3594**		

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	**yellow grid areas are where values are calculated**							**7.0000**	**1.1545E-04**				**W(u) calculation test**
"From" Authorized POA wells to Silver Lake center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	245.00	19,600.00	3.14	0.0261	3.0933	5.0334		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	20,145.00	3.14	0.0276	3.0399	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	245.00	18,370.00	3.14	0.0230	3.2198	0.5756		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	245.00	17,500.00	3.14	0.0208	3.3147	0.0912		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	245.00	16,220.00	3.14	0.0179	3.4637	0.7303		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	245.00	15,450.00	3.14	0.0162	3.5593	0.1509		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	245.00	15,430.00	3.14	0.0162	3.5619	5.4041		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**11.99**			
"To" Proposed POA well LAKE 1336 closest to Silver Lake center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	245.00	15,450.00	3.14	0.0162	3.5593	12.8275		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**12.83**	**0.8421**		
"From" Authorized POA wells to Silver Lake center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	245.00	19,600.00	3.14	0.0261	3.0933	2.4832		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	20,145.00	3.14	0.0276	3.0399	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	245.00	18,370.00	3.14	0.0230	3.2198	0.2843		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	245.00	17,500.00	3.14	0.0208	3.3147	0.0469		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	245.00	16,220.00	3.14	0.0179	3.4637	0.3911		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	245.00	15,450.00	3.14	0.0162	3.5593	0.0745		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	245.00	15,430.00	3.14	0.0162	3.5619	2.6710		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**5.95**			
"To" Proposed POA well LAKE 1336 closest to Silver Lake center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	245.00	15,450.00	3.14	0.0162	3.5593	6.3673		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**6.37**	**0.4165**		

Vertical GW Flow Using Darcy Equation

Darcy Equation: $Q = K A [(h_1 - h_2) / (L_1 - L_2)]$

Q = volumetric GW flow
K = hydraulic conductivity
A = area

$h_1 - h_2$ = change in head at lake center (head at lake vs. head of "main GW reservoir" potentiometric surface below lake)
$L_1 - L_2$ = distance for change in head (distance from lake bed to "main GW reservoir" deposits below)
$[(h_1 - h_2) / (L_1 - L_2)]$ = hydraulic gradient

Vertical GW Flow		Vertical GW Flow Change		Flow Change	Flow Change	Hydraulic Conductivity	Lake Area		Change in Head	Head Change Distance	Comments
Q	Q	Q	Q	Percent	Increase	$K_v = K_{xy} / 100$	A	A	$h_1 - h_2$	$L_1 - L_2$	
(ft^3/day)	(acre-ft/day)	(ft^3/day)	(acre-ft/day)	%		(ft/day)	(ft^2)	(acre)	(feet)	(feet)	
Vertical GW flow from Silver Lake bed through lower permeability deposits to the higher permeability "main GW reservoir"											
57,700,297	1,324.62	---	---			0.63	455,265,086	10,451.45	30.00	150.00	Full lake, pre-transfer, wells = off, K = mean
27,188,431	624.16	---	---			0.30	455,265,086	10,451.45	30.00	150.00	Full lake, pre-transfer, wells = off, K = median
67,201,613	1,542.74	9,501,316	218.12	16.47%		0.63	455,265,086	10,451.45	34.94	150.00	Full lake, pre-transfer, wells = on 30 day full rate, K = mean
31,665,459	726.94	4,477,028	102.78	16.47%		0.30	455,265,086	10,451.45	34.94	150.00	Full lake, pre-transfer, wells = on 30 day full rate, K = median
62,412,488	1,432.79	4,712,191	108.18	8.17%		0.63	455,265,086	10,451.45	32.45	150.00	Full lake, pre-transfer, wells = on 30 day pro-rated, K = mean
29,408,819	675.13	2,220,389	50.97	8.17%		0.30	455,265,086	10,451.45	32.45	150.00	Full lake, pre-transfer, wells = on 30 day pro-rated, K = median
Vertical GW flow from Silver Lake bed through lower permeability deposits to the higher permeability "main GW reservoir"											
57,700,297	1,324.62	---	---			0.63	455,265,086	10,451.45	30.00	150.00	Full lake, post-transfer, wells = off, K = mean
27,188,431	624.16	---	---			0.30	455,265,086	10,451.45	30.00	150.00	Full lake, post-transfer, wells = off, K = median
68,586,420	1,574.53	10,886,123	249.91	18.87%	1.15	0.63	455,265,086	10,451.45	35.66	150.00	Full lake, post-transfer, wells = on 30 day full rate, K = mean
32,317,982	741.92	5,129,551	117.76	18.87%	1.15	0.30	455,265,086	10,451.45	35.66	150.00	Full lake, post-transfer, wells = on 30 day full rate, K = median
63,104,892	1,448.69	5,404,594	124.07	9.37%	1.15	0.63	455,265,086	10,451.45	32.81	150.00	Full lake, post-transfer, wells = on 30 day pro-rated, K = mean
29,735,081	682.62	2,546,650	58.46	9.37%	1.15	0.30	455,265,086	10,451.45	32.81	150.00	Full lake, post-transfer, wells = on 30 day pro-rated, K = median
Vertical GW flow from Silver Lake bed through lower permeability deposits to the higher permeability "main GW reservoir"											
57,700,297	1,324.62	---	---			0.63	455,265,086	10,451.45	30.00	150.00	Full lake, pre-transfer, wells = off, K = mean
27,188,431	624.16	---	---			0.30	455,265,086	10,451.45	30.00	150.00	Full lake, pre-transfer, wells = off, K = median
80,761,182	1,854.02	23,060,885	529.41	39.97%		0.63	455,265,086	10,451.45	41.99	150.00	Full lake, pre-transfer, wells = on 245 day full rate, K = mean
38,054,741	873.62	10,866,310	249.46	39.97%		0.30	455,265,086	10,451.45	41.99	150.00	Full lake, pre-transfer, wells = on 245 day full rate, K = median
69,144,189	1,587.33	11,443,892	262.72	19.83%		0.63	455,265,086	10,451.45	35.95	150.00	Full lake, pre-transfer, wells = on 245 day pro-rated, K = mean
32,580,803	747.95	5,392,372	123.79	19.83%		0.30	455,265,086	10,451.45	35.95	150.00	Full lake, pre-transfer, wells = on 245 day pro-rated, K = median
Vertical GW flow from Silver Lake bed through lower permeability deposits to the higher permeability "main GW reservoir"											
57,700,297	1,324.62	---	---			0.63	455,265,086	10,451.45	30.00	150.00	Full lake, post-transfer, wells = off, K = mean
27,188,431	624.16	---	---			0.30	455,265,086	10,451.45	30.00	150.00	Full lake, post-transfer, wells = off, K = median
82,376,791	1,891.11	24,676,494	566.49	42.77%	1.07	0.63	455,265,086	10,451.45	42.83	150.00	Full lake, post-transfer, wells = on 245 day full rate, K = mean
38,816,017	891.09	11,627,586	266.93	42.77%	1.07	0.30	455,265,086	10,451.45	42.83	150.00	Full lake, post-transfer, wells = on 245 day full rate, K = median
69,951,993	1,605.88	12,251,696	281.26	21.23%	1.07	0.63	455,265,086	10,451.45	36.37	150.00	Full lake, post-transfer, wells = on 245 day pro-rated, K = mean
32,961,441	756.69	5,773,010	132.53	21.23%	1.07	0.30	455,265,086	10,451.45	36.37	150.00	Full lake, post-transfer, wells = on 245 day pro-rated, K = median

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	**yellow grid areas are where values are calculated**							**7.0000**	**1.1545E-04**				**W(u) calculation test**
"From" Authorized POA wells to OSIP 2017 Silver Lake wet area center (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	30.00	16,780.00	3.14	0.1564	1.4285	2.3244		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	17,460.00	3.14	0.1694	1.3610	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	30.00	15,100.00	3.14	0.1267	1.6117	0.2881		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	30.00	15,500.00	3.14	0.1335	1.5658	0.0431		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	30.00	13,565.00	3.14	0.1022	1.8030	0.3802		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	30.00	12,100.00	3.14	0.0813	2.0116	0.0853		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	30.00	14,640.00	3.14	0.1191	1.6664	2.5283		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**5.65**			
"To" Proposed POA well LAKE 1336 closest to OSIP 2017 Silver Lake wet area center (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	30.00	12,100.00	3.14	0.0813	2.0116	7.2497		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**7.25**	**1.6004**		
"From" Authorized POA wells to OSIP 2017 Silver Lake wet area center (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	30.00	16,780.00	3.14	0.1564	1.4285	1.1467		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	17,460.00	3.14	0.1694	1.3610	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	30.00	15,100.00	3.14	0.1267	1.6117	0.1423		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	30.00	15,500.00	3.14	0.1335	1.5658	0.0221		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	30.00	13,565.00	3.14	0.1022	1.8030	0.2036		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	30.00	12,100.00	3.14	0.0813	2.0116	0.0421		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	30.00	14,640.00	3.14	0.1191	1.6664	1.2496		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**2.81**			
"To" Proposed POA well LAKE 1336 closest to OSIP 2017 Silver Lake wet area center (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	30.00	12,100.00	3.14	0.0813	2.0116	3.5986		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**3.60**	**0.7922**		

Drawdown Calculations Using Theis Equation

Theis Equation: $s = [Q/(4*T*pi)][W(u)]$

$u = (r*r*S)/(4*T*t)$

$W(u) = (-\ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...$

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note:	**yellow grid areas are where values are calculated**							**7.0000**	**1.1545E-04**				**W(u) calculation test**
"From" Authorized POA wells to OSIP 2017 Silver Lake wet area center (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	245.00	16,780.00	3.14	0.0192	3.3971	5.5277		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	17,460.00	3.14	0.0207	3.3192	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	245.00	15,100.00	3.14	0.0155	3.6044	0.6443		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	245.00	15,500.00	3.14	0.0163	3.5530	0.0977		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	245.00	13,565.00	3.14	0.0125	3.8159	0.8046		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	245.00	12,100.00	3.14	0.0100	4.0419	0.1714		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	245.00	14,640.00	3.14	0.0146	3.6654	5.5611		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**12.81**			
"To" Proposed POA well LAKE 1336 closest to OSIP 2017 Silver Lake wet area center (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	245.00	12,100.00	3.14	0.0100	4.0419	14.5666		LAKE 1336	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**14.57**	**1.7598**		
"From" Authorized POA wells to OSIP 2017 Silver Lake wet area center (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	245.00	16,780.00	3.14	0.0192	3.3971	2.7270		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	17,460.00	3.14	0.0207	3.3192	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	245.00	15,100.00	3.14	0.0155	3.6044	0.3182		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	245.00	15,500.00	3.14	0.0163	3.5530	0.0503		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	245.00	13,565.00	3.14	0.0125	3.8159	0.4308		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	245.00	12,100.00	3.14	0.0100	4.0419	0.0846		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	245.00	14,640.00	3.14	0.0146	3.6654	2.7486		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**6.36**			
"To" Proposed POA well LAKE 1336 closest to OSIP 2017 Silver Lake wet area center (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	245.00	12,100.00	3.14	0.0100	4.0419	7.2306		LAKE 1336	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**7.23**	**0.8710**		

Vertical GW Flow Using Darcy Equation

Darcy Equation: $Q = K A [(h_1 - h_2) / (L_1 - L_2)]$

Q = volumetric GW flow
K = hydraulic conductivity
A = area

$h_1 - h_2$ = change in head at lake center (head at lake vs. head of "main GW reservoir" potentiometric surface below lake)
$L_1 - L_2$ = distance for change in head (distance from lake bed to "main GW reservoir" deposits below)
$[(h_1 - h_2) / (L_1 - L_2)]$ = hydraulic gradient

Vertical GW Flow		Vertical GW Flow Change		Flow Change	Flow Change	Hydraulic Conductivity	Lake Area		Change in Head	Head Change Distance	Comments
Q	Q	Q	Q	Percent	Increase	$K_v = K_{xy} / 100$	A	A	$h_1 - h_2$	$L_1 - L_2$	
(ft^3/day)	(acre-ft/day)	(ft^3/day)	(acre-ft/day)	%		(ft/day)	(ft^2)	(acre)	(feet)	(feet)	
Vertical GW flow from Silver Lake bed through lower permeability deposits to the higher permeability "main GW reservoir"											
12,385,510	284.33	---	---			0.63	97,723,765	2,243.43	30.00	150.00	2017 lake, pre-transfer, wells = off, K = mean
5,836,063	133.98	---	---			0.30	97,723,765	2,243.43	30.00	150.00	2017 lake, pre-transfer, wells = off, K = median
14,718,114	337.88	2,332,604	53.55	18.83%		0.63	97,723,765	2,243.43	35.65	150.00	2017 lake, pre-transfer, wells = on 30 day full rate, K = mean
6,935,189	159.21	1,099,125	25.23	18.83%		0.30	97,723,765	2,243.43	35.65	150.00	2017 lake, pre-transfer, wells = on 30 day full rate, K = median
13,545,619	310.96	1,160,109	26.63	9.37%		0.63	97,723,765	2,243.43	32.81	150.00	2017 lake, pre-transfer, wells = on 30 day pro-rated, K = mean
6,382,708	146.53	546,645	12.55	9.37%		0.30	97,723,765	2,243.43	32.81	150.00	2017 lake, pre-transfer, wells = on 30 day pro-rated, K = median
Vertical GW flow from Silver Lake bed through lower permeability deposits to the higher permeability "main GW reservoir"											
12,385,510	284.33	---	---			0.63	97,723,765	2,243.43	30.00	150.00	2017 lake, post-transfer, wells = off, K = mean
5,836,063	133.98	---	---			0.30	97,723,765	2,243.43	30.00	150.00	2017 lake, post-transfer, wells = off, K = median
15,378,675	353.05	2,993,165	68.71	24.17%	1.28	0.63	97,723,765	2,243.43	37.25	150.00	2017 lake, post-transfer, wells = on 30 day full rate, K = mean
7,246,445	166.36	1,410,382	32.38	24.17%	1.28	0.30	97,723,765	2,243.43	37.25	150.00	2017 lake, post-transfer, wells = on 30 day full rate, K = median
13,871,771	318.45	1,486,261	34.12	12.00%	1.28	0.63	97,723,765	2,243.43	33.60	150.00	2017 lake, post-transfer, wells = on 30 day pro-rated, K = mean
6,536,391	150.05	700,328	16.08	12.00%	1.28	0.30	97,723,765	2,243.43	33.60	150.00	2017 lake, post-transfer, wells = on 30 day pro-rated, K = median
Vertical GW flow from Silver Lake bed through lower permeability deposits to the higher permeability "main GW reservoir"											
12,385,510	284.33	---	---			0.63	97,723,765	2,243.43	30.00	150.00	2017 lake, pre-transfer, wells = off, K = mean
5,836,063	133.98	---	---			0.30	97,723,765	2,243.43	30.00	150.00	2017 lake, pre-transfer, wells = off, K = median
17,674,123	405.74	5,288,613	121.41	42.70%		0.63	97,723,765	2,243.43	42.81	150.00	2017 lake, pre-transfer, wells = on 245 day full rate, K = mean
8,328,062	191.19	2,491,999	57.21	42.70%		0.30	97,723,765	2,243.43	42.81	150.00	2017 lake, pre-transfer, wells = on 245 day full rate, K = median
15,011,238	344.61	2,625,728	60.28	21.20%		0.63	97,723,765	2,243.43	36.36	150.00	2017 lake, pre-transfer, wells = on 245 day pro-rated, K = mean
7,073,309	162.38	1,237,245	28.40	21.20%		0.30	97,723,765	2,243.43	36.36	150.00	2017 lake, pre-transfer, wells = on 245 day pro-rated, K = median
Vertical GW flow from Silver Lake bed through lower permeability deposits to the higher permeability "main GW reservoir"											
12,385,510	284.33	---	---			0.63	97,723,765	2,243.43	30.00	150.00	2017 lake, post-transfer, wells = off, K = mean
5,836,063	133.98	---	---			0.30	97,723,765	2,243.43	30.00	150.00	2017 lake, post-transfer, wells = off, K = median
18,400,739	422.42	6,015,229	138.09	48.57%	1.14	0.63	97,723,765	2,243.43	44.57	150.00	2017 lake, post-transfer, wells = on 245 day full rate, K = mean
8,670,445	199.05	2,834,381	65.07	48.57%	1.14	0.30	97,723,765	2,243.43	44.57	150.00	2017 lake, post-transfer, wells = on 245 day full rate, K = median
15,370,418	352.86	2,984,908	68.52	24.10%	1.14	0.63	97,723,765	2,243.43	37.23	150.00	2017 lake, post-transfer, wells = on 245 day pro-rated, K = mean
7,242,555	166.27	1,406,491	32.29	24.10%	1.14	0.30	97,723,765	2,243.43	37.23	150.00	2017 lake, post-transfer, wells = on 245 day pro-rated, K = median

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note: yellow grid areas are where values are calculated								7.0000	1.1545E-04				W(u) calculation test
"From" Authorized POA wells to Paulina Marsh center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	30.00	35,635.00	3.14	0.7055	0.3699	0.6019		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	36,125.00	3.14	0.7250	0.3566	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	30.00	34,150.00	3.14	0.6479	0.4132	0.0739		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	30.00	39,320.00	3.14	0.8589	0.2796	0.0077		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	30.00	37,185.00	3.14	0.7682	0.3291	0.0694		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	30.00	35,130.00	3.14	0.6856	0.3842	0.0163		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	30.00	43,490.00	3.14	1.0508	0.2016	0.3059		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**1.08**			
"To" Proposed POA well LAKE 4437 closest to Paulina Marsh center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	30.00	34,150.00	3.14	0.6479	0.4132	1.4892		LAKE 4437	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**1.49**	**0.4141**		
"From" Authorized POA wells to Paulina Marsh center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	30.00	35,635.00	3.14	0.7055	0.3699	0.2969		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	30.00	36,125.00	3.14	0.7250	0.3566	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	30.00	34,150.00	3.14	0.6479	0.4132	0.0365		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	30.00	39,320.00	3.14	0.8589	0.2796	0.0040		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	30.00	37,185.00	3.14	0.7682	0.3291	0.0372		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	30.00	35,130.00	3.14	0.6856	0.3842	0.0080		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	30.00	43,490.00	3.14	1.0508	0.2016	0.1512		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**0.53**			
"To" Proposed POA well LAKE 4437 closest to Paulina Marsh center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	30.00	34,150.00	3.14	0.6479	0.4132	0.7392		LAKE 4437	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**0.74**	**0.2054**		

Drawdown Calculations Using Theis Equation

Theis Equation: s = [Q/(4*T*pi)][W(u)]
u = (r*r*S)/(4*T*t)
W(u) = (-ln u)-(0.5772157)+(u/1*1!)-(u*u/2*2!)+(u*u*u/3*3!)-(u*u*u*u/4*4!)+...

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

Transmissivity T (gpd/ft)	Transmissivity T (ft2/day)	Storage Coefficient S	Pumping Rate Q (gal/min)	Pumping Rate Q (ft3/sec)	Time t (days)	Distance r (feet)	pi	u	W(u)	Drawdown s (feet)	Drawdown Change s (feet)	Pumping Well	Comments
								Note : W(u) calculation valid when u < 7.1					
Note: yellow grid areas are where values are calculated								7.0000	1.1545E-04				W(u) calculation test
"From" Authorized POA wells to Paulina Marsh center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,593.35	3.55	245.00	35,635.00	3.14	0.0864	1.9563	3.1833		LAKE 4283	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	36,125.00	3.14	0.0888	1.9313	0.0000		LAKE 1331	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	175.04	0.39	245.00	34,150.00	3.14	0.0793	2.0347	0.3637		LAKE 4437	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	26.93	0.06	245.00	39,320.00	3.14	0.1052	1.7774	0.0489		LAKE 1330	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	206.46	0.46	245.00	37,185.00	3.14	0.0941	1.8785	0.3961		LAKE 1335	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	41.52	0.09	245.00	35,130.00	3.14	0.0840	1.9825	0.0841		LAKE 1336	Continuous Pumping at Full Rate
112,207.80	15,000.00	0.00100	1,485.63	3.31	245.00	43,490.00	3.14	0.1287	1.5980	2.4244		LAKE 1405	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**6.50**			
"To" Proposed POA well LAKE 4437 closest to Paulina Marsh center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	3,528.93	7.86	245.00	34,150.00	3.14	0.0793	2.0347	7.3327		LAKE 4437	Continuous Pumping at Full Rate
			3,528.93	**7.86**						**7.33**	**0.8323**		
"From" Authorized POA wells to Paulina Marsh center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	786.06	1.75	245.00	35,635.00	3.14	0.0864	1.9563	1.5704		LAKE 4283	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	0.00	0.00	245.00	36,125.00	3.14	0.0888	1.9313	0.0000		LAKE 1331	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	86.45	0.19	245.00	34,150.00	3.14	0.0793	2.0347	0.1796		LAKE 4437	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	13.85	0.03	245.00	39,320.00	3.14	0.1052	1.7774	0.0251		LAKE 1330	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	110.56	0.25	245.00	37,185.00	3.14	0.0941	1.8785	0.2121		LAKE 1335	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	20.50	0.05	245.00	35,130.00	3.14	0.0840	1.9825	0.0415		LAKE 1336	Continuous Pro-Rated Pumping
112,207.80	15,000.00	0.00100	734.27	1.64	245.00	43,490.00	3.14	0.1287	1.5980	1.1983		LAKE 1405	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**3.23**			
"To" Proposed POA well LAKE 4437 closest to Paulina Marsh center when full (Transmissivity from Morgan (1988) and McFarland and Ryals (1991)): Used S = 0.001													
112,207.80	15,000.00	0.00100	1,751.69	3.90	245.00	34,150.00	3.14	0.0793	2.0347	3.6398		LAKE 4437	Continuous Pro-Rated Pumping
			1,751.69	**3.90**						**3.64**	**0.4127**		

Vertical GW Flow Using Darcy Equation

Darcy Equation: $Q = K A [(h_1 - h_2) / (L_1 - L_2)]$

Q = volumetric GW flow
K = hydraulic conductivity
A = area

$h_1 - h_2$ = change in head at lake center (head at lake vs. head of "main GW reservoir" potentiometric surface below lake)
$L_1 - L_2$ = distance for change in head (distance from lake bed to "main GW reservoir" deposits below)
$[(h_1 - h_2) / (L_1 - L_2)]$ = hydraulic gradient

Vertical GW Flow		Vertical GW Flow Change		Flow Change	Flow Change	Hydraulic Conductivity	Marsh Area		Change in Head	Head Change Distance	Comments
Q	Q	Q	Q	Percent	Increase	$K_v = K_{xy} / 100$	A	A	$h_1 - h_2$	$L_1 - L_2$	
(ft^3/day)	(acre-ft/day)	(ft^3/day)	(acre-ft/day)	%		(ft/day)	(ft^2)	(acre)	(feet)	(feet)	
Vertical GW flow from Paulina Marsh through lower permeability deposits to the higher permeability "main GW reservoir"											
64,650,699	1,484.18	---	---			0.63	510,104,933	11,710.40	30.00	150.00	all marsh, pre-transfer, wells = off, K = mean
30,463,467	699.34	---	---			0.30	510,104,933	11,710.40	30.00	150.00	all marsh, pre-transfer, wells = off, K = median
66,978,124	1,537.61	2,327,425	53.43	3.60%		0.63	510,104,933	11,710.40	31.08	150.00	all marsh, pre-transfer, wells = on 30 day full rate, K = mean
31,560,151	724.52	1,096,685	25.18	3.60%		0.30	510,104,933	11,710.40	31.08	150.00	all marsh, pre-transfer, wells = on 30 day full rate, K = median
65,792,862	1,510.40	1,142,162	26.22	1.77%		0.63	510,104,933	11,710.40	30.53	150.00	all marsh, pre-transfer, wells = on 30 day pro-rated, K = mean
31,001,655	711.70	538,188	12.36	1.77%		0.30	510,104,933	11,710.40	30.53	150.00	all marsh, pre-transfer, wells = on 30 day pro-rated, K = median
Vertical GW flow from Paulina Marsh through lower permeability deposits to the higher permeability "main GW reservoir"											
64,650,699	1,484.18	---	---			0.63	510,104,933	11,710.40	30.00	150.00	all marsh, post-transfer, wells = off, K = mean
30,463,467	699.34	---	---			0.30	510,104,933	11,710.40	30.00	150.00	all marsh, post-transfer, wells = off, K = median
67,861,684	1,557.89	3,210,985	73.71	4.97%	1.38	0.63	510,104,933	11,710.40	31.49	150.00	all marsh, post-transfer, wells = on 30 day full rate, K = mean
31,976,485	734.08	1,513,019	34.73	4.97%	1.38	0.30	510,104,933	11,710.40	31.49	150.00	all marsh, post-transfer, wells = on 30 day full rate, K = median
66,245,417	1,520.79	1,594,717	36.61	2.47%	1.40	0.63	510,104,933	11,710.40	30.74	150.00	all marsh, post-transfer, wells = on 30 day pro-rated, K = mean
31,214,899	716.60	751,432	17.25	2.47%	1.40	0.30	510,104,933	11,710.40	30.74	150.00	all marsh, post-transfer, wells = on 30 day pro-rated, K = median
Vertical GW flow from Paulina Marsh through lower permeability deposits to the higher permeability "main GW reservoir"											
64,650,699	1,484.18	---	---			0.63	510,104,933	11,710.40	30.00	150.00	all marsh, pre-transfer, wells = off, K = mean
30,463,467	699.34	---	---			0.30	510,104,933	11,710.40	30.00	150.00	all marsh, pre-transfer, wells = off, K = median
78,658,351	1,805.75	14,007,652	321.57	21.67%		0.63	510,104,933	11,710.40	36.50	150.00	all marsh, pre-transfer, wells = on 245 day full rate, K = mean
37,063,884	850.87	6,600,418	151.52	21.67%		0.30	510,104,933	11,710.40	36.50	150.00	all marsh, pre-transfer, wells = on 245 day full rate, K = median
71,611,425	1,643.97	6,960,725	159.80	10.77%		0.63	510,104,933	11,710.40	33.23	150.00	all marsh, pre-transfer, wells = on 245 day pro-rated, K = mean
33,743,367	774.64	3,279,900	75.30	10.77%		0.30	510,104,933	11,710.40	33.23	150.00	all marsh, pre-transfer, wells = on 245 day pro-rated, K = median
Vertical GW flow from Paulina Marsh through lower permeability deposits to the higher permeability "main GW reservoir"											
64,650,699	1,484.18	---	---			0.63	510,104,933	11,710.40	30.00	150.00	all marsh, post-transfer, wells = off, K = mean
30,463,467	699.34	---	---			0.30	510,104,933	11,710.40	30.00	150.00	all marsh, post-transfer, wells = off, K = median
80,447,020	1,846.81	15,796,321	362.63	24.43%	1.13	0.63	510,104,933	11,710.40	37.33	150.00	all marsh, post-transfer, wells = on 245 day full rate, K = mean
37,906,707	870.22	7,443,240	170.87	24.43%	1.13	0.30	510,104,933	11,710.40	37.33	150.00	all marsh, post-transfer, wells = on 245 day full rate, K = median
72,494,984	1,664.26	7,844,285	180.08	12.13%	1.13	0.63	510,104,933	11,710.40	33.64	150.00	all marsh, post-transfer, wells = on 245 day pro-rated, K = mean
34,159,701	784.20	3,696,234	84.85	12.13%	1.13	0.30	510,104,933	11,710.40	33.64	150.00	all marsh, post-transfer, wells = on 245 day pro-rated, K = median

Transient Stream Depletion Calculation (Hunt, 2003) for T-13908

Well	Depth (feet)	Distance (feet)	Discharge gpm	Discharge cfs	Silver Creek Depletion (pre-transfer distribution) 30	60	90	120	150	180	210	240	270	300	330	360	Unit
LAKE 4283	671	13,255	1,593.35	3.5500	0.000293	0.000468	0.000671	0.000901	0.001155	0.001434	0.001735	0.002058	0.002133	0.002323	0.002503	0.002672	cfs
LAKE 1331	648	14,145	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 4437	520	10,725	175.04	0.3900	0.000074	0.000112	0.000154	0.000199	0.000248	0.000300	0.000354	0.000411	0.000403	0.000427	0.000449	0.000469	cfs
LAKE 1330	525	14,900	26.93	0.0600	0.000003	0.000005	0.000007	0.000010	0.000013	0.000016	0.000019	0.000023	0.000025	0.000028	0.000030	0.000033	cfs
LAKE 1335	646	11,965	206.46	0.4600	0.000058	0.000090	0.000127	0.000167	0.000211	0.000258	0.000309	0.000363	0.000366	0.000393	0.000418	0.000441	cfs
LAKE 1336	522	9,040	41.52	0.0925	0.000031	0.000044	0.000059	0.000075	0.000091	0.000108	0.000126	0.000144	0.000134	0.000140	0.000144	0.000149	cfs
LAKE 1405	411	17,280	1,485.63	3.3100	0.000072	0.000125	0.000191	0.000270	0.000363	0.000468	0.000586	0.000717	0.000797	0.000902	0.001007	0.001110	cfs
Pre-transfer Totals			**3,528.93**	**7.8625**	**0.000531**	**0.000844**	**0.001209**	**0.001622**	**0.002081**	**0.002584**	**0.003129**	**0.003716**	**0.003858**	**0.004213**	**0.004551**	**0.004874**	cfs

Well	Depth (feet)	Distance (feet)	Discharge gpm	Discharge cfs	Silver Creek Depletion (post-transfer: pump maximum allowed at closest well only scenario, LAKE 1336) 30	60	90	120	150	180	210	240	270	300	330	360	Unit
LAKE 4283	671	13,255	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 1331	648	14,145	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 4437	520	10,725	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 1330	525	14,900	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 1335	646	11,965	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 1336	522	9,040	3,528.93	7.8625	0.002601	0.003763	0.005014	0.006342	0.007738	0.009192	0.010696	0.012244	0.011410	0.011879	0.012282	0.012627	cfs
LAKE 1405	411	17,280	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
Post-transfer Totals			**3,528.93**	**7.8625**	**0.002601**	**0.003763**	**0.005014**	**0.006342**	**0.007738**	**0.009192**	**0.010696**	**0.012244**	**0.011410**	**0.011879**	**0.012282**	**0.012627**	cfs
Post-transfer Totals Increase			**0.00**	**0.0000**	**0.002070**	**0.002919**	**0.003805**	**0.004720**	**0.005657**	**0.006608**	**0.007567**	**0.008528**	**0.007552**	**0.007666**	**0.007731**	**0.007753**	cfs
Post vs. Pre Totals ratio			**1.00**	**1.0000**	**4.898305**	**4.458531**	**4.147229**	**3.909988**	**3.718405**	**3.557276**	**3.418345**	**3.294941**	**2.957491**	**2.819606**	**2.698748**	**2.590685**	ratio

Well	Depth (feet)	Distance (feet)	Discharge gpm	Discharge cfs	Silver Creek Depletion (post-transfer: pump maximum allowed at furthest well only scenario, LAKE 1405) 30	60	90	120	150	180	210	240	270	300	330	360	Unit
LAKE 4283	671	13,255	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 1331	648	14,145	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 4437	520	10,725	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 1330	525	14,900	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 1335	646	11,965	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 1336	522	9,040	0.00	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	cfs
LAKE 1405	411	17,280	3,528.93	7.8625	0.000170	0.000298	0.000455	0.000642	0.000861	0.001111	0.001392	0.001704	0.001894	0.002143	0.002392	0.002638	cfs
Post-transfer Totals			**3,528.93**	**7.8625**	**0.000170**	**0.000298**	**0.000455**	**0.000642**	**0.000861**	**0.001111**	**0.001392**	**0.001704**	**0.001894**	**0.002143**	**0.002392**	**0.002638**	cfs
Post-transfer Totals Increase			**0.00**	**0.0000**	**-0.000361**	**-0.000546**	**-0.000754**	**-0.000980**	**-0.001220**	**-0.001473**	**-0.001737**	**-0.002012**	**-0.001964**	**-0.002070**	**-0.002159**	**-0.002236**	cfs
Post vs. Pre Totals ratio			**1.00**	**1.0000**	**0.320151**	**0.353081**	**0.376344**	**0.395808**	**0.413743**	**0.429954**	**0.444871**	**0.458558**	**0.490928**	**0.508664**	**0.525599**	**0.541239**	ratio

Theis_Equation_specific_capacity_to_transmissivity												
Basin_Fill												
Well County	**Well Num**	**Total Depth**	**Rate**	**Total Time**	**Drawdown**	**Diameter**	**GW**	**Transmissivity**	**Open Interval**	**Conductivity**	**Data**	
		feet	**gpm**	**hours**	**feet**	**inches**	**Source**	**ft2/day**	**feet**	**ft/day**	**Source**	
LAKE	1255	110	25	2	5	6	Basin Fill	1,153.09	30	38.44	Well Log	
LAKE	1258	155	15	4	10	20	Basin Fill	273.46	135	2.03	Well Log	
LAKE	1271	130	20	1	3	6	Basin Fill	1,493.05	50	29.86	Well Log	
LAKE	1276	130	100	3	20	6	Basin Fill	1,186.32	54	21.97	Well Log	
LAKE	1281	110	12	4	15	6	Basin Fill	169.49	40.5	4.18	Well Log	No total time recorded, used 4-hr default
LAKE	1290	108	30	4	10	6	Basin Fill	700.83	58	12.08	Well Log	
LAKE	1306	132	70	3	5	6	Basin Fill	3,557.21	50	71.14	Well Log	
LAKE	1307	132	60	3	5	6	Basin Fill	3,018.87	64	47.17	Well Log	
LAKE	1310	130	50	3	5	6	Basin Fill	2,485.97	47	52.89	Well Log	
LAKE	1312	119	25	1	5	6	Basin Fill	1,096.12	47	23.32	Well Log	
LAKE	1334	137	12	4	10	8	Basin Fill	250.87	110	2.28	Well Log	No total time recorded, used 4-hr default
LAKE	1346	77	200	3	10	6	Basin Fill	5,197.93	16	324.87	Well Log	
LAKE	1357	55	12	4	5	8	Basin Fill	529.18	2	264.59	Well Log	No total time recorded, used 4-hr default
LAKE	4033	100	25	1	6	6	Basin Fill	900.91	20	45.05	Well Log	
LAKE	5009	105	9	1	6	6	Basin Fill	298.98	28	10.68	Well Log	
							Min	**169.49**	**2.00**	**2.03**		
							Max	**5,197.93**	**135.00**	**324.87**		
							Mean	**1,487.49**	**50.10**	**63.37**		
							Median	**1,096.12**	**47.00**	**29.86**		
							25 percentile	**298.98**	**28.00**	**10.68**		
							50 percentile	**1,096.12**	**47.00**	**29.86**		
							75 percentile	**2,485.97**	**58.00**	**52.89**		

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 JAN 31 1975 STATE ENGINEER SALEM, OREGON

LAKE 1330

RECEIVED MAY 24 1974 STATE ENGINEER SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON

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

State Well No. 285/15E-13 db

State Permit No. G-7080

(1) OWNER:
Name View Point Ranches
Address P.O. Box 240
Chiloquin Valley 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 ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☒
14" Diam. from 0 ft. to 137 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) 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?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "
Bailer test 9 gal./min. with 219 ft. drawdown after 1 hrs.
Artesian flow g.p.m.
Temperature of water Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used Cement
Well sealed from land surface to 130 ft.
Diameter of well bore to bottom of seal 17 in.
Diameter of well bore below seal 14 in.
Number of sacks of cement used in well seal 8 sacks
Number of sacks of bentonite used in well seal sacks
Brand name of bentonite
Number of pounds of bentonite per 100 gallons of water lbs./100 gals.
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
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Lake. Driller's well number 2.
NW ¼ SE ¼ Section 13 T. 28S R. Rise W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 65 to 75 ft.
Static level 53 ft. below land surface. Date 4-14-74
Artesian pressure None. lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 14 in.
Depth drilled 295 ft. Depth of completed well 270 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
Brown Sandy Clay.	0	10	
Small Gray Gravle.	10	14	
Brown Sandy Clay.	14	65	
Small Gravel Carring Water	65	75	53
Small Gravel Black.	75	135	
Black Lava.	135	137	
Yellow Clay	137	170	
Black Sand Stone.	170	181	
Gray Clay	181	205	
Clay + Gravel Green	205	255	
Hard Brown Shale	255	270	
Black Heaving Sand.	270	295	51
Stopped Well, To be deepened at Later Date.			

Work started 4-10 19 74 Completed 5-9 19 74
Date well drilling machine moved off of well 5-15 19 74

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] Denny M. McClane (Drilling Machine Operator) Date May 13, 1974
Drilling Machine Operator's License No. 107

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 Denny M. McClane (Person, firm or corporation) (Type or print)
Address 1607 Austin Klamath Falls
[Signed] Denny M. McClane (Water Well Contractor)
Contractor's License No. 476 Date May 13, 1974

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

LAKE 1330

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

Application for
Well ID Number

RECEIVED BY OWRD

MAR 28 2016

SALEM, OR

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

I. OWNER INFORMATION

Current Owner Name *(please print)*: ZX Ranch / View Point Ranch

Mailing Address: PO Box 7

City, State, Zip: Paisley, OR 97636

Mail Well ID Tag to: ☒ SAME AS ABOVE ☐ In Care Of (C/O)

Name & Address: _____

City, State, Zip: _____

II. WELL LOCATION INFORMATION *(Please fill out as completely as possible)*

Township: 28 (North / (South)) Range: 15 ((East) / West) Section: 13 NW 1/4 of the SE 1/4

Tax Lot (usually last 3-5 numbers of Tax Map #): _____ County Lake

GPS Coordinates: _____

Street Address of Well, City: Silver Lake, Oregon

If the property had a different street address in the past: _____

III. GENERAL WELL INFORMATION *(Please fill out as completely as possible, AND attach copy of Well Log, if available)*

Use of Well (domestic, irrigation, commercial, industrial, monitoring): Irrigation

Date Well Constructed (or property built): 1974 Total Well Depth: 270 Casing Diameter: _____

Owner at time the well was constructed (if known): View Point Ranch Well Log # (if known): LAKE_1330

Other Information: _____

SUBMITTED BY *(please print)*: Daphne Story

PHONE: 541-943-3105 **EMAIL &/or FAX:** daphne.story@simplot.com

Send application to: Oregon Water Resources Department 725 Summer St NE, Suite A, Salem, Oregon 97301; or fax to (503) 986-0902. Applications are processed in the order they are received, and Well ID Numbers are mailed within 4-5 business days.

For Official Use Only by the Oregon Water Resources Department:

Received Date:	Well Log Number:	Well Identification #:
3-28-16	LAKE 1330	L-122406

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.

Lake 1331

LAKE 1331

WATER WELL REPORT

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

RECEIVED
AUG 23 1976

State Well No. .....
State Permit No. 28s/15E-13 bb

(1) OWNER:
Name View Point Ranch
Address Christmas Valley, Ore.

(2) TYPE OF WORK (check):
New Well [X] Deepening [ ] Reconditioning [ ] Abandon [ ]
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary [ ] Driven [ ]
Cable [X] Jetted [ ]
Dug [ ] Bored [ ]

(4) PROPOSED USE (check):
Domestic [ ] Industrial [ ] Municipal [ ]
Irrigation [X] Test Well [ ] Other [ ]

(5) CASING INSTALLED:
Threaded [ ] Welded [X]
14 " Diam. from 0 ft. to 116 ft. Gage .250
10 " Diam. from 165 ft. to 333 ft. Gage .188
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? [X] Yes [ ] No.
Type of perforator used Mills
Size of perforations 2 1/2 in. by 3/8 in.
710 perforations from 180 ft. to 330 ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? [ ] Yes [X] 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?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "
Bailer test 20 gal./min. with 0 ft. drawdown after 3 hrs.
Artesian flow g.p.m.
Temperature of water 51° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used Cement
Well sealed from land surface to 116 ft.
Diameter of well bore to bottom of seal 17 in.
Diameter of well bore below seal 14 in.
Number of sacks of cement used in well seal 10 sacks
Number of sacks of bentonite used in well seal — sacks
Brand name of bentonite —
Number of pounds of bentonite per 100 gallons of water lbs./100 gals.
Was a drive shoe used? [X] Yes [ ] No Plugs Size: location ft.
Did any strata contain unusable water? [ ] Yes [X] No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? [ ] Yes [X] No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County LAKE, OREGON Driller's well number Vaughn Valley 2
NW 1/4 NW 1/4 Section 13 T. 28S R. 15E W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 128 ft.
Static level 96 ft. below land surface. Date 1-31-76
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 14
Depth drilled 648 ft. Depth of completed well 648 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. *Report each change in position of Static Water Level and indicate principal water-bearing strata.*

MATERIAL	From	To	SWL
Top Soil	0	3	
Sand Med. Brown	3	11	
Clay Soft Brown	11	50	
Rock Decomposed	50	57	
Clay Soft Grey	57	72	
Clay Hard Yellow	72	86	
Chevasse	86	86½	
Clay Hard Brown	86½	88	
Rock Lava Hard	88	118	
Clay Cong. & Cinders	118	128	
Sand Med. Black w/B	128	129	96
Clay Hard Brown	129	146	
Sand Black w/ Pumice w/B	146	149	96
Packed Sand Black	149	184	
Sandstone Brown	184	235	
Sand stone Grey w/B	235	358	96
Clay Cong. Grey+Green w/B	358	635	93
Sand Coarse Black w/B	635	640	99
Rock Broken Lava + Cinders w/B	640	648	99

Work started 1-10 1976 Completed 7-22 1976
Date well drilling machine moved off of well 8-17 1976

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] Glen Blevins (Drilling Machine Operator) Date 8-18, 1976
Drilling Machine Operator's License No. 1015

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 Blaylock & Woods Well Drilling (Person, firm or corporation) (Type or print)
Address P.O. Box 2 Silver Lake, Ore.
[Signed] Silver Blaylock (Water Well Contractor)
Contractor's License No. 425 Date 8-18, 1976

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

LAKE 1331

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

Application for
Well ID Number

RECEIVED BY OWRD

MAR 28 2016

SALEM, OR

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

I. OWNER INFORMATION

Current Owner Name *(please print)*: ZX Ranch / View Point Ranch

Mailing Address: PO Box 7

City, State, Zip: Paisley, OR 97636

Mail Well ID Tag to: ☒ SAME AS ABOVE ☐ In Care Of (C/O)

Name & Address: _____

City, State, Zip: _____

II. WELL LOCATION INFORMATION *(Please fill out as completely as possible)*

Township: 28 (North / South) Range: 15 (East / West) Section: 13 NW 1/4 of the NW 1/4

Tax Lot (usually last 3-5 numbers of Tax Map #): _____ County Lake

GPS Coordinates: _____

Street Address of Well, City: Silver Lake, Oregon

If the property had a different street address in the past: _____

III. GENERAL WELL INFORMATION *(Please fill out as completely as possible, AND attach copy of Well Log, if available)*

Use of Well (domestic, irrigation, commercial, industrial, monitoring): Irrigation

Date Well Constructed (or property built): 1976 Total Well Depth: 648 Casing Diameter: _____

Owner at time the well was constructed (if known): View Point Ranch Well Log # (if known): LAKE_1331

Other Information: LAKE 4279

SUBMITTED BY *(please print)*: Daphne Story

PHONE: 541-943-3105 **EMAIL &/or FAX:** daphne.story@simplot.com

Send application to: Oregon Water Resources Department 725 Summer St NE, Suite A, Salem, Oregon 97301; or fax to (503) 986-0902. Applications are processed in the order they are received, and Well ID Numbers are mailed within 4-5 business days.

For Official Use Only by the Oregon Water Resources Department:

Received Date:	Well Log Number:	Well Identification #:
3-28-16	LAKE 1331 (original) LAKE 4279 (add liner-alt only)	L-122414

LAKE 1335

ORIGINAL
File Original and Duplicate with the STATE ENGINEER, SALEM, OREGON

Lake 1335

RECEIVED FEB 5 1958 STATE ENGINEER SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON

G50

State Well No. 28/15-13 B(1)

State Permit No. G410

(1) OWNER:
Name Ed Albertsen
Address Philomath Oregon

(2) LOCATION OF WELL:
County Lake Owner's number, if any— 3

SE ¼ SW ¼ Section 13 T. 28S R. 15 E W.M.

Bearing and distance from section or subdivision corner

(3) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐

Irrigation ☒ Test Well ☐ Other ☐

(5) TYPE OF WELL:
Rotary ☒ Driven ☐

Cable ☒ Jetted ☐

Dug ☐ Bored ☐

(6) CASING INSTALLED:
Threaded ☐ Welded ☐

12 " Diam. from G.L. ft. to 336 ft. Gage 50Lb.

" Diam. from ft. to ft. Gage

" Diam. from ft. to ft. Gage

(7) PERFORATIONS:
Perforated? ☒ Yes ☐ No

Type of perforator used Fabricated Type

SIZE of perforations ¼ in. by 3 in.

100 perforations from 106 ft. to 146 ft.

perforations from ft. to ft.

perforations from ft. to ft.

perforations from ft. to ft.

perforations from ft. to ft.

(8) 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.

(9) CONSTRUCTION:
Was well gravel packed? ☐ Yes ☒ No Size of gravel:

Gravel placed from ft. to ft.

Was a surface seal provided? ☐ Yes ☐ No To what depth? ft.

Material used in seal—

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? Depth of strata

Method of sealing strata off

(10) WATER LEVELS:
Static level 20' ft. below land surface Date 11/21/57

Artesian pressure lbs. per square inch Date

Log Accepted by:

[Signed] A E Albertsen (Owner) Date 2/4/58 19

(11) WELL TESTS:
Drawdown is amount water level is lowered below static level

Was a pump test made? ☒ Yes ☐ No If yes, by whom? Western Pump Co.

Yield: 1600 gal./min. with 35 ft. drawdown after 4 hrs.

" " " "

" " " "

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

Artesian flow g.p.m. Date

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

(12) WELL LOG:
Diameter of well 12" inches.

Depth drilled 346 ft. Depth of completed well 346 ft.

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Sand and Clay	0	18
Loose Sand	18	24
Sand and Clay	24	76
Shale	76	89
Sand and Clay	89	218
Fine Sand	218	312
Shale	312	340
Clay	340	613
Black Basalt	613	627
Red Cinders	627	634
Lava Rock	634	642
Gray Rock	642	646
W.L. 17.5' below T.C. 5/9/59 Field Crew		

Work started Oct. 16 19 57 Completed Nov. 21 19 57

(13) PUMP:
Manufacturer's Name

Type: H.P.

Well Driller's Statement:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Frank Skillings (Person, firm, or corporation) (Type or print)

Address Rt. 1 Box 243 Corvallis Oregon

Driller's well number

[Signed] Frank Skillings (Well Driller)

License No. 214 Date Nov. 21, 1957

(USE ADDITIONAL SHEETS IF NECESSARY)

Western Pump & Irrigation Co.
P. O. BOX 54
SILVER LAKE, OREGON

DEVELOPING AND TESTING TIME SHEET

28/15 – 13 PW) LAKE

CUSTOMER A. E ALBERTSEN LOCATION WELL #3 SILVER LAKE DATE 11-20-57

Well Size 12" Depth ____ Pump Setting 90' Air Line 90'

Started Pump at 11:30 A.M. Standing Water Level at Start of Test 20' Feet

DEV. & TESTING (Time) 11:30 AM	PUMPING LEVEL (Ft.)	G.P.M.	SURGED WELL (Time) ____ M. CONDITION
11:30 P.M.	40'	1000	CLEAR
12:45 P.M.	60'	1500	MURKY
1:15 P.M.	63'	1600	CLEARING
2:15 P.M.	63'	1600	CLEARING
3:30 P.M.	63'	1600	CLEAR

DEV. & TESTING (Time) ____ M.	PUMPING LEVEL (Ft.)	G.P.M.	SURGED WELL (Time) ____ M.

BACK DOWN TEST

P.L. ____ G.P.M. ____
P.L. ____ G.P.M. ____
P.L. ____ G.P.M. ____
P.L. ____ G.P.M. ____
P.L. ____ G.P.M. ____
P.L. ____ G.P.M. ____

GRAVEL MOVED ____ Ft.
GRAVEL MOVED ____ Ft.
GRAVEL MOVED ____ Ft.
GRAVEL MOVED ____ Ft.

STOPPED TESTING AT 3:45 P.M.

DATE 11-20-57

WATER LEVEL: 43' 1 MINUTE 20 Feet
WATER LEVEL: 20' 5 MINUTES 43 Feet
WATER LEVEL: 20' 30 MINUTES 43 Feet

STANDING LEVEL 20 Feet

Take Readings Every 2 Hours

Western Pump & Irrigation Co.
P. O. BOX 54
SILVER LAKE, OREGON

Engineer [signature]

STATE ENGINEER
Salem, Oregon

LAKE 1335

State Well No. 28/15-13 P(1)

County Lake

Application No. G-410

Water Level Record

OWNER: Ed Albertsen OWNER'S NO. #3

Description of measuring point: Top of well port on west side of pump base which is 0.60

Date	Water Level Feet (above) (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks
4/24/58	16.80	WSB - New well			
10/15/58	16.90	WSB - Pump inst.			
5/11/59	-	wet Tape - can't measure - Pump operating 75 H.P. Turb			
10/14/59	17.82	WSB. static			
4-26-60	16.70	JES:WSB			
10-24-60	18.12	WSB			
5-2-61	Pumping	WSB			
10-19-61	18.14	WSB & RD - OIL			

REMARKS:

State Printing 89314

LAKE 1335

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

Application for Well ID Number

RECEIVED
MAY 11 2016
WATER RESOURCES DEPT
SALEM, OREGON

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

I. OWNER INFORMATION

Current Owner Name *(please print)*: ZX Ranch

Mailing Address: PO Box 7

City, State, Zip: Paisley, OR 97636

Mail Well ID Tag to: ☒ SAME AS ABOVE ☐ In Care Of (C/O)

Name & Address:

City, State, Zip:

II. WELL LOCATION INFORMATION *(Please fill out as completely as possible)*

Township: 28 (North / South) Range: 15 (East / West) Section: 13 SE 1/4 of the SW 1/4

Tax Lot (usually last 3-5 numbers of Tax Map #): 500 County LAKE

GPS Coordinates: 43.14014 -120.89440

Street Address of Well, City: SILVER LAKE, OREGON

If the property had a different street address in the past:

III. GENERAL WELL INFORMATION *(Please fill out as completely as possible, AND attach copy of Well Log, if available)*

Use of Well (domestic, irrigation, commercial, industrial, monitoring): IRRIGATION

Date Well Constructed (or property built): 11/21/1957 Total Well Depth: 346' Casing Diameter: 12

Owner at time the well was constructed (if known): ED ALBERTSEN Well Log # (if known): LAKE 1335

Other Information:

SUBMITTED BY *(please print)*: DAPHNE STORY

PHONE: 541-943-3105 **EMAIL &/or FAX:** daphne.story@simplot.com

Send application to: Oregon Water Resources Department 725 Summer St NE, Suite A, Salem, Oregon 97301; or fax to (503) 986-0902. Applications are processed in the order they are received, and Well ID Numbers are mailed within 4-5 business days.

For Official Use Only by the Oregon Water Resources Department:

Received Date:	Well Log Number:	Well Identification #:
5-11-16	LAKE 1335	L-122914

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.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

Lake 1336

State Well No. 28S/15E-14dd

State Permit No.

RECEIVED
JUN 19 1978
WATER RESOURCES DEPT.
SALEM, OREGON

(1) OWNER:
Name View Point Ranch
Address Christmas Valley
Oregon 97638

(2) TYPE OF WORK (check):
New Well [X] Deepening [ ] Reconditioning [ ] Abandon [ ]
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary [ ] Driven [ ]
Cable [X] Jetted [ ]
Dug [ ] Bored [ ]

(4) PROPOSED USE (check):
Domestic [ ] Industrial [ ] Municipal [ ]
Irrigation [X] Test Well [ ] Other [ ]

CASING INSTALLED:
Threaded [ ] Welded [X]
14" Diam. from 0 ft. to 125 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

PERFORATIONS:
Perforated? [ ] Yes [X] 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 [X] 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? [X] Yes [ ] No If yes, by whom? Del Hand
Yield: 14 60 gal./min. with 34 ft. drawdown after 4 hrs.
" " "
" " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 48 Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used Cement
Well sealed from land surface to 60 ft.
Diameter of well bore to bottom of seal 18 in.
Diameter of well bore below seal 14 in.
Number of sacks of cement used in well seal 15 sacks
Number of sacks of bentonite used in well seal NONE sacks
Brand name of bentonite
Number of pounds of bentonite per 100 gallons of water lbs./100 gals.
Was a drive shoe used? [X] Yes [ ] No Plugs 2X4 Size: location 125 ft.
Did any strata contain unusable water? [ ] Yes [X] No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? [ ] Yes [X] No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Lake Driller's well number
SE¼ SE¼ Section 14 T. 28S R. 15E W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 85 ft.
Static level 17FT 4 IN. ft. below land surface. Date 5-30-78
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 14 IN.
Depth drilled 522 ft. Depth of completed well 522 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. *Report each change in position of Static Water Level and indicate principal water-bearing strata.*

MATERIAL	From	To	SWL
Top Soil	0	2	
Grey Clay	2	7	
Hard Grey Lava	7	30	
Soft Grey Clay	30	80	
Coarse Grey Sand	80	82	30
Soft Blue Clay	82	110	
Grey Lava	110	142	
Soft Blue Clay	142	155	
Fine Sinders	155	160	
Hard Brown Clay	160	175	
Decomposed Lava	175	210	
Hard Grey Lava	210	246	
Fine Red Sinders	246	248	
Hard Grey Clay	248	267	
Fine White pumice Sand	267	269	
Soft Grey Clay	269	288	
Coarse Grey Sand	288	289	
Soft Grey Clay	289	332	
Fine Black Sand	332	334	

Work started 1-25 19 78 Completed 5-29 19 78
Date well drilling machine moved off of well 5-30 19 78

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] Silas Blaylock (Drilling Machine Operator) Date 6-7, 19 78
Drilling Machine Operator's License No. 383

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 Silas Blaylock (Person, firm or corporation) (Type or print)
Address Box 2 Silver Lake Or. 97638
[Signed] Silas Blaylock (Water Well Contractor)
Contractor's License No. 425 Date 6-7, 19 78

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

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.

WATER WELL REPORT

STATE OF OREGON

(Please type or print)

(Do not write above this line)

State Well No. .....

State Permit No. .....

(1) OWNER:

Name

Address

(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 ☐

(5) CASING INSTALLED:

Threaded ☐ Welded ☐

..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " 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?

Yield: gal./min. with ft. drawdown after hrs.

" " " "

" " " "

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

Artesian flow g.p.m.

Temperature of water Depth artesian flow encountered ..... ft.

(9) CONSTRUCTION:

Well seal—Material used .....

Well sealed from land surface to ..... ft.

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

Diameter of well bore below seal ..... in.

Number of sacks of cement used in well seal ..... sacks

Number of sacks of bentonite used in well seal ..... sacks

Brand name of bentonite .....

Number of pounds of bentonite per 100 gallons of water ..... lbs./100 gals.

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

Method of sealing strata off

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

Gravel placed from ..... ft. to ..... ft.

(10) LOCATION OF WELL:

County Driller's well number

¼ ¼ Section T. R. W.M.

Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.

Depth at which water was first found ft.

Static level ft. below land surface. Date

Artesian pressure lbs. per square inch. Date

(12) WELL LOG:

Diameter of well below casing .....

Depth drilled ft. Depth of completed well 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
Soft Blue Clay	334	398	
Fine pumice Gravel	398	399	
Hard Blue Clay	399	445	
Hard Brown Clay	445	472	
Coarse Brown Sand	472	474	
Hard Brown Clay	474	520	
Fine Black Sand	520	522	

Work started 19 Completed 19

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] ..... Date ....., 19.....
(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] .....
(Water Well Contractor)

Contractor's License No. ..... Date ....., 19.....

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

LAKE 1405

OBSERVATION WELL

STATE ENGINEER
Salem, Oregon

Lake 1405

Well Record

STATE WELL NO. 28/16-19C(1)
COUNTY Lake
APPLICATION NO. U-656

OWNER: A. E. Albertsen

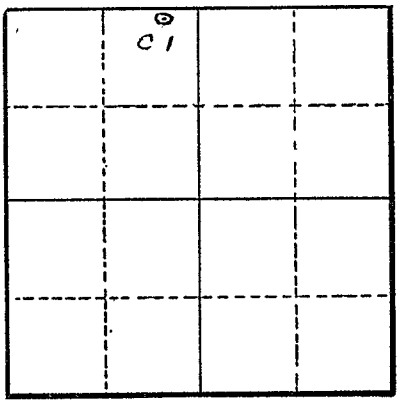
MAILING ADDRESS:

CITY AND STATE:

LOCATION OF WELL: Owner's No. 1

NE ¼ NW ¼ Sec. 19 T. 28 ~~N.~~ S., R. 16 ~~W.~~ E., W.M.

Bearing and distance from section or subdivision corner S. 84° 18' W. 471 ft. from N¼ cor. Sec. 19



Section 19

Altitude at well

TYPE OF WELL: drilled Date Constructed 1953

Depth drilled 411 Depth cased

CASING RECORD: 16 inch

FINISH:

AQUIFERS:

WATER LEVEL: 41 ft. on 12-7-53

PUMPING EQUIPMENT: Type H.P.
Capacity G.P.M.

WELL TESTS:
Drawdown ft. after hours G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER irrigation Temp. °F., 19
SOURCE OF INFORMATION
DRILLER or DIGGER
ADDITIONAL DATA:
Log X Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 28/16-19C(1)
County Lake
Application No. U-656

Well Log

Owner: A. E. Albertson Owner's No.

Driller: Pat McGinley Date Drilled

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Soil	0	15	15
Hardpan or cemented gravel	15	30	15
Chalk	30	65	35
Lava, black, small amount of water	65	68	3
Lava, soft black more water at 75' to 80'	68	80	12
Lava, firm black	80	87	7
Lava, soft, black	87	105	18
Chalk, brown	105	345	240
Shale, black	345	352	7
Lava, black	352	375	23
Lava, varigated, some sand	375	381	6
Lava, soft, red, and sand	381	405	24
Lava, red, firm	405	408	3
Lava, black firm	408	411	3

LAKE 1405

STATE ENGINEER
Salem, Oregon

State Well No. 28/16-19 C D

County LAKE

Application No. U-656

Water Level Record

OWNER: A. E. Albertson OWNER'S NO.

Description of measuring point: Top of port on East side of Pump base at LSD

Date	Water Level Feet (above) (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks
4-26-60	37.53	JES-WSB			
10-26-60	37.68	WSB			
5-4-61	Pumping	WSB			
10/19/61	38.03	WSB & RD			

REMARKS:

State Printing 89314

LAKE 1405

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

Application for Well ID Number

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

RECEIVED
MAY 11 2016
WATER RESOURCES DEPT
SALEM, OREGON

I. OWNER INFORMATION

Current Owner Name *(please print)*: ZX Ranch

Mailing Address: PO Box 7

City, State, Zip: Paisley, OR 97636

Mail Well ID Tag to: ☒ SAME AS ABOVE ☐ In Care Of (C/O)

Name & Address:

City, State, Zip:

II. WELL LOCATION INFORMATION *(Please fill out as completely as possible)*

Township: 28 (North / (South)) Range: 16 ((East) / West) Section: 19 NE 1/4 of the NW 1/4

Tax Lot (usually last 3-5 numbers of Tax Map #): 1700 County LAKE

GPS Coordinates: 43.13645 -120.87143

Street Address of Well, City: SILVER LAKE, OREGON

If the property had a different street address in the past:

III. GENERAL WELL INFORMATION *(Please fill out as completely as possible, AND attach copy of Well Log, if available)*

Use of Well (domestic, irrigation, commercial, industrial, monitoring): IRRIGATION

Date Well Constructed (or property built): 1953 Total Well Depth: 411' Casing Diameter: 16

Owner at time the well was constructed (if known): A.E. ALBERTSEN Well Log # (if known): LAKE_1405

Other Information:

SUBMITTED BY *(please print)*: DAPHNE STORY

PHONE: 541-943-3105 **EMAIL &/or FAX:** daphne.story@simplot.com

Send application to: Oregon Water Resources Department 725 Summer St NE, Suite A, Salem, Oregon 97301; or fax to (503) 986-0902. Applications are processed in the order they are received, and Well ID Numbers are mailed within 4-5 business days.

For Official Use Only by the Oregon Water Resources Department:

Received Date:	Well Log Number:	Well Identification #:
5-11-16	LAKE 1405	L-122913

LAKE 4283

RECEIVED
AUG 30 1993
WATER RESOURCES DEPT.
SALEM, OREGON

28S/15E/1366

STATE OF OREGON
WATER WELL REPORT
(as required by ORS 537.765)

(START CARD) # 45339

(1) OWNER: Well Number
Name View Point RANCH
Address Christmas Valley
City State Ore Zip 97641

(2) TYPE OF WORK:
☑ New Well ☐ Deepen ☐ Recondition ☐ Abandon

(3) DRILL METHOD:
☑ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Other

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

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☑ No Depth of Completed Well 671 ft.
Explosives used ☐ Yes ☒ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
24"	0	28	cement	0	28	32 Sack
18"	28	190				
14"	190	320				
12"	320	671				

How was seal placed: Method ☐ A ☐ B ☑ C ☐ D ☐ E
☐ Other
Backfill placed from ft. to ft. Material
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	18"	+1	28	250	☑	☐	☑	☐
	14"	0	190	250	☑	☐	☑	☐
	10"	190	320		☐	☑	☐	☐
	10"	320	671		☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:
☐ Perforations Method None
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
100	190	Mill		14"		☐ 250	☑
190	320	Mill		10"		☐	☑
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☑ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
2000		671	1 hr.

Temperature of Water 53 Depth Artesian Flow Found
Was a water analysis done? ☐ Yes By whom
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

(9) LOCATION OF WELL by legal description:
County LAKE Latitude Longitude
Township 28 S N or S. Range 15E E or W. WM.
Section 13 NW ¼ SW ¼
Tax Lot 500 Lot Block Subdivision
Street Address of Well (or nearest address) Vaughn Valley

(10) STATIC WATER LEVEL:
101 ft. below land surface. Date 7-28-93
Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:
Depth at which water was first found 135 ft

From	To	Estimated Flow Rate	SWL
135 ft	137 ft	90 GAL-M	101

(12) WELL LOG:
Ground elevation

Material	From	To	SWL
CLAY & SAND GRAVEL	0	11	
	11	20	
BROWN STONE	20	90	
BLACK LAVA ROCK	90	130	
BLACK SANDSTONE	130	135	
BLACK SAND	135	176	WB
BROWN STONE	176	230	
BROWN SANDSTONE	230	285	
GRAY STONE	285	576	
BLACK SANDSTONE	576	640	
BLACK & BROWN CINDERS	640	671	WB

RECEIVED
NOV - 1 1993
WATER RESOURCES DEPT
SALEM, OREGON

RECEIVED
JAN 26 1994
WATER RESOURCES DEPT
SALEM, OREGON

Date started 6-31-93 Completed 7-28-93

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.

WWC Number
Signed Date

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 567
Signed Melvin Leach Date 9-28-93

ORIGINAL & FIRST COPY - WATER RESOURCES DEPARTMENT SECOND COPY - CONSTRUCTOR THIRD COPY - CUSTOMER 9809C 10/91

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

Application for
Well ID Number

RECEIVED BY OWRD

MAR 2 8 2016

SALEM, OR

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

I. OWNER INFORMATION

Current Owner Name *(please print)*: ZX Ranch / View Point Ranch

Mailing Address: PO Box 7

City, State, Zip: Paisley, OR 97636

Mail Well ID Tag to: ☒ SAME AS ABOVE ☐ In Care Of (C/O)

Name & Address: _____

City, State, Zip: _____

II. WELL LOCATION INFORMATION *(Please fill out as completely as possible)*

Township: 28 (North / South) Range: 15 (East / West) Section: 13 NW 1/4 of the NW 1/4

Tax Lot (usually last 3-5 numbers of Tax Map #): _____ County Lake

GPS Coordinates: _____

Street Address of Well, City: Silver Lake, Oregon

If the property had a different street address in the past: _____

III. GENERAL WELL INFORMATION *(Please fill out as completely as possible, AND attach copy of Well Log, if available)*

Use of Well (domestic, irrigation, commercial, industrial, monitoring): Irrigation

Date Well Constructed (or property built): 1993 Total Well Depth: 671 Casing Diameter: _____

Owner at time the well was constructed (if known): View Point Ranch Well Log # (if known): LAKE_4283

Other Information: _____

SUBMITTED BY *(please print)*: Daphne Story

PHONE: 541-943-3105 **EMAIL &/or FAX:** daphne.story@simplot.com

Send application to: Oregon Water Resources Department 725 Summer St NE, Suite A, Salem, Oregon 97301; or fax to (503) 986-0902. Applications are processed in the order they are received, and Well ID Numbers are mailed within 4-5 business days.

For Official Use Only by the Oregon Water Resources Department:

Received Date:	Well Log Number:	Well Identification #:
3-28-16	LAKE 4283	L-122416

ORIGINAL
File Original, and Duplicate with the STATE ENGINEER SALEM, OREGON

NOV 14 1956
STATE ENGINEER
SALEM, OREGON

WATER WELL DRILLERS REPORT
STATE OF OREGON

Do Not Fill In — State Well No. 28/15 - ~~14 H (1)~~ -F Q (2)
State Permit No. 14 H (3)

A 09 G 51

4431

(1) OWNER:
Name ~~Buster Vaughn~~ A. E. Albertson VIEW POINT RANCH INC.
Address Paisley, Oregon

(2) LOCATION OF WELL: near Silver Lake, Ore.
County Lake Owner's number, if any— 2
R. F. D. or Street No.
Bearing and distance from section or subdivision corner N. 29° 10' E. 134.8 ft. from the SW cor. of the SE NE
Apparently within SE NE, Sec. 14, T. 28 S, R. 15 E.W.M.

(3) TYPE OF WORK (check):
New well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(5) EQUIPMENT:
Rotary ☐
Cable ☒
Dug Well ☐

(6) CASING INSTALLED:
Threaded ☐ Welded ☒

FROM	ft. to	ft.	Diam.	Gage or Wall
0	342		16	

If gravel packed — Diameter of Bore, from ft., to ft.

Type and size of shoe or well ring 16 Size of gravel:
Describe joint

(7) PERFORATIONS:
Type of perforator used
SIZE of perforations in., length, by in.
FROM ft. to ft. perf per foot No. of rows

SCREENS:
Give Manufacturer's Name, Model No. and Size

(8) CONSTRUCTION:
Was a surface sanitary seal provided? ☐ Yes ☐ No To what depth ft.
Were any strata sealed against pollution? ☐ Yes ☐ No
If yes, note depth of strata
FROM ft. to ft.
METHOD OF SEALING

(9) WATER LEVELS:
Depth at which water was first found 67 ft.
Standing level before perforating ft.
Standing level after perforating ft.
Log Accepted by:
[Signed] .... Dated ...., 19....
Owner

App. G-50 & 51

(10) WELL TESTS:
Was a pump test made? ☐ Yes ☒ No If yes, by whom? Valley Pump Co
Yield: gal./min. with ft. draw down after hrs.

OBSERVATION WELL

Artesian flow .... g.p.m.
Shut-in pressure .... lbs. per square inch.
Bailer test .... g.p.m. with .... ft. drawdown
Temperature of water Was a chemical analysis made? ☐ Yes ☐ No
Was electric log made of well? ☐ Yes ☐ No

(11) WELL LOG:
Diameter of well, 16 inches.
Total depth 520 ft. Depth of completed well 520 ft.
Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

ft. to	ft.	
0	7	Soil & Gravel
7	28	Hard Dark Lava
28	245	Sand--First Water 67'
245	452	Rotten Chalk
452	477	Broken Lava
477	495	Red Lava
495	499	Red Soft Lava-4' more Water
499	508	Red Firm Lava
508	510	Dark Cinders
510	520	Hard Black Lava

Ground elevation at well site .... feet above mean sea level.
Work started Nov. 1954 Completed Feb. 1955

Well Driller's Statement:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Pat McGinley
(Person, firm, or corporation) (Typed or printed)
Address Tulelake, California.
Driller's well number
[Signed] L. M. Brownlee
(Well Driller)
License No. 154 Dated Nov. 29, 1955

14 N(2)

STATE ENGINEER
Salem, Oregon

State Well No. 28/15-~~14~~ 6Q(1)

County Lake

Application No. .....

A.E. Albertson

Water Level Record

OWNER: ~~W.W. Vaughn~~ OWNER'S NO. .....

Description of measuring point: Top of casing at + 1.3 feet above LSD.
Change to bottom of rectangular slot cut in west side of casing at L.S.D.

Date	Water Level Feet ~~(above)~~ (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks
5/25/56	47.35	WSB.			
8-29-56	46.90	WSB.			
10-17-56	46.70	WSB.			
5-2-57	46.28	WSB.			
8-21-57	—	WSB Pumping (wet Tape)			
4-26-60	46.04	SES-WSB			
10-26-60	47.00	WSB			
5-3-61	Pumping	WSB			
10-19-61	48.77	WSB&RD			

REMARKS: New well See hydrograph.

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