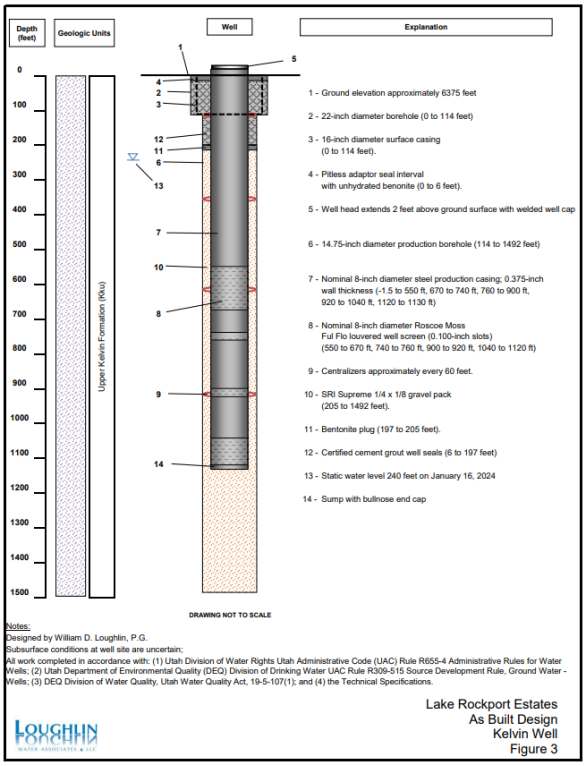
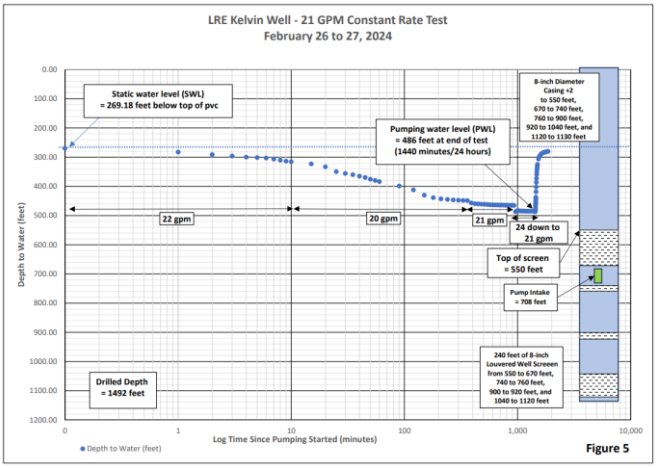
WELL CONSTRUCTION REPORT
KELVIN WELL
WS003, DDW FILE #12669
LAKE ROCKPORT ESTATES
PUBLIC WATER SUPPLY SYSTEM #22104
SUMMIT COUNTY, UTAH





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LOUGHLIN WATER ASSOCIATES LLC

Prepared for:
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Attn: Ted Mickelson, P.E.
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May 2024

May 10, 2024

Utah Division of Drinking Water
Attn: Michael Newberry, P.E., Section Manager
Permitting & Engineering Support
P.O. Box 144830
Salt Lake City, Utah 84114-4830

Subject: **Transmittal – Well Construction Report - Kelvin Well (WS003)**
Lake Rockport Estates, Public Water System (PWS) #22104, File #12669
Summit County, Utah
For Lake Rockport Estates

Dear Michael:

Please find attached the Well Construction Report for the Kelvin Well (WS003) for Lake Rockport Estates, Public Water System (PWS) #22104, Summit County, Utah. The report includes some of the information required by the Utah Division of Drinking Water (DDW) for compliance with Utah Administrative Code R309-515-6(5)(c). The DDW issued a Plan Approval for the well (File #12669) in a letter dated November 9, 2023. We will submit a Drinking Water Source Protection (DWSP) plan for the well to the DDW under separate cover.

If you have any questions or need more information, please do not hesitate to call me at or (435) 649-4005.

Very truly yours,

Loughlin Water Associates, LLC

William D. Loughlin, P.G.
Manager, Principal Hydrogeologist

Enclosure

Cc: Greg Warner - Lake Rockport Estates
Julie Cobleigh – Utah Division of Drinking Water
Michael Hartvigsen – Jones & DeMille Engineers

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WELL CONSTRUCTION REPORT
KELVIN WELL
WIN 448417 (WS003)
LAKE ROCKPORT ESTATES
PUBLIC WATER SYSTEM (PWS) #22104, FILE#12669
SUMMIT COUNTY, UTAH

Prepared for:

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STATE OF UTAH

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Date: May 10, 2024

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EXECUTIVE SUMMARY

This report summarizes the drilling, construction, and testing of the Kelvin Well (the well) for Lake Rockport Estates. Lake Rockport Estates is Utah Division of Drinking Water (DDW) Public Water System (PWS) #22104. This report provides information required by the DDW for a new PWS well in accordance with Utah Administrative Code (UAC) R309-515-6(5)(c). The DDW tracked and permitted the Kelvin Well as part of Lake Rockport Estates, PWS #22104, File #12669. Figures 1 and 2 show the location of the well.

Loughlin Water Associates, LLC (Loughlin Water, 2021a,b) submitted Technical Specifications and a Preliminary Evaluation Report (PER) for the Kelvin Well to DDW during July 2021. DDW (2023) concurred with both the Technical Specifications and the PER in November 2023. Appendix A provides a copy of the DDW approval letter.

DDW approved the plan to drill the well subject to submittal of a Start Card issued by the Utah Division of Water Rights (DWRi), also known as the State Engineer. The DWRi (1) approved Water Right Exchange Application E5778 (35-13385), (2) issued Start Card, and (3) assigned it Well Identification Number (WIN) 448158. Appendix B provides copies of the DWRi approval and Start Card.

Alan Lang (Lang), Utah License No. 873, drilled, constructed, developed, and tested the well from December 1, 2023, to February 27, 2024. Lang drilled the well to 1492 feet and installed (1) 16-inch diameter steel casing with a certified grout seal to 114 feet, (2) 8-inch diameter production casing interspersed with 240 feet of 0.100-inch louvered well screen and a 10-foot sump from +1.5 to 1130 feet, (3) 1/4 x 1/8-inch gravel pack from 114 to 1492 feet , and (4) a certified grout seal from 6 to 197 feet and a 10-foot bullnose sump to 1130 feet. Lang subcontracted Century Wireline Services (Century) to geophysically log the borehole.

Appendix C provides a copy of the Well Driller Report (well log) and lithologic log. Table 1 summarizes, and Figure 3 illustrates, the as-built construction of the well. Appendix D provides a copy of the geophysical logs, and Appendix E provides a copy of the grout seal certification letter.

Lang conducted a step rate test at approximately 20, 23, 27, 30, 32, and 37 gallons per minute (gpm) on February 23, 2024, and a 24-hour constant-rate test at 44 gpm from February 26 to 27, 2024. Appendix F provides a copy of the performance curve for the test pump. Appendix G presents and Figures 4 and 5 plot the pumping test data. Table 2 presents the calculated specific capacities from pump testing.

We assessed water quality through the (1) monitoring of "*field*" parameters during development and pump testing and (2) collection of a sample at the end of the 24-hour pumping test for laboratory analysis. Chemtech-Ford Laboratories (Chemtech) analyzed the sample for the parameters required by Utah Administrative Code (UAC) R309-515-4(5) for a new PWS well for a non-transient, community system. Table 3 summarizes field measurements of water quality parameters during constant-rate testing of the well. Appendix H provides copies of laboratory reports and chain-of-custody forms. Table 4 summarizes and compares the analytical results to Utah Drinking Water Standards.

Total dissolved solids (TDS) were 688 milligrams per liter (mg/L), which is less than the Utah Primary Maximum Contaminant Level (PCML) of 1000 mg/L but greater than the Secondary Maximum Contaminant Limit (SMCL) of 500 mg/L. Iron at 0.46 mg/L exceeded the SMCL of 0.3 mg/L and pH at 8.8 units was outside the SMCL range of 6.5 to 8.5 units.

Lang disinfected the well on February 28, 2024, following the procedures outlined in UAC R309-515-6(11), *Well Disinfection* and UAC R655-9.6.5, *Well Disinfection and Chlorination of Water*. Loughlin Water collected a sample at the end of the 24-hour constant rate pumping test on February 27, 2024, for laboratory analysis of e. coli and Coliform bacteria. Both forms of bacteria were absent from the sample.

According to UAC R309-110-4 and R309-515-6(10)(c), the safe yield of the Kelvin Well is about 14 gpm, which is about two-thirds of the 21-gpm test rate; however, the well could be equipped to pump at a rate up to the test rate of about 21 gpm. The intake for the pump should be set at or deeper than about 700 to 720 feet, the depth at which the test pump was set.

DIVISION OF DRINKING WATER REQUIRED INFORMATION

This report summarizes the drilling, construction, and testing of the Kelvin Well (the well) for Lake Rockport Estates. Lake Rockport Estates is Utah Division of Drinking Water (DDW) Public Water System (PWS) #22104 and the well is DDW Source WS003. This report provides information required by the DDW for a new PWS well in accordance with Utah Administrative Code (UAC) R309-515-6(5)(c). The DDW tracked and permitted the Kelvin Well as part of Lake Rockport Estates, PWS #22104, File #12669. Figures 1 and 2 show the location of the well.

Loughlin Water Associates, LLC (Loughlin Water, 2021a,b) submitted Technical Specifications and a Preliminary Evaluation Report (PER) for the well to DDW during July 2021. DDW (2023) concurred with both the Technical Specifications and the PER in November 2023. Appendix A provides a copy of the DDW approval letter.

DDW approved the plan to drill the well subject to submittal of a Start Card issued by the Utah Division of Water Rights (DWRi), also known as the State Engineer. The DWRi (1) approved Water Right Exchange Application E5778 (35-13385), (2) issued the Start Card, and (3) assigned it Well Identification Number (WIN) 448158. Appendix B provides copies of the DWRi approval and Start Card.

The following appendices provide information required by the DDW for compliance with Utah Administrative Code (UAC) R309-515-6(5)(b) and (c) and supplementary well construction information:

- DDW Plan Approval – Appendix A
- DWRi Water Right Approval and Start Card – Appendix B
- Well Driller Report and Lithologic Log – Appendix C
- Geophysical Logs – Appendix D
- Grout Seal Certification Letter – Appendix E
- Performance Curve for Test Pump – Appendix F
- Pumping Test Data – Appendix G
- Analytical Laboratory Report – Appendix H

This report discusses the information provided in these appendices. Plans and specifications to equip and connect the Kelvin Well to the Lake Rockport Estates PWS will be prepared and submitted to the DDW by others.

DRILLING, LOGGING, AND CONSTRUCTION OF KELVIN WELL

LOCATION

Figures 1 and 2 show the location of the Kelvin Well, which is approximately:

- South 805 feet and East 101 feet from the North Quarter (N4) Corner of Section 5, Township 1 South, Range 5 East, Salt Lake Base and Meridian (SLB&M);

- Easting 465,762.3 meters; Northing 4,512,981.4 meters (UTM NAD 83); and
- Latitude 40.767096 degrees north and Longitude -111.405686 degrees (NAD83).

DRILLING AND WELL CONSTRUCTION

Alan Lang (Lang), Utah License No. 568 (Alan Lang), drilled, constructed, and tested the Kelvin Well from December 1, 2023, to February 27, 2024. Lang collected drill cutting samples from the borehole approximately every 5 feet by compositing samples over 5-foot intervals as the cuttings were discharged from the cyclone.

Loughlin Water observed well drilling, described drill cuttings, reviewed geophysical logs, prepared the final well design, observed well construction and development, observed, and certified the grout seal, helped plan and monitor pumping tests, and collected water quality samples.

GEOPHYSICAL LOGGING

Century Wireline Services (Century) performed geophysical logging of the borehole on December 22, 2023. Appendix D provides copies of the geophysical logs, including:

- Spontaneous potential;
- Short and long normal electrical resistance;
- Single point resistivity
- Temperature;
- 3-arm caliper;
- Natural gamma; and
- Deviation (gyroscope).

AS-BUILT CONSTRUCTION

Appendix C presents a copy of the Well Driller Report (well log) prepared by Lang and lithologic log prepared by Loughlin Water. Table 1 summarizes, and Figure 3 illustrates, the as-built construction of the well. Table 1 includes a summary of the lithologic log. John S. Brown, P.G., an authorized representative of the DDW, witnessed and certified the materials and installation of the grout seals installed around the surface casing and production casing. Appendix E provides a copy of the Well Seal Certification Letter.

TABLE 1
SUMMARY OF AS-BUILT INFORMATION FOR KELVIN WELL

Well Name:	Kelvin Well
WIN:	448417
Well Owner:	Lake Rockport Estates

Approximate Well Location:	See Figures 1 and 2 and PLS, UTM, and Latitude/Longitude coordinates provided above.		
Well Drilling Contractor:	Lang Equipment (Alan Lang), Utah License No. 568		
Ground Surface Elevation:	Approximately 6370 feet according to the DWRi Location Calculator (https://maps.waterrights.utah.gov/asp/location.asp)/.		
Drilled Depth:	1492 feet		
Static Water Level:	266.75 feet below ground surface on February 26, 2024.		
Boring Diameters/ Drilling Methods:	**Depth Interval**	**Borehole Diameter**	**Drilling Method**
	0 – 40 feet:	22 inches	Conventional mud rotary with water and bentonite
	40 – 1492 feet:	14.75 inches	Conventional Mud Rotary and Flooded Reverse with water and bentonite
Summary of Lithology:	**Depth Interval**	**Geologic Unit**	
	0 – 1492+ feet:	Kelvin Formation (Kk)	
Blank Casing:	**Depth Interval**	**Blank Well Casing**	
	0 – 114 feet:	16-inch diameter low-carbon steel (LCS) surface casing	
	+1.5 – 550 feet 670 – 740 feet 760 – 900 feet 920 – 1040 feet 1120 - 1130 feet	8-inch diameter LCS production casing	
Well Screen:	**Depth Interval**	**Well Screen**	
	550 – 670 feet 740 – 760 feet 900 – 920 feet 1040 – 1120 feet	8-inch diameter Ful-Flo Louvered well screen with 0.070-inch slots	
Gravel Pack:	**Depth Interval**	**Well Screen**	
	302 – 1492 feet	¼ x 1/8 SRI Supreme gravel pack	
Well Seals:	0 – 8 feet:	Unhydrated bentonite	
	8 – 291 feet:	Certified neat cement grout	
	291 – 302 feet:	Unhydrated bentonite	
Pumping Tests:	**Step-rate test** at 20, 23, 27, 30, 32, and 37 gpm on February 23, 2024.		
Pumping Tests:	**Constant rate test** at 21 gpm from February 26 to 27, 2024, with drawdown after 24 hours of 216.82 feet and specific capacity of 0.1 gpm per foot of drawdown (gpm/ft)		

WIN = Well Identification Number; Mbr = Member; gpm = gallons per minute.

PLUMBNESS AND ALIGNMENT

Century performed a gyroscopic deviation survey of the borehole on December 22, 2023. The borehole deviates about 18.3 feet to the southwest between the ground surface and

1,309 feet. A plumbness and alignment test was not performed on the completed well because the test pump was installed and removed without issues and deviation survey showed the boring as straight and deviated less than 5 feet from vertical at the maximum pump setting of about 710 feet.

DEVELOPMENT

Lang developed the well using both airlift and pumping methods. Lang developed the Kelvin Well by airlifting using a single swab tool coupled to dual tube drill pipe in the screened portion of the well (550 to 1120 feet) from January 12 to 21, 2024. Lang airlifted the well at about 32 gpm. Lang removed several feet of fill from the bottom of the well after completing airlift development and before installing the test pump.

Lang installed a Grundfos Model 230S 16-stage submersible test pump with the intake set at about 708 feet and conducted development and test pumping. Appendix F provides a copy of the performance curve and other information for the test pump.

Lang developed the well by pumping at about 16 to 85 gpm from February 13 to February 22, 2024. Sand content during pump testing declined from a high of about 7.04 parts per million (ppm) during pump development on February 15, 2024, to a low of <1 ppm during constant-rate testing on February 27, 2024.

PUMPING TESTS

Lang conducted step-rate and constant-rate pumping tests of the Kelvin Well. Lang measured the (1) pumping rate using an in-line totalizing meter, (2) water level by hand using a water level meter, and (3) sand content using a Rossum Sand Tester. Appendix G provides the pumping test data.

STEP-RATE TEST

A step-rate pumping test was conducted to: (1) comply with the recommendation in UAC R309-515-6(10)(a), (2) evaluate well and aquifer performance at different pumping rates, (3) estimate specific capacity and well loss at various pumping rates, (4) select the rate for the 24-hour constant-rate test, and (5) provide base-line data for evaluation of potential future changes in specific capacity.

Lang conducted a step-rate pumping test on February 23, 2024 at about 20, 23, 27, 30, 32, and 37 gpm. The first five steps lasted about 30 minutes, while the final step lasted about 20 minutes. Figure 4 is a plot of pumping water level versus log time since pumping started for the step-rate test. Figure 4 includes a diagram of the well to help relate pumping water level to the screened interval and pump setting.

Table 2 shows the specific capacity at each pumping rate.

TABLE 2
SPECIFIC CAPACITY PUMPING TEST CALCULATIONS FOR KELVIN WELL

Pumping Rate (gpm)	Duration of Pumping (minutes)	Drawdown (feet)	Specific Capacity (gpm/ft)	Date	Comment
20	30	92.63	0.22	2/23/24	Step-rate test
23	30	146.06	0.16	2/23/24	Step-rate test
27	30	199.08	0.14	2/23/24	Step-rate test
30	30	255.10	0.12	2/23/24	Step-rate test
32	30	328.10	0.10	2/23/24	Step-rate test
37	20	421.63	0.088	2/23/24	Step-rate test
21	1440	216.82	0.10	2/27/24	Constant-rate test

Specific capacity is pumping rate in gpm divided by drawdown in feet (ft). Table 2 shows that specific capacity declined from about 0.22 gpm/ft at 20 gpm to 0.088 gpm/ft at 37 gpm after pumping for 30 minutes, and (2) was about 0.10 gpm after pumping at 21 gpm for 1440 minutes (24 hours).

CONSTANT-RATE TEST

Lang conducted a 24-hour constant-rate pumping test at 21 gpm from February 26 to 27, 2024. The pre-pumping (static) water level was 269.18 feet below the measuring point and the pumping water level was 486 feet after pumping for 24 hours at 21 gpm which indicates that (1) drawdown was 216.82 feet (486 minus 269.18 feet) and (2) specific capacity was 0.10 gpm/ft (21 gpm divided by 216.82 feet).

Figure 5 is a plot of water level versus log time since pumping started and includes a diagram of the well to help relate pumping water level to the screened interval and pump setting. After pumping stopped, Lang measured the water level by hand during the recovery period for 420 minutes. The water level recovered (rose) to 280.21 feet after 420 minutes of not pumping.

WATER QUALITY

We assessed water quality through (1) monitoring of "*field*" parameters during rig (airlift) development, pump development, step testing, and constant-rate testing and (2) the collection of water samples for laboratory analyses at the conclusion of the 24-hour test.

FIELD MONITORING OF WATER QUALITY

Appendix G presents and Table 3 summarizes field measurements of specific conductance, temperature, pH, and turbidity in water produced from the well during constant-rate testing.

TABLE 3

FIELD COLLECTED DATA FOR KELVIN WELL CONSTANT-RATE TEST

Parameter	Minimum	Maximum	Average	Final
pH	8.81	9.29	9.14	8.84
Conductivity (µS / cm)	1223	1259	1245	1230
Turbidity (NTU)	6.22	97.8	41.4	6.22[a]

NTU = Nephelometer Turbidity Units; µS / cm = microsiemens per centimeter.
[a] *Chemtech reported a turbidity of 1.7 NTU in the sample collected at the end of the constant-rate test.*

LABORATORY ANALYSIS OF WATER QUALITY SAMPLES

Loughlin Water collected a water quality sample on February 27, 2024, at the end of the 24-hour 21-gpm constant rate test for laboratory analysis. Chemtech-Ford Analytical Laboratories of Sandy, Utah (Chemtech) analyzed the sample for the constituents listed in UAC R309-515-4(5) for a new PWS well for a non-transient, community water system. Appendix H provides copies of the laboratory report and chain-of-custody form, and Table 4 summarizes and compares analytical results to Utah Drinking Water Standards.

Utah Administrative Code (UAC) R309-200 divides the standards into:

- Primary Drinking Water Standards, or Maximum Contaminant Levels (PMCLs), are the "*Maximum permissible level of a contaminant in water which is delivered to any user of a Public Water System.*"
- Secondary Drinking Water Standards, or Secondary MCLs (SMCLs), which deal with substances that "*affect the aesthetic quality of drinking water. They are presented as recommended limits or ranges and are not grounds for rejection. The taste of the water may be unpleasant, and the usefulness of the water may be impaired if these standards are significantly exceeded.*"

TABLE 4
WATER QUALITY DATA AND UTAH DRINKING WATER STANDARDS

Parameters (mg/L except as noted)	Primary or Secondary MCL [a]	Kelvin 2/27/2024[f]
Primary Inorganic Contaminants R309-200-5(1)	Primary MCL	
Antimony	0.006	ND
Arsenic	0.01	0.0090
Barium	2	0.091
Beryllium	0.004	ND
Cadmium	0.005	ND
Chromium	0.1	ND
Cyanide (free)	0.2	ND
Fluoride	4[b]	0.468
Mercury	0.002	ND
Nickel	NS	ND
Nitrate (as Nitrogen)	10	0.32

Parameters (mg/L except as noted)	Primary or Secondary MCL [a]	Kelvin 2/27/2024[f]
Nitrite (as N)	1	ND
Total Nitrate and Nitrite (as Nitrogen)	10	0.32
Selenium	0.05	0.0061
Sodium	NS	240
Sulfate	500 / 1000[b,c]	47.0
Thallium	0.002	0.002
Total Dissolved Solids	1000 / 2000[b,d]	688
Turbidity (NTU) R309-200-5(5)	5.0 NTU	1.7
Lead and Copper R309-200-5(2)		
Copper	1.3 [b,e]	0.0030
Lead	0.015 [e]	0.0005
Organic Contaminants R309-200-5(3)		
Pesticides/PCB/SOC	Varies	ND
Volatile Organic Compounds (VOCs)	Varies	ND, except for Chloroform [h] and Toluene [i]
Radiological Chemicals R309-200-5(4)		
Gross alpha, pCi/L	15	7.7 +/- 3.5
Gross beta, pCi/L	50	0.4 +/- 1.86
Radium 226, pCi/L	5	0.24 +/- 1.64
Radium 228, pCi/L	5	1.1 +/- 0.285
Secondary Inorganic Contaminants R309-200-6	**Secondary MCL**	
Aluminum	0.05 to 0.2	ND
Chloride	250	203
Color (color units)	15	5
Corrosivity (Langelier index)	non-corrosive	non-corrosive
Foaming Agents (Surfactant as MBAS)	0.5	ND
Iron	0.3	0.13
Manganese	0.05	0.012
Odor (threshold odor numbers)	3	ND
pH (standard units)	6.5-8.5	**8.8**
Silver	0.1	ND
Zinc	5	ND
Additional Chemicals R309-515-4(5)(b)		
Ammonia as N	NS	ND
Boron	NS	0.13
Calcium	NS	10.1
Magnesium	NS	5.4
Potassium	NS	0.7
Specific Conductance (µmhos/cm @ 25°C)	NS	1270
Alkalinity - Bicarbonate (HCO_3) as $CaCO_3$	NS	264
Alkalinity – Carbonate (CO_3) as $CaCO_3$	NS	6.9
Alkalinity – Hydroxide (OH) as $CaCO_3$	NS	ND
Alkalinity – Total as $CaCO_3$	NS	271
Phosphate, Ortho as PO4	NS	0.01
Silica (as silicon dioxide)	NS	10.2
Total Hardness as CaCO3	NS	47.3

Parameters (mg/L except as noted)	Primary or Secondary MCL [a]	Kelvin 2/27/2024[f]
Langelier Index	NS	0.57
Microbiological Quality R309-200-5(6)		
Total Coliform, Org/100ml	Absent	Absent [g]
E. Coli, Org/100ml	Absent	Absent [g]
Iron Bacteria (Not required by regulation)		
Iron Bacteria	NS	NS[j]

MCL = Maximum Contaminant Level; MBAS = Methyl Blue Active; ND = not detected; NS = no Utah Water Quality Standard; N = Nitrogen; $CaCO_3$ = Calcium Carbonate; NSD = not sampled.
[a] *As per UAC R309-200.*
[b] *Secondary MCLs are 2 mg/L for fluoride, 250 mg/L for sulfate, 500 mg/L for TDS, and 1 for copper.*
[c] *If Sulfate is greater than 500 mg/L, then supplier must demonstrate that (1) no better water is available and (2) the water will not be available for human commercial establishments.*
[d] *If TDS is greater than 1,000 mg/L, then supplier must demonstrate that no better water is available.*
[e] *Standard is applicable at the consumer's tap based on statistical sampling.*
[f] *Sample collected after well was pumped at 21 gpm for 23 hours.*
[g] *Sample collected on February 27, 2024.*
[h] *Chloroform was detected at 1.4 microgram per liter (µ/L); there is no PMCL for SMCL or Chloroform.*
[i] *Toluene was detected at 1.1 µ/L which is considerably less than the PMCL for Toluene of 1000 µ/L.*
[j] *The water sample collected for Iron Bacteria analysis was lost in transit to lab.*

Table 4 shows that:

- Total dissolved solids (TDS) at 688 milligrams per liter (mg/L) were less than the PCML (1000 mg/L) but greater than the SMCL (500 mg/L).
- pH at 8.8 units, was outside the SMCL range of 6.5 to 8.5 units.
- No other PMCLs or SMCLs were exceeded in the February 27, 2024, sample.

The dominant ions were bicarbonate, sodium, and chloride. The water is considered to be "*slightly hard*" at 47.3 mg/L (as $CaCO_3$). The Langelier Index was 0.57, which indicates the water is over saturated with respect to calcium carbonate (CaCO3) and may be scale-forming.

WELL DISINFECTION

Lang disinfected the well on January 17, 2024, and February 28, 2024, following the procedures outlined in UAC R309-515-6(11), *Well Disinfection* and UAC R655-9.6.5, *Well Disinfection and Chlorination of Water*. As indicated in Table 4, both coliform bacteria and e. coli were absent in the sample collected on February 27, 2024.

OPINION OF SAFE YIELD AND RECOMMENDED DISCHARGE RATE

According to the DDW in UAC R309-110, the "*desired design discharge rate*" is the:

> *"…rate selected for the permanent pump installed in a public drinking water well source. This pumping rate is selected by the water system owner or engineer and can match or be the same rate utilized during the constant-rate pump test required*

> *by R309-515 and R309-600 to determine delineated protection zones. For consideration of the number of permanent residential connections or ERC's that a well source can support (see Safe Yield) the Division will consider 2/3 of the test pumping rate as the safe yield."*

Use of this "*two thirds*" rule is the first step in approximating the long-term yield of a new well. The second step is to monitor the pumping rate, water level, and water quality of the well on a long-term basis and, as appropriate, revise the pumping rate of the well.

The *"firm"* or "*safe*" yield is a groundwater resource concept originally employed to designate the rate at which water can be withdrawn from an aquifer without depleting the supply. Lohman (1972) redefined safe yield as the volume of groundwater that can be withdrawn "*…without getting into trouble.*" "T*rouble*" can include:

- Excessively lowering the water level in the well;
- Adversely impacting water levels in or production from other wells or springs in the area;
- Producing from the well at a rate so much larger than the recharge to the aquifer such that water levels are permanently lowered and groundwater is mined from or permanent physical damage is done to the aquifer;
- Producing sandy or turbid water; and/or
- Causing degradation in the quality of water produced from the well.

In our opinion the safe yield of the Kelvin Well is 14 gpm, which is two-thirds of the 21-gpm used for the 24-hour constant-rate test. We recommend the following to avoid "*trouble*":

- Equip the well with a pump capable of producing up to the tested rate of 21 gpm. Pump testing indicates that the water level recovers (rises to the pre-pumping level) slowly after pumping ceases. The well should be equipped with a variable frequency drive (VFD) to reduce the frequency that the pump would turn on and off and to improve pumping efficiency.
- Set the intake for the permanent pump at a depth that is below the maximum anticipated pumping level plus the required additional depth to accommodate the net positive suction head (NPSH) characteristics of the selected pump at the maximum anticipated pumping level. This level is about 708.
- Pump the well to waste until the turbidity falls below 5 NTU when it is put in service.
- Once the water produced from the well falls below 5 NTU, (1) measure and record the water level, pumping rate, and total production on a regular basis, (2) observe and record the cloudiness or turbidity of the produced water, and (3) measure and record the conductivity of the produced water on a quarterly basis.
- Monitor the pumping rates and water levels and (1) do not exceed a pumping rate of 21 gpm, (2) assess seasonal and long-term variation in water level and well yield, (3) evaluate the long-term capacity of the well, (4) evaluate pumping equipment behavior, (5) estimate the length of service time to schedule preventive maintenance or repairs, and (6) comply with water right requirements.

- Monitor the turbidity of the water and adjust the pumping rate as necessary to prevent the produced water from exceeding 5 NTU. Note that the well will likely produce turbid water on start-up and then become clearer with pumping. The degree and length of time when turbid water is produced will likely decrease with time as the well is pumped and further development of the aquifer occurs. Pump water to waste that exceeds 5 NTU.
- Monitor the conductivity of the water to (1) identify changes in water quality; (2) assess the effect of long-term withdrawals on water quality; and (3) modify the pumping rate, if necessary.
- Equip the well system with a pump-to-waste device that will allow flushing the well at the start of the operating season and discharge turbid water, if any, at the start of each pumping cycle.
- If there is an extended period of non-use, thoroughly flush the well at the beginning of the new operating season. Monitor the well on an annual basis for the presence of iron bacteria.

PLANS AND SPECIFICATIONS TO EQUIP AND CONNECT WELL

Plans and specifications to equip and connect the Kelvin Well to the Lake Rockport Estates water system will be prepared by others and submitted to the DDW under separate cover.

REFERENCES CITED

Cooper, H.H., and Jacob, C.E., 1946), *A Generalized Graphical Method for Evaluating Formation Constants and Summarizing Well Field History:* Transactions, American Geophysical Union, vol. 27, p. 526-534.

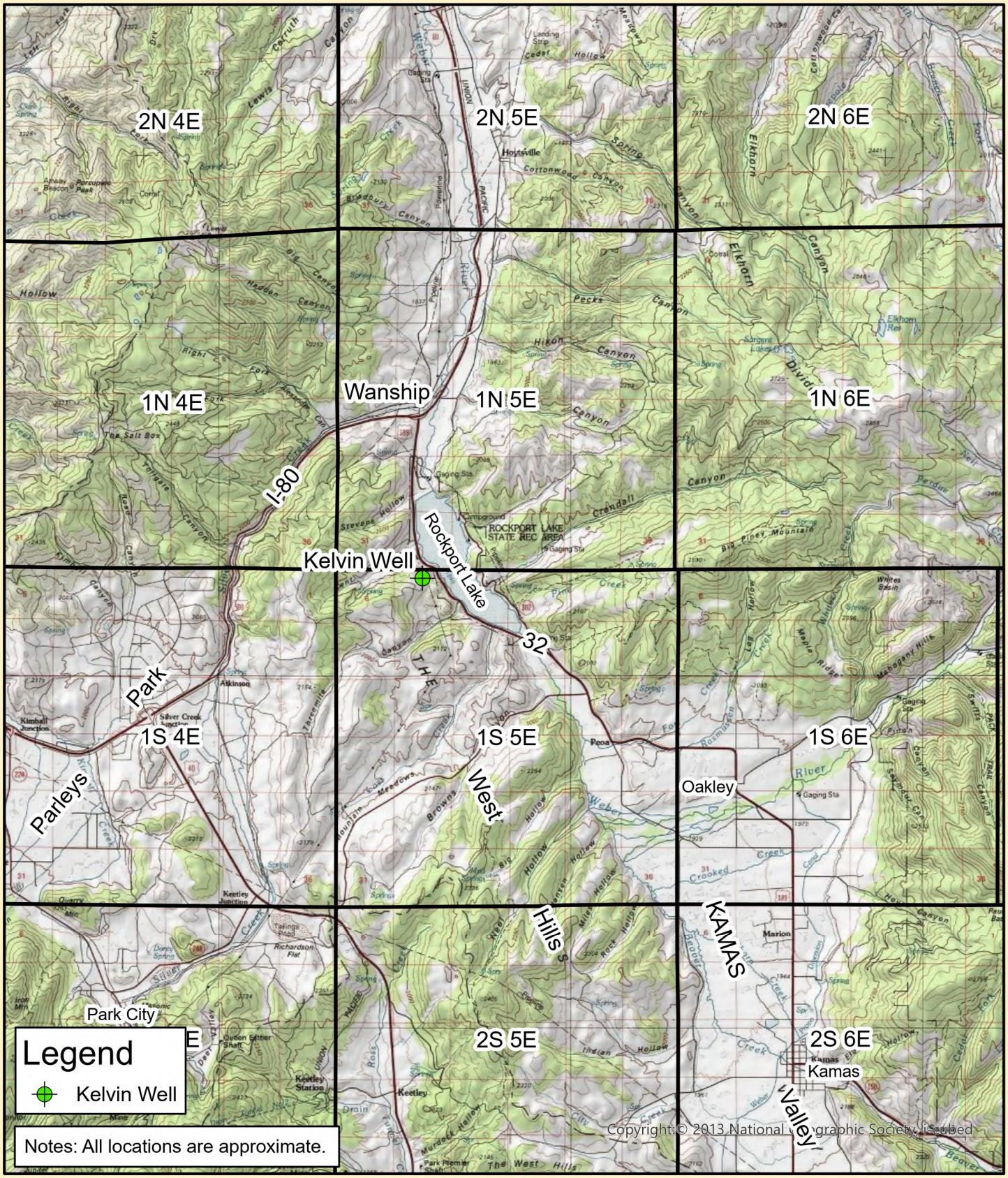
Lohman, S.W., 1972, *Ground-Water Hydraulics*: U.S. Geological Survey Professional Paper 708.

Loughlin Water Associates, LLC (Loughlin Water), 2021a, Technical Specifications, Drill, Construct and Test, Proposed Kelvin Well, Lake Rockport Estates Water System (PWS) #22104, Summit County, Utah: unpublished consultant report prepared by Loughlin Water for Jones & Demille Engineering, dated July 22, 2021.

Loughlin Water Associates, LLC (Loughlin Water), 2021b, Preliminary Evaluation Report (PER), Proposed Kelvin Well, Lake Rockport Estates, Public Water System (PWS) #22104, Summit County, Utah: unpublished consultant report prepared by Loughlin Water for Jones & DeMille Engineering, dated July 22, 2021.

Utah Department of Environmental Quality, Division of Drinking Water (DDW), 2023, Approval, Well Drilling Kelvin Well (WS003), Lake Rockport Estates, PWS #22104, File #12669: DDW letter Lake Rockport Estates, dated November 9, 2023.

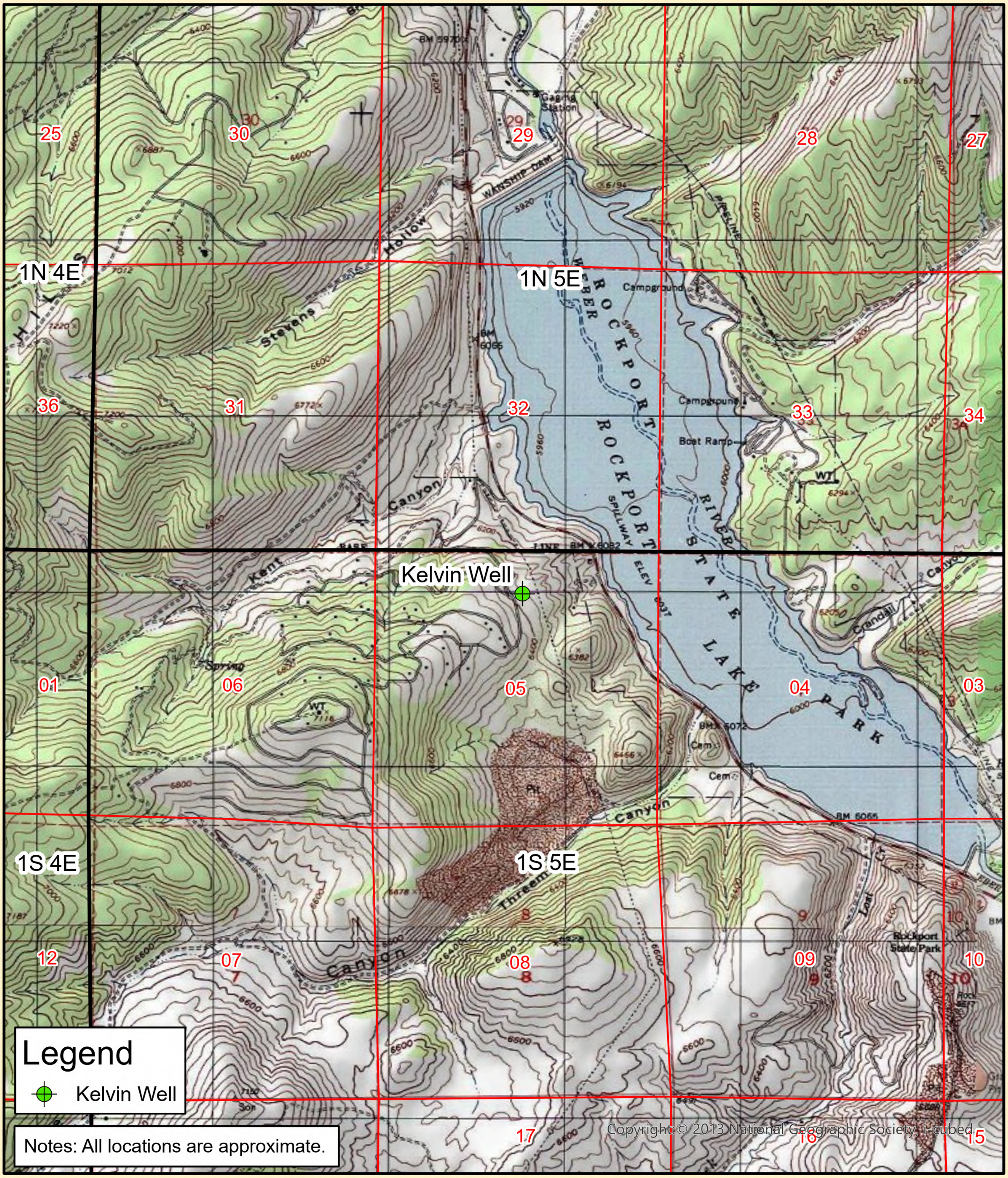
FIGURES



LOUGHLIN WATER ASSOCIATES LLC

Prepared by Connor J. Smith G.I.T.

Lake Rockport Estates
Regional Map
Figure 1

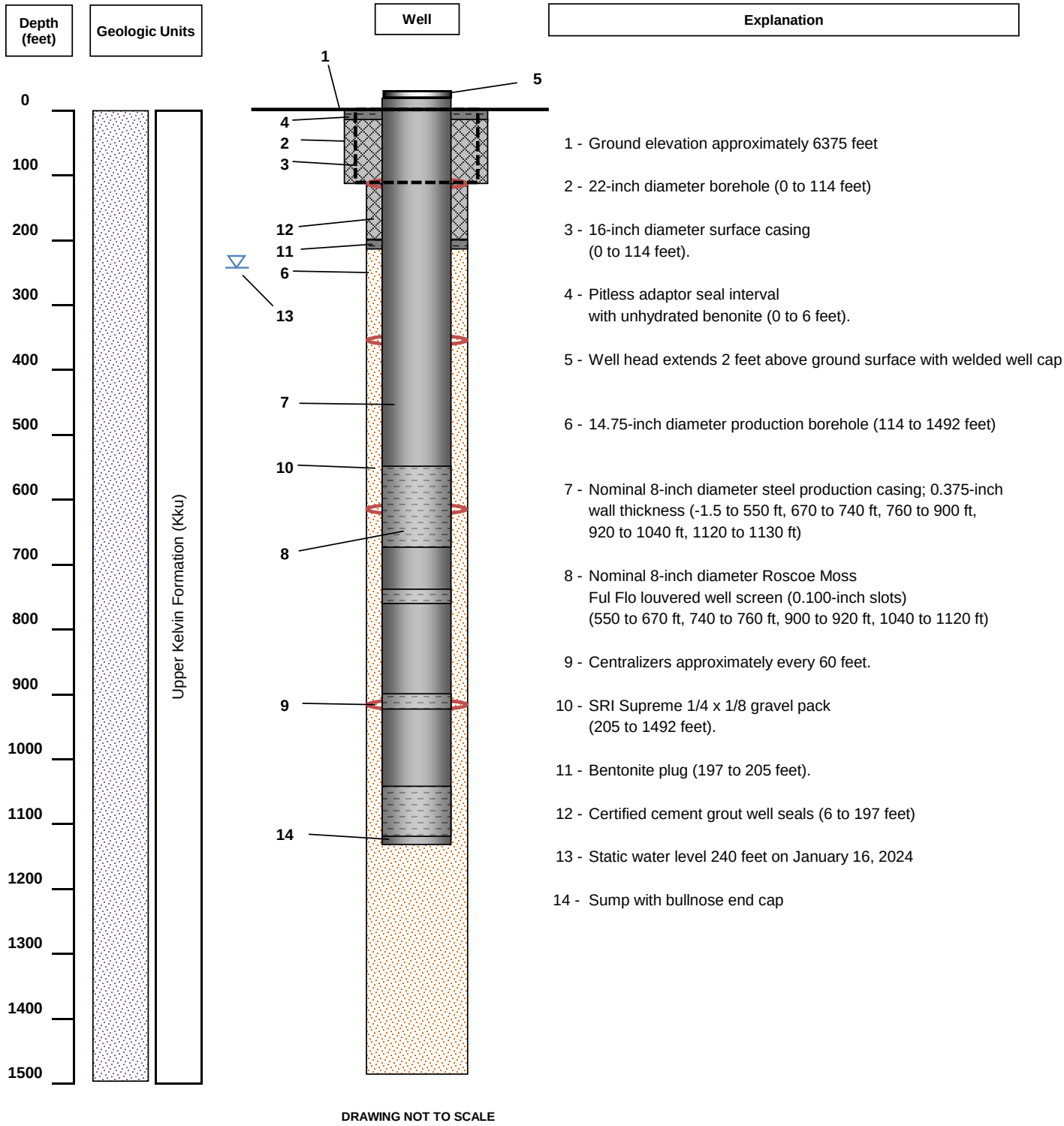

1N 4E
1N 5E
1S 4E
1S 5E
Kelvin Well
25
30
29
28
27
36
31
32
33
34
01
06
05
04
03
12
07
08
09
10
17
16
15
Gaging Station
WANSHIP DAM
Hollow
Stevens
Canyon
Kent
Spring
Campground
Boat Ramp
WEBER
ROCKPORT
ROCKPORT STATE LAKE PARK
RIVER
SPILLWAY ELEV 6037
Crandall
Threemile
Canyon
Lost
Rockport State Park
Pit
Cem
Legend
Kelvin Well
Notes: All locations are approximate.
Copyright:© 2013 National Geographic Society, i-cubed

Prepared by Connor J. Smith G.I.T.

N

0 5,000
Feet

Lake Rockport Estates
Topographic Map
Figure 2



DRAWING NOT TO SCALE

Notes:

Designed by William D. Loughlin, P.G.

Subsurface conditions at well site are uncertain;

All work completed in accordance with: (1) Utah Division of Water Rights Utah Administrative Code (UAC) Rule R655-4 Administrative Rules for Water Wells; (2) Utah Department of Environmental Quality (DEQ) Division of Drinking Water UAC Rule R309-515 Source Development Rule, Ground Water - Wells; (3) DEQ Division of Water Quality, Utah Water Quality Act, 19-5-107(1); and (4) the Technical Specifications.

LOUGHLIN WATER ASSOCIATES LLC

Lake Rockport Estates
As Built Design
Kelvin Well
Figure 3

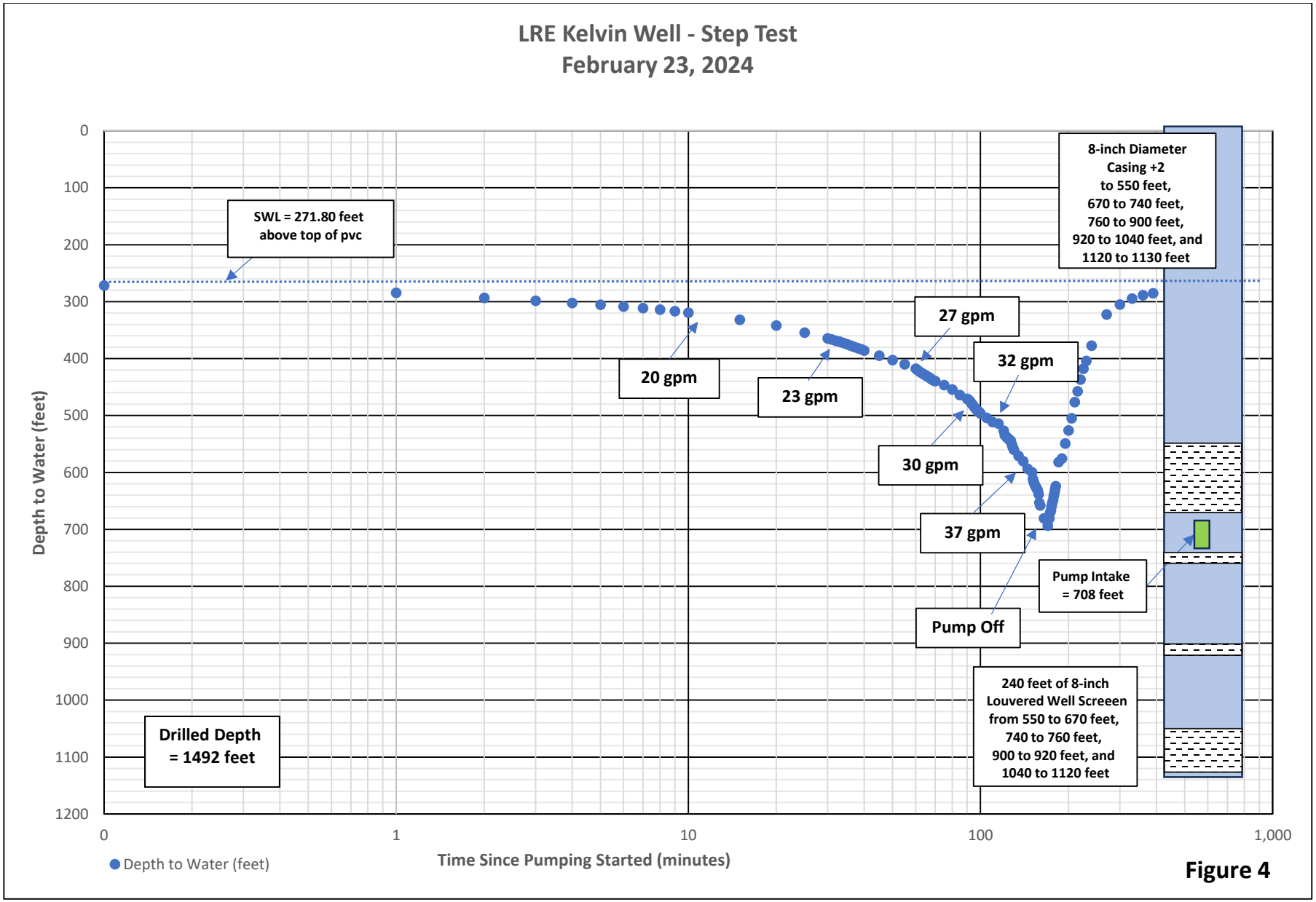

LRE Kelvin Well - Step Test
February 23, 2024
Depth to Water (feet)
Time Since Pumping Started (minutes)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
0
1
10
100
1,000
SWL = 271.80 feet above top of pvc
20 gpm
23 gpm
27 gpm
32 gpm
30 gpm
37 gpm
Pump Off
8-inch Diameter Casing +2 to 550 feet, 670 to 740 feet, 760 to 900 feet, 920 to 1040 feet, and 1120 to 1130 feet
Pump Intake = 708 feet
240 feet of 8-inch Louvered Well Screeen from 550 to 670 feet, 740 to 760 feet, 900 to 920 feet, and 1040 to 1120 feet
Drilled Depth = 1492 feet
Depth to Water (feet)

Figure 4

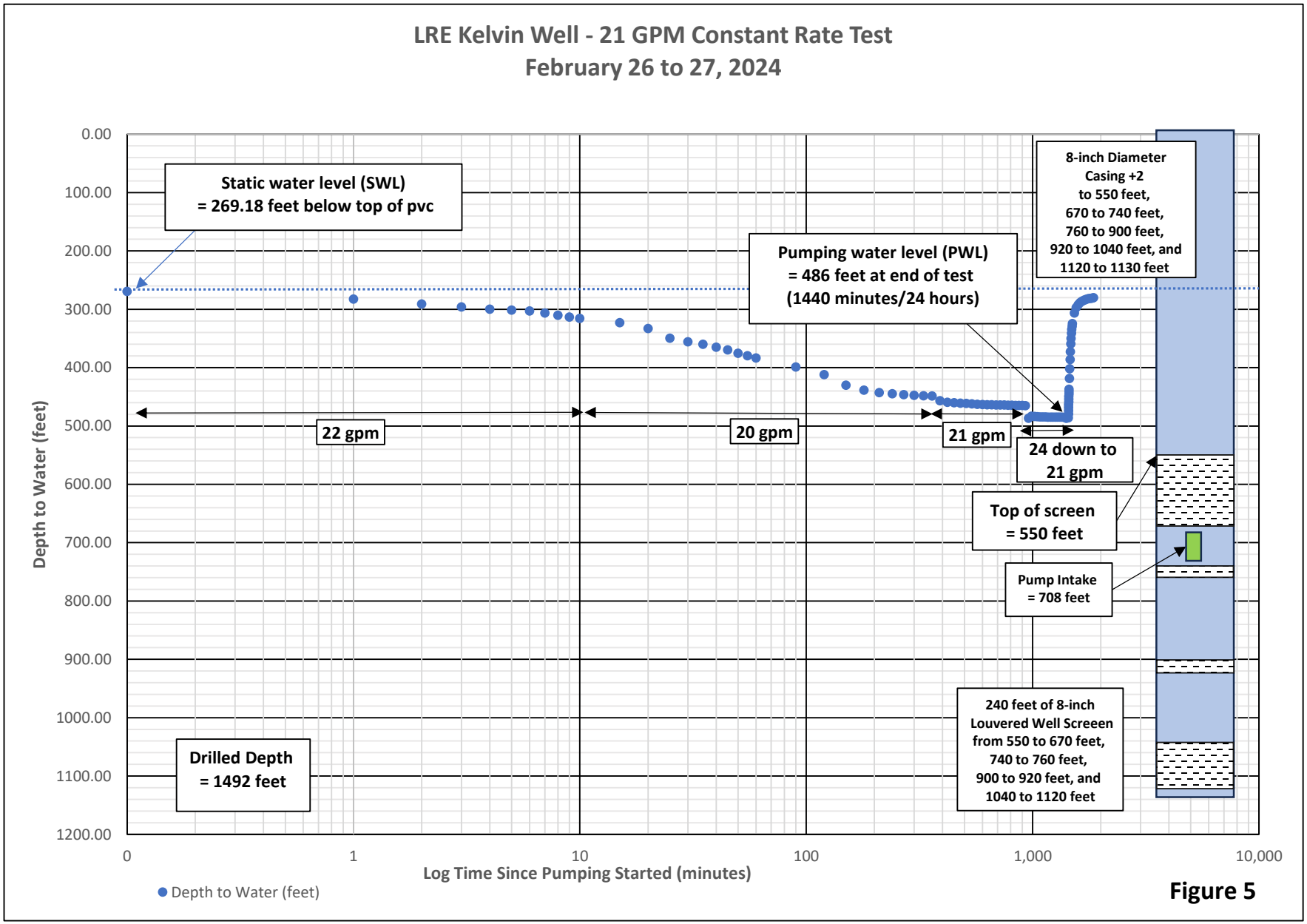

LRE Kelvin Well - 21 GPM Constant Rate Test
February 26 to 27, 2024
Depth to Water (feet)
0.00
100.00
200.00
300.00
400.00
500.00
600.00
700.00
800.00
900.00
1000.00
1100.00
1200.00
0
1
10
100
1,000
10,000
Log Time Since Pumping Started (minutes)
Depth to Water (feet)
Static water level (SWL)
= 269.18 feet below top of pvc
Pumping water level (PWL)
= 486 feet at end of test
(1440 minutes/24 hours)
22 gpm
20 gpm
21 gpm
24 down to
21 gpm
8-inch Diameter
Casing +2
to 550 feet,
670 to 740 feet,
760 to 900 feet,
920 to 1040 feet, and
1120 to 1130 feet
Top of screen
= 550 feet
Pump Intake
= 708 feet
240 feet of 8-inch
Louvered Well Screeen
from 550 to 670 feet,
740 to 760 feet,
900 to 920 feet, and
1040 to 1120 feet
Drilled Depth
= 1492 feet

Figure 5

APPENDIX A

UTAH DIVISION OF DRINKING WATER (DDW) PLAN APPROVAL

State of Utah

SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF DRINKING WATER
Tim Davis
Director

November 9, 2023

Greg Warner
Lake Rockport Estates
100 Rockport Blvd
Coalville, Utah 84017

Subject: **Plan Approval**, Well Drilling, Kelvin Well (WS003)*;*
Lake Rockport Estates Water System, System #22104, File #12669

Dear Greg Warner:

The Division of Drinking Water (the Division) received the plans and specifications for drilling the Kelvin Well from your consultant, Neil Burk, P.G. with Loughlin Water Associates, LLC on July 22, 2021. The well drilling start card was received on November 6, 2023.

We understand that this project consists of drilling a minimum 6-inch diameter exploration pilot borehole to an approximate depth of 1,500 feet, an air-list test, and geophysically logging the borehole. A minimum 16-inch diameter surface casing will be installed to a depth of 120 feet. An 8-inch diameter production casing will be installed to a depth of approximately 1,500 feet with well-screen assembly. The well will be grouted from 10 feet to 200 feet below the ground surface, with the top 10 feet sealed with unhydrated bentonite to allow for the installation of a pitless adaptor unit. The project also includes well development and pump testing. The Kelvin Well is identified as WS003 in the Division's database.

We have received the following information for Kelvin Well (WS003):

1. Plans and specifications for borehole and well drilling.
2. Preliminary Evaluation Report.
3. Valid Start Card from the Division of Water Rights.

We have completed our review of the plans and specifications, stamped, and signed by Neil Burk, P.E., and dated July 22, 2021, and found they basically comply with the applicable portions of *Utah's Administrative Rules for Public Drinking Water Systems*. On this basis, **the plans for drilling the Kelvin Well (WS003) are hereby approved**. This approval pertains to well drilling, development, aquifer testing, and disinfection of Kelvin Well (WS003) only. Please be aware that discharge permits may be required by the Utah Division of Water Quality for discharges generated during well drilling and aquifer drawdown testing.

The Utah Division of Water Rights (State Engineer's Office) regulates the drilling of water wells. **Before the drilling of a well commences, the well driller must receive a start card from the State Engineer's Office**. Please be aware that, for public drinking water supply wells, in addition to the Division of Drinking Water's *R309-515* rule, the Division of Water Rights' rule *R655-4* also applies and shall be followed.

After drilling is completed, you are required to submit additional information outlined in *R309-515-6(5)(b)* and *(c)* for review and **obtain approval from the Director for equipping this well and constructing discharge piping and infrastructure necessary for introducing the well water into the distribution system**. After obtaining the well-equipping approval, you'll then be required to obtain an Operating Permit before Kelvin Well (WS003) may be put in service. A checklist outlining the well approval process, including the items required for well equipping and an Operating Permit, is enclosed for your information.

Please label the well water sample collected for new source chemical analysis with your water system number **UTAH22104** and **WS003** (for both the facility ID and sample point ID) on all laboratory forms for each individual source. This will ensure proper identification and entry of the new source chemical analysis results in our database.

Approvals or permits from the local authority or county may be necessary before beginning construction of this project. As the project proceeds, notice of any changes in the approved design, as well as any change affecting the quantity or quality of the delivered water, must be submitted to the Division. We may also conduct interim and final inspections of this project. Please notify us when actual construction begins so that these inspections can be scheduled.

This approval must be renewed if construction has not begun or if substantial materials have not been ordered within one year of the date of this letter.

<u>Drinking Water Source Protection Requirement</u>

The Division received your submission of the Preliminary Evaluation Report (PER) for the Kelvin Well from your consultant, Loughlin Water Associates, LLC on July 22, 2021. **The Division concurs with this Report**. **The PER must be refined, and a complete Drinking Water Source Protection (DWSP) Plan submitted within one year of the date of this letter.** Refer to R309-600-13(6) and R309-600-7(1). You must submit proof that the delineation has been submitted to Summit County to be covered under the

Summit County Source Protection Ordinance before the well can receive an Operating Permit. If you have questions about the source protection requirements, please contact source protection staff at (801) 536-4200.

If you have any questions regarding this approval, please contact Julie Cobleigh, of this office, at (385) 214-9770, or me at (385) 515-1464.

Sincerely,

Michael Newberry, P.E.
Engineering Manager

JJC/DLB/mrn/mdb

Enclosure — Well Approval Checklist

cc: Nathan Brooks, Summit County Health Department, nbrooks@summitcounty.org
Greg Warner, Lake Rockport Estates, gwarner@uolf.org
Bill Loughlin, P.G., Loughlin Water Associates, bill@loughlinwater.com
Julie Cobleigh, Division of Drinking Water, jjcobleigh@utah.gov
Deidre Beck, Division of Drinking Water, dbeck@utah.gov

DDW-2021-020700

Division of Drinking Water
Checklist for New Public Drinking Water Wells
(per Utah Administrative Code, Rule *R309-515-6*)

System Name:_____ System Number: _____

Well Name & Description:_____

1. Approval to Drill the Well

- ☐ Project Notification Form (PNF)
- ☐ Preliminary Evaluation Report (PER) concurrence
- ☐ Well drilling specifications and plans
- ☐ Valid Start Card or authorization to drill letter from the Division of Water Rights

2. Approval to Equip the Well

- ☐ PNF (if the well drilling and well equipping are designed by different consultants)
- ☐ Well location data
- ☐ Certification of well seal
- ☐ Well driller's report (well log)
- ☐ Aquifer drawdown test results (step drawdown test & constant-rate test) for well yield determination
- ☐ Chemical analyses of the well water
- ☐ Plans and specifications for equipping the well
    - ☐ Pump information (e.g., pump specifications, pump curve & operating point, motor information, etc.)
    - ☐ Well head discharge piping
    - ☐ Well house design

3. Operating Permit to Introduce the Well Water

- ☐ Documentation of valid water right(s)
- ☐ Recorded land use agreements, or documentation that the requirements for coverage under the City/County source protection ordinance have been met
- ☐ Design engineer's certification of conformance with plan approval conditions
- ☐ Design engineer's certification of rule conformance for any deviation from approved plans
- ☐ As-built or record drawings
- ☐ Evidence of O&M manual delivery to system owner
- ☐ Satisfactory bacteriological results as evidence of proper flushing and disinfection

APPENDIX B

UTAH DIVISION OF WATER RIGHTS (DWRi)
WATER RIGHT APPROVAL AND START CARD

SPENCER J. COX
Governor
DEIDRE M. HENDERSON
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Water Rights

JOEL FERRY
Executive Director

TERESA WILHELMSEN
State Engineer/Division Director

ORDER OF THE STATE ENGINEER
For Exchange Application Number 35-14167 (E6386)

SEP 2 2 2022

Exchange Application Number 35-14167 (E6386) in the name of Lake Rockport Estates Property Owners was filed on May 10, 2022, to exchange 127.00 acre-feet of water, as evidenced by Water Right Number 35-828 (A27609) owned by the U.S. Bureau of Reclamation and a contract (Number 41033) for its use with Weber Basin Water Conservancy District. The 127.00 acre-feet of water is to be released from Wanship Reservoir and, in lieu thereof, 127.00 acre-feet of water will be diverted from: (1) Well - South 1430 feet and East 901 feet from the W¼ Corner of Section 32, T1N, R5E, SLB&M (8-inch well, 100-500 feet deep); and (2) Well - South 805 feet and East 101 feet from the N¼ Corner of Section 5, T1S, R5E, SLB&M (8-inch well, 100-500 feet deep). The water is to be used for year-round municipal purposes within the service area of Lake Rockport Estates Property Owners.

Notice of the exchange application was published in The Summit County News on May 27 and June 3, 2022. No protests were received.

It is the opinion of the State Engineer that this exchange application can be approved without adversely affecting existing rights. The applicant is put on notice that diligence must be shown in pursuing the development of this application, which can be demonstrated by the completion of the project as proposed in the exchange application.

It is, therefore, **ORDERED** and Exchange Application Number 35-14167 (E6386) is hereby **APPROVED** subject to prior rights and the following conditions:

1) The basis for this exchange right is a contract between the applicant and Weber Basin Water Conservancy District. This contract must be maintained for this exchange to remain valid. No water may be withdrawn under this application if a contract is not in effect.

2) Total diversion under this exchange application is limited to 127.00 acre-feet of water per year for year-round municipal purposes within the service area of Lake Rockport Estates Property Owners.

3) The water being exchanged shall be released from Wanship Reservoir into Weber River as called for by the river commissioner.

4) The applicant shall construct or install and maintain controlling works and a measuring device as required by Section 73-5-4 of Utah Code.

The applicant is strongly cautioned that other permits may be required before any development of this application can begin and it is the responsibility of the applicant to determine the applicability of and acquisition of such permits. Once all other permits have been acquired, this is your authority to develop the water under the above referenced application which under Sections 73-3-10 and 73-3-12, Utah Code Annotated, 1953, as amended, must be diligently prosecuted to completion. The water must be put to beneficial use and proof must be filed on or before **September 30, 2029,** or a request for extension of time must be acceptably filed; otherwise the application will be lapsed. This approval is limited to the rights to divert and beneficially use water and does not grant any rights of access to, or use of land or facilities not owned by the applicant.

As noted, this approval is granted subject to prior rights. The applicant shall be liable to mitigate or provide compensation for any impairment of or interference with prior rights as such may be stipulated among parties or decreed by a court of competent jurisdiction.

Under the authority of Section 73-3-20 of the Utah Code, the applicant is required to submit a proof of diversion and beneficial use of water upon 60 days notification by the State Engineer. The proof shall be in the same form and contain the same elements as required for appropriation or permanent change of water under Section 73-3-16 of the Utah Code Annotated.

Proof of beneficial use is evidence to the State Engineer that the water has been fully placed to its intended beneficial use. By law, it must be prepared by a registered engineer or land surveyor, who will certify to the location, uses and extent of your water right.

Upon the submission of proof as required by Section 73-3-16, Utah Code, for this application, the applicant must identify every source of water used under this application and the amount of water used from that source. The proof must also show the capacity of the sources of supply and demonstrate that each source can provide the water claimed to be diverted under this right as well as all other water rights which may be approved to be diverted from those sources.

Failure on your part to comply with the requirements of the applicable statutes may result in the lapsing of this exchange application.

It is the applicant's responsibility to maintain a current address with this office and to update ownership of their water right. Please notify this office immediately of any change of address or for assistance in updating ownership. Additionally, if ownership of this water right or the property with which it is associated changes, the records of the Division of Water Rights should be updated. For assistance in updating title to the water right, please contact the Division at the phone number below.

Your contact with this office, should you need it, is with the Weber River/Western Regional Office. The telephone number is 801-538-7240.

This Order is subject to the provisions of Administrative Rule R655-6-17 of the Division of Water Rights and to Sections 63G-4-302, 63G-4-402, and 73-3-14 of the Utah Code which provide for filing either a Request for Reconsideration with the State Engineer or for judicial review with the appropriate District Court. A Request for Reconsideration must be filed in writing with the State Engineer within 20 days of the date of this Order. The written request shall be filed in-person, by mail, or electronically. If the request is filed electronically it shall be submitted to: waterrights@utah.gov, which is the authorized general email for the Division. However, a Request for Reconsideration is not a prerequisite to filing for judicial review. A petition for judicial review must be filed within 30 days after the date of this Order or, if a Request for Reconsideration has been filed, within 30 days after the date the Request for Reconsideration is denied. A Request for Reconsideration is considered denied when no action is taken 20 days after the Request is filed.

Dated this 22 day of September, 2022.

Teresa Wilhelmsen, P.E., State Engineer
By: Blake W. Bingham, Deputy

Mailed a copy of the foregoing Order this 22 day of September, 2022 to:

Lake Rockport Estates Property Owners
c/o Alan Lindsley
100 Rockport Blvd.
Coalville UT 84017

Weber Basin Water Conservancy District
2837 East Highway 193
Layton UT 84040

Kent Wilkerson, River Commissioner
5833 Cascade Drive
Mountain Green UT 84050

Division of Water Rights
Distribution Section
c/o Susan Odekirk
WEBER RIVER

BY: Doralee Cannon
Doralee Cannon, Applications/Records Secretary

DRILLER (START) CARD for Exchange Application: E6386(35-14167)

IMPORTANT: THIS CARD MUST BE RECEIVED BY THE DIVISION OF WATER RIGHTS PRIOR TO THE BEGINNING OF WELL CONSTRUCTION -- REQUIRED FOR WELLS DEEPER THAN 30 PROOF DUE/EXPIRATION DATE: September 30, 2029

START CARDS CAN BE SUBMITTED ONLINE WITH THE WATER RIGHT NUMBER OR NON-PRODUCTION WELL NUMBER AND THE PIN.

ONLINE SUBMISSION WATER RIGHT: E6386 **ONLINE SUBMISSION PIN:** 526562

ONLINE SUBMISSION URL: http://waterrights.utah.gov/welldrilling/startcardOnline.asp

OWNER/APPLICANT: Lake Rockport Estates Property Owners

MAILING ADDRESS: c/o Alan Lindsley, 100 Rockport Blvd. Coalville UT 84017

PHONE NUMBER: 801-560-7021

WELL LOCATION: S 805' E 101' from N4 Cor, S05, T 1S , R 5E, SLB&M

WELL UTM COORDINATES: Easting: 465762 Northing: 4512981

WELL ACTIVITY: **NEW(X)** REPLACE( ) REPAIR( ) DEEPEN( )

PROPOSED START DATE: _____

PROJECTED COMPLETION DATE: _____

LICENSE #: _____ **LICENSEE/COMPANY:** _____

_____ _____

Licensee Signature **Date**

NOTICE TO APPLICANT: THIS CARD IS TO BE GIVEN TO A UTAH-LICENSED WATER WELL DRILLER FOR SUBMITTAL TO THE DIVISION OF WATER RIGHTS PRIOR TO WELL CONSTRUCTION.

STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416 - FAX No. 801-538-7467

COMMENTS: _____

START CARDS MAY ALSO SUBMITTED BY PHONE*, FAX, OR EMAIL.

PHONE: 801-538-7416 - FAX: 801-538-7467 - EMAIL: waterrights_wells@utah.gov

*IF THE START CARD IS PHONED IN, THEN THE COMPLETED AND SIGNED START CARD MUST BE RETURNED TO THE DIVISION OF WATER RIGHTS BY FAX. EMAIL, OR MAIL.

***** FOR OFFICE USE ONLY *****

WIN: **WELL LOG SENT:**

APPLICANT CARD for Exchange Application: E6386(35-14167)

IMPORTANT: THIS CARD MUST BE COMPLETED, SIGNED AND RETURNED BY THE WELL OWNER/APPLICANT AS SOON AS THE WELL IS DRILLED BY A LICENSED UTAH WELL DRILLER. PROOF DUE/EXPIRATION DATE: September 30, 2029

OWNER/APPLICANT: Lake Rockport Estates Property Owners

MAILING ADDRESS: c/o Alan Lindsley, 100 Rockport Blvd. Coalville UT 84017

PHONE NUMBER: 801-560-7021

WELL LOCATION: S 805' E 101' from N4 Cor, S05, T 1S , R 5E, SLB&M

WELL UTM COORDINATES: Easting: 465762 Northing: 4512981

WELL ACTIVITY: **NEW(X)** REPLACE( ) REPAIR( ) DEEPEN( )

WELL COMPLETION DATE: _____

NAME OF DRILLING COMPANY/LICENSEE: _____

_____ _____

Owner/Applicant Signature **Date**

NOTICE TO APPLICANT: COMPLETE AND RETURN THIS PORTION UPON FINAL WELL COMPLETION.
DO NOT GIVE THIS CARD TO LICENSED WELL DRILLER. - YOU MUST RETURN IT.

STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416 - FAX No. 801-538-7467

COMMENTS: _____

START/APPLICANT CARD INSTRUCTIONS: First, for each well, you must give a Driller (Start) Card to licensed driller with whom you contract to construct your well. Second, it is your responsibility to sign and return this Applicant Card to this office immediately after completion of the well.

CAUTION: There may be local health requirements for the actual siting of your well. Please check with the proper local authority before construction begins. See enclosed sheet addressing construction information.

***** FOR OFFICE USE ONLY *****

WIN: **PROCESS DATE:**

APPENDIX C

WELL DRILLER'S REPORT AND LITHOLOGIC LOG

WELL DRILLER'S REPORT
State of Utah
Division of Water Rights

For additional space, use "Additional Well Data Form" and attach

Well Identification

Water Right or Application: E6386 (35-14167) WIN: 448417

Owner *Note any changes*

Lake Rockport Estates Property Owners
c/o Alan Lindsley
100 Rockport Blvd.
Coalville UT 84017

Contact Person/Engineer: _____

Well Location *Note any changes*

S 805' E 101' from the N4 corner of section 05, Township 1S, Range 5E, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Drillers Activity Start Date: 11·30·23 Completion Date: 2·29·24

Check all that apply: [X] New [ ] Repair [ ] Deepen [ ] Replace Nature of Use: _____

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0'	114'	22"	CONVENTIONAL MUD	BENTONITE
114'	1492'	14 3/4"	FLOODED REVERSE	BENTONITE

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
														See Attached

Static Water Level

Date 2·26·24 Water Level 269.18 feet Flowing? [ ] Yes [X] No

Method of Water Level Measurement WATER SOUNDER If Flowing, Capped Pressure N/A PSI

Point to Which Water Level Measurement was Referenced GROUND LEVEL Elevation 6360'

Height of Water Level reference point above ground surface 2.43 feet Temperature _____ degrees [ ] C [ ] F

Driller Name LANG, ALAN License No. 568

Construction Information

DEPTH (feet) FROM	DEPTH (feet) TO	CASING: CASING TYPE AND MATERIAL/GRADE	CASING: WALL THICK (in)	CASING: NOMINAL DIAM. (in)	DEPTH (feet) FROM	DEPTH (feet) TO	☑SCREEN ☐PERFORATIONS ☐OPEN BOTTOM: SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
-1.15	114'	LOW CARBON STEEL - SURFACE CASING	0.375	16"	548.51	668.92	0.100	8"	LCS - FLU FLO
+2.97	548.51	LCS	0.3125	8"	739.10	759.19	0.100	8"	LCS - FLU FLO
668.92	739.10	LCS	0.3125	8"	899.47	919.48	0.100	8"	LCS - FLU FLO
759.19	899.47	LCS	0.3125	8"	1,039.80	1,119.93	0.100	8"	LCS - FLU FLO
919.48	1,039.80	LCS	0.3125	8"					LOUVERED

Well Head Configuration: 8" BLANK CAP Access Port Provided? ☐Yes ☑No

Casing Joint Type: WELDED Perforator Used: NO

Was a Surface Seal Installed? ☑Yes ☐No Depth of Surface Seal: 114 feet Drive Shoe? ☐Yes ☑No

Surface Seal Material Placement Method: Trim Pipe (BC)

Was a temporary surface casing used? ☐Yes ☑No If yes, depth of casing: _____ feet diameter: _____ inches

DEPTH (feet) FROM	DEPTH (feet) TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	**Quantity** of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0'	114'	NEAT CEMENT GROUT - AROUND SURFACE CASING	1,225 GAL SLURRY	15.7 lbs / GAL
0'	197'	NEAT CEMENT GROUT BETWEEN 14 3/4" BOREHOLE & 8" CASING	1,325 GAL SLURRY	15.5 lbs / GAL
		BOREHOLE & 8" CASING INSIDE 16" CASING		
197'	205'	BENTONITE PELLET SEAL	5 CUBIC FEET	
205'	1492'	SRI SUPREME 1/4 x 1/8 GRAVEL	1,320 CUBIC FEET	

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
2/26-2/27	Constant Rate Test	21	✓		216	24

Pump (Permanent)

Pump Description: SUBMERSIBLE Horsepower: 50 Pump Intake Depth: 708 feet

Approximate Maximum Pumping Rate: 21 GPM Well Disinfected upon Completion? ☑Yes ☐No

Comments

Description of construction activity, additional materials used, problems encountered, extraordinary Circumstances, abandonment procedures. *Use additional well data form for more space.*

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name LANG, ALAN (Person, Firm, or Corporation - Print or Type) License No. 568

Signature Alan Lang (Licensed Well Driller) Date 4/1/24

Construction Information (con't)

DEPTH (feet)		CASING			DEPTH (feet)		☐SCREEN ☐PERFORATIONS ☐OPEN BOTTOM		
FROM	TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	FROM	TO	SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
1,119.93	1130	LCS W/ BULLNOSE		8"					

DEPTH (feet)		SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION		
FROM	TO	SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	**Quantity** of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)

Comments (con't)

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name LANG, ALAN (Person, Firm, or Corporation - Print or Type) **License No.** 568

Signature Alan Lang (Licensed Well Driller) **Date** 4/1/24

Table 1
Lithologic Log
Lake Rockport Estates Well #2 (Kelvin Well)

Depth		Kelvin Well Lithologic Description (in decreasing order of abundance)
From	To	
0	20	Pink and red claystone with gray sandstone and calcite
20	30	Red claystone
30	70	Red claystone with gray white limestone and calcite
70	100	Red claystone
100	120	Pink claystone with gray limestone
120	125	Red claystone with calcite
125	130	White gray fine well-sorted sandstone
130	145	Red white gray fine well-sorted sandstone with calcite
145	195	Gray claystone with tan and gray siltstone
195	200	Red claystone with calcite
200	220	Pink-, white-, and brick-colored claystone and calcite
220	250	Brownish Red claystone with gray limestone chips and calcite
250	265	Red claystone with beige and gray well-sorted sandstone and calcite
265	300	Red claystone with gray limestone and gray- and brick-colored sandstone and calcite
300	325	Pink and white claystone with gray sandstone and calcite
325	340	Brown, gray, and dark-gray claystone
340	350	Pink claystone
350	390	Red and brown claystone with gray sandstone, brick-colored mudstone, and calcite
390	400	Gray claystone
400	415	Pink and white claystone with calcite
415	425	Red claystone with gray well-sorted sandstone and calcite
425	500	Brick-colored claystone with gray fine well-sorted sandstone and calcite
500	545	Gray and red-brown siltstone pebbles and some calcite; conglomerate
545	550	Gray and pink claystone with gray sandstone and calcite
550	590	Gray and tan fine well-sorted sandstone with calcite
590	595	Gray and dark gray claystone
595	605	Gray sandstone with gray- brick-colored claystone and calcite
605	625	Gray siltstone and gray tan sandstone with red mudstone and calcite
625	670	Gray sandstone with calcite
670	740	Gray claystone with gray sandstone and calcite. Fracture 697 to 700 feet.
740	745	Gray claystone with gray sandstone, black mudstone, and calcite
745	765	Gray sandstone with black and red mudstone and calcite
765	780	Gray claystone with gray siltstone and calcite
780	865	Red claystone
865	907	Brown claystone with gray limestone and calcite
907	920	Maroonish gray light gray pink sandy limestone
920	935	Dark gray limestone with calcite
935	1040	Red claystone with calcite
1040	1065	Dark gray sandy limestone with red claystone; fracture at 1058 feet
1065	1080	Red and gray claystone with gray limestone
1080	1115	Gray sandy conglomerate with red claystone and calcite
1115	1125	Black red claystone with gray limestone (sand)
1125	1175	Gray claystone with dark gray limestone
1175	1185	Gray brown claystone with dark gray limestone
1185	1240	Brown gray claystone with dark gray limestone
1240	1285	Red gray claystone with calcite
1285	1300	Brownish grayish claystone with dark gray limestone
1300	1415	Brownish grayish reddish pinkish claystone with calcite
1415	1430	Gray white sandy limestone with brownish reddish claystone and calcite
1430	1492	Red, dark red, dark gray claystone with calcite

Notes:

Logged by Connor J. Smith, G.I.T. of Loughlin Water Associates.

APPENDIX D

GEOPHYSICAL LOGS

Century Wireline Services

ROCKPORT

COMPANY	LANG EQUIPMENT
WELL	ROCKPORT
WELL EXT	
FIELD	
COUNTY	SUMMIT
STATE	UTAH
COUNTRY	—
API NO.	NA

COMPANY : LANG EQUIPMENT
WELL : ROCKPORT
WELL EXT :
FIELD :
COUNTY : SUMMIT
STATE : UTAH
COUNTRY : —
API NO. : NA
UNIQ ID : NA

LOCATION : SECTION: NA TOWNSHIP: NA RANGE: NA
LAT GPS UTM NA
LON GPS UTM NA

PERMANENT DATUM	GL	Elevations	Other Services:
DRL MEASURED FROM	GL	KB NA	CALIPER
LOG MEASURED FROM	GL	DF NA	
ELEV. PERM. DATUM	NA FT	GL NA FT	

DISPLAY7_JL63f

DATE	12/22/23 12:32
DEPTH DRILLER	FT
DEPTH LOGGER	1311 FT
FIRST READING	FT
LAST READING	FT
BIT SIZE	14.75 IN
CASING -- DRILLER	114 FT
CASING -- LOGGER	FT
CASING O.D.	16 IN
CASING TYPE	STEEL
FLUID TYPE	MUD
FLUID DENSITY	9.1 LB/GAL
FLUID VISCOSITY	
FLUID PH	
MUD SOURCE	NA
RM @ MEAS TEMP	179 @ NA F
RMF @ MEAS TEMP	@ F
RMC @ MEAS TEMP	NA @ F
CIRC. STOPPED	NA
RIG NUMBER	NA
RECORDED BY	J. SKIPPER
WITNESSED BY	SAMMY
REMARKS 1	NA
REMARKS 2	NA
REMARKS 3	NA

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

5 INCH LOG, ELOG ROCKPORT 12/22/23

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 54
MAGNETIC DECL : 0 ELECT. CUTOFF : 75000 BIT SIZE : 14.75 IN
PRESENTATION : 9057A.0 -- 12/22/2023 DISPLAY7_JL63f

5 INCH LOG, ELOG ROCKPORT 12/22/23

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 54
MAGNETIC DECL : 0 ELECT. CUTOFF : 75000 BIT SIZE : 14.75 IN
PRESENTATION : 9057A.0 -- 12/22/2023 DISPLAY7_JL63f

TOOL CALIBRATION ROCKPORT 12/22/23 12:32
TOOL 9057A TM VERSION 2005
SERIAL NUMBER 2441

	DATE	TIME	SENSOR		STANDARD Point1	STANDARD Point2	RESPONSE [CPS] Point1	RESPONSE [CPS] Point2
1	Feb25,14	07:13:16	GAMMA	[API-GR]	1.000	340.000	0.000	332
2	Jun06,12	12:53:27	NEUTRON	[CPS]	Default	271.000	Default	40.000
3	Feb25,14	06:57:21	SP	[MV]	0.000	329.000	320870	160080
4	Feb25,14	06:57:36	RES(16N)	[OHM-M]	0.000	1954.550	3810	431622
5	Feb25,14	06:57:46	RES(64N)	[OHM-M]	0.000	1987.740	3304	434893
6	Feb25,14	07:49:28	TEMP	[DEG-F]	33.800	120.000	333050	391891
7	Feb25,14	06:57:56	RES	[OHM]	0.000	945.000	4420	166235
8	Jun06,12	12:53:38	POR(NEU)	[PERCENT]	100.000		40.000	

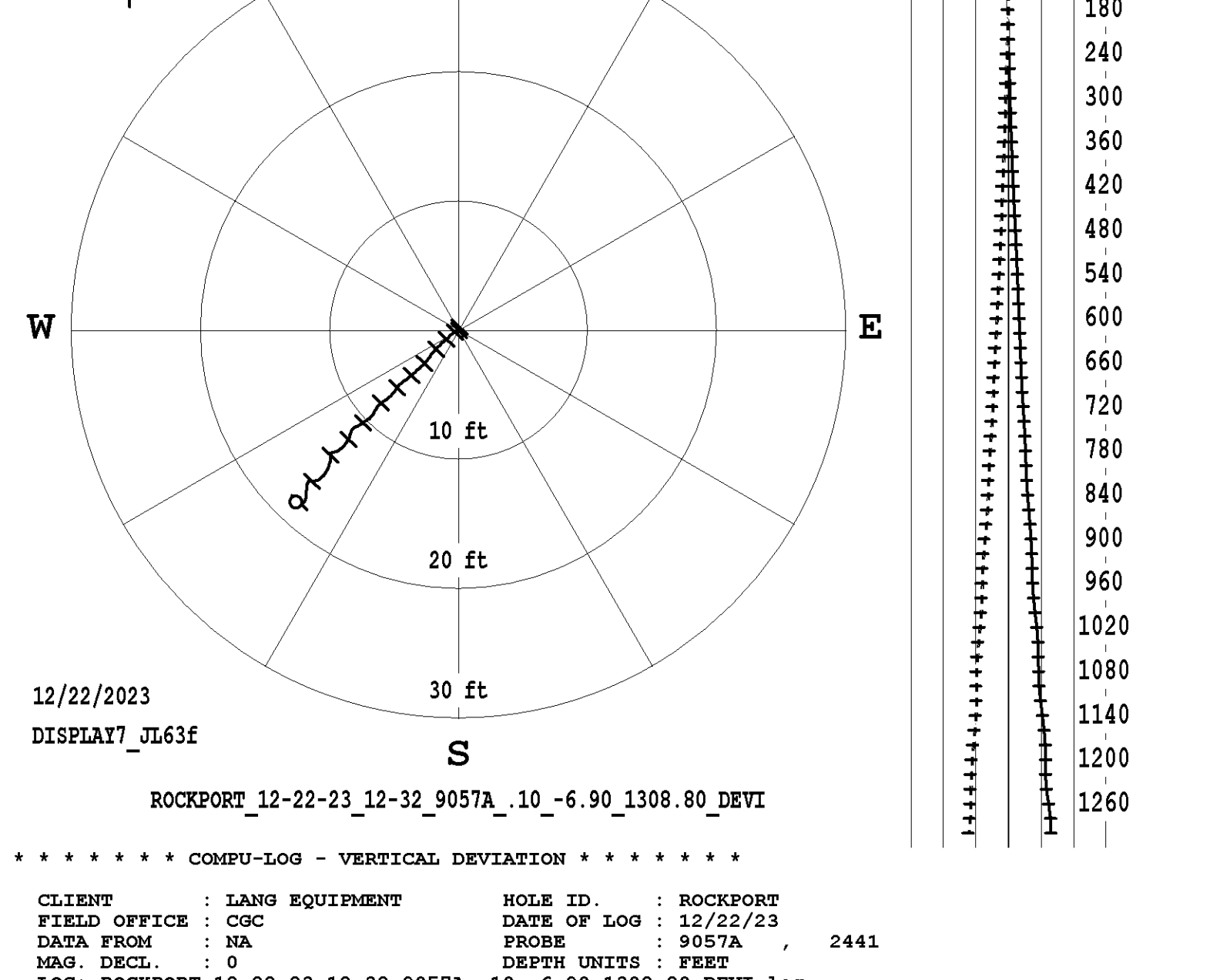
TOOL CALIBRATION ROCKPORT Jun06,12 12:53:38
TOOL TM VERSION 2005
SERIAL NUMBER

	DATE	TIME	SENSOR		STANDARD Point1	STANDARD Point2	RESPONSE [CPS] Point1	RESPONSE [CPS] Point2
1	Dec31,69	17:00:00		[CPS]	Default		Default	

PLAN VIEW
COMPU-LOG DEVIATION

Client: LANG EQUIPMENT
Location:
Hole ID: ROCKPORT
Date of Log: 12/22/23
Probe: 9057A 2441
Magnetic Decl: 0.0°

Distance: 18.31 ft
Azimuth: 223.45 °
True Depth: 1308.57 ft
Scale: 10 ft/Division
+ = 100 ft Incr
o = Bottom of Hole



12/22/2023
DISPLAY7_JL63f

ROCKPORT_12-22-23_12-32_9057A_.10_-6.90_1308.80_DEVI

* * * * * * * COMPU-LOG - VERTICAL DEVIATION * * * * * * *

CLIENT : LANG EQUIPMENT HOLE ID. : ROCKPORT
FIELD OFFICE : CGC DATE OF LOG : 12/22/23
DATA FROM : NA PROBE : 9057A , 2441
MAG. DECL. : 0 DEPTH UNITS : FEET
LOG: ROCKPORT_12-22-23_12-32_9057A_.10_-6.90_1308.80_DEVI.log

CABLE DEPTH	TRUE DEPTH	NORTH DEV.	EAST DEV.	DISTANCE	AZIMUTH	SANG	SANGB
-6.90	-6.80	-0.00	-0.00	0.0	201.2	0.0	360.0
23.10	23.10	0.07	0.08	0.1	49.3	0.2	2.4
53.10	53.10	0.18	0.06	0.2	19.4	0.5	346.9
83.10	83.10	0.21	0.09	0.2	22.5	0.2	159.3
113.10	113.10	0.21	0.02	0.2	5.0	0.2	59.2
143.10	143.10	0.10	-0.10	0.1	317.4	0.5	198.4
173.10	173.10	-0.01	-0.20	0.2	268.2	0.4	236.7
203.10	203.10	-0.14	-0.33	0.4	247.1	0.5	258.0
233.10	233.10	-0.29	-0.50	0.6	240.4	0.4	247.4
263.10	263.09	-0.48	-0.74	0.9	237.4	0.6	218.8
293.10	293.09	-0.66	-0.90	1.1	233.7	0.5	250.8
323.10	323.09	-0.84	-1.13	1.4	233.2	0.5	231.0
353.10	353.09	-1.08	-1.41	1.8	232.4	0.6	206.3
383.10	383.09	-1.33	-1.65	2.1	231.3	0.7	208.7
413.10	413.08	-1.58	-1.90	2.5	230.3	0.8	213.2
443.10	443.08	-1.91	-2.18	2.9	228.7	0.9	210.5
473.10	473.08	-2.25	-2.41	3.3	226.9	0.9	211.0
503.10	503.07	-2.58	-2.69	3.7	226.3	0.7	206.2
533.10	533.07	-2.87	-2.99	4.1	226.2	0.7	207.7
563.10	563.07	-3.17	-3.32	4.6	226.4	0.8	213.3
593.10	593.07	-3.41	-3.61	5.0	226.6	0.9	220.5
623.10	623.06	-3.69	-3.93	5.4	226.8	1.0	221.2
653.10	653.06	-3.95	-4.32	5.9	227.5	1.1	230.6
683.10	683.05	-4.25	-4.65	6.3	227.6	1.0	213.6
713.10	713.05	-4.63	-4.92	6.8	226.8	1.0	206.6
743.10	743.05	-5.05	-5.25	7.3	226.1	0.9	224.6
773.10	773.04	-5.39	-5.69	7.8	226.5	1.2	242.2
803.10	803.04	-5.63	-6.08	8.3	227.2	0.9	227.4
833.10	833.03	-5.99	-6.35	8.7	226.7	0.9	195.6
863.10	863.03	-6.50	-6.65	9.3	225.6	1.3	219.5
893.10	893.00	-7.04	-7.29	10.1	226.0	1.5	234.1
923.10	922.99	-7.41	-7.83	10.8	226.6	1.0	240.1
953.10	952.99	-7.58	-8.19	11.2	227.2	0.5	230.2
983.10	982.98	-7.99	-8.39	11.6	226.4	1.5	203.3
1013.10	1012.97	-8.77	-8.78	12.4	225.1	1.7	210.8
1043.10	1042.96	-9.32	-9.38	13.2	225.2	1.2	245.4
1073.10	1072.95	-9.46	-9.90	13.7	226.3	0.6	267.3
1103.10	1102.94	-9.69	-9.94	13.9	225.7	1.0	189.2
1133.10	1132.93	-10.49	-10.07	14.5	223.8	1.8	195.7
1163.10	1162.91	-11.30	-10.56	15.5	223.1	1.9	226.9
1193.10	1192.90	-11.66	-11.24	16.2	224.0	1.1	253.3
1223.10	1222.90	-11.69	-11.64	16.5	224.9	0.6	220.9
1253.10	1252.89	-12.36	-11.80	17.1	223.7	2.3	177.8
1283.10	1282.87	-13.25	-11.97	17.9	222.1	1.2	228.4
1308.80	1308.37	-13.29	-12.59	18.3	223.5	0.0	360.0

APPENDIX E

GROUT SEAL CERTIFICATION

LOUGHLIN
WATER ASSOCIATES LLC

February 8, 2024

Lake Rockport Estates Property Owners
Attn: Greg Warner
100 Rockport Blvd
Coalville, Utah 84017

Subject: **Well Seal Certification for the Kelvin Well (WS003)**
Lake Rockport Association
Public Water System (PWS) # UTAH22104, File # 12669, WIN 448417
Summit County, Utah

Dear Mr. Warner:

On December 3, 2023, and on January 16, 2024 I witnessed the sealing procedures for the well referenced above as authorized by R309-515-6(5)(b). This letter is to certify that the well sealing procedure met the requirements of **Utah Administrative Code (UAC), Rule R309-515-6(6)(i), Well Sealing Techniques and Requirements, and Rule R655-4-11.4, Surface Seals and Interval Seals.**

Table 1 summarizes background information on the Kelvin Well.

TABLE 1
WELL BACKGROUND

Well Name:	Kelvin Well
Water Right Number:	E6386 (35-14167)
Well Owner:	Lake Rockport Estates Property Owners
Well Type:	Public Water System (PWS) Well
Public Water System (PWS) Name:	Lake Rockport Estates Property Owners
PWS Number:	UTAH22104
Water Source ID:	WS003
DDW File Number:	12669
Consultant:	Jones & DeMille Engineering, Michael Hartvigsen, P.E.

Table 2 summarizes, and Figure 1 shows the location of the Kelvin Well.

3100 W. Pinebrook Road, Ste. 1100 ▲ Park City, Utah 84098
Phone: 435.649.4005 ▲ Fax: 435.649.4085 ▲ Mobile: 435.659.1752 ▲ www.LoughlinWater.com

TABLE 2
WELL LOCATION INFORMATION

County:	Summit County
Nearest Town:	Wanship, Utah
Location Listed on Start Card:	South 805 feet, East 101 feet from the North Quarter Corner of Section 5, Township 1 South, Range 5 East, Salt Lake Base and Meridian (SLB&M); UTM (NAD 83) Northing: 4512981.448, Easting: 465762.272
Local Health Department:	Summit County Health Department
Street Address:	NA
Latitude/Longitude:	The well is located at approximately: 40.76715, -111.40593
Method Used to Determine Latitude/Longitude:	Utah Division of Water Rights (DWRi, also known as the Utah State Engineer)
Datum:	NAD83
Well Head Elevation:	Approximately 6375 feet
Method Used to Determine Elevation:	Estimated from DWRi online map tool

NA means not applicable.

Table 3 summarizes the well driller information.

TABLE 3
WELL DRILLER INFORMATION

Name of Licensed Well Driller:	Alan Lang
License Number:	568
Company Representative's Name:	Alan Lang
Company Name:	Lang Equipment, LLC. (Lang)
Mailing Address:	PO Box 27558 Salt Lake City, UT 84127
Phone Number:	(801) 294-5178
Responsible Driller/Operator Onsite During Well Sealing:	Sammy Tho (OR808) Kyle Schilling (OR750) Ben Stine

Table 4 summarizes, and Figure 2 shows the as-built construction for the Kelvin Well.

TABLE 4
WELL CONSTRUCTION INFORMATION

Well Drilling Method:	**Depth Interval**	**Well Drilling Method**
	0 – 114 feet:	Conventional mud drilling
	114 – 1492 feet:	Flooded reverse circulation
Borehole Diameter:	**Depth Interval**	**Borehole Diameter**
	0 – 114 feet:	22 inches
	114 – 1492 feet:	14.75 inches
Blank Casing:	**Depth Interval**	**Blank Casing**
	+0.5 – 114 feet:	16-inch diameter steel surface casing (0.375-inch wall thickness) grouted in boring
	+1.5 – 550 feet:	Nominal 8-inch diameter low carbon steel production well casing (0.375-inch wall thickness)
	670 – 740 feet:	Nominal 8-inch diameter low carbon steel production well casing (0.375-inch wall thickness)
	760 – 900 feet:	Nominal 8-inch diameter low carbon steel production well casing (0.375-inch wall thickness)
	920 – 1040 feet:	Nominal 8-inch diameter low carbon steel production well casing (0.375-inch wall thickness)
	1120 – 1130 feet:	Nominal 8-inch diameter low carbon steel production well casing (0.375-inch wall thickness)
Well Screen:	**Depth Interval**	**Well Screen**
	550 to 670 feet:	8-inch diameter Ful-Flo louvered screen, 0.100-inch louvers
	740 to 760 feet:	8-inch diameter Ful-Flo louvered screen, 0.100-inch louvers
	900 to 920 feet:	8-inch diameter Ful-Flo louvered screen, 0.100-inch louvers
	1040 to 1120 feet:	8-inch diameter Ful-Flo louvered screen, 0.100-inch louvers
Annulus Size:	**Depth Interval**	**Annulus Size**
	0 – 114 feet:	2 inches (between the 24-inch borehole wall and 20-inch diameter well casing placed in boring)
	114 – 1130 feet:	3 inches (between the nominal 8-inch diameter casing and 14.75-inch diameter boring)
Gravel Pack:	**Depth Interval**	**Gravel Pack**
	205 - 1492	1/8 x ¼ SRI Supreme
Well Seals:	**Depth Interval**	**Seal Material**
	197 – 205 feet:	Bentonite pellet seal
	0 - 197 feet:	Neat cement grout between 14.75-inch borehole and 8-inch diameter casing and inside 16-inch diameter casing
	0 - 114 feet:	Neat-cement grout (around 16-inch diameter casing) inside 22-inch boring
Pitless Adapter:	A pitless adapter will be installed on the well.	

Table 5a and 5b summarize and describe the well sealing process of the surface casing and the production casing that were witnessed on December 3, 2023, and on January 16, 2024, respectively.

TABLE 5a
WELL SURFACE CASING SEALING DESCRIPTION

Description of Well Sealing Process:	On December 3, 2023, I witnessed the sealing of a 16-inch diameter surface casing for the Kelvin Well from a depth of 114 feet up to the surface with neat cement grout that was mixed on-site by Lang. The cement grout was installed into the mud-filled annular space of the well via a 1-1/2 inch diameter tremie pipe initially set to 100 feet below grade. Lang mixed and pumped the cement grout into the tremie pipe with a grout pump. A total of approximately 154 cubic feet (5.7 cubic yards) of neat cement grout was mixed on-site and pumped into the annular space between the 22-inch boring and the 16-inch surface casing.
Grout Material:	Neat cement grout as prepared on site.
Grout Volume:	The theoretical volume of the annular space from grade to a depth of 114 feet between the 16-inch diameter surface casing and the 22-inch diameter borehole is 132 cubic feet (4.88) cubic yards. Approximately 154 cubic feet (5.7 cubic yards) of neat cement grout was installed from 7 batches in the annular space of the well between a depth of 114 feet and the ground surface, which was approximately 1.2 times the theoretical volume. The discrepancy between the theoretical and actual volumes installed is due to washouts and irregular borehole diameter in the 22-inch diameter boring between 114 feet and the ground surface and small grout loss inside the bottom of the casing.
Grout Density:	The grout density was measured for seven batches and ranged from 15.1 to 16.0 pounds per gallon (lbs/gal) prior to installation in the borehole.
Method of Placement:	Tremie pipe and grout pump.
Depth from Surface:	This certified well seal extends from about 6 feet to a depth of 114 feet.
Did Grout Come to the Surface?	The grout was installed to ground surface but settled to about 6 feet. Hole plug installed to surface.
Length of Tremie Pipe:	The bottom of the tremie pipe was initially set at a depth of 100 feet and remained at that depth throughout the grout pumping episodes.

TABLE 5b
WELL PRODUCTION CASING SEALING DESCRIPTION

Description of Well Sealing Process:	On January 16, 2024, I witnessed the sealing of an 8-inch diameter well production casing for the Kelvin Well from a depth of 197 feet up to ground surface with neat cement grout that was mixed on-site by Lang. Lang mixed and pumped the cement grout into the tremie pipe with a grout pump. The cement grout was installed into the annular space of the well via a 1-1/2-inch diameter tremie pipe initially set to 180 feet below grade. A total of approximately 178 cubic feet (6.6 cubic yards) of neat cement grout was mixed on-site and pumped into the annular space from ground surface to 197 feet between the 14.75-inch boring and the 16-inch surface casing and the 8-inch diameter production casing.
Grout Material:	Neat cement grout as prepared on site.
Grout Volume:	The theoretical volume of the annular space from grade to a depth of 197 feet (between the 16-inch diameter surface casing and the 8-inch diameter production casing is about 114 cubic feet (4.2 cubic yards). The theoretical volume of the annular space from 114 feet to a depth of 197 feet (between the 14.75-inch diameter boring and the 8-inch diameter production casing is about 66 cubic feet (2.4 cubic yards). Total combined theoretical volume of grout is about 180 cubic feet. Approximately 178 cubic feet (6.6 cubic yards) of neat cement grout was installed from 7 batches in the annular space of the well between a depth of 197 feet and where it was brought to 2 feet below ground surface, which was approximately 0.99 times the theoretical volume.
Grout Density:	The grout density was measured to be between 15.1 to 15.7 pounds per gallon (lbs/gal) prior to installation in the borehole. Grout density was measured for 7 total batches.
Method of Placement:	Tremie pipe and grout pump.
Depth from Surface:	This certified well seal extends from 2 feet below ground surface to a depth of 197 feet.
Did Grout Come to the Surface?	The grout came to about 2 feet below the ground surface and settled couple feet following pulling tremie from 100 feet.
Length of Tremie Pipe:	The cement grout was installed into the annular space of the well via a 1-1/2-inch diameter tremie pipe initially set to 180 feet below grade for the initial 4 cement batches. The tremie pipe was shortened by 80 feet after pumping the first 100 cubic feet.

This well seal certification is not a Plan Approval to construct a public drinking water well or an Operating Permit to use the well as a public drinking water source. Such approval may only be granted by the Director of the Division of Drinking Water. A copy of this letter has been sent to the Director of the Division of Drinking Water.

If you have any questions or need more information, please do not hesitate to call me at (435) 649-4005 (office) or (801) 580-4530 (mobile).

Sincerely,

John S. Brown, P.G., L.P.I.
Senior Hydrogeologist
Loughlin Water Associates, LLC

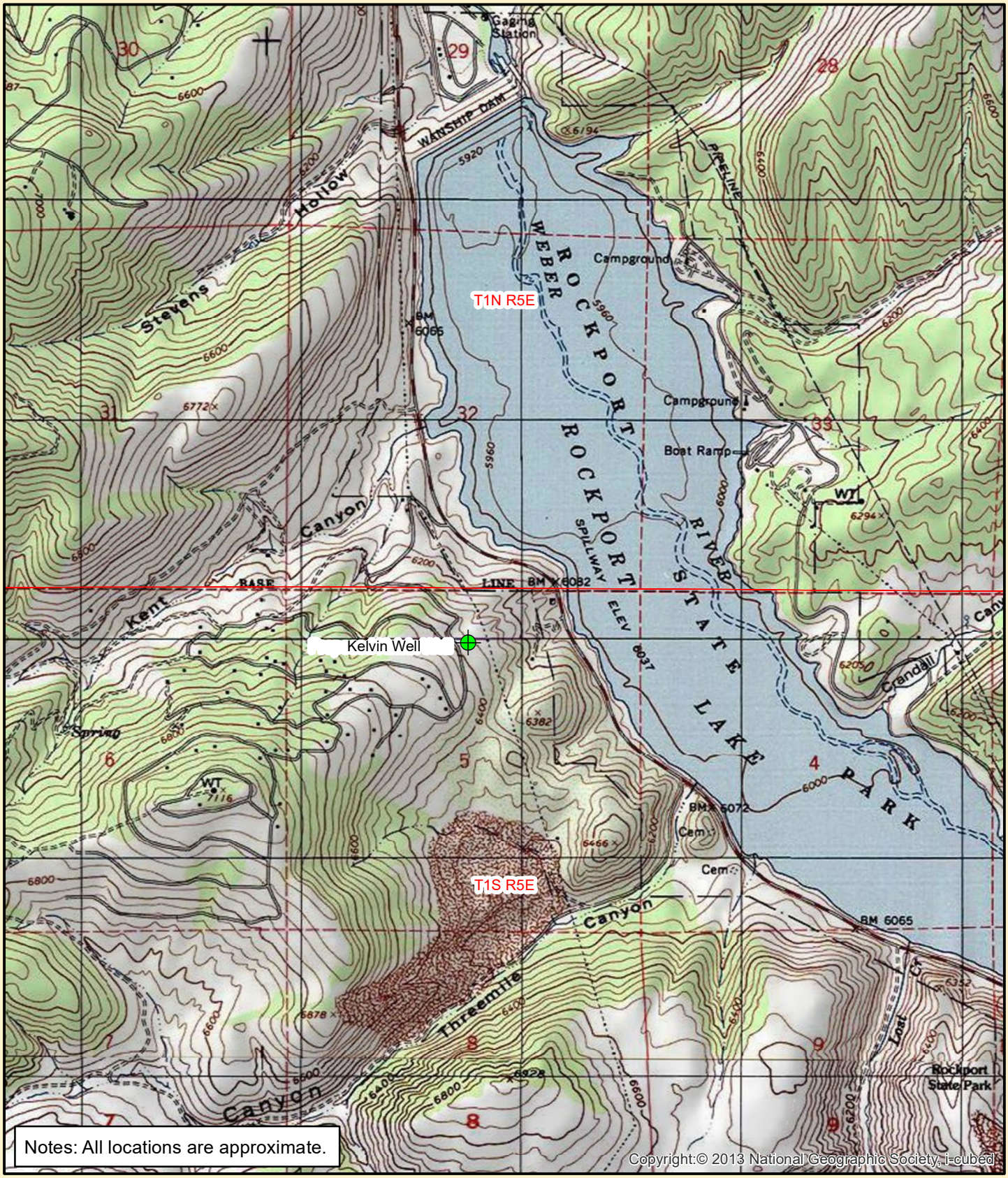
Table 1 – Well Background
Table 2 – Well Location Information
Table 3 – Well Driller Information
Table 4 – Well Construction Information
Table 5a, 5b – Well Sealing Description

Figure 1 – Location Map
Figure 2 – As-Built Construction Diagram

Attachment: Grout Witness Authorization Letter

cc: Michael Hartvigsen, Jones & DeMille, michael.h@jonesanddemille.com
Lang Equipment, LLC., Alan Lang, Alan.lang@langequipment.com
Michael Newberry, P.E., Division of Drinking Water, mnewberry@utah.gov
Jim Goddard, Division of Water Rights, jimgoddard@utah.gov
Julie Cobleigh, Division of Drinking Water, jjcobleigh@utah.gov
Ryan Hamilton, Division of Water Rights, rhamilton@utah.gov

FIGURES



LOUGHLIN WATER ASSOCIATES LLC

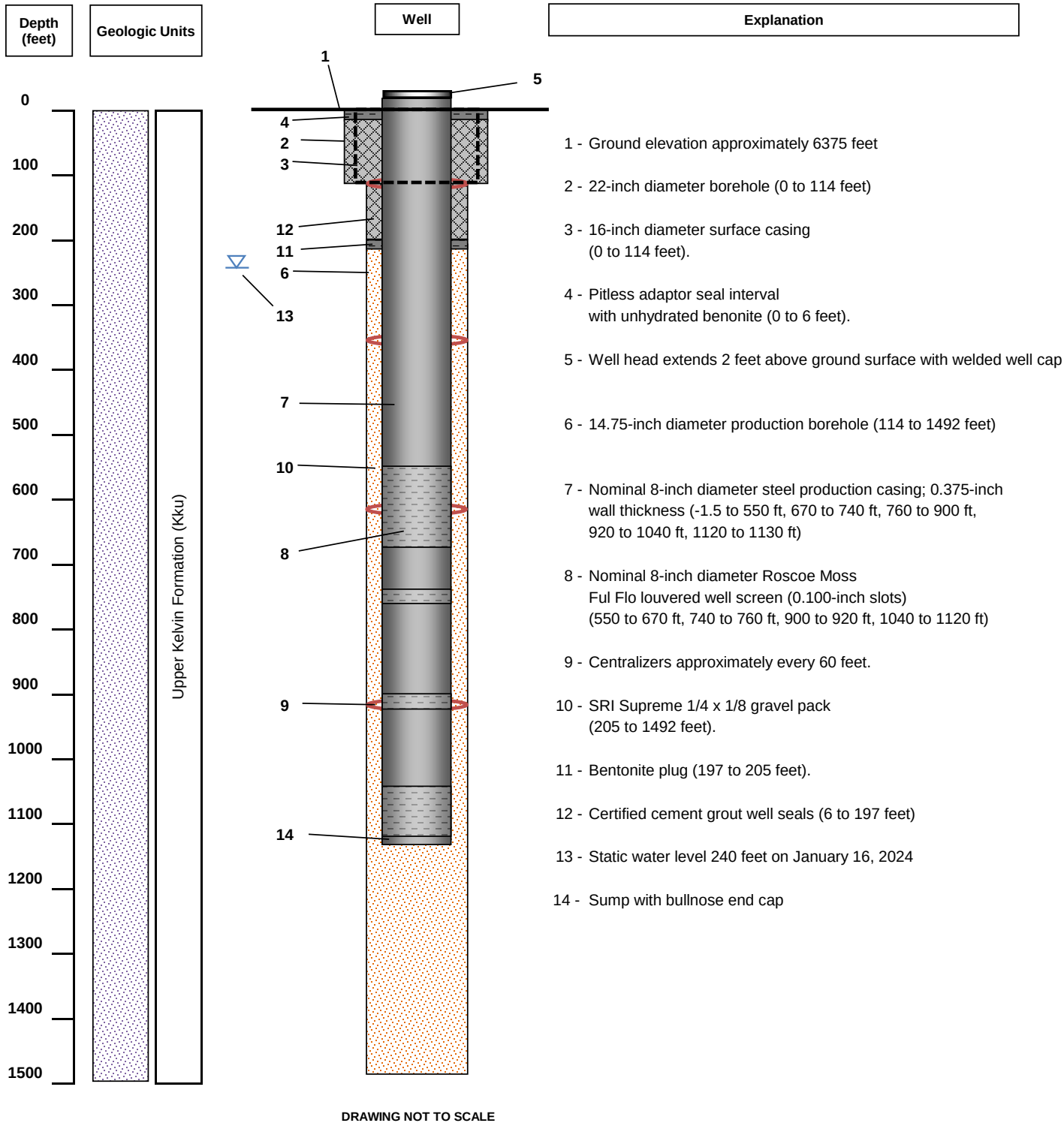
Prepared by Neil I. Burk, P.G.

N

0 2,000

Feet

Lake Rockport Estates
Topographic Map
Figure 1



DRAWING NOT TO SCALE

Notes:

Designed by William D. Loughlin, P.G.

Subsurface conditions at well site are uncertain;

All work completed in accordance with: (1) Utah Division of Water Rights Utah Administrative Code (UAC) Rule R655-4 Administrative Rules for Water Wells; (2) Utah Department of Environmental Quality (DEQ) Division of Drinking Water UAC Rule R309-515 Source Development Rule, Ground Water - Wells; (3) DEQ Division of Water Quality, Utah Water Quality Act, 19-5-107(1); and (4) the Technical Specifications.

LOUGHLIN WATER ASSOCIATES LLC

Lake Rockport Estates
As Built Design
Kelvin Well
Figure 3

ATTACHMENT

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF DRINKING WATER
Marie E. Owens, P.E.
Director

March 11, 2019

John S. Brown, P.G.
Loughlin Water Associates, LLC
3100 W. Pinebrook Road, Suite 1100
Park City, UT 84098

Subject: **Well Seal Witness Authorization**

Dear Mr. Brown:

On April 10, 2017, the Division of Drinking Water (the Division) received your request that the Director authorize you to witness the well sealing procedures for public drinking water wells and issue well seal certificates per Utah Administrative Code *R309-515-6(5)(b)*. Evidence of passing the water well drilling rules exam was received on February 21, 2019.

The Division's Well Seal Witness Authorization Review Committee reviewed your application based on the below criteria:

1. At least 5 years professional experience designing wells, supervising well drilling or other equivalent experience associated with well drilling or well sealing that are acceptable to the Director [*R309-515-6(5)(b)(ii)(A)*].
2. Evidence of licensure as a professional engineer or professional geologist in Utah [*R309-515-6(5)(b)(ii)(B)(II)*].
3. No familial, former long term employee, business partnerships, etc. with a well driller [*R309-515-6(5)(b)(ii)(B)(III)*].
4. Acknowledgement that the applicant would not be acting as an agent or employee of the State of Utah and that any losses incurred while acting as a witness would not be covered by governmental immunity or Utah's insurance [*R309-515-6(5)(b)(ii)(B)(IV)*].
5. Willingness to attend training events as required by the Director [*R309-515-6(5)(b)(ii)(B)(V)*].
6. Complete, with a minimum of 75% passing grade, an examination on water well drilling rules as offered by the Division of Water Rights [*R309-515-6(5)(b)(ii)(B)(V)*].

The Well Seal Witness Authorization Review Committee determined that you have met all of the above criteria. **On this basis you are hereby authorized to witness the public drinking water**

well sealing procedure and to issue well seal certificates. This authorization is contingent upon your continuous fulfillment of the conditions for obtaining authorization per *R309-515-6(5)(b)(ii)*.

Please include all of the following information, as a minimum, in each well seal certificate per *R309-515-6(5)(b)(iii)*, and send a copy of the well seal certificate to the Division.

(A) Certification that the well sealing procedure met all the requirements of Rule *R309-515-6(6)(i)*;
(B) The water right under which the well was drilled and the well driller's license number;
(C) The public water system name (if applicable);
(D) The latitude and longitude of the well and method used for its determination;
(E) The well head's approximate elevation;
(F) Casing diameter(s), length(s), and material(s);
(G) The size of the annulus between the borehole and casing;
(H) A description of the sealing process including the sealing material used, its volume, density, method of placement, and depth from surface; and
(I) The names and company affiliations of other individuals observing the sealing procedure including, but not limited to the well driller, the well owner, and/or a consultant.

Thank you for your interest in being a part of this program, and congratulations on becoming an authorized well grout inspector.

Sincerely,

Marie Owens, P.E.
Director

NL/LL/ hs

cc: John S. Brown, Loughlin Water, johnsbrown@loughlinwater.com
DEQ District Engineers
Deidre Beck, Division of Drinking Water, dbeck@utah.gov
Nathan Lunstad, Division of Drinking Water, nlunstad@utah.gov
Jim Goddard, Division of Water Rights, jimgoddard@utah.gov

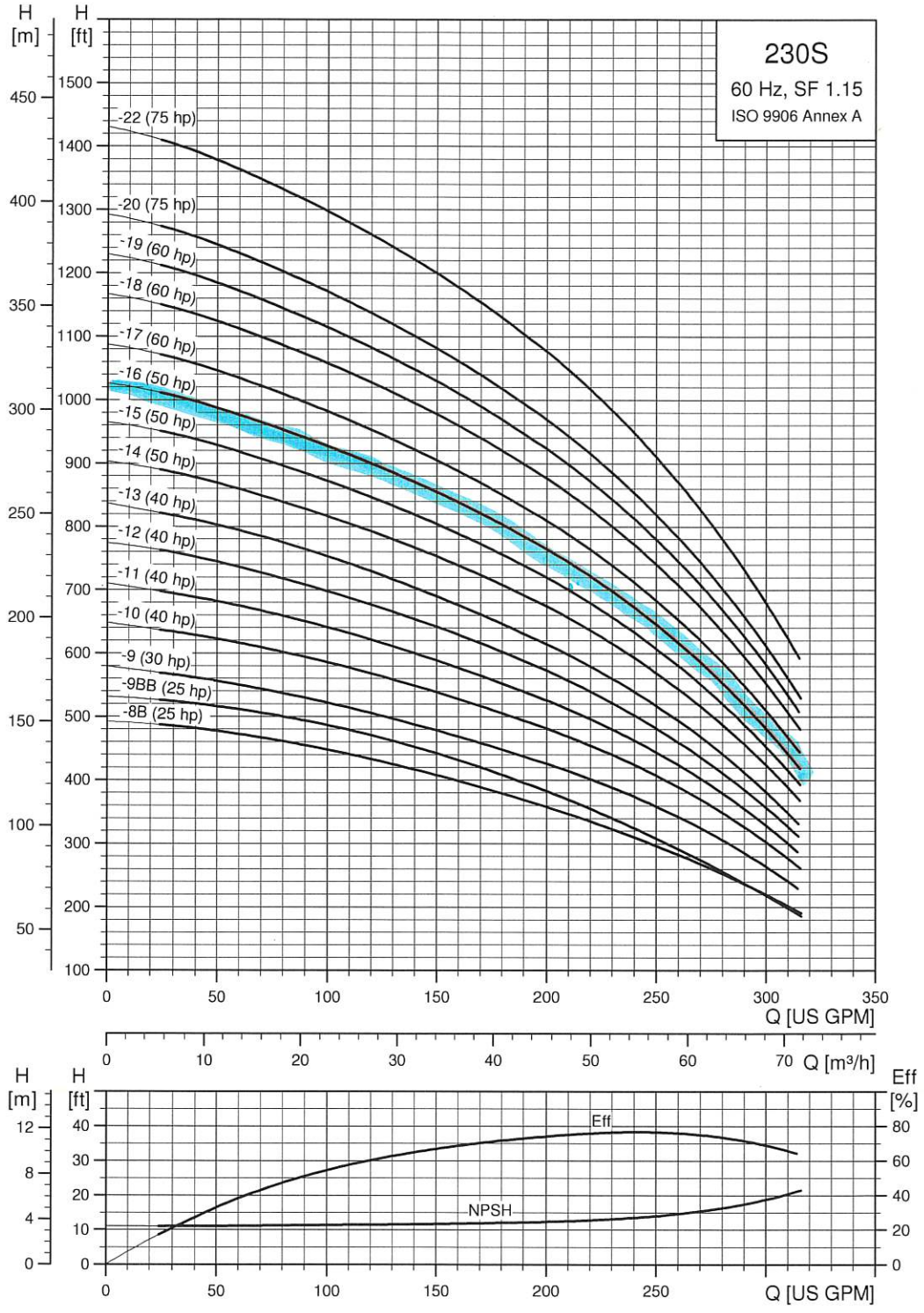
DDW-2018-017024

APPENDIX F

PERFORMANCE CURVE FOR TEST PUMP

6" and larger wells - continued

SP 230S (230 gpm)



TM05 0244 5014

APPENDIX G

PUMPING TEST DATA

TEST PUMPING REPORT

LANG DRILLING

205 S 1200 W, North Salt Lake, UT 84054
PO BOX 27558, Salt Lake City, UT 84127
P: 801-294-5178

Well Owner:
Location: Rock Port
Well Name / Job #: S23-14170.
Casing Size: 8" Depth: 1132
Pump Size: Depth: 708'
Bowl Size:

Date: 2-23-24
Operator:
Engineer:
Static Level: 271.80
Datum: 2.5

Type of Test: Step test
Discharge Pipe: Orifice: Meter:

Time of Day	Δ T	Inches of Orifice Pressure	Q GPM	Pumping Level	Static Level	Δ WL	Specific Capacity	Sand Content PPM	Elapsed Time	Start	Stop	MLS	Remarks
9:00 AM	232257				271.80								Pump on 35 HZ. 19 GPM
9:01				284.56									
9:02				293.43									
9:03				298.46									
9:04				302.50									
9:05				305.42									
9:06				308.50									
9:07				311.38									
9:08				314.21									
9:09				316.82									
9:10	232465		20.8	319.59									
9:15	232554		17.8	331.82									
9:20	232641		17.4	342.02									
9:25	232744		20.6	354.51									
9:30	232847			364.43									Increase 23 GPM
9:31				366.46									
9:32				368.89									
9:33				370.50									
9:34				372.80									
9:35				375.23									
9:36				377.46									
9:37				379.67									
9:38				381.73									
9:39				383.75									
9:40	233084		23.7	385.82									
9:45	233202		23.6	394.85									
9:50	233314		22.4	402.83									
9:55	233425		22.2	409.91									
10:00	233544		23.8	417.86									

TEST PUMPING REPORT

LANG DRILLING

205 S 1200 W, North Salt Lake, UT 84054
PO BOX 27558, Salt Lake City, UT 84127
P: 801-294-5178

Well Owner:
Location: Rock Port
Well Name / Job #: S23-1417O
Casing Size: 8" Depth: 1132
Pump Size: Depth: 708
Bowl Size:

Date: 2-23-24
Operator:
Engineer:
Static Level: 271.80
Datum: 2.5

Type of Test: Step Test
Discharge Pipe: Orifice: Meter:

Time of Day	233544 @ 10:00AM ΔT	Inches of Orifice Pressure	Q GPM	Pumping Level	Static Level	Δ WL	Specific Capacity	Sand Content PPM	Elapsed Time	Start	Stop	MLS	Remarks
10:01AM				420.41	[redacted]								35 Hz 27 GPM
10:02				423.14									
10:03				425.61									
10:04				428.03									
10:05				429.81									
10:06				431.84									
10:07				433.63									
10:08				436.40									
10:09				438.49									
10:10	233824		[redacted]28	439.66									
10:15	233952		[redacted]25.6	446.46									
10:20	234089		27.4	454.30									
10:25	234225		27.2	464.00									
10:30	234360		27	470.80									470.77 x 45Hz 30 GPM
10:31				472.42									
10:32				475.03									
10:33				478.57									
10:34				481.36									
10:35				484.87									
10:36				487.45									
10:37				490.20									
10:38				492.77									
10:39				494.05									
10:40	234667		30.7	496.43									
10:45	234804		27.4	504.03									
10:50				511.50									
10:55	235098		29.4	514.20									
11:00AM	235250		30.4	526.90									

TEST PUMPING REPORT

LANG DRILLING

205 S 1200 W, North Salt Lake, UT 84054
PO BOX 27558, Salt Lake City, UT 84127
P: 801-294-5178

Well Owner:
Location: Rock Port
Well Name / Job #: S23-14170
Casing Size: 8" Depth: 1132'
Pump Size: Depth: 708'
Bowl Size:

Date: 2-23-24
Operator:
Engineer:
Static Level: 271.80
Datum: 2.50

Type of Test: Step Test
Discharge Pipe: Orifice: Meter:

Time of Day	235250 @ 11:00AM ΔT	Inches of Orifice Pressure	Q GPM	Pumping Level	Static Level	Δ WL	Specific Capacity	Sand Content PPM	Elapsed Time	Start	Stop	MLS	Remarks
11:01 AM				534.45									36 GPM
1102				536.20									
11:03				538.62									
11:04				540.11									
11:05				541.98									
11:06				543.41									
11:07				544.32									
11:08				551.18									
11:09				555.85									
11:10	235604		35.4	559.96									
11:15	235762		31.6	571.22									
11:20	235912		30	580.35									
11:25	236060		29.6	593.43									
11:30	236224		32.8	599.90									40 GPM
11:31				602.00									
11:32				616.45									
11:33				620.23									
11:34				623.85									
11:35				626.72									
11:36				629.15									
11:37				631.53									
11:38				638.32									
11:39				653.62									
11:40	236620		39.6	658.04									
11:45	236795		35	680.72									
11:50	[redacted]		37.8	693.43				1.08	2:51	9:00AM	11:51AM	.35	Stop @ 11:51 AM
	236984												

TEST PUMPING REPORT

LANG DRILLING
205 S 1200 W, North Salt Lake, UT 84054
PO BOX 27558, Salt Lake City, UT 84127
P: 801-294-5178

Well Owner:
Location: Rock Port
Well Name / Job #: S23-14170
Casing Size: 8" Depth: 1132'
Pump Size: Depth: 708'
Bowl Size:

Date:
Operator:
Engineer:
Static Level: 271.80
Datum: 2.50

Type of Test: Recovery
Discharge Pipe: Orifice: Meter:

Time of Day	ΔT	Inches of Orifice Pressure	Q GPM	Pumping Level	Static Level	Δ WL	Specific Capacity	Sand Content PPM	Elapsed Time	Start	Stop	MLS	Remarks
11:51 AM													
11:52				681.20									STOP Pumping
11:53				670.71									Recovery
11:54				667.20									
11:55				660.00									
11:56				654.11									
11:57				648.84									
11:58				641.62									
11:59				636.28									
12:00PM				629.72									
12:01				624.40									
12:05				581.85									
12:10				575.80									
12:15				549.10									
12:20				526.18									
12:25				504.94									
12:30				476.65									
12:35				457.63									
12:40				436.75									
12:45				417.84									
12:50				404.30									
1:00				377.25									
1:30				322.42									
2:00				304.97									
2:30				294.65									
3:00 PM				288.92									
3:30 PM				285.30									

TEST PUMPING REPORT

LANG DRILLING

205 S 1200 W, North Salt Lake, UT 84054
PO BOX 27558, Salt Lake City, UT 84127
P: 801-294-5178

Well Owner:
Location: Rock Port
Well Name / Job #: S23-14170
Casing Size: 8" Depth: 1132'
Pump Size: Depth: 708'
Bowl Size:

Date: 2-26-24
Operator:
Engineer:
Static Level: 269.18 @ 8:55AM
Datum: 2.50

Type of Test: 24 HR Constant Rate
Discharge Pipe:
Orifice:
Meter: 236984

Time of Day	ΔT	Inches of Orifice Pressure	Q GPM	Pumping Level	Static Level	Δ WL	Specific Capacity	Sand Content PPM	Elapsed Time	Start	Stop	MLS	Remarks
9:00 AM	236984				269.18								Pump on
9:01				282.55		13.37							
9:02				290.69									
9:03				296.00									
9:04				299.71									
9:05				301.41									
9:06				302.81									
9:07				306.18									
9:08				309.97									
9:09				313.30									
9:10	237203		21.9	315.52		46.34	0.47						
9:15	237392		17.8	322.91		53.73	0.33	21.13	25 min	9:15AM	9:40AM	1.0	
9:20	237581		17.8	332.77		63.59	0.12						
9:25	237503		24.4	349.30		80.12	0.30						
9:30	237607		20.8	355.74		86.56	0.24						
9:35	237702		19.0	359.92		90.74	0.20						
9:40	237796		18.8	364.78		95.60	0.19						
9:45	237896		20	369.66		100.48	0.20	7.0	15 min	9:45AM	10:00AM	.2	
9:50	237997		19.8	375.18		106.00	0.18						
9:55	238098		20.2	379.46		110.28	0.18						
10:00	238198		20.0	383.37		114.19	0.17						
10:30	238781		19.4	398.69		129.51	0.15	0.64	163 min	10:17AM	1:00pm	.2	
11:00	239376		19.8	411.90		142.72	0.14						
11:30	240026		21.6	429.89		160.71	0.13						
12:00PM	240658		21.0	438.51		169.33	0.12						
12:30	241280		20.7	442.67		173.49	0.12						
1:00	241894		20.4	444.75		175.57	0.11			1:01PM			
1:30	242498		20.1	446.33		177.15	0.11						
2:00	243100		20.0	447.30		178.12	0.11						

TEST PUMPING REPORT

LANG DRILLING

205 S 1200 W, North Salt Lake, UT 84054
PO BOX 27558, Salt Lake City, UT 84127
P: 801-294-5178

Well Owner:
Location: Rock Port
Well Name / Job #: S23-14170
Casing Size: 8" Depth: 1132'
Pump Size: Depth: 708
Bowl Size:

Date: 2-26-24
Operator:
Engineer:
Static Level: 269.18
Datum: 2.50

Type of Test: 24 HR Constant Rate
Discharge Pipe:
Orifice:
Meter:

Time of Day	243100 @ 2:00 PM ΔT	Inches of Orifice Pressure	Q GPM	Pumping Level	Static Level	ΔWL	Specific Capacity	Sand Content PPM	Elapsed Time	Start	Stop	MLS	Remarks
2:30 PM	243700		20	448.15	269.18	178.97	0.11			1:01 PM			
3:00	244298		19.9	448.67		179.49	0.11						
3:30	244939		21.3	456.45		187.27	0.11						
4:00	245569		21	459.17		189.99	0.11						
4:30	246194		20.8	460.16		190.98	0.10						
5:00	246811		20.5	460.90		191.72	0.10						
5:30	247423		20.4	461.13		191.95	0.10						
6:00	248035		20.4	462.09		192.91	0.10						
6:30	248644		20.3	462.90		193.72	0.10						
7:00	249249		20.1	463.26		194.08	0.10						
7:30	249852		20.1	463.56		194.38	0.10						
8:00	250455		20.1	463.59		194.41	0.10						
8:30	251058		20.1	463.85		194.67	0.10						
9:00	251664		20.2	463.98		194.80	0.10						
9:30	252260		19.9	464.05		194.87	0.10						
10:00	252861		20.0	464.20		195.02	0.10						
10:30	253460		19.9	464.32		195.14	0.10						
11:00	254058		19.9	464.60		195.42	0.10						
11:30	254657		19.9	464.71		195.53	0.10						
12:00 AM	255256		19.9	464.88		195.70	0.10						
12:30	255854		19.9	465.01		195.86	0.10						
1:00	256581		24.2	486.60		217.42	0.11						
1:30	257212		21.0	483.33		214.17	0.09						
2:00	257844		21.0	483.42		214.24	0.09						
2:30	258483		21.3	484.05		214.87	0.09						
3:00	259117		21.1	484.28		215.10	0.09						
3:30	259740		20.7	484.48		215.30	0.09						
4:00	260364		20.8	484.52		215.34	0.09						

TEST PUMPING REPORT

LANG DRILLING

205 S 1200 W, North Salt Lake, UT 84054
PO BOX 27558, Salt Lake City, UT 84127
P: 801-294-5178

Well Owner:
Location: ROCKPORT
Well Name / Job #: 923-14170
Casing Size: 8" Depth: 1132'
Pump Size: Depth: 708'
Bowl Size:

Date: 2-27-24
Operator:
Engineer:
Static Level: 269.18
Datum: 2.50

Type of Test: 24 HR CONSTANT RATE

Discharge Pipe: Orifice: Meter:

Time of Day	Δ T	Inches of Orifice Pressure	Q GPM	Pumping Level	Static Level	Δ WL	Specific Capacity	Sand Content PPM	Elapsed Time	Start	Stop	MLS	Remarks
4:30 AM	260994		21.0	484.70	269.18	215.52	0.09	0.13	1199 mins	1:01 PM	9:00 AM	0.3	19 Hours 59 mins (Sand)
5:00	261614		20.6	484.79	|	215.61	0.09						
5:30	262232		20.6	484.75	|	215.57	0.09						
6:00	262854		20.7	484.80	|	215.62	0.09						
6:30	263475		20.7	484.82	|	215.64	0.09						
7:00	264098		20.7	484.88	|	215.70	0.09						
7:30	264717		20.6	484.92	|	215.74	0.09						
8:00	265338		20.7	484.96	|	215.78	0.09						
8:30	265955		20.5	485.80	|	216.62	0.09						
9:00	266575		20.6	486.00	|	216.82	0.09						Pump off

TEST PUMPING REPORT

LANG DRILLING

205 S 1200 W, North Salt Lake, UT 84054
PO BOX 27558, Salt Lake City, UT 84127
P: 801-294-5178

Well Owner:
Location: Rock Port
Well Name / Job #: S23-14170
Casing Size: 8" Depth: 1132'
Pump Size: Depth: 708'
Bowl Size:

Date: 2-27-24
Operator:
Engineer:
Static Level: 269.18 2-26@8:55AM
Datum: 2.5

Type of Test: Recovery
Discharge Pipe: 2 1/2 Orifice: Meter:

Time of Day	ΔT	Inches of Orifice Pressure	Q GPM	Pumping Level	Water ~~Static~~ Level	Δ WL	Specific Capacity	Sand Content PPM	Elapsed Time	Start	Stop	MLS	Remarks
9:00AM													Pump off
9:01					479.27								
9:02					473.42								
9:03					468.21								
9:04					463.30								
9:05					458.52								
9:06					453.89								
9:07					449.45								
9:08					445.08								
9:09					440.96								
9:10					436.97								
9:15					418.40								
9:20					402.03								
9:25					386.21								
9:30					372.56								
9:35					359.23								
9:40					349.65								
9:45					341.14								
9:50					334.30								
9:55					329.00								
10:00					324.27								
10:30					306.40								
11:00					297.10								
11:30					291.95								
12:00PM					288.60								
12:30					286.31								
1:00					284.55								
1:30					283.38								
2:00					282.40								
2:30					281.70								
3:00					281.21								

TEST PUMPING REPORT

LANG DRILLING

205 S 1200 W, North Salt Lake, UT 84054
PO BOX 27558, Salt Lake City, UT 84127
P: 801-294-5178

Well Owner:
Location: Rock Port
Well Name / Job #: S23-14170
Casing Size: 8" Depth: 1132
Pump Size: Depth: 708
Bowl Size:

Date: 2-27-24
Operator:
Engineer:
Static Level: 269.18 2-26-24 @ 8:55AM
Datum: 2.5

Type of Test: Recovery
Discharge Pipe: 2 1/2 Orifice: Meter:

Time of Day	ΔT	Inches of Orifice Pressure	Q GPM	Pumping Level	Water ~~Static~~ Level	Δ WL	Specific Capacity	Sand Content PPM	Elapsed Time	Start	Stop	MLS	Remarks
3:30PM					280.69								
4:00PM					280.21								

Appendix G
Field Measurements of Water Quality Parameters - Kelvin Well

Sample Date/Time	pH	Conductivity (µS/cm)	Sample Temperature (°F)	Turbidity (NTU)	Comments
1/20/24 1:00 AM	9.20	1301	75.7	611	Drill rig airlift development with swab
1/20/24 4:00 AM	9.20	1271	76.4	259	Drill rig airlift development with swab
1/20/24 7:30 AM	9.24	1268	70.6	293	Drill rig airlift development with swab
1/20/24 8:30 AM	9.27	1274	60.5	191	Drill rig airlift development with swab
2/13/24 1:30 PM	9.07	1260	62.4	159	Pumping development
2/13/24 2:00 PM	8.97	1311	59.8	414	Pumping development
2/13/24 3:00 PM	9.29	1256	58.8	255	Pumping development
2/13/24 3:30 PM	9.23	1255	58.8	258	Pumping development
2/13/24 4:10 PM	9.12	1253	59.2	275	Pumping development
2/13/24 6:00 PM	9.36	1282	47.4	108	Pumping development
2/14/24 10:30 AM	9.45	1298	46.2	109	Pumping development
2/14/24 12:00 PM	9.43	1303	46.0	156	Pumping development
2/14/24 2:00 PM	9.39	1269	48.2	181	Pumping development
2/14/24 3:20 PM	9.28	1236	57.4	129	Pumping development
2/14/24 3:57 PM	9.30	1236	59.2	138	Pumping development
2/15/24 8:30 AM	9.24	1246	57.9	125	Pumping development
2/15/24 10:30 AM	9.31	1259	58.7	103	Pumping development
2/15/24 12:30 PM	9.27	1259	58.7	75.3	Pumping development
2/15/24 2:30 PM	9.25	1262	58.6	131	Pumping development
2/15/24 4:15 PM	9.13	1233	57.5	73	Pumping development
2/16/24 7:30 AM	8.99	1220	59.8	126	Pumping development
2/16/24 10:00 AM	9.07	1242	59.3	94	Pumping development
2/16/24 12:00 PM	8.80	1286	43.1	157	Pumping development
2/16/24 2:00 PM	9.02	1233	57.7	101	Pumping development
2/16/24 4:00 PM	9.01	1227	58.1	85.6	Pumping development
2/16/24 5:30 PM	9.23	1252	58.3	82.2	Pumping development
2/19/24 5:30 AM	9.05	1245	55.5	77.1	Pumping development
2/19/24 9:30 AM	9.30	1258	47.2	96.5	Pumping development
2/19/24 11:30 AM	9.27	1295	49.1	54.4	Pumping development
2/19/24 1:30 PM	9.27	1292	48.1	111	Pumping development
2/19/24 3:30 PM	9.24	1271	50.9	49	Pumping development
2/19/24 4:20 PM	9.23	1241	58.8	92.6	Pumping development
2/20/24 7:30 AM	9.28	1229	58.7	111	Pumping development
2/20/24 9:30 AM	9.20	1251	59.3	54.2	Pumping development
2/20/24 11:30 AM	9.16	1259	55.9	41.5	Pumping development
2/20/24 1:30 PM	9.15	1257	55.0	25.3	Pumping development
2/20/24 3:45 PM	9.14	1267	52.3	26.8	Pumping development
2/20/24 4:20 PM	9.20	1228	58.8	29.4	Pumping development
2/20/24 6:00 PM	9.16	1241	62.0	27	Pumping development
2/21/24 7:30 AM	9.20	1232	61.5	36.7	Pumping development
2/21/24 9:30 AM	9.16	1254	60.3	41	Pumping development
2/21/24 11:30 AM	9.15	1253	58.4	31.7	Pumping development
2/21/24 1:30 PM	9.15	1248	58.5	29	Pumping development
2/21/24 2:30 PM	9.21	1240	57.6	25.7	Pumping development
2/21/24 3:30 PM	9.16	1220	58.0	22	Pumping development
2/21/24 4:30 PM	9.06	1242	55.5	21.5	Pumping development
2/21/24 6:00 PM	9.08	1229	63.2	25.8	Pumping development
2/22/24 7:30 AM	9.12	1220	64.3	37.4	Pumping development
2/22/24 9:30 AM	9.13	1248	64.0	36	Pumping development
2/22/24 11:30 AM	9.12	1242	62.9	25.1	Pumping development
2/22/24 1:30 PM	9.13	1235	61.3	22.2	Pumping development
2/22/24 3:15 PM	9.13	1229	61.5	17.82	Pumping development
2/22/24 4:00 PM	9.12	1226	58.0	14.95	Pumping development
2/23/24 9:10 AM	9.12	1228	54.6	9.75	Step Test

Appendix G
Field Measurements of Water Quality Parameters - Kelvin Well

Sample Date/Time	pH	Conductivity (µS/cm)	Sample Temperature (°F)	Turbidity (NTU)	Comments
2/23/24 9:25 AM	9.10	1222	54.8	28.2	Step Test
2/23/24 9:40 AM	9.27	1226	55.8	21.4	Step Test
2/23/24 9:55 AM	9.23	1232	54.2	23.8	Step Test
2/23/24 10:10 AM	9.11	1242	55.9	28.5	Step Test
2/23/24 10:25 AM	9.21	1227	55.7	30.4	Step Test
2/23/24 10:40 AM	9.17	1224	58.9	32.8	Step Test
2/23/24 11:10 AM	9.20	1249	62.1	50	Step Test
2/23/24 11:26 AM	9.17	1258	61.8	39.7	Step Test
2/23/24 11:40 AM	8.91	1232	61.8	118	Step Test
2/26/24 9:14 AM	9.25	1240	55.2	56.1	24-hour Constant Rate Test
2/26/24 9:30 AM	9.29	1235	57.4	97.4	24-hour Constant Rate Test
2/26/24 9:45 AM	9.29	1245	57.6	97.8	24-hour Constant Rate Test
2/26/24 10:00 AM	9.20	1248	57.4	38	24-hour Constant Rate Test
2/26/24 10:30 AM	9.25	1259	57.2	36.8	24-hour Constant Rate Test
2/26/24 11:00 AM	9.20	1259	56.8	32.7	24-hour Constant Rate Test
2/26/24 11:30 AM	9.16	1255	56.6	28.6	24-hour Constant Rate Test
2/26/24 12:00 PM	9.14	1252	56.6	27.1	24-hour Constant Rate Test
2/26/24 12:30 PM	9.12	1246	57	28	24-hour Constant Rate Test
2/27/24 8:07 AM	8.81	1223	51.6	7.09	24-hour Constant Rate Test
2/27/24 8:50 AM	8.84	1230	52.6	6.22	24-hour Constant Rate Test
Average:	9.17	1250			

Notes:
bgs means below ground surface;
gpm means gallons per minute;
NTU means Nephelometric Turbidity Units;
ppm means parts per million;
psi means pounds per square inch;
µS/cm means microsiemens per centimeter;
°F means degrees Fahrenheit; and
-- means not applicable or parameter not measured.

APPENDIX H

ANALYTICAL LABORATORY REPORTS

CHEMTECH-FORD
LABORATORIES

3/8/2024

Work Order: 24B1857
Project: [none]

Loughlin Water Associates, LLC
Attn: Connor Smith
3100 West Pinebrook Road #1100
Park City, UT 84098

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Andrew Royer, Project Manager

CHEMTECH-FORD LABORATORIES

Certificate of Analysis

Lab Sample No.: 24B1857-01

Name:	**Loughlin Water Associates, LLC**	***Sample Date:***	2/27/2024 8:00 AM
Sample Site:	Kelvin Well	***Receipt Date:***	2/27/2024 10:01 AM
Comments:		***Sampler:***	Conner Smith
Sample Matrix:	Drinking Water	***Project:***	
PO Number:		***System No.:***	UTAH22104
Source Code:	WS003 ***Sample Point:*** WS003	***Report to State:***	Y

Parameter	Sample Result	EPA Max Contaminant Level (MCL)	Minimum Reporting Limit	Units	Analytical Method	Preparation Date/Time	Analysis Date/Time	Flag
Calculations								
Langelier Index @ 22 Deg. C	0.57			None	Calculation	03/07/2024	03/07/2024	
Hardness, Total as CaCO3	47.3		1.32	mg/L	SM 2340 B/[CALC]	02/29/2024	03/01/2024	
Inorganic								
Alkalinity - Bicarbonate (as CaCO3)	264		1.0	mg/L	SM 2320 B	02/29/2024	02/29/2024	
Alkalinity - Carbonate (as CaCO3)	6.9		1.0	mg/L	SM 2320 B	02/29/2024	02/29/2024	
Alkalinity - Hydroxide (as CaCO3)	ND		1.0	mg/L	SM 2320 B	02/29/2024	02/29/2024	
Alkalinity - Total (as CaCO3)	271		1.0	mg/L	SM 2320 B	02/29/2024	02/29/2024	
Ammonia as N	ND		0.20	mg/L	SM 4500 NH3 H	02/28/2024	02/28/2024	
Chloride	203	250	1.00	mg/L	EPA 300.0	02/27/2024	02/27/2024	
Color	5	15	0	Color Units	SM 2120 B	02/27/2024 13:44	02/27/2024 13:56	
Conductivity	1270		1.00	umho/cm	EPA 120.1	02/29/2024	02/29/2024	
Cyanide, Free	ND	0.2	0.016	mg/L	EPA 335.4	02/27/2024	02/27/2024	
Fluoride	0.468	4	0.100	mg/L	EPA 300.0	02/27/2024	02/27/2024	
MBAS Surfactants	ND	0.5	0.08	mg/L	SM 5540 C	02/28/2024 10:58	02/28/2024 12:59	
Nitrate as N	0.32	10	0.10	mg/L	EPA 300.0	02/27/2024 15:02	02/27/2024 17:26	
Nitrite as N	ND	1	0.10	mg/L	EPA 300.0	02/27/2024 15:02	02/27/2024 17:26	
Odor	ND	3	0	T.O.N.	SM 2150 B	02/27/2024 13:44	02/27/2024 13:59	
pH	8.8		0.1	pH Units	SM 4500 H-B	02/27/2024 15:10	02/27/2024 15:44	SPH
Phosphate, ortho as P	0.01		0.01	mg/L	SM 4500 P-E	02/28/2024 15:31	02/29/2024 12:45	
Sulfate	47.0	250	1.00	mg/L	EPA 300.0	02/27/2024	02/27/2024	
Total Dissolved Solids (TDS)	688	1000	20	mg/L	SM 2540 C	02/27/2024	02/27/2024	
Turbidity	1.7	5	0.05	NTU	EPA 180.1	02/27/2024 09:30	02/27/2024 11:25	
Metals								
Aluminum, Total	ND	0.2	0.05	mg/L	EPA 200.7/200.2	02/29/2024	03/01/2024	
Antimony, Total	ND	0.006	0.0005	mg/L	EPA 200.8/200.2	02/28/2024	02/28/2024	
Arsenic, Total	0.0090	0.01	0.0005	mg/L	EPA 200.8/200.2	02/28/2024	02/28/2024	
Barium, Total	0.091	2	0.005	mg/L	EPA 200.7/200.2	02/29/2024	03/01/2024	
Beryllium, Total	ND	0.004	0.001	mg/L	EPA 200.7/200.2	02/29/2024	02/29/2024	
Boron, Total	0.13		0.05	mg/L	EPA 200.7/200.2	02/29/2024	03/01/2024	
Cadmium, Total	ND	0.005	0.0002	mg/L	EPA 200.8/200.2	02/28/2024	02/28/2024	
Calcium, Total	10.1		0.2	mg/L	EPA 200.7/200.2	02/29/2024	03/01/2024	
Chromium, Total	ND	0.1	0.005	mg/L	EPA 200.7/200.2	02/29/2024	03/01/2024	
Copper, Total	0.0030	1.3	0.0010	mg/L	EPA 200.8/200.2	02/28/2024	02/28/2024	
Iron, Total	0.13	0.3	0.02	mg/L	EPA 200.7/200.2	02/29/2024	03/01/2024	
Lead, Total	0.0005	0.015	0.0005	mg/L	EPA 200.8/200.2	02/28/2024	02/28/2024	

CHEMTECH-FORD LABORATORIES

Certificate of Analysis

Lab Sample No.: 24B1857-01

Name:	**Loughlin Water Associates, LLC**	***Sample Date:***	2/27/2024 8:00 AM
Sample Site:	Kelvin Well	***Receipt Date:***	2/27/2024 10:01 AM
Comments:		***Sampler:***	Conner Smith
Sample Matrix:	Drinking Water	***Project:***	
PO Number:		***System No.:***	UTAH22104
Source Code:	WS003	***Sample Point:*** WS003	***Report to State:*** Y

Parameter	Sample Result	EPA Max Contaminant Level (MCL)	Minimum Reporting Limit	Units	Analytical Method	Preparation Date/Time	Analysis Date/Time	Flag
Metals (cont.)								
Magnesium, Total	5.4		0.2	mg/L	EPA 200.7/200.2	02/29/2024	03/01/2024	
Manganese, Total	0.012	0.05	0.005	mg/L	EPA 200.7/200.2	02/29/2024	03/01/2024	
Mercury, Total	ND	0.002	0.00020	mg/L	EPA 200.8/200.2	03/04/2024	03/04/2024	
Nickel, Total	ND	0.1	0.005	mg/L	EPA 200.7/200.2	02/29/2024	02/29/2024	
Potassium, Total	0.7		0.5	mg/L	EPA 200.7/200.2	02/29/2024	03/01/2024	
Selenium, Total	0.0061	0.05	0.0005	mg/L	EPA 200.8/200.2	02/28/2024	02/28/2024	
Silica, (as SiO2) Total	10.2		0.1	mg/L	EPA 200.7/200.2	02/29/2024	03/01/2024	
Silver, Total	ND	0.1	0.0005	mg/L	EPA 200.8/200.2	02/28/2024	02/28/2024	
Sodium, Total	240		0.5	mg/L	EPA 200.7/200.2	02/29/2024	03/01/2024	
Thallium, Total	ND	0.002	0.0002	mg/L	EPA 200.8/200.2	02/28/2024	02/28/2024	
Zinc, Total	ND	5	0.01	mg/L	EPA 200.7/200.2	02/29/2024	02/29/2024	
Carbamates								
3-Hydroxycarbofuran	ND		1	ug/L	EPA 531.1	02/28/2024	02/28/2024	
Aldicarb	ND		1	ug/L	EPA 531.1	02/28/2024	02/28/2024	
Aldicarb sulfone	ND		1	ug/L	EPA 531.1	02/28/2024	02/28/2024	
Aldicarb sulfoxide	ND		1	ug/L	EPA 531.1	02/28/2024	02/28/2024	
Carbaryl	ND		1	ug/L	EPA 531.1	02/28/2024	02/28/2024	
Carbofuran	ND	40	1	ug/L	EPA 531.1	02/28/2024	02/28/2024	
Methomyl	ND		1	ug/L	EPA 531.1	02/28/2024	02/28/2024	
Oxamyl	ND	200	1	ug/L	EPA 531.1	02/28/2024	02/28/2024	
Herbicides								
2,4,5-TP (Silvex)	ND	50	0.440	ug/L	EPA 515.3	03/05/2024	03/06/2024	
2,4-D	ND	70	0.220	ug/L	EPA 515.3	03/05/2024	03/06/2024	
Dalapon	ND	200	2.20	ug/L	EPA 515.3	03/05/2024	03/06/2024	
Dicamba	ND		1.00	ug/L	EPA 515.3	03/05/2024	03/06/2024	
Dinoseb	ND	7	0.440	ug/L	EPA 515.3	03/05/2024	03/06/2024	
Pentachlorophenol	ND	1	0.088	ug/L	EPA 515.3	03/05/2024	03/06/2024	
Picloram	ND	500	0.220	ug/L	EPA 515.3	03/05/2024	03/06/2024	
Pesticides								
Endrin	ND	2	0.022	ug/L	EPA 508.1	02/27/2024	03/04/2024	
Heptachlor	ND	0.4	0.088	ug/L	EPA 508.1	02/27/2024	03/04/2024	
Heptachlor epoxide	ND	0.2	0.044	ug/L	EPA 508.1	02/27/2024	03/04/2024	
Lindane	ND	0.2	0.044	ug/L	EPA 508.1	02/27/2024	03/04/2024	
Methoxychlor	ND	40	0.22	ug/L	EPA 508.1	02/27/2024	03/04/2024	

CHEMTECH-FORD LABORATORIES

Certificate of Analysis

Lab Sample No.: 24B1857-01

Name:	**Loughlin Water Associates, LLC**	***Sample Date:***	2/27/2024 8:00 AM
Sample Site:	Kelvin Well	***Receipt Date:***	2/27/2024 10:01 AM
Comments:		***Sampler:***	Conner Smith
Sample Matrix:	Drinking Water	***Project:***	
PO Number:		***System No.:***	UTAH22104
Source Code:	WS003	***Sample Point:*** WS003	***Report to State:*** Y

Parameter	Sample Result	EPA Max Contaminant Level (MCL)	Minimum Reporting Limit	Units	Analytical Method	Preparation Date/Time	Analysis Date/Time	Flag
Pesticides (cont.)								
PCB-1016	ND	0.2	0.20	ug/L	EPA 508.1	02/27/2024	03/04/2024	
PCB-1221	ND	0.5	0.20	ug/L	EPA 508.1	02/27/2024	03/04/2024	
PCB-1232	ND	0.5	0.20	ug/L	EPA 508.1	02/27/2024	03/04/2024	
PCB-1242	ND	0.5	0.50	ug/L	EPA 508.1	02/27/2024	03/04/2024	
PCB-1248	ND	0.5	0.50	ug/L	EPA 508.1	02/27/2024	03/04/2024	
PCB-1254	ND	0.5	0.50	ug/L	EPA 508.1	02/27/2024	03/04/2024	
PCB-1260	ND	0.5	0.50	ug/L	EPA 508.1	02/27/2024	03/04/2024	
PCB - Total	ND	0.5	0.50	ug/L	EPA 508.1	02/27/2024	03/04/2024	
Toxaphene	ND	3	2.2	ug/L	EPA 508.1	02/27/2024	03/04/2024	
Semi-Volatile Compounds								
Alachlor	ND	2	0.44	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Aldrin	ND		2.00	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Atrazine	ND	3	0.22	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Benzo (a) pyrene	ND	0.2	0.04	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Bis (2-ethylhexyl) Adipate	ND	400	1.30	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Bis (2-ethylhexyl) Phthalate	ND	6	1.30	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Butachlor	ND		0.50	ug/L	EPA 525.2	02/27/2024	02/29/2024	
alpha-Chlordane	ND	2	0.44	ug/L	EPA 525.2	02/27/2024	02/29/2024	
gamma-Chlordane	ND	2	0.44	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Chlordane - Total	ND	2	0.44	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Dieldrin	ND		1.00	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Hexachlorobenzene	ND	1	0.22	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Hexachlorocyclopentadiene	ND	50	0.22	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Metolachlor	ND		0.50	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Metribuzin	ND		0.50	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Propachlor	ND		0.50	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Simazine	ND	4	0.15	ug/L	EPA 525.2	02/27/2024	02/29/2024	
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,1,1-Trichloroethane	ND	200	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,1,2,2-Tetrachloroethane	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,1,2-Trichloroethane	ND	5	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,1,2-Trichlorotrifluoroethane	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,1-Dichloroethane	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,1-Dichloroethene	ND	7	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	

CHEMTECH-FORD LABORATORIES

Certificate of Analysis

Lab Sample No.: 24B1857-01

Name:	**Loughlin Water Associates, LLC**	***Sample Date:***	2/27/2024 8:00 AM
Sample Site:	Kelvin Well	***Receipt Date:***	2/27/2024 10:01 AM
Comments:		***Sampler:***	Conner Smith
Sample Matrix:	Drinking Water	***Project:***	
PO Number:		***System No.:***	UTAH22104
Source Code:	WS003 ***Sample Point:*** WS003	***Report to State:***	Y

Parameter	Sample Result	EPA Max Contaminant Level (MCL)	Minimum Reporting Limit	Units	Analytical Method	Preparation Date/Time	Analysis Date/Time	Flag
Volatile Organic Compounds (cont.)								
1,1-Dichloropropene	ND		0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,2,3-Trichlorobenzene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,2,3-Trichloropropane	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,2,4-Trichlorobenzene	ND	70	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,2,4-Trimethylbenzene	ND	70	1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,2-Dichlorobenzene	ND	600	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,2-Dichloroethane	ND	5	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,2-Dichloropropane	ND	5	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,3,5-Trimethylbenzene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,3-Dichlorobenzene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,3-Dichloropropane	ND		0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
1,4-Dichlorobenzene	ND	75	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
2,2-Dichloropropane	ND		0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
2-Chlorotoluene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
4-Chlorotoluene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Benzene	ND	5	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Bromobenzene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Bromochloromethane	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Bromodichloromethane	ND		0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Bromoform	ND		0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Bromomethane	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Carbon Tetrachloride	ND	5	1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Chlorobenzene	ND	100	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Chloroethane	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Chloroform	1.4		0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Chloromethane	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
cis-1,2-Dichloroethene	ND	70	1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
cis-1,3-Dichloropropene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Dibromochloromethane	ND		0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Dibromomethane	ND	5	1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Dichlorodifluoromethane	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Ethyl Benzene	ND	700	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Hexachlorobutadiene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Isopropylbenzene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Methyl tert-Butyl Ether (MTBE)	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Methylene Chloride	ND	5	1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	

CHEMTECH-FORD LABORATORIES

Certificate of Analysis

Lab Sample No.: 24B1857-01

Name:	**Loughlin Water Associates, LLC**	***Sample Date:***	2/27/2024 8:00 AM
Sample Site:	Kelvin Well	***Receipt Date:***	2/27/2024 10:01 AM
Comments:		***Sampler:***	Conner Smith
Sample Matrix:	Drinking Water	***Project:***	
PO Number:		***System No.:***	UTAH22104
Source Code:	WS003	***Sample Point:*** WS003	***Report to State:*** Y

Parameter	Sample Result	EPA Max Contaminant Level (MCL)	Minimum Reporting Limit	Units	Analytical Method	Preparation Date/Time	Analysis Date/Time	Flag
Volatile Organic Compounds (cont.)								
Naphthalene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
n-Butyl Benzene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
n-Propyl Benzene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
p-Isopropyltoluene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
sec-Butyl Benzene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Styrene	ND	100	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
tert-Butylbenzene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Tetrachloroethene	ND	5	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Toluene	1.1	1000	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
trans-1,2-Dichloroethene	ND	100	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
trans-1,3-Dichloropropene	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Trichloroethene	ND	5	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Trichlorofluoromethane	ND		1.0	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Vinyl Chloride	ND	2	0.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	
Xylenes, total	ND	10000	1.5	ug/L	EPA 524.2	03/05/2024	03/05/2024	

Report Footnotes

Abbreviations

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1 ug/L = one microgram per liter or 1 ug/Kg = one microgram per kilogram = 1 part per billion.
1 ng/L = one nanogram per liter or 1 ng/Kg = one nanogram per kilogram = 1 part per trillion.

Data Comparisons

Values reported in **RED** exceed Primary Drinking Water standards.
Values reported in **BLUE** exceed Secondary Drinking Water standards.
BLANK values in the MCL column indicate no standard.
On calculated parameters, there may be a slight difference between summing the rounded values shown on the report vs the unrounded values used in the calculation.

Flag Descriptions

24B1857-01 = SM 4500 P-E: The analysis was performed past the EPA recommended holding time.

SPH = Sample submitted past method specified holding time.

DRINKING WATER SAMPLES ONLY

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: Loughlin Water Associates, LLC
ADDRESS: 3100 Pinebrook Rd, Suite 1100
CITY/STATE/ZIP: Park City, UT 84098
PHONE #: 435-649-4005 FAX: 435-649-4085
CONTACT: Connor Smith PROJECT:
EMAIL: connor@loughlinwater.com

** Expedited turnaround subject to additional charge*

BILLING ADDRESS: Same
BILLING CITY/STATE/ZIP:
PURCHASE ORDER:

CHEMTECH-FORD LABORATORIES

TURNAROUND TIME REQUIRED: Normal
* Expedited turnaround subject to additional charge

State System Number
UTAH22104 WS003

Send to State
X Yes ☐ No

24B1857

Rads on 24B1860

Lab Use Only	LOCATION	DATE	TIME	FACILITY ID (source code)	POINT CODE (DBP)	Field: Residual Chlorine	New PWS Well Analysis	Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)
-01	1. Kelvin Well	2/27/24	8:00				✓			
	2.									
	3.									
	4.									
	5.									
	6.									
	7.									
	8.									
	9.									
	10.									

Bacteria: **R** = Routine; **I** = Investigative; **TR** = Trigger Source; **RP** = Repeat

REPEAT: **OR** = Original Location; **UP** = Upstream; **DN** = Downstream

LAB FAIL Ref #

Sampled by: [print] Connor Smith
Sampled by: [signature] Connor Smith

ON ICE (circled) NOT ON ICE Temp (C°): 7.0

Special Instructions:

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Connor Smith	2/27/24 10:01	Denise Brun	2/27/24 10:01

CHEMTECH-FORD
9632 South 500 West
Sandy, UT 84070

801.262.7299 PHONE
866.792.0093 FAX
www.ChemtechFord.com

Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum).
Client agrees to pay collection costs and attorney's fees.

Work Order # 2413857

CHEMTECH FORD LABORATORIES
Sample Receipt

CHEMTECH-FORD LABORATORIES

Delivery Method:

☐ UPS ☐ USPS
☐ FedEx ☐ Chemtech Courier
☑ Walk-in ☐ Customer Courier

Receiving Temperature 7.0 °C

Sample #	Container	Chemtech Lot # or Preservative	Number of Subsamples	Preserved by Client/Third Party	Preserved in Receiving/Laboratory	Filtered in Field by Client	Misc Volume (oz/mL)	Comments
-01	V(3)	1322						
	U(2)	1342						
	KX(3)	1259						
2/27/24	V(2)	1226						
	Ag(2)	1354						
	N	1353						
	m	1325						
	C	1328						
	AP	1309						
	Am Gl (250)	1293						

Sample Condition (check if *yes*)

- ☐ Custody Seals
- ☑ Containers Intact
- ☑ COC can be matched to bottles
- ☑ Received on Ice
- ☑ Correct Containers(s)
- ☑ Sufficent Sample Volume
- ☐ Headspace Present (VOC)
- ☐ Temperature Blank
- ☑ Received within Holding Time

Plastic Containers

A- Plastic Unpreserved
B- Miscellaneous Plastic
C- Cyanide Qt (NaOH)
E- Coliform/Ecoli/HPC
F- Sulfide Qt (Zn Acetate)
L- Mercury 1631
M- Metals Pint (HNO3)
N- Nutrient Pint (H2SO4)
R- Radiological (HNO3)
S- Sludge Cups/Tubs
Q- Plastic Bag

Glass Containers

D- 625 (Na2S2O3)
G- Glass Unpreserved
H- HAAs (NH4Cl)
J- 508/515/525 (Na2SO3)
K- 515.3 Herbicides
O- Oil & Grease (HCl)
P- Phenols (H2SO4)
T- TOC/TOX (H3PO4)
U- 531 (MCAA, Na2S2O3)
V- 524/THMs (Ascorbic Acid)
W- 8260 VOC (1:1 HCl)
X- Vial Unpreserved
Y- 624/504 (Na2S2O3)
Z- Miscellaneous Glass

CHEMTECH-FORD
LABORATORIES

2/28/2024

Work Order: 24B1858
Project: [none]

Loughlin Water Associates, LLC
Attn: Connor Smith
3100 West Pinebrook Road #1100
Park City, UT 84098

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Melissa Connolly, Project Manager

CHEMTECH-FORD
LABORATORIES

Certificate of Analysis

Lab Sample No.: 24B1858-01

Name:	**Loughlin Water Associates, LLC**	***Sample Date:***	2/27/2024 8:00 AM
Sample Site:	Kelvin Well	***Receipt Date:***	2/27/2024 10:01 AM
Comments:		***Sampler:***	Conner Smith
Sample Matrix:	Drinking Water	***Project:***	
PO Number:		***System No.:***	UTAH25012
Source Code:	***Sample Point:***	***Report to State:***	N

Parameter	Sample Result	EPA Max Contaminant Level (MCL)	Minimum Reporting Limit	Units	Analytical Method	Preparation Date/Time	Analysis Date/Time	Flag
Microbiology								
Coliform, Total	Absent		1	Org/100 mL	EPA 9223B	02/27/2024 13:30	02/28/2024 14:30	
E. Coli	Absent		1	Org/100 mL	EPA 9223B	02/27/2024 13:30	02/28/2024 14:30	

Report Footnotes

Abbreviations

ND = Not detected at the corresponding Minimum Reporting Limit.
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1 ug/L = one microgram per liter or 1 ug/Kg = one microgram per kilogram = 1 part per billion.
1 ng/L = one nanogram per liter or 1 ng/Kg = one nanogram per kilogram = 1 part per trillion.

Data Comparisons

Values reported in **RED** exceed Primary Drinking Water standards.
Values reported in **BLUE** exceed Secondary Drinking Water standards.
BLANK values in the MCL column indicate no standard.
On calculated parameters, there may be a slight difference between summing the rounded values shown on the report vs the unrounded values used in the calculation.

DRINKING WATER SAMPLES ONLY

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: Loughlin Water Associates, LLC
ADDRESS: 3100 Pinebrook Rd, Suite 1100
CITY/STATE/ZIP: Park City, UT 84098
PHONE #: 435-649-4005 FAX: 435-649-4085
CONTACT: Connor Smith PROJECT:
EMAIL: connor@loughlinwater.com
** Expedited turnaround subject to additional charge*

BILLING ADDRESS: Same
BILLING CITY/STATE/ZIP:
PURCHASE ORDER:

CHEMTECH-FORD LABORATORIES

TURNAROUND TIME REQUIRED: Normal
* Expedited turnaround subject to additional charge

State System Number	Send to State
	☐ Yes ☒ No

24B 1858

Lab Use Only	CLIENT SAMPLE INFORMATION						TESTS REQUESTED										Bacteria: R = Routine; I = Investigative; TR = Trigger Source; RP = Repeat. REPEAT: OR = Original Location; UP = Upstream; DN = Downstream	
	LOCATION	DATE	TIME	FACILITY ID (source code)	POINT CODE (DBP)	Field: Residual Chlorine	[redacted]									Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)		LAB FAIL Ref #
-01	1. Kelvin Well	2/27/24	8:00													✓				
	2.																			
	3.																			
	4.																			
	5.																			
	6.																			
	7.																			
	8.																			
	9.																			
	10.																			

Sampled by: [print] Connor Smith Sampled by: [signature] Connor Smith

ON ICE NOT ON ICE Temp (C°): 7.0

Special Instructions:

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

W-E 1249

Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Connor Smith	2/27/24 10:01	Denise Brun	2/27/24 10:01
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

CHEMTECH-FORD
9632 South 500 West
Sandy, UT 84070

801.262.7299 PHONE
866.792.0093 FAX
www.ChemtechFord.com

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Client agrees to pay collection costs and attorney's fees.

CHEMTECH-FORD
LABORATORIES

4/18/2024

Work Order: 24B1860
Project: [none]

Loughlin Water Associates, LLC
Attn: Connor Smith
3100 West Pinebrook Road #1100
Park City, UT 84098

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Andrew Royer, Project Manager

CHEMTECH-FORD
LABORATORIES

Certificate of Analysis

Lab Sample No.: 24B1860-01

Name:	**Loughlin Water Associates, LLC**	***Sample Date:***	2/27/2024 8:00 AM
Sample Site:	Kelvin Well	***Receipt Date:***	2/27/2024 10:01 AM
Comments:		***Sampler:***	Conner Smith
Sample Matrix:	Drinking Water	***Project:***	
PO Number:		***System No.:***	UTAH22104
Source Code:	WS003	***Sample Point:*** WS003	***Report to State:*** Y

Parameter	Sample Result	EPA Max Contaminant Level (MCL)	Minimum Reporting Limit	Units	Analytical Method	Preparation Date/Time	Analysis Date/Time	Flag
Radiochemistry								
Gross Alpha	7.7 ± 3.5	15	2.4	pCi/L	EPA 900.0	03/04/2024	03/11/2024	SL-62
Gross Beta	0.4 ± 1.86		1.5	pCi/L	EPA 900.0	03/04/2024	03/11/2024	SL-62
Radium-226	0.24 ± 0.164	5	0.21	pCi/L	SM 7500 Ra B	04/10/2024	04/15/2024	SL-62
Radium-228	1.1 ± 0.285	5	0.48	pCi/L	EPA 904.0	03/06/2024	03/20/2024	SL-62

Report Footnotes

Abbreviations

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1 ug/L = one microgram per liter or 1 ug/Kg = one microgram per kilogram = 1 part per billion.
1 ng/L = one nanogram per liter or 1 ng/Kg = one nanogram per kilogram = 1 part per trillion.

Data Comparisons

Values reported in **RED** exceed Primary Drinking Water standards.
Values reported in **BLUE** exceed Secondary Drinking Water standards.
BLANK values in the MCL column indicate no standard.
On calculated parameters, there may be a slight difference between summing the rounded values shown on the report vs the unrounded values used in the calculation.

Flag Descriptions

SL-62 = Analysis performed by Pace Analytical National, Mount Juliet, TN 37122

DRINKING WATER SAMPLES ONLY

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY:	Loughlin Water Associates, LLC
ADDRESS:	3100 Pinebrook Rd, Suite 1100
CITY/STATE/ZIP:	Park City, UT 84098
PHONE #:	435-649-4005 **FAX:** 435-649-4085
CONTACT:	Connor Smith **PROJECT:**
EMAIL:	connor@loughlinwater.com

** Expedited turnaround subject to additional charge*

BILLING ADDRESS: Same

BILLING CITY/STATE/ZIP:

PURCHASE ORDER:

CHEMTECH-FORD LABORATORIES

TURNAROUND TIME REQUIRED: Normal

* Expedited turnaround subject to additional charge

State System Number	Send to State
UTAH22104 WS003	X Yes ☐ No

24B18160

Ag(z)-1347 (preserved @ receiving)

TESTS REQUESTED

Bacteria

R = Routine
I = Investigative
TR = Trigger Source
RP = Repeat

REPEAT
OR = Original Location
UP = Upstream
DN = Downstream

Lab Use Only	CLIENT SAMPLE INFORMATION						New PWS Well Analysis	RADS	Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	LAB FAIL Ref #
	LOCATION	DATE	TIME	FACILITY ID (source code)	POINT CODE (DBP)	Field: Residual Chlorine						
-01	1. Kelvin Well	2/27/24	8:00				✓	X				
	2.											
	3.											
	4.											
	5.											
	6.											
	7.											
	8.											
	9.											
	10.											

Sampled by: [print] Connor Smith Sampled by: [signature] Connor Smith

ON ICE NOT ON ICE Temp (C°): 7.0

Special Instructions:

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature] Connor Smith	Date/Time 2/27/24 10:01	Received by: [signature] Denise Brun	Date/Time 2/27/24 10:01
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

CHEMTECH-FORD
9632 South 500 West
Sandy, UT 84070

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866.792.0093 FAX
www.ChemtechFord.com

Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum).
Client agrees to pay collection costs and attorney's fees.

Walkin

Sample Receipt Conditions:

- ( ) Custody Seals Present
- (✓) Containers Intact
- (✓) COC and Labels Match
- (✓) Received on Ice
- (✓) Correct Containers
- (✓) COC Included
- (✓) COC Complete
- ( ) Sufficient Sample Volume
- ( ) Headspace Present (VOC)
- ( ) Temperature Blank
- (✓) Received within Hold

Checked by: DB