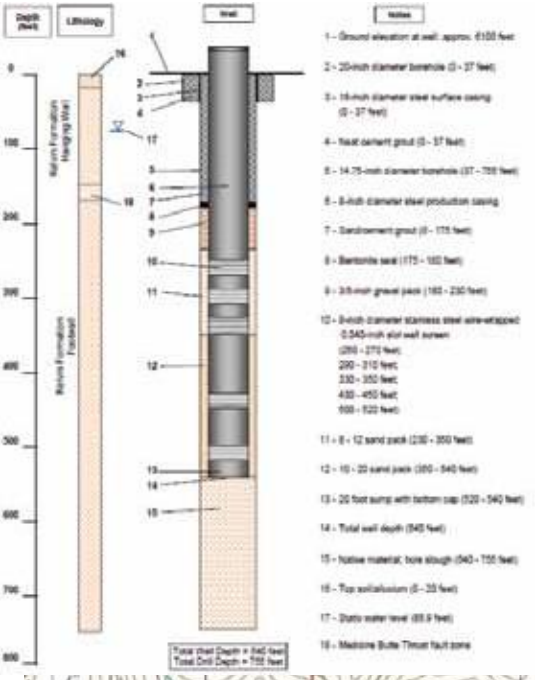
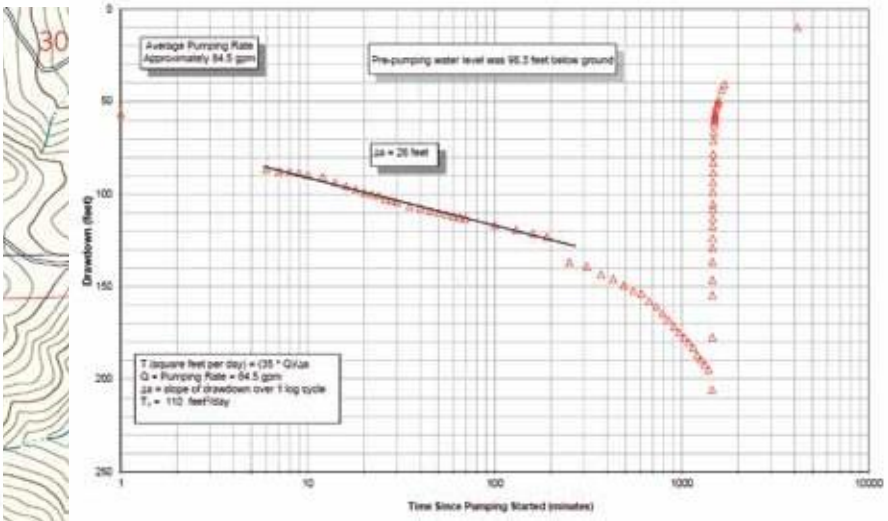
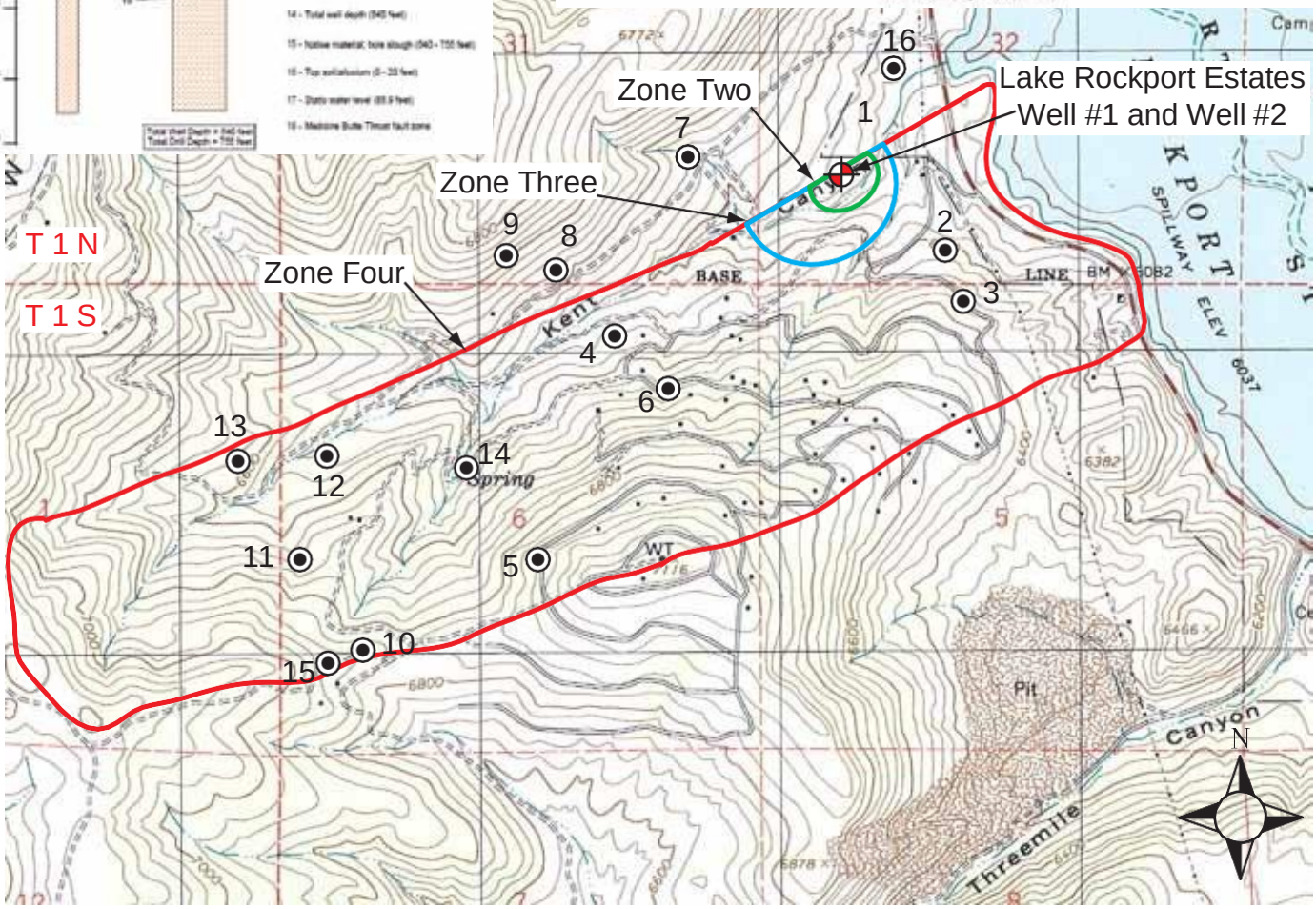
LAKE ROCKPORT ESTATES WELL #2
DRINKING WATER SOURCE PROTECTION (DWSP) PLAN
LAKE ROCKPORT ESTATES
UTAH PWS NO. 22104







Prepared by:
Loughlin Water Associates, LLC
3100 W. Pinebrook Rd. Ste. 1100
Park City, Utah 84098
(435) 649-4005

April 2013

Prepared for:
PSOMAS
Attention: Ted Mickelsen, P.E.
4179 Riverboat Rd, Ste. 200
Salt Lake City, Utah 84123

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WATER ASSOCIATES LLC

April 17, 2013

Utah Division of Drinking Water
Attention: Kate Johnson
P.O. Box 144830
Salt Lake City, Utah 84114-4830

Subject: Transmittal of Drinking Water Source Protection (DWSP) Plan for
Lake Rockport Estates Well #2
Lake Rockport Estates, Summit County, Utah
Public Water System No. 22104
DDW File No. 07408

Dear Kate:

Please find enclosed the Drinking Water Source Protection (DWSP) Plan for Lake Rockport Estates Well #2 (WS002) located in Summit County, Utah. Lake Rockport Estates is Public Water System (PWS) No. 22104 and is a non-transient community water system.

This document was prepared by Loughlin Water Associates, LLC, and is provided for your review.

If you have any questions or need more information, please do not hesitate to call us at (435) 649-4005 (office) or BiJ1 at (435) 659-1752 (mobzte).

Very truly yours,

Loughlin Water Associates, LLC

Neil I. Burk, P.G.
Project Hydrogeologist

Enclosure

cc: Ted Mickelsen, P.E. - PSOMAS
Alan Lindsley — Lake Rockport Estates

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DRINKING WATER SOURCE PROTECTION (DWSP) PLAN
LAKE ROCKPORT ESTATES WELL 62
WATER SOURCE WSO02
LAKE ROCKPORT ESTATES
PUBLIC WATER SYSTEf8 NO. 22104
SUf4IHIT COUNTY, UTAH

Prepared for:

PSOMAS
Attention: Ted Mickelsen, P.E.
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Salt Lake City, Utah 84123

Prepared by:

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Date: April 17, 2013

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EXECUTIVE SUMMARY

This Drinking Water Source Protection (DWSP) Plan is for Lake Rockport Estates Well #2 (the well). The Utah Division of Drinking Water (DDW) designates the well as water source WS002 of the Lake Rockport Estates public water system (PWS) No. 22104. Lake Rockport Estates is classified as a non-transient, community water system by the DDW. The location of the Lake Rockport Estates Well #2 is described in Section 1.2 and shown on Figures 1 and 2.

The DDW requires a DWSP Plan for all public drinking water sources in accordance with Utah Administrative Code (UAC) R309-600, Drinking Water Source Protection (DWSP). This DWSP plan characterizes and outlines source water areas (recharge areas), identifies threats to water quality (pollution sources), and assesses the potential risks these threats pose to the water supply. Because a contamination incident can damage or make unusable the water supply for the development, a long-term commitment is necessary to assure the protection of the drinking water source.

Hydrogeologic conditions were characterized based on a review of available published and unpublished information, a site visit and evaluation of pumping test data for the well. Analytical groundwater modeling combined with hydrogeologic mapping was used to delineate the Zone Two, Three and Four DWSP area boundaries. The well is screened in the Kelvin Formation and should be classified as "protected" in accordance with DDW rules.

Following DDW protocol, the source protection areas were visited to identify potential contaminant sources (PCSs) within the protection zones. PCSs were identified and assessed and summarized in Tables 6 through 9. The location of PCSs are shown on Figure 7. No sewer lines are located within Zone One or Zone Two of the well.

A land use agreement has been signed and recorded to prevent the location of uncontrolled PCSs or pollution sources within the Zone One DWSP area of Lake Rockport Estates Well #2. Additionally, Lake Rockport Estates has a program to manage future PCSs that may want to locate within the DWSP areas.

Table 10 outlines the management strategies to control PCSs and Table 11 provides an implementation schedule. Section 8 is an evaluation of resources that Lake Rockport Estates has to implement the DWSP plan. Section 9 summarizes records that document the implementation of the DWSP plan. Section 10 presents a contingency plan that was prepared for Lake Rockport Estates Well #2. Section 11 outlines public notification requirements.

1.0 INTRODUCTION

This Drinking Water Source Protection (DWSP) Plan is for Lake Rockport Estates Well #2 (the well). The Utah Division of Drinking Water (DDW) designates the well as water source WS002 of the Lake Rockport Estates public water system (PWS) No. 22104. Lake Rockport Estates is classified as a non-transient, community water system by the DDW. The location of the Lake Rockport Estates Well #2 is described in Section 1.2 and shown on Figures 1 and 2.

Lake Rockport Estates submitted a preliminary evaluation report (PER) for the well to the DDW in March 2008. The PER was approved by the DDW on April 17, 2009. The plan approval letter is provided in Appendix A.

The overall approach used to prepare this DWSP Plan was to: (1) compile, evaluate, and use, to the degree feasible, applicable data from previous work and (2) follow the step-by-step instructions and format provided by DDW guidance documents. The principal documents that were used as guidance include:

- Utah Administrative Code (UAC) R309-600, Source Protection: Drinking Water Source Protection for Ground-Water Sources, dated November 15, 2012;
- Ground Water Source Protection User's Guide, dated June 1, 2012; and
- Drinking Water Source Protection Plan: Standard Report Format for Existing Wells and Springs, dated January 2007.

1.1 SYSTEM INFORMATION

System information is provided as follows:

Water System Name:	Lake Rockport Estates
System Number:	22104
System Address:	Lake Rockport Estates 100 Rockport Boulevard Coalville, Utah 84017
New or Existing System:	Existing
Public or Non-Public:	Public
Type of Public System:	Non-transient, community

1.2 SOURCE INFORMATION

Source information is provided as follows:

Source Name:	Lake Rockport Estates Well #2
DDW Source Number:	WS002
Proposed New or Existing Source:	Existing
Well, Spring, or Tunnel:	Well
Individual Source, Wellfield or Springfield:	Individual Well
Construction Date of Source:	April 30, 2008 – May 6, 2009
Description of Location:	Approximately North 1282 feet, East 1126 feet from the southwest (SW) corner of Section 32, Township 1 North, Range 5 East, Salt Lake Base and Meridian (SLB&M), based on a hand-held GPS device.

1.3 DESIGNATED PERSON

The Designated Person for the water system is as follows:

	Designated Person
Name:	Alan Lindsley
Address:	Lake Rockport Estates 100 Rockport Boulevard Coalville, Utah 84017
Phone Number:	801-560-7021

2.0 DELINEATION REPORT

This Delineation Report: (1) contains the geologic data, aquifer characteristics summary, aquifer test summary, well data, and pump data required by UAC R309-600; (2) summarizes the data and methods used to establish the Zone Two (250-day time of travel), Zone Three (3-year time of travel zone), and Zone Four (15-year time of travel) DWSP areas; and (3) provides the maps and narrative descriptions of the DWSP areas.

Analytical groundwater modeling combined with hydrogeologic mapping was used to delineate the DWSP area boundaries. The delineation incorporates information from reports published by the Utah Geological Survey (UGS) and the U.S. Geological Survey (USGS), files of the DWRi, published literature, other sources, and a site visit.

The Delineation Report contains the supporting information identified in the Ground Water Source Protection User's Guide (DDW, 2012) and UAC R309-600 including the boundaries of the DWSP areas drawn on the Wanship, Utah (1997) USGS 7.5-minute topographic base map.

2.1 GEOLOGIC DATA

The purpose of this section is to identify, characterize, and map the extent of: (1) geologic units which provide groundwater storage and flow (aquifers); (2) geologic units which may provide vertical and horizontal limits to groundwater flow (aquitards or confining beds); (3) faults which may be barriers or preferential paths to groundwater flow; and (4) fractures and/or karst features which may provide local and regional controls on groundwater flow. This section describes the regional geology and provides background information for understanding the local geology of the source protection zones.

2.1.1 Background Investigations

Bryant (1990 and 1992) mapped the geology of the area surrounding Lake Rockport Estates at scales of 1:100,000 and 1:250,000, respectively. Hurlow (2002) compiled and modified previous mapping of the area to produce a 1:100,000-scale geologic map as part of his study of the geology of the Kamas-Coalville region and its relation to groundwater conditions.

2.1.2 Regional and Local Geology

Geologic units exposed at the ground surface, near Lake Rockport Estates are shown on the geologic map on Figure 2. The generalized north-northwest to south-southeast geologic cross-section, shown on Figure 3, was constructed from the geologic map on Figure 2 in addition to subsurface information obtained from drilling the Lake Rockport Estates Well #2. A copy of the well log for Lake Rockport Estates Well #2 is provided in Appendix B.

As indicated on Figures 2 and 3, bedrock in the Lake Rockport Estates area consists primarily of the Cretaceous-aged Upper Member of the Kelvin Formation (Kk). According to Bryant (1990) and Hurlow (2002) this unit: (1) consists of interbedded sandstone, siltstone, claystone, and conglomerate and (2) is about 4,260 feet thick.

In the area surrounding Lake Rockport Estates, Tertiary volcanic and alluvial (conglomerate) bedrock unconformably overly steeply to moderately northerly dipping (30 to 60 degrees) Mesozoic-age bedrock. Erosion of the overlying Tertiary volcanic and conglomerate bedrock units has exposed the Mesozoic-age bedrock in some of the drainages and at the lower elevations in the area.

The Mesozoic-age bedrock was deformed by compressional forces of the Sevier and Laramide orogenies during late Cretaceous and early Tertiary time (approximately 100 to 50 million years ago), which eventually uplifted the Uinta Mountains during the early Tertiary. The Mesozoic-age bedrock underlying Lake Rockport Estates dips steeply to moderately north to northwestward and has been displace by thrust faulting.

The Medicine Butte Thrust fault located just south of Lake Rockport Estates Well #2 trends west-southwest and east-northeast along Kent Canyon. As indicated on Figure 3, the Medicine Butte Thrust has placed the lower (older) part of the formation over the upper (younger) part of the Kelvin Formation.

The conglomerate bedrock (Toc) was formed by lithification of alluvium that was eroded from the uplifted mountains. Volcanic activity deposited the Keetley Volcanics (Tkb) throughout the area, which occurred during Tertiary time (approximately 36 to 30 million years ago) following the orogenic uplifts.

Normal faults have also been mapped in the area, which were formed during the late Cenozoic (starting approximately 20 million years ago) by (1) relaxation of the compressional forces which allowed for some extension, (2) by Basin and Range extension, or (3) a combination of the two.

2.1.3 Geologic Units

The geologic units shown on Figures 2 and 3 are described in Table 1. These descriptions are based primarily on those provided by Bryant (1990) and Hurlow (2002).

TABLE 1
DESCRIPTION OF GEOLOGIC UNITS[a]

Formation Name	Geologic Age	Thickness (feet)	Description
Alluvium (Qal)	Holocene	< 10	Boulder to pebble gravel, sand silt, and clay deposited in channels and flood plains of streams.

Formation Name	Geologic Age	Thickness (feet)	Description
Older Alluvial Fan and Debris Flow Deposits (Qof)	Pleistocene	< 33	Poorly sorted gravel, sand, and silt; locally bouldery. Crudely bedded to nonbedded. Deposits occur above present drainage and are inactive.
Keetley Volcanics (Tkb)	Oligocene and Eocene	1600+	Intrusive and flow rock, breccia, lahar, and tuff, as well as volcaniclasitic and nonvolcanic sandstone and conglomerate. Intrusive rocks, flows and breccias range from black, red, brown to light gray. Light-gray to gray lahar, flow breccia, and tuff.
Older Conglomerate (Toc)	Oligocene and Eocene	< 985	Boulder, cobble, and pebble conglomerate containing fragments of sandstone derived from Mesozoic and upper Paleozoic formations. Contains a few lahars and beds of tuff and volcanic gravel.
Henefer Formation (Khe)	Upper Cretaceous	2630	Light-gray clay, siltstone, sandstone, and conglomerate; red siltstone and clay; and gray calcareous siltstone containing a few thin lenses of coal. Beds and lenses of pebble and cobble conglomerate numerous near top.
Oyster Ridge Sandstone Member of Frontier Formation (Kfo)	Upper Cretaceous	195 to 330	Light-yellow to gray marine sandstone and pebbly sandstone locally overlain by nonmarine sandstone, siltstone and silty shale.
Lower Member of Frontier Formation (Kfl)	Upper Cretaceous	4495	Light- to dark-gray marine shale, sandstone, conglomeratic sandstone, and silty shale, coal and gray, light red, grayish-red, and green claystone.
Upper Member of Kelvin Formation (Kk)	Lower Cretaceous	4260	Yellowish-gray, grayish-red, and light- to moderate-red sandstone; gray, reddish-brown, and grayish-red siltstone and claystone; and conglomerate. Conglomerate contains pebbles and cobbles of sandstone, siltstone, and minor amounts of limestone.
Parleys Member of Kelvin Formation (Kkp)	Lower Cretaceous	160	Light- to pale-gray limestone associated with pale-lavender-gray siltstone containing limestone nodules; reddish-brown siltstone, pale-brown to pale-reddish-brown sandstone, and conglomerate.

Formation Name	Geologic Age	Thickness (feet)	Description
Preuss Sandstone (Jp)	Middle Jurassic	980	Reddish-brown, grayish-red, and light- to moderate-red silty sandstone, sandstone, and silty shale. Contains anhydrite and salt in the subsurface. Thickness is about 980 feet.

[a] Descriptions are based primarily on Bryant (1990) and Hurlow (2002).

2.1.4 Folds, Faults and Fractures

Faulting and folding of bedrock are important aspects in groundwater flow because they typically create fractures, which can influence the direction and magnitude of groundwater flow. Faults often act as barriers to groundwater flow across the fault, but can also act as conduits to flow parallel to the fault. Fractures associated with faults can increase the permeability of rock units, and in carbonate rocks, fractures can be enhanced or enlarged by dissolution from circulating groundwater.

Structural features in the area are related to three tectonic events: (1) folding and thrust structures related to compression during the Sevier orogeny, (2) folding and thrust structures related to compression during the Laramide orogeny and (3) extensional normal faulting in the late Cenozoic. Deformation of the Mesozoic-age bedrock and faulting along the Medicine Butte Thrust likely occurred during the Seveir orogeny and produced the north to northwest dip of Mesozoic strata in the area underlying Lake Rockport Estates.

Folding and faulting fractured the bedrock during the deformation process. As such, it is assumed that the water produced from Lake Rockport Estates Well #2 is derived from fractures in the Kelvin Formation. Hurlow (2002) indicates "*Joint populations are characterized by two steeply dipping sets and one bedding-plane set and by good connectivity, but calcite cement is ubiquitous"* in sandstone beds from the Kelvin Formation.

2.2 WELL CONSTRUCTION DATA

The location of Lake Rockport Estates Well #2 is shown on Figures 1 and 2, and is described in Table 2, which also summarizes estimated ground surface elevation, lithologies, and well construction data. Figure 4 illustrates the as-built well construction. The Well Driller's Report, the lithologic log and the pump installation log for Lake Rockport Estates Well #2 are provided in Appendix B.

An authorized representative of the DDW witnessed and certified the materials and installation of the grout seals (surface casing and production casing) from the surface to a depth of 175 feet. A copy of the Well Seal Certification Letter is provided in Appendix C.

TABLE 2
LAKE ROCKPORT ESTATES WELL #2 CONSTRUCTION

Well Name:	Lake Rockport Estates Well #2	
Well Owner:	Lake Rockport Estates	
Approximate Well Location: (see Figure 1)	North 1282 feet, East 1127 feet from the southwest corner of Section 32, Township 1 North, Range 5 East, SLB&M, based on a hand-held GPS device.	
Ground Surface Elevation:	Estimated to be about 6100 feet, based on the Wanship (1997) 7.5 minute topographic map and GPS location;	
Drilled Depth: (see Appendix B)	755 feet	
Static Water Level:	Approximately 86.9 feet on March 23, 2009	
Summary Lithology: (see Appendix B)	**Depth Interval**	**Predominant Lithology**
	0 – 20 feet:	Top soil
	20 – 755 feet:	Kelvin Formation (Kk): Interbedded sandstone, siltstone, claystone and conglomerate
Borehole:	**Depth Interval**	**Borehole Diameter and Drilling Method**
	0 – 37 feet:	20-inch – Air rotary
	37 – 320 feet:	14.75-inch – Air rotary
	320 – 755 feet:	14.75-inch – Flooded reverse mud rotary
Casing:	**Depth Interval**	**Blank Well Casing**
	0 – 37 feet:	16-inch diameter steel casing – Surface casing
	+1.5 – 250 feet:	8-inch diameter steel casing – Production casing
	270 – 290 feet:	Same as above (SAA)
	310 – 330 feet:	SAA
	350 – 430 feet:	SAA
	450 – 500 feet:	SAA
	520 – 540 feet:	SAA
Well Screen:	**Depth Interval**	**Well Screen**
	250 – 270 feet:	8-inch diameter stainless steel wire-wrapped 0.040-inch slot well screen
	290 – 310 feet:	
	330 – 350 feet:	SAA
	430 – 450 feet:	SAA
	500 – 520 feet:	SAA
Filter Pack:	**Depth Interval**	**Filter Pack**
	180 – 230 feet:	3/8-inch gravel pack
	230 – 350 feet:	8 – 12 sand pack
	350 – 540 feet:	10 – 20 sand pack
Grouted Intervals: (see Appendix C)	**Depth Interval**	**Grout or Seal Material**
	0 – 37 feet:	Witnessed and certified neat cement grout seal – Surface casing
	0 – 175 feet:	Witnessed and certified sand/cement grout seal – Production casing
	175 – 180 feet:	Bentonite seal

Drilling Contractor:	Mike Zimmerman Well Service (Utah License No. 527).
Test Pumping Rates (see Appendix E):	Step-Rate Test: 22, 62, 111 gallons per minute (gpm) on March 23, 2009. Constant-Rate Test: 24-hour test with an average pumping rate of 84.5 gpm and a total drawdown of 205.4 feet on March 28 and 29, 2009.
Pump Make/Model (see Appendix B):	Franklin Submersible – 1005T4006A-5064
Equipped Pumping Rate (see Appendix B):	90 gpm
Pump Depth Setting (see Appendix B):	480 feet

2.3 AQUIFER DATA

This section (1) identifies the hydrogeologic units that yield groundwater to the well, (2) estimates aquifer hydraulic parameters from the pumping test of the well, (3) provides an overview of the groundwater regime that controls groundwater flow, and (4) provides the framework for the delineation of the DWSP zones presented in Section **2.4** (Methods Used to Delineate DWSP Zones).

2.3.1 Identification of Hydrogeologic Units

All of the geologic units in the area produce some groundwater. Lake Rockport Estates Well #2 produces water from the Kelvin Formation. Other wells located at Lake Rockport Estates utilize the Kelvin Formation as an aquifer also. However, they are domestic wells for single family use.

2.3.2 Permeability Architecture

Permeability architecture is defined herein as the spatial arrangement of permeable zones emplaced in a formation or group of formations by physical and/or chemical processes. Permeable zones consist of faults, joints, and interconnected pores in consolidated rock units and unconsolidated deposits, which allow for the storage and movement of groundwater. Inherent in the definition of permeability architecture is the understanding that several distinct permeable zones can be superimposed within a formation, and the connection of the various permeable zones yields a network of permeable pathways for groundwater circulation. These permeable pathways are commonly oriented either parallel or perpendicular to bedding.

We assume that most of the water produced from Lake Rockport Estates Well #2 derives groundwater from fractures with some contribution from intergranular spaces in sandstone beds.

2.3.3 Transmissivity, Saturated Thickness, and Effective Porosity

A constant-rate pumping test of the Lake Rockport Estates Well #2 was conducted in late March 2009 with an average pumping rate of 84.5 gallons per minute (gpm) for 1455 minutes (approximately 24 hours). Drawdown was 205.4 feet at the end of the test, resulting in a specific capacity (pumping rate divided by drawdown) of 0.41 gpm per foot (gpm/ft).

Appendix E provides pumping test data for the Lake Rockport Estates Well #2 and plots of drawdown and depth to water versus time (and log time) since pumping started for the constant-rate pumping test.

Constant-rate pumping test plots presented in Appendix E show an increase in slope of the drawdown curve. Changes in slope often suggest a groundwater flow boundary has been encountered. However, the increased slope of the drawdown curve observed in this pumping test is from the pumping water level dropping below the well screen. When the pumping water level falls below the top of the well screen the saturated thickness of the aquifer decreases and less water can flow into the well, thereby increasing the slope of the drawdown curve. Another factor contributing to the increase in slope of the drawdown curve is a change in the groundwater flow regime where groundwater flowing towards the well changes from laminar flow to turbulent flow, which increases well loss during pumping.

We estimate the transmissivity of the Kelvin Formation aquifer to be 110 square feet per day (ft^2/day) based on the method of Copper and Jacob (1946) using the constant-rate pumping test data (see drawdown plot in Appendix E). We estimate the hydraulic conductivity of sandstone beds in the Kelvin Formation to be 1 foot per day, based on the transmissivity and saturated thickness (described below) of the aquifer.

Estimation of an alternate transmissivity based on the steeper portion of the curve and accounting for the decrease in saturated thickness created by the declining pumping water level, a similar hydraulic conductivity can be calculated for both transmissivity estimates. This suggests that the increase in slope of the drawdown curve is not a result of groundwater flow boundary effects.

In accordance with DDW guidance, we assume the saturated thickness of an aquifer is equal to the total length of well screen and/or perforated interval in a well. Therefore, the saturated thickness of the Kelvin Formation aquifer in the vicinity of Lake Rockport Estates Well #2 is 100 feet.

Effective porosity is defined as saturated, connected pore space through which groundwater travels. Driscoll (1986) reports a range of 5 to 30 percent porosity for sandstone. The Lake Rockport Estates Well #2 is completed sandstone beds of the Kelvin Formation and we assume an effective porosity of 15 percent for the aquifer.

2.3.4 Groundwater Flow Directions, Hydraulic Gradients and Boundaries

Groundwater generally flows in the direction of the hydraulic gradient, from recharge areas at higher altitudes, which receive the bulk of seasonal precipitation, toward discharge areas at lower altitudes. A portion of the precipitation infiltrates into shallow unconsolidated deposits and weathered, near-surface bedrock, and then flows downward toward the zone of saturation through factures and bedding in bedrock.

When delineating the recharge area for a well or spring, several assumptions are typically made. First, faults typically act as barriers to groundwater flow across the fault. This is due to fine-grained low permeable material, called fault gouge, which forms in the fault core. Second, surface water divides are generally assumed to coincide with underlying groundwater divides. And third, groundwater within boundaries flows down gradient toward the spring or well.

In the vicinity of Lake Rockport Estates Well #2, groundwater is principally derived from precipitation that falls on the ground surface and infiltrates into the subsurface. After infiltration, groundwater then flows down gradient through fractures, bedding planes, normal joints, and intergranular spaces in the bedrock units.

Groundwater in the Kelvin Formation in the vicinity of Lake Rockport Estates likely flows parallel to strike of bedding planes and the Medicine Butte Thrust fault. Thus, the hydraulic gradient is estimated to be North 60º East. Based on water levels in nearby wells the hydraulic gradient is estimated to be 0.06 feet per foot. Well logs for wells shown on Figures 1 and 2 are provided in Appendix D.

Groundwater flow boundaries are expected to exist along the Medicine Butte Thrust fault and the Absaroka Thrust fault, located south of the Medicine Butte fault. A mapped normal fault located north of the Medicine Butte fault may also act as a groundwater flow boundary. These faults likely act as barriers to groundwater flow across the faults. Enhanced permeability may exist parallel to the faults on either side of the fault core from fracturing of the bedrock during the deformation process.

As shown on Figure 2, the surface trace of the Medicine Butte Thrust fault is located adjacent to and southeast of Lake Rockport Estates Well #2. The borehole for the well penetrated the fault zone at depths of 170 to 190 feet (Figure 3). The top of well screen is at a depth of 250 feet. Therefore, water produced from Lake Rockport Estates Well #2 is from the footwall block of the Medicine Butte Thrust in the Kelvin Formation, located southeast of the fault trace.

Due to the direction of the hydraulic gradient and the orientation of the Medicine Butte Thrust Absaroka Thrust faults it is unlikely that the groundwater flow boundaries created by these structures will have significant impacts on pumping Lake Rockport Estates Well #2 at the equipped pumping rate.

2.4 METHODS USED TO DELINEATE DWSP ZONES

According to the 2011 Ground Water Source Protection User's Guide, a source protection area is the "*... surface and subsurface area surrounding a well, spring, or tunnel through which contamination is likely to move toward and pollute a source*". Two methods are allowed under UAC R309-600-9 to determine this area: (1) the Preferred Delineation Procedure, and (2) the Optional Two-Mile Radius Delineation Procedure. The Preferred Delineation Procedure was selected for the well because it uses site hydrogeologic conditions to determine the source protection area and it is more accurate than the Optional Two-Mile Delineation Procedure.

Generalized descriptions of the four protection zones delineated by the Preferred Delineation Procedure follow:

Zone One - 100-Foot Fixed-Radius Accident Prevention Zone: Zone One is a 100-foot fixed radius from the wellhead and is referred to as the accident prevention zone. Its purpose is to prevent accidents and to protect the wellhead.

Zone Two - 250-day Attenuation Zone: Zone Two is the 250-day time of travel (TOT), the boundary of the aquifer(s) which supplies water to the source, or the groundwater divide, whichever is closer. Zone Two is sometimes referred to as the attenuation zone. Its purpose is to reduce concentrations of pathogenic microorganisms and some chemicals to levels below maximum contaminant levels before groundwater reaches a well, spring or tunnel. Zone Two represents a moderate level of protection.

Zone Three - 3-year Waiver Criteria Zone: Zone Three is the area within a 3-year TOT to the source, the boundary of the aquifer(s) which supplies water to the source, or the groundwater divide, whichever is closer. Zone Three is a three-year groundwater TOT to the well referred to as the waiver criteria zone. This zone has been established to provide a basis for granting monitoring waivers in the future. Use waivers may be granted for either the volatile organic compounds (VOC) or the pesticide parameter group. To qualify for a use waiver, a system must verify that none of the chemicals or pesticides in the parameter groups has been used in the three-year TOT zone. If a system does not qualify for a use waiver, it may still qualify for a susceptibility waiver. Susceptibility waiver allows the use, disposal, storage, transport, and manufacture of chemicals within Zone Three as long as they are controlled in such a manner as to prevent contamination of the system's well or spring. The DWSP Plan must verify that land management strategies are implemented that will control the chemicals being used in Zone Three.

Zone Four - 15-year Remedial Action Zone: Zone Four is the area within a 15-year TOT to the source, the boundary of the aquifer(s) which supplies water to the source, or the groundwater divide, whichever is closer. Its purpose is to provide protection to the drinking water source and to afford sufficient time for remediation or development of a new source in case of a contamination incident. Zone Four represents a moderate level of protection.

2.4.1 Delineation of DWSP Zone One

Regulatory mandate defines Zone One as a fixed 100-foot radius around each wellhead.

2.4.2 Delineation of DWSP Zones Two, Three, and Four

The Zone Two (250-day TOT), Zone Three (3-year TOT) and Zone Four (15-year TOT) DWSP area boundaries were delineated using analytical groundwater modeling combined with hydrogeologic mapping. Analytical groundwater modeling was performed using the Multiple Well Capture (MWCAP) module of the EPA Wellhead Protection Area (WHPA) Model, Version 2.2, dated September 1993 (Blandford and others, 1993). Table 3 lists input and aquifer parameters used in the model. Copies of the model-generated printouts and TOT plots are provided in Appendix F.

TABLE 3
INPUTS TO WHPA MODEL

Input Parameter	Value	Reference
Analytical Groundwater Model	MWCAP module of WHPA	Multiple Well Capture (MWCAP) module of the EPA Wellhead Protection Area (WHPA) Model, Version 2.2, dated September 1993 (Blandford and others, 1993).
Number of Pumping Wells	One	Only PWS in the area.
Pumping Rate	17,324 ft^3/day (90 gpm)	The equipped pumping rate of the well is 90 gpm.
Aquifer Type	Confined (protected)	Based on the lithology encountered during drilling of Lake Rockport Estates Well #2, the static water level in relation to the screen interval, and the grout seal depth.
Boundary Conditions	One	Medicine Butte Thrust fault (see Figure 2).
Transmissivity	110 ft^2/d	Estimated from a constant-rate pumping test of Lake Rockport Estates Well #2.
Direction of Hydraulic Gradient	North 60° East	Parallel to strike of geologic units and structures in the area, based on water levels in nearby wells.
Magnitude of Hydraulic Gradient (under non-pumping conditions)	0.06 ft/ft	Based on water levels in nearby wells.
Effective Porosity	15 percent	Driscoll (1986) reports a range of 5 to 30 percent for sandstone.
Saturated Thickness	100 ft	Screen interval of Lake Rockport Estates Well #2.

2.5 MAP AND DESCRIPTIONS OF DWSP ZONES

The Zone Two (250-day TOT), Zone Three (3-year TOT), and Zone Four (15-year TOT) DWSP areas for Lake Rockport Estates Well #2 # 2 are overlaid on a 1:24,000-scale topographic and geologic map on Figures 5 and 6, respectively. The Zone One DWSP area, a 100-foot radius zone around the well, is not shown. Because the Medicine Butte Thrust Fault is assumed to be a groundwater flow boundary, the DWSP protection zones are truncated at the fault. Figures 5 and 6 show the DWSP zones extending across the fault to the northwest because the fault dips to the northwest and the DWSP protection zones have been projected to the surface from depth where the proposed well will be screened. The hydrogeologic assumptions used to delineate the DWSP Zone Four Boundary for the well include the following:

- **Northwest Boundary** – The surface trace of the Medicine Butte Thrust Fault at depth where the well will be screened.
- **Southeast Boundary** – The surface water drainage divide between Kent Canyon Creek and Threemile Canyon Creek.
- **Northeast Boundary** – The shoreline of Lake Rockport Reservoir.
- **Southwest Boundary** – The east and west surface water drainage divide of the West Hills.

TABLE 4
DIMENSIONS OF DWSP AREAS

Protection Area	Total Length (Distance Parallel to Direction of Groundwater Flow)	Distance Upgradient from Well	Distance Downgradient from Well	Maximum Width (Distance Perpendicular to Direction of Calculated Groundwater Gradient)
Zone Two 250-Day TOT	700 feet	450 feet	250 feet	450 feet
Zone Three 3-year TOT	1800 feet	1250 feet	550 feet	900 feet
Zone Four 15-year TOT	12,900 feet	10,300 feet	2600 feet	3300 feet

The delineation of DWSP zones is a dynamic process and the DWSP zones should be updated as:

- More hydrogeologic data become available;
- New wells, if any, are developed in the DWSP zone;
- The well is deepened or replaced; and
- Annual production from any well within the zones changes significantly over time.

2.6 PROTECTED OR UNPROTECTED AQUIFER CLASSIFICATION

According to UAC R309-600-6(1)(x), a protected aquifer is "*…a producing aquifer in which the following conditions are met: (i) A naturally protective clay layer, at least 30 feet in thickness, is present above the aquifer; (ii) the PWS [Public Water System] provides data to indicate the lateral continuity of the clay layer to the extent of zone two; and (iii) the public-supply well is grouted with a grout seal that extends from the ground surface down to at least 100 feet below the surface, and for a thickness of at least 30 feet through the protective clay.*"

The following information indicates that the Kelvin Formation aquifer in the vicinity of Lake Rockport Estates Well #2 qualifies for protected status:

- **Presence of Protective Clay Layer.** As shown on the lithologic and well log for Lake Rockport Estates Well #2, more than 30 feet of low-permeability claystone or mudstone was encountered during drilling of the borehole. The aquifer is under confined conditions in the area near the well, which is created by low permeable material overlying the aquifer.

- **Lateral Continuity of Protective Clay Layer.** Based on the characteristics and lithology of the Kelvin Formation, low-permeability geologic units (claystone, mudstone and shale) likely extend throughout the Zone Two DWSP area for the well.

- **Grout Seal.** Lake Rockport Estates Well #2 is grouted to a depth of 180 feet through over 30 feet of low-permeable material into the Medicine Butte Thrust fault, which is composed of low-permeable material. The grout seal certification letter is provided in Appendix C.

3.0 INVENTORY OF POTENTIAL CONTAMINATION SOURCES

The approach used to identify and assess potential contamination sources (PCSs) located in the DWSP areas for the Lake Rockport Estates Well #2 followed guidance provided in:

- Division of Drinking Water Ground Water Source Protection User's Guide dated June 1, 2012 (DDW, 2012);
- Drinking Water Source Protection (DWSP) Plan: Standard Report Format for Existing Wells and Springs, dated January 2007 (DDW, 2007);
- Wellhead Protection: A Guide for Small Communities (EPA, 1993);
- Managing Ground Water Contamination Sources in Wellhead Protection Areas, a Priority Setting Approach (EPA, 1991b);
- Information Provided at DDW Source Protection Seminar for Consultants (February, 1998).

The overall approach used to compile a list of PCSs, identify the hazards, identify and assess the controls, identify and assess management procedures, and assess risk can be summarized as follows:

- A site reconnaissance was conducted by Loughlin Water personnel on April 3, 2013, to identify and confirm the locations of PCSs, identify their hazards, and identify and assess any controls that are in place;
- Identification and screening of PCSs and hazards present through a review of various Federal, and State databases; and
- Review of plans for future development.

General guidelines followed for identifying and assessing PCSs were as follows:

- PCS were identified in accordance with the master list of PCSs provided in Chapter 5 of the DDW Ground Water Source Protection User's Guide and
- Professional judgment as recommended in DDW guidance.

3.1 LIST OF POTENTIAL CONTAMINATION SOURCES

Lake Rockport Estates is a seasonal residential community. Access is gained through a locked gate near Utah Highway 32. Drinking water is provided on a seasonal basis from Lake Rockport Estates Well #1 or Well #2. Each home is serviced by a septic system for waste management. Lake Rockport Estates Well #2 is located in an undeveloped area of the community.

Possible PCSs in the DWSP areas are listed in Table 5.

TABLE 5
LIST OF *POSSIBLE* PCSs

Name of PCS	PCS Type[a]	DWSP Zone(s) of the Well	Address of PCS	Name, Address, Phone No. of Contact Person
Gated Lake Rockport Estates Well #2 Access Road	39	1, 2, 3, 4	Roadway approaches the well sites from the east	Alan Lindsley Lake Rockport Estates 100 Rockport Boulevard Coalville, Utah 84017 Phone: 801-560-7021
Gated Lake Rockport Estates Roadways	39	2, 3, 4	Located throughout Lake Rockport Estates	Alan Lindsley Lake Rockport Estates 100 Rockport Boulevard Coalville, Utah 84017 Phone: 801-560-7021 Bob Swenson Summit County Environmental Health Director 650 Round Valley Drive Park City, Utah 84060 Phone: 435-333-1584 Fax: 435-333-1580 bswensen@summitcounty.org
Septic Systems	44	3, 4	Located at homes in Lake Rockport Estates at various locations	Alan Lindsley Lake Rockport Estates 100 Rockport Boulevard Coalville, Utah 84017 Phone: 801-560-7021 Summit County Septic Program Bob Swenson Summit County Environmental Health Director 650 Round Valley Drive Park City, Utah 84060 Phone: 435-333-1584 Fax: 435-333-1580 bswensen@summitcounty.org

Name of PCS	PCS Type[a]	DWSP Zone(s) of the Well	Address of PCS	Name, Address, Phone No. of Contact Person
Residential Properties	37	3, 4	Homes within Lake Rockport Estates	Greg Warner Lake Rockport Estates Property Owners Association (POA) 100 Rockport Boulevard Coalville, Utah 84017 Alan Lindsley Lake Rockport Estates 100 Rockport Boulevard Coalville, Utah 84017 Phone: 801-560-7021
Lake Rockport Estates Well #2 and Submersible Pump	1 and 49	1, 2, 3, 4	Lake Rockport Estates Well #1 is located less than 50 feet away from Well #2.	Jim Goddard Utah Division of Water Rights 1594 W. N. Temple, Suite 220 P.O. Box 146300 Salt Lake City, UT 84114-6300 801-538-7240
Utah Highway 32 and Other Roadways	39	4	Located outside of Lake Rockport Estates property boundaries	Kevin Callahan Summit County Public Works 60 North Main PO Box 128 Coalville, Utah 84017 Phone: 435-336-3978 kcallahan@summitcounty.org Bob Swenson Summit County Environmental Health Director 650 Round Valley Drive Park City, Utah 84060 Phone: 435-333-1584 Fax: 435-333-1580 bswensen@summitcounty.org
Domestic Water Wells and Submersible Pumps	1 and 49	4	Located at various homes within and nearby Lake Rockport Estates (see Figure 5)	Jim Goddard Utah Division of Water Rights 1594 W. N. Temple, Suite 220 P.O. Box 146300 Salt Lake City, UT 84114-6300 801-538-7240

[a] Number refers to list number in master list of PCSs provided in Appendix G.

3.2 IDENTIFICATION OF PCS HAZARDS

Identified activities and hazards associated with each possible PCS found in the DWSP areas are listed in Table 6.

TABLE 6
HAZARDS IDENTIFIED AT PCSs

Name of *Possible* PCS	Identified Activity	PCS Type[a]	Identified Hazards
Gated Lake Rockport Estates Well #2 Access Road	Motor vehicle accidents and spills; Winter de-icing salts and chemicals	39	Chemical: Hydrocarbons from fuels, oil, hydraulic fluid, antifreeze, road salts and de-icing chemicals
Gated Lake Rockport Estates Roadways	Motor vehicle accidents and spills; Winter de-icing salts and chemicals	39	Chemical: Hydrocarbons from fuels, oil, hydraulic fluid, antifreeze, road salts and de-icing chemicals
Septic Systems	Household and human waste disposal	44	Chemical and biological: Human and household waste
Residential Properties	Residential pesticide, herbicide, and fertilizer storage, use, filling and mixing areas	37	Chemical: Household chemicals and waste
Lake Rockport Estates Well #1 and Submersible Pump	PWS water well with submersible pump	1 and 49	None
Highway 32 and Other Roadways	Motor vehicle accidents and spills; Winter de-icing salts and chemicals	39	Chemical: Hydrocarbons from fuels, oil, hydraulic fluid, antifreeze, road salts and de-icing chemicals
Domestic Water Wells and Submersible Pumps	Water well pump	1 and 49	None

[a] Number refers to list number in master list of PCSs provided in Appendix G.

3.3 PRIORITIZED INVENTORY

A semi-quantitative approach was used to assign a numerical risk value to and develop prioritized ranking for each PCS. Note that if the hazard was characterized as "none" for a PCS in Section 3.2, then it was not considered an actual PCS and it was not prioritized in Section 3.3.

The following factors were considered in the assignment of a numerical risk value to each PCS: (1) the estimated distance from the PCS to the drinking water source; (2) the estimated volume of the hazard present at the PCS; and (3) the presence and degree of controls in place at the PCS that would prevent accidental spills. In general, it was assumed that:

- PCSs located closer to the drinking water source represent a greater risk than PCSs located farther away;
- PCSs with a greater volume of a hazard represent a greater risk than PCSs with a smaller volume of a hazard; and
- PCSs with no controls represent a greater risk than PCSs with controls.

It was further assumed that distance represents 34 percent, volume represents 33 percent, and the presence and degree of controls represent 33 percent of the total relative risk.

The total relative risk (R) was calculated for each PCS using the following equation:

R = D + V + C

where,

R = Total relative risk;
D = Distance from PCS to the drinking water source;
V = Volume of hazard present at the PCS; and
C = Presence and degree of controls present at the PCS.

Points for distance (D), volume (V), and controls (C) were assigned as follows:

Distance to Drinking Water Source (D)

0 to 100 ft = 34 points
100 to 500 ft = 25 points
500 to 1,000 ft = 17 points
1,000 to 3,000 ft = 8 points
More than 3,000 ft = 4 points

Volume of Hazard (V)

More than 500 gallons = 33 points
50 to 500 gallons = 22 points
Less than 50 gallons = 11 points

Presence and Degree of Regulatory Control (C)

No controls = 33 points
Some controls = 22 points
Full controls = 11 points

Professional judgment was also used, as appropriate, if two or more PCSs were assigned the same number of points for total relative risk. Factors considered in using professional judgment included, but were not limited to: (1) the chemical, physical, and toxicological properties of the hazard present at the PCS; and (2) the type of control present. Hazardous constituents that are characterized as soluble, persistent, mobile, and toxic or carcinogenic were considered to represent a greater relative risk than hazards that are not characterized as such. PCSs without regulatory controls

were considered to represent a greater relative risk than PCSs with regulatory controls. PCSs that appeared to pose no risk because no chemicals are used were not prioritized.

Table 7 summarizes the scores and lists the PCS priority order.

TABLE 7
PRIORITIZED LIST OF ACTUAL PCSs

Rank	Name of PCS	Distance to Drinking Water Source (34%)	Volume of hazard (33%)	Controls in Place (33%)	Total Risk Points
1	Gated Lake Rockport Estates Well #2 Access Road	34	11	22	67
2	Highway 32 and Other Roadways	8	22	33	63
3	Septic Systems	17	22	22	61
4	Residential Properties	17	11	33	61
5	Gated Lake Rockport Estates Roadways	25	11	22	58

3.4 POTENTIAL CONTAMINATION SOURCE LOCATIONS AND MAP

Each PCS is identified in Table 8 with respect to its location within the Zone One, Two, Three, or Four of the proposed Lake Rockport Estates Well #2.

TABLE 8
LOCATIONS OF PCSs WITHIN DWSP AREAS

PCS ID No.[a]	Name of PCS	DWSP Zone(s)
1	Gated Lake Rockport Estates Well #2 Access Road	1, 2, 3, 4
2	Highway 32 and Other Roadways	4
3	Septic Systems	3, 4
4	Residential Properties	3, 4
5	Gated Lake Rockport Estates Roadways	2, 3, 4

[a] The PCS ID (identification) number is the ranking from Table 7.

The approximate location of each PCS is shown on Figure 7.

3.5 SEWER LINES WITHIN ZONES ONE AND TWO

There are no sewer lines or septic systems within DWSP Zone One or Zone Two of Lake Rockport Estates Well #2.

4.0 IDENTIFICATION AND ASSESSMENT OF CONTROLS

This section presents the assessment of potential contamination source (PCS) hazards. Four types of hazard controls are recognized for PCSs in UAC R309-600-10(2): (1) regulatory controls, (2) best management and pollution prevention practices, (3) physical controls, and (4) negligible quantity controls. Identified hazards were assessed as adequately controlled or not adequately controlled. General guidelines to the assessment the controls present at each PCS were as follows:

- Guidance provided in UAC R309-600-10(2) and in the Ground Water Source Protection User's Guide (DDW, 2012);
- Although the U.S. Department of Transportation (DOT) regulates hazardous materials and waste transport various federal, state, and local agencies regulates response to and cleanups of spills, the major transportation routes were assumed to be "not adequately controlled";
- According to the Groundwater Source Protection Users Guide (DDW, 2012), if more than one control exists then only one control needs to identified; and
- Reassessment of hazards has been set for six (6) years, which is based on the DDW requirement for updating DWSP Plans.

The identified control for each PCS hazard is listed in Table 9.

TABLE 9
ASSESSMENT OF PCS HAZARD CONTROLS

PCS ID No.[a]	Name of PCS	Controls	Enforcement Agency or Contact	Control ***Adequate*** or ***Not Adequate***
1	Gated Lake Rockport Estates Well #2 Access Road	***Negligible Quantity Controls:*** *Lake Rockport Estates Well #2 access road will only be used by Lake Rockport Estates personnel to access the well site area, which is fenced in and locked.*	Alan Lindsley Lake Rockport Estates 100 Rockport Boulevard Coalville, Utah 84017 Phone: 801-560-7021	*Adequate*
2	Highway 32 and Other Roadways	***Regulatory Controls:*** ***1) 40 CFR Part 302****, Designation, Reportable Quantities and Notification* ***2) 49 CFR Part 171.15*** *Immediate Notice of Certain Hazardous Materials Incidents* ***3) Utah Code Annotated, Section 63-5-5****, Hazardous Chemical Emergency Planning and Information Act of 1987* ***4)*** *State of Utah, Emergency Operations Plan, Hazardous Materials Response Support Plan.*	Kevin Callahan Summit County Public Works 60 North Main PO Box 128 Coalville, Utah 84017 Phone: 435-336-3978 kcallahan@summitcounty.org Bob Swenson Summit County Environmental Health Director 650 Round Valley Drive Park City, Utah 84060 Phone: 435-333-1584 Fax: 435-333-1580 bswensen@summitcounty.org Butch Swenson Summit County Emergency Management 517 Wild Willow Dr. Francis, Utah 84036 Phone: 435-640-1910 rswenson@allwest.net	*Not Adequate*

PCS ID No.[a]	Name of PCS	Controls	Enforcement Agency or Contact	Control *Adequate* or *Not Adequate*
3	Septic Systems	***Regulatory Controls: UAC R317-4 through R317-8 -*** *Onsite Wastewater Disposal Systems.* ***Best Management Practices:*** *See Summit County's Septic Program for additional information about education, permitting and maintenance;* http://www.summitcountyhealth.org/property-owners/septic-program/	Summit County Septic Program Bob Swenson Summit County Environmental Health Director 650 Round Valley Drive Park City, Utah 84060 Phone: 435-333-1584 Fax: 435-333-1580 bswensen@summitcounty.org	*Not Adequate*
4	Residential Properties	***Regulatory Controls: UAC R68-7 -*** *Pesticide Control Rule.* ***Best Management Practices:*** *Follow recommended storage, use, and disposal instructions provided on chemical packages.*	Alan Lindsley Lake Rockport Estates 100 Rockport Boulevard Coalville, Utah 84017 Phone: 801-560-7021 Sterling Banks, Director Utah State University Cooperative Extension in Summit County PO Box 127 Coalville, UT 84017-0127 (435) 336-3219 sterling.banks@usu.edu	*Not Adequate*
5	Gated Lake Rockport Estates Roadways	***Negligible Quantity Controls:*** *Lake Rockport Estates roads are private. Access is gained through a locked gate and the only traffic is from residents, guests or related to operational activities.*	Alan Lindsley Lake Rockport Estates 100 Rockport Boulevard Coalville, Utah 84017 Phone: 801-560-7021	*Adequate*

[a] The PCS ID (identification) number is the ranking from Table 7.

5.0 MANAGEMENT PROGRAM FOR PCS

Land management, management practices, or pollution prevention strategies must be implemented for any PCS that has been determined to be *not adequately controlled.* Management strategies for PCSs are summarized in Table 10 for PCSs characterized as not adequately controlled.

TABLE 10
MANAGEMENT STRATEGIES TO CONTROL PCS HAZARDS

PCS ID No.[a]	Name of PCS	Hazard Potential	Proposed Management Strategy
3	Septic Systems	Nitrates, bacteria or viruses could contaminate the well.	Distribute informational brochures to each Lake Rockport Estates household providing information about the DWSP areas and the residential contamination hazards to their drinking water source. Potential contaminant sources within Lake Rockport Estates property boundaries includes: septic systems, household waste and pesticide use. Include the following information in the brochures: **1)** Provide the septic tank fact sheet shown in Appendix H. Request home owners not to dispose of hazardous materials in septic systems and to follow the Summit County guidelines for the maintenance and use of septic systems. Septic system information is available at: http://www.summitcountyhealth.org/property-owners/septic-program/ . **2)** Provide the household waste, fertilizer and pesticide fact sheets shown in Appendix H. Request that the use of household chemicals such as pesticides, herbicides and fertilizers be strictly in accordance with manufacturer's directions and dosages and to follow proper disposal practices. Improper use or disposal could pose a contamination risk to groundwater. **3)** Request residents to stay apprised of any accidents or hazardous material releases that could contaminate the groundwater resources. **4)** Request home owners with private wells to maintain their wells and keep the well head area clear, especially from materials and/or objects that pose a contamination hazard.
4	Residential Properties	A variety of household products such as paints, household cleaners, detergents, oil, fuel, and other small quantities of hazardous wastes could potentially contaminate groundwater if spilled or disposed of improperly. Additionally, homeowners generally treat their lawns and gardens with fertilizers, pesticides and herbicides. These too, could potentially contaminate the groundwater.	

PCS ID No.[a]	Name of PCS	Hazard Potential	Proposed Management Strategy
3	Highway 32 and Other Roadways	Vehicle accidents can cause the release of hazardous materials such as gasoline, diesel fuel, antifreeze and other hazardous liquids. Additionally, winter maintenance includes the application of salts to de-ice the roadways. These salts could potentially increase the sodium content of the aquifer.	**1)** Provide Summit County Local Emergency Planning Committee (LEPC) with information regarding the Lake Rockport Estates Well #2 DWSP zones and request that Lake Rockport Estates be informed of any hazardous waste incidents that may adversely affect the groundwater. **2)** Stay apprised of any accidents or hazardous material releases that could contaminate the groundwater sources. **3)** If road salts are used, monitor annually for sodium content in the well and take steps to mitigate if road salts have a detrimental effect on water quality.

[a] The PCS ID (identification) number is the ranking from Table 7.

6.0 MANAGEMENT PROGRAM FOR FUTURE PCS

Lake Rockport Estates recognizes the importance of protecting their drinking water source. We believe that Lake Rockport Estates Well #2 qualifies for protected aquifer classification, as defined in UAC R309-600-6(1)(x). As such, Lake Rockport Estates is seeking a land use agreement for the Zone One (100-foot radius around the well head) DWSP area for Lake Rockport Estates Well #2. The land use agreement is pending and will be submitted by Lake Rockport Estates to the DDW under separate cover.

Additionally, the DWSP Rule (UAC R309-600-12(4)) requires that the PWS establish a program to manage PCSs that may want to locate within the DWSP areas. To meet this requirement Lake Rockport Estates will:

- Contact each new PCS as it locates within the DWSP areas;
- Add each new PCS to the inventory;
- Identify and assess the controls at each new PCS; and
- Plan and implement land management strategies if not adequately controlled.

7.0 IMPLEMENTATION SCHEDULE

The Implementation Schedule outlines the dates when Lake Rockport Estates will implement the land management, management practices, or pollution prevention strategies for PCSs that have been assessed as *not adequately controlled*. Table 12 shows the implementation schedule for both existing and future PCSs.

TABLE 12
IMPLEMENTATION SCHEDULE

PCS Name and Land Management Strategy	Date to Implement	Frequency
Septic Systems and Residential Properties: Distribute informational brochures to each Lake Rockport Estates household providing information about the DWSP areas and the residential contamination hazards to their drinking water source. Potential contaminant sources within Lake Rockport Estates property boundaries includes: septic systems, household waste and pesticide use. Include the following information in the brochures: **1)** Provide the septic tank fact sheet shown in Appendix H. Request home owners not to dispose of hazardous materials in septic systems and to follow the Summit County guidelines for the maintenance and use of septic systems. Septic system information is available at: http://www.summitcountyhealth.org/property-owners/septic-program/ . **2)** Provide the household waste, fertilizer and pesticide fact sheets shown in Appendix H. Request that the use of household chemicals such as pesticides, herbicides and fertilizers be strictly in accordance with manufacturer's directions and dosages and to follow proper disposal practices. Improper use or disposal could pose a contamination risk to groundwater. **3)** Request residents to stay apprised of any accidents or hazardous material releases that could contaminate the groundwater resources. **4)** Request home owners with private wells to maintain their wells and keep the well head area clear, especially from materials and/or objects that pose a contamination hazard. Request home owners with private wells to maintain their wells and keep the well head area clear, especially from materials and/or objects that pose a contamination hazard.	2013	Every 3 years thereafter
Utah 32 and Other Roadways: **1)** Provide Summit County Local Emergency Planning Committee (LEPC) with information regarding the Lake Rockport Estates Well #2 DWSP zones and request that Lake Rockport Estates be informed of any hazardous waste incidents that may adversely affect the groundwater. **2)** Stay apprised of any accidents or hazardous material releases that could contaminate the groundwater sources. **3)** If road salts are used, monitor annually for sodium content in the well and take steps to mitigate if road salts have a detrimental effect on water quality.	2013	Every 3 years thereafter

PCS Name and Land Management Strategy	Date to Implement	Frequency
Future PCSs: Lake Rockport Estates will: Contact each new PCS as it locates within the DWSP areas; Add each new PCS to the inventory; Identify and assess the controls at each new PCS; and Plan and implement land management strategies if not adequately controlled.	2013	Ongoing

8.0 RESOURCE EVALUATION

According to the DWSP program that has been developed by the DDW, each public water system must assess the financial and other resources, which may be required to implement a DWSP Plan and determine how these resources may be acquired.

8.1 FINANCIAL RESOURCES

Lake Rockport Estates will administer all water system improvement programs for their public water system. Lake Rockport Estates budgets funds for water system improvement programs, such as the implementation of Lake Rockport Estates Well #2 DWSP Program. It is unlikely that implementation of the DWSP Plan will require any substantial funding by Lake Rockport Estates.

8.2 HUMAN RESOURCES

Implementation of the DWSP Plan should not require any additions to Lake Rockport Estates staff. Lake Rockport Estates will ensure the consistent application of control measures under the DWSP Plan by means of plan reviews, building inspections and other surface inspections of the area. This will be accomplished through land use planning procedures. In order to implement all of the management strategies covered in the DWSP Plan, Lake Rockport Estates will dedicate their own personnel to enact these strategies.

9.0 RECORD KEEPING

Lake Rockport Estates will keep records of letters, flyers, meetings, and correspondence regarding land management strategies. Lake Rockport Estates will update this section of the DWSP Plan as steps are taken to implement the items covered in this document. Such changes may include:

- Identification of new PCSs that were either not identified earlier or are new to the area;
- Changes in management practices at existing PCSs;
- Acquisition of new information which significantly affects the assessment of a potential source of groundwater contamination; and
- Implementation of public education programs, letters and other correspondence about preventing groundwater contamination.

10.0 CONTINGENCY PLAN

A contingency plan was prepared in accordance with UAC R309-600 and guidance provided by the DDW (2003) and EPA (1990b). According to the DDW Ground Water Source Protection User's Guide (2012):

> "*Contingency plans should focus on the identification and possible solution of problems that may arise in the event that the Drinking Water Source Protection (DWSP) Plan fails. Additionally, Contingency plans address problems public water systems (PWSs) need to solve in the event of water shortages or contamination incidents that may impact their ability to supply safe drinking water to the public. Contingency planning includes emergency response, rationing, remediation, and new source development plans. Prior planning helps PWSs avoid crisis planning during emergency situations*".

There are four parts to this Contingency Plan:

- Emergency Response;
- Rationing;
- Remediation; and
- Source Development Plans.

10.1 EMERGENCY RESPONSE PLAN

10.1.1 Emergency Contacts

In case of an emergency, Lake Rockport Estates will notify the proper personnel and resources to provide assistance and to relay information to water users. Table 12 lists a variety of people who most likely would be called upon to help in case of an emergency. Lake Rockport Estates will keep copies of this information available.

10.1.2 Emergency Documentation

In case of an emergency, Lake Rockport Estates personnel will document the emergency. Documenting an emergency can be difficult to do; however, it is critical to evaluate and respond to the situation. In case of an emergency, Lake Rockport Estates personnel will be responsible for completing an Emergency Notification Form and any other pertinent documentation when an emergency occurs. A blank Emergency Notification Report Form is provided in Appendix I.

TABLE 12
EMERGENCY CONTACTS

Agency	Name	Work Number	Emergency Number
Lake Rockport Estates 100 Rockport Boulevard Coalville, Utah 84017	Alan Lindsley	(801) 560-7021	
Summit County Health Department Environmental Health Director 650 Round Valley Drive Park City, UT 84060	Bob Swenson	(435) 333-1584	911
Summit County Health Department Emergency Response Coordinator 650 Round Valley Drive Park City, UT 84060	Katie Mullaly	(435) 333-1503	911
Summit County Sheriff 6300 North Silver Creek Drive Park City, UT 8098	Dispatch	(435) 615-3510	911
Summit County LEPC[a] 7988 Springshire Park City, UT 84098	Butch Swenson	(435) 640-1910	911
Park City Fire District 736 W. Bitner Road Park City, UT 84098-5432		(435) 940-2500	911
Summit County Public Works 60 North Main PO Box 128 Coalville, Utah 84017	Kevin Callahan	(435) 336-3978	911
State of Utah Division of Drinking Water (DDW)		(801) 536-4200	(801) 536-4123
State of Utah Division of Environmental Response and Remediation (DERR)		(801) 536-4100	(801) 538-6333
State of Utah Department of Emergency Services And Homeland Security	Staff Duty Officer	(435) 538-3400	

[a] LEPC means Local Emergency Planning Committee.

10.1.3 Damage Assessment

Emergencies often involve damage to the water system components. In order to respond to this problem, Lake Rockport Estates will have to assess the level of damage and take adequate measures to mitigate them. Lake Rockport Estates will identify and assess the system components that may be affected and document the assessment and any repairs that are made. Lake Rockport Estates will utilize a Disaster

Evaluation Checklist to identify and assess the system components that may be affected. A sample Disaster Evaluation Checklist is also provided in Appendix J.

10.1.4 Water System Repair

Most water system emergencies involve equipment or water system breakdowns. Lake Rockport Estates is no exception. In order to react to emergencies, Lake Rockport Estates has compiled a list of contractors and material suppliers that is presented in Table 13. These companies or individuals can be called upon to help remedy problems with Lake Rockport Estates water system. This list will be updated as necessary.

TABLE 13
WATER SYSTEM ENGINEERING, REPAIR, AND WATER QUALITY CONTACTS

Item	Company or Agency	Contact	Telephone
Water Quality Testing	State of Utah Health Department		(801) 584-8400
	Chemtech Ford Laboratory		(801) 262-7299
General Troubleshooting of Water System	Utah Division of Drinking Water (DDW)		(801) 536-4200
Utility Line Location	Blue Stakes	Blue Stakes	(800) 662-4111
Pump or Well Problem	Mike Zimmerman Well Service	Mike Zimmerman	(801) 250-1400
Engineering	Psomas	Ted Mickelsen, P.E.	(801) 270-5777
Hydrogeology	Loughlin Water Associates LLC	Bill Loughlin, P.G.	(435) 649-4005

10.1.5 Water Quality Assessment and Testing

In the event that a water emergency occurs, the water quality might be adversely impacted and testing of the source or distribution system waters may be necessary. In that event, Lake Rockport Estates can contact the resources and laboratories listed in Table 14 to perform water quality assessments and testing.

10.2 RATIONING AND WATER CONSERVATION

If a water emergency such as a drought or system failure requires rationing, Lake Rockport Estates can implement such a measure. It will be up to Lake Rockport Estates personnel to assess the nature, duration and extent that rationing will be required in their system and then go through the appropriate channels to ensure that

rationing is implemented. The following are some steps that can be taken in the event that rationing is required:

- Estimate potable water requirements.
- Estimate the capability of the system to meet these requirements. This point is the "balance point"; if capability exceeds requirements, there is an estimated margin of safety and priorities could be relaxed. If requirements exceed capabilities, indicating an urgency for rationing water.
- Allocate water under assumed conditions.
- Prepare guidelines for water allowances, priorities, rationing, and phasing of estimated water requirements.
- Establish procedures for emergency treatment, pumping, distribution of water, and stations for service of emergency water.

10.3 REMEDIATION (WATER SUPPLY DECONTAMINATION PLANS)

According to the DDW:

> *"The technology is available for reducing some contaminants in drinking water to acceptable levels. The most common example of this approach is disinfection to remove microbiological contamination. Another example is air stripping to remove volatile organic compounds, such as solvents. As contamination continues to threaten drinking water sources throughout the country, new remediation technology is being developed. Water system management should keep up on what is currently available in the field of remediation technology. There is only one alternative to not remediating a contaminated water supply and that is to abandon the drinking water source."*

Specific treatment technologies have not been identified at this time, but Lake Rockport Estates will use this Contingency Plan to guide them through the process and to help them remedy any water quality problems that may occur.

10.4 SOURCE DEVELOPMENT PLAN

New water sources may need to be developed by Lake Rockport Estates in the event of water shortages or source contamination. The following considerations Lake Rockport Estates will have to address when planning for a new source:

- Identification of potential new sources. Development of the new source may need to be in a separate or different aquifer due to contamination of the current source or aquifer.
- Potential source production of each new source in relation to current source production.
- Acquisition of ownership and water rights for each potential new source.
- Source protection zones around each potential new source.

- An inventory of potential contamination sources within each approximate protection zone which may affect the quality of the drinking water now or in the future.
- The microbiological, chemical, and radiological quality of each potential drinking water source.
- The financial resources (and possible sources of revenue) that may be required for each drinking water source development.
- A Preliminary Evaluation Report (PER) will need to be submitted to the DDW concurrently with engineering plans and specifications before construction begins on any new groundwater source of drinking water.

11.0 PUBLIC NOTIFICATION

The objectives of public notification are to (1) help the public to understand source protection principles; and (2) solicit help in achieving source protection goals. To achieve these objectives, Lake Rockport Estates will distribute a memo to all full and part time employees, volunteers, and consumers of the Lake Rockport Estates Well #2 water notifying them of all of the following:

- The Drinking Water Source Protection (DWSP) Plan for the Lake Rockport Estates Well #2 is available for review.
- Potential contamination sources (PCSs) of concern for the Lake Rockport Estates Well #2 are (1) spills of gasoline, diesel fuel, antifreeze and other hazardous liquids along roadways, (2) septic systems, (3) household hazardous waste and (4) pesticide use.
- Land management strategies have been developed to further protect the Lake Rockport Estates Well #2 from contamination.
- The Lake Rockport Estates Well #2 is susceptible to contamination.
- Please contact Lake Rockport Estates with any questions or concerns about the DWSP Plan.

12.0 WAIVERS

12.1 USE WAIVERS

Although unlikely, we do not know whether chemicals within the volatile organic compound (VOC) and/or pesticide parameter group(s) have been used, stored, or transported within the past five years within Zones One, Two, and Three of Lake Rockport Estates Well #2. Lake Rockport Estates reserves the right to apply for a use waiver on the basis of the requirements of UAC R309-600-16(3) in the future.

12.2 SUSCEPTIBILITY WAIVERS

As indicated in Section 2.6, we believe that the Lake Rockport Estates Well #2 qualifies for protected aquifer classification, as defined in UAC R309-600-6(1)(x). Therefore, Lake Rockport Estates reserves the right to apply for a susceptibility waiver per UAC R309-600-16(4) as part of the DWSP plan for the well.

13.0 REFERENCES

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14.0 GLOSSARY OF TERMS

The purpose of this Glossary is to provide a list of terms used in this document and commonly used by hydrogeologists, as well as some specific terms used in groundwater contamination assessments and Drinking Water Source Protections. These definitions are adapted from EPA (1991) and the Drinking Water Source Protection Rule (UAC R309-600).

Adit: Horizontal or nearly horizontal passage from the surface from which a mine is entered.

Alluvium: A general term for clay, silt, sand, gravel or similar unconsolidated material deposited during comparatively recent geologic time by a stream or other body of running water.

Analytical model: A model that provides approximate or exact solutions to simplified mathematical forms of the differential equations for water movement and solute transport. Analytical models can generally be solved using calculators or computers.

Anisotropy: The condition of having different properties in different directions. The condition under which one or more of the hydraulic properties of an aquifer vary according to the direction of groundwater flow.

Anticline: A fold in rock strata that is convex upward.

Aquifer test: A test to determine hydrologic properties of an aquifer, involving the withdrawal of measured quantities of water from, or addition of water to, a well and the measurement of resulting change in head in the aquifer both during and after the period of discharge or addition. Same as pump test.

Aquifer/Aquifer System: A formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield sufficient, economical quantities of water to wells, springs, and drains tunnels.

Aquitard: The less-permeable beds in a stratigraphic sequence that tend to restrict or impede groundwater flow relative to the more permeable beds that serve as aquifers.

Area of influence: Area surrounding a pumping or recharging well within which the water table or potentiometric surface has been changed due to the spring's pumping or recharge.

Artesian Conditions: In a confined aquifer, when the water level in a well rises above the top of the aquifer.

Attenuation: The process of diminishing contaminant concentrations in groundwater, due to filtration, biodegradation, dilution, sorption, volatilization, and other processes.

Collection area: The area surrounding a groundwater source which is underlain by collection pipes, tile, tunnels, infiltration boxes, or other groundwater collection devices.

Colluvium: Loose, heterogeneous, incoherent mass of soil material and/or rock fragments deposited chiefly by mass wasting.

Cone of depression (COD): A depression in the groundwater table or potentiometric surface that has the shape of an inverted cone and develops around a well from which water is being withdrawn. Its trace (perimeter) on the land surface defines the zone of influence of a well. Also called the pumping cone and/or the cone of drawdown.

Confined aquifer: The following criteria are met in order to verify and maintain an upward hydraulic gradient in the producing aquifer: an effective confining layer must exist between the ground surface and the producing aquifer. This confining layer must have a lower hydraulic conductivity than the producing aquifer; and the potentiometric surface of the producing aquifer must remain higher in elevation than the potentiometric surface of the overlying aquifer. If there is no overlying aquifer, then the potentiometric surface of the producing aquifer must remain higher in elevation than the upper surface of the overlying confining layer. These criteria must be maintained during periods of maximum and long-term pumping and seasonal groundwater fluctuations. Not all confined aquifers in nature have an upward hydraulic gradient; however, for the purposes of R309-113, an upward hydraulic gradient must be maintained.

Contact: The surface where two different kinds of rock come together.

Contaminant: An undesirable substance not normally present, or an unusually high concentration of a naturally occurring substance, in water, soil, or other environmental medium.

Contamination: The degradation of natural water quality as a result of man's activities.

Controls: The codes, ordinances, rules, and regulations currently in effect to regulate a potential contamination source.

Criteria: The conceptual standards that form the basis for DWSP area delineation to include distance, groundwater time of travel, aquifer boundaries, and groundwater divides.

Criteria threshold: A value or set of values selected to represent the limits above or below which a given criterion will cease to provide the desired degree of protection.

DDW: Division of Drinking Water.

Designated person: The person appointed by a PWS to ensure that the requirements of R309-113 are met.

Dike: Tabular igneous intrusion that cuts across planar bedding or foliation of the surrounding rock.

Dispersion: The spreading and mixing of chemical constituents in groundwater caused by diffusion and mixing due to microscopic variations in velocities within and between pores.

Drawdown: The vertical distance groundwater elevation is lowered, or the amount head is reduced, due to the removal of groundwater. Also the decline in potentiometric surface caused by the withdrawal of water from a hydrogeologic unit. The distance between the static water level and the surface of the cone of depression. A lowering of the water table of an unconfined aquifer or the potentiometric surface of a confined aquifer caused by pumping of groundwater from wells.

DWSP Program: The program to protect drinking water source protection zones and management areas from contaminants that may have an adverse effect on the health of persons.

DWSP Zone: The surface and subsurface area surrounding a groundwater source of drinking water supplying a PWS, through which contaminants are reasonably likely to move toward and reach such groundwater source.

EPA: Environmental Protection Agency.

Executive Secretary: The individual authorized by the Drinking Water Board to conduct business on its behalf.

Existing groundwater source of drinking water: A public supply groundwater source for which plans and specifications are submitted to DDW on or before the effective date of the DWSP Rule.

Fissure: A fracture or crack in a rock along which there is a distinct separation.

Flow line: The general path that a particle of water follows under laminar flow conditions. Line indicating the direction followed by groundwater toward points of discharge. Flow lines generally are considered perpendicular to equipotential lines.

Flow model: A computer model that calculates a hydraulic head field for the study area using numerical methods to arrive at an approximate solution to the differential equation of groundwater flow.

Flow path: The path a water molecule or solute follows in the subsurface.

Flow System/Hydraulic Boundary: A hydrologic feature that prevents the flow of groundwater. Examples include groundwater divides or low permeability material that impedes groundwater flow.

Flowing Artesian: When the water level in a well rises above and flows at the ground surface.

Footwall: The lower side of a horizontal or inclined rock body or fault. If the fault has dip-slip translational movement along a normal fault, the footwall block is up thrown; the footwall block is downthrown along a reverse fault.

Fracture: A general term for any break in a rock, which includes cracks, joints, and faults.

GPM: Gallons per minute.

Groundwater barrier: Rock or artificial material with a relatively low permeability that occurs (or is placed) below ground surface, where it impedes the movement of groundwater and thus may cause a pronounced difference in the heads on opposite sides of the barrier.

Groundwater basin: General term used to define a groundwater flow system that has defined boundaries and may include more than one aquifer. The basin includes both the surface area and the permeable materials beneath it. A rather vague designation pertaining to a groundwater reservoir that is more or less separate from neighboring groundwater reservoirs. A groundwater basin could be separated from adjacent basins by geologic boundaries or by hydrologic boundaries.

Groundwater divide: Ridge in the water table, or potentiometric surface, from which groundwater moves away at right angles in both directions. Line of highest hydraulic head in the water table or potentiometric surface.

Groundwater mound: Raised area in a water table or other potentiometric surface, aerated by groundwater recharge.

Groundwater source: Any well, spring, tunnel, adit, or other underground opening from or through which groundwater flows or is pumped from subsurface water bearing formations.

Hanging wall: The upper side of a horizontal or inclined rock body or fault. The hanging wall is downthrown along a normal fault with dip-slip movement; the hanging wall is up thrown along a reverse-slip fault.

Head, total: Height of the column of water at a given point in a groundwater system above a datum plane such as mean sea level. The sum of the elevation head (distance of a point above datum), the pressure head (the height of a column of liquid that can be supported by static pressure at the point), and the velocity head (the height to which the liquid can be raised by its kinetic energy).

Heterogeneity: Characteristic of a medium in which material properties vary from point to point.

Homogeneity: Characteristic of a medium in which material properties are identical throughout.

HWMU: Means Hazardous Waste Management Unit as defined by Federal rules.

Hydraulic Conductivity (K): A coefficient of proportionality describing the rate at which water can move through a permeable medium. It is a function of the porous medium and the fluid.

Hydraulic Gradient (i): Slope of a water table or potentiometric surface. More specifically, change in head per unit of distance in a given direction, generally the direction of the maximum rate of decrease in head. The difference in hydraulic head divided by the distance along the flow path.

Hydrogeologic methods: The techniques used to translate selected criteria and criteria thresholds into mappable delineation boundaries. These methods include, but are not limited to, arbitrary fixed radii, analytical calculations and models, hydrogeologic mapping, and flow models.

Hydrogeologic unit: Any soil or rock unit or zone that because of its hydraulic properties has a distinct influence on the storage or movement of groundwater.

Impermeable: Characteristic of geologic materials that limit their ability to transmit significant quantities of water under the head differences normally found in the subsurface environment.

Interference: The result of two or more pumping wells, the drawdown cones of which intercept. At a given location, the total well interference is the sum of the drawdowns due to each individual well. The condition occurring when the area of influence of a water well comes into contact with or overlaps that of a neighboring well, as when two wells are pumping from the same aquifer or are located near each other.

Isotropy: The condition in which the properties of interest (generally hydraulic properties of the aquifer) are the same in all directions.

Land management strategies: Zoning and non-zoning controls which include, but are not limited to, the following: zoning and subdivision ordinances, site plan reviews, design and operating standards, source prohibitions, purchase of property and development rights, public education programs, groundwater monitoring, household hazardous waste collection programs, water conservation programs, memoranda of understanding, written contracts and agreements, and so forth.

Leakage: The vertical flow of groundwater; commonly used in the context of vertical groundwater flow through confining strata.

Limestone: A bedded sedimentary deposit consisting chiefly of calcium carbonate.

Management area: The area outside of zone one and within a two-mile radius where the Optional Two-mile Radius Delineation Procedure has been used to identify a protection area.

Maximum contaminant level (MCL): Maximum permissible level of a contaminant in water that is delivered to the users of a public water system. Maximum containment level is defined more explicitly in Safe Drinking Water Act (SDWA) regulations (40 CFR Section 141.2).

Mg/L: Milligrams per liter

MSL: Mean sea level.

Moraine: Mound, ridge, or other distinct accumulation of unsorted, unstratified glacial material deposited chiefly by direct action of glacier ice.

New groundwater source of drinking water: A public supply groundwater source of drinking water for which plans and specifications are submitted to DDW after the effective date of the DWSP Rule.

Nonpoint source: Any conveyance not meeting the definition of point source.

Normal fault: A fault, with an angle usually between 45-90 degrees, at which the hanging wall (upper block) has moved downward relative to the footwall (lower block).

Observation well: A well drilled in a selected location for the purpose of observing parameters such as water levels or water chemistry changes.

PCS: Potential contamination sources.

Permeability: Capacity of a rock or soil material to transmit a fluid.

Pieziometric surface: See potentiometric surface.

Point source: Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, animal feeding operation with more than ten animal units, landfill, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture.

Pollution source: Point source discharges of contaminants to groundwater or potential discharges of the liquid forms of "extremely hazardous substances" which are stored in containers in excess of "applicable threshold planning quantities" as specified in SARA Title III. Examples of possible pollution sources include, but are not limited to, the following: storage facilities that store the liquid forms of extremely hazardous substances, septic tanks, drain fields, class V underground injection wells, landfills, open dumps, land filling of sludge and seepage, manure piles, salt piles, pit

privies, drain lines, sewer lines, and animal feeding operations with more than ten animal units.

Porosity: The ratio of the volume of void spaces in a rock or sediment to the total volume of the rock or sediment.

Potable water: Suitable for human consumption as drinking water.

Potential contamination source: Any facility or site that employs an activity or procedure which may potentially contaminate groundwater. A pollution source is also a potential contamination source.

Potentiometric Surface: A surface that represents the level to which water will rise in tightly cased wells. If the head varies significantly with depth in the aquifer, then there may be more than one potentiometric surface. The water table is a particular potentiometric surface for an unconfined aquifer.

Pump Test: A test to determine hydrologic properties of an aquifer, involving the withdrawal of measured quantities of water from, or additional of water to, a well and the measurement of resulting changes in head in the aquifer both during and after the period of discharge or addition.

PWS: Public water system.

Radial flow: The flow of water in an aquifer toward a well.

Recharge area: Area in which water reaches the groundwater reservoir by surface infiltration. An area in which there is a downward component of hydraulic head in the aquifer.

Residual soil: Unconsolidated or partly weathered material, presumed to have developed in place (by weathering) from the consolidated rock on which it lies.

Reverse fault: Fault with a dip greater than 45 degrees at which the hanging wall (upper block) appears to have moved upward relative to the footwall (lower block).

Sandstone: Cemented or otherwise compacted detrital sediment composed predominantly of quartz sand grains.

Shale: laminated sediment in which the constituent particles are composed of clay. Same as mudstone, except mudstone may be composed of a percentage of silt and may or may not be laminated.

Stagnation point: A place in a groundwater flow field at which the groundwater is not moving.

SWMU: Means Solid Waste Management Unit as defined by Federal Regulations

Thrust fault: Fault with a dip of 45 degrees or less in which the hanging wall (upper block) appears to have moved upward relative to the footwall (lower block).

Time of travel (TOT): The time required for a particle of water to move in the saturated zone from a specific point to a groundwater source of drinking water.

UAC: Utah Administrative Code.

Unconfined Aquifer: Any aquifer that does not meet the definition of a confined aquifer. An aquifer over which there are no confining strata and the water table forms the upper boundary.

VOC: Volatile organic compounds.

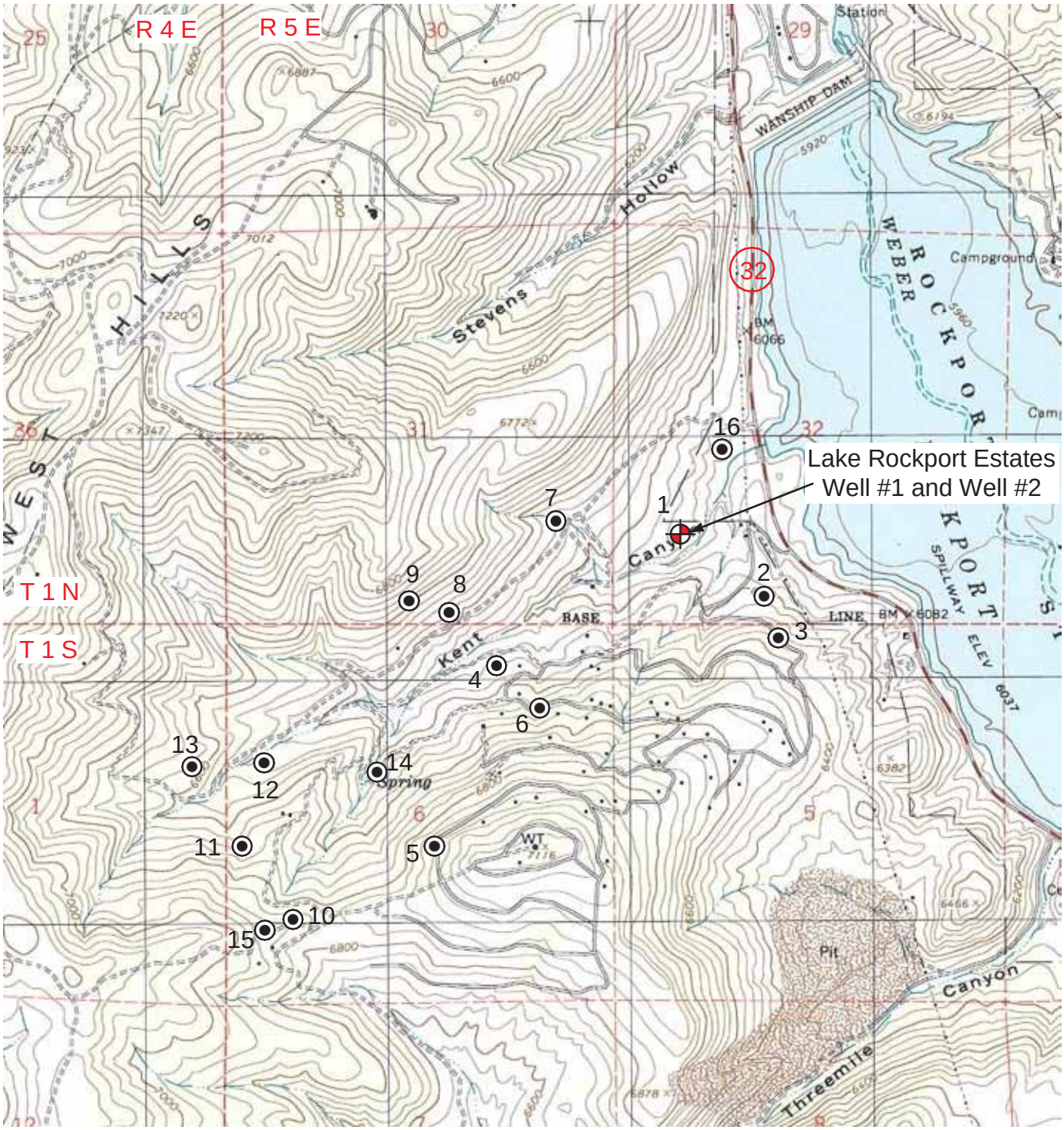
Well field: An area containing two or more wells supplying a public water supply system.

Wellhead protection area (WHPA): The surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or well field.

Wellhead: The physical structure, facility, or device at the land surface from or through which groundwater flows or is pumped from subsurface, water-bearing formations.

Zone of Contribution (ZOC): The area surrounding a pumping well, spring, or tunnel that encompasses all areas and features that supply groundwater recharge to the spring, or tunnel.

FIGURES



Base map: Wanship (1997) USGS 7.5-minute topographic map

0 Feet 4000

Approximate Scale

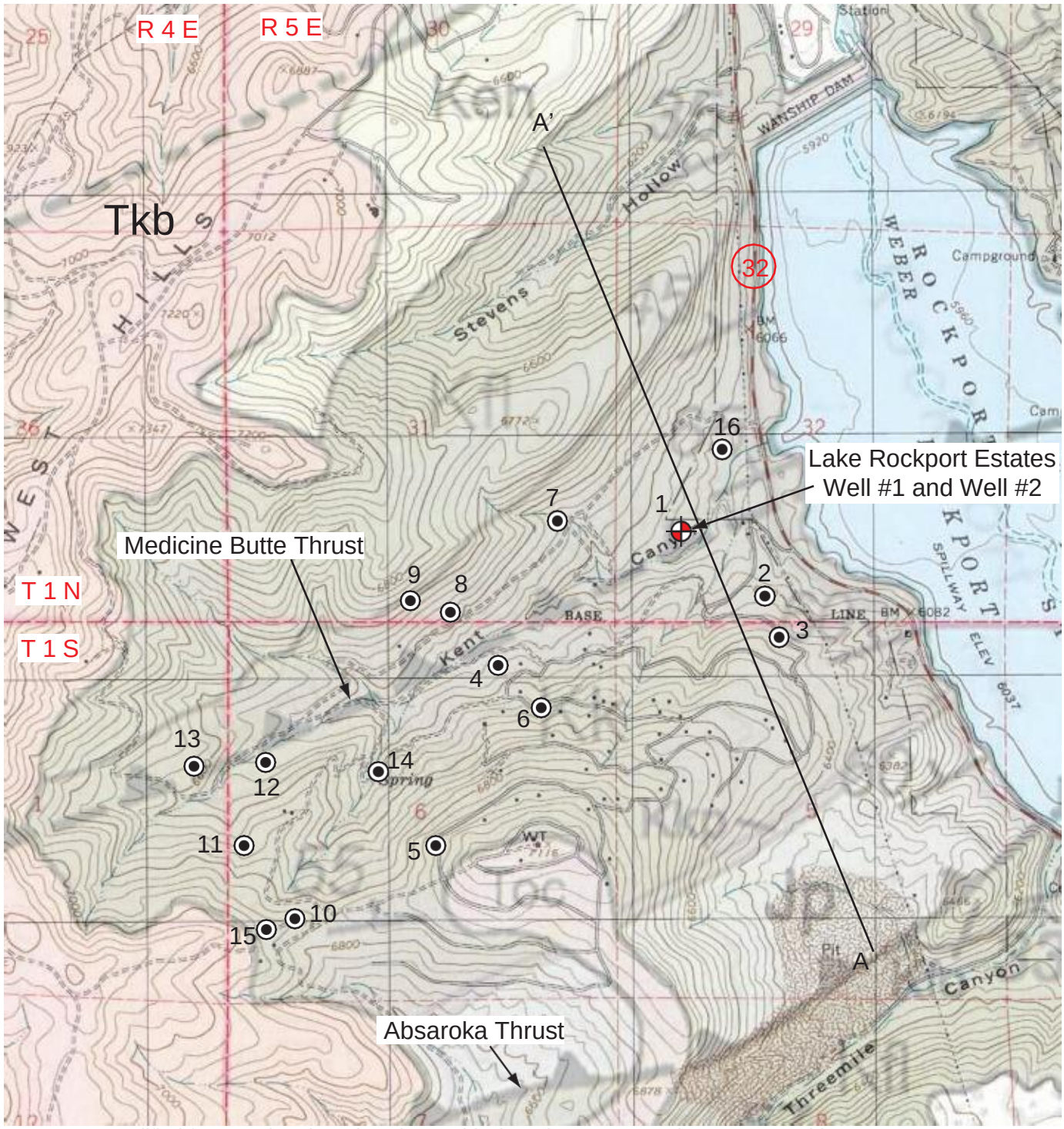
N

◉ 3 Well and Well ID #_

Notes:
See Appendix D for Well Data.

Lake Rockport Estates Well #2
Location Map
Figure 1

LOUGHLIN WATER ASSOCIATES, LLC



Base map: Modified from Hurlow (2002) and Wanship (1997) USGS 7.5-minute topographic map

A ——A' Geologic Cross Section (see Figure 3)

◉ 3 Well and Well ID #

0 Feet 4000

Approximate Scale

N

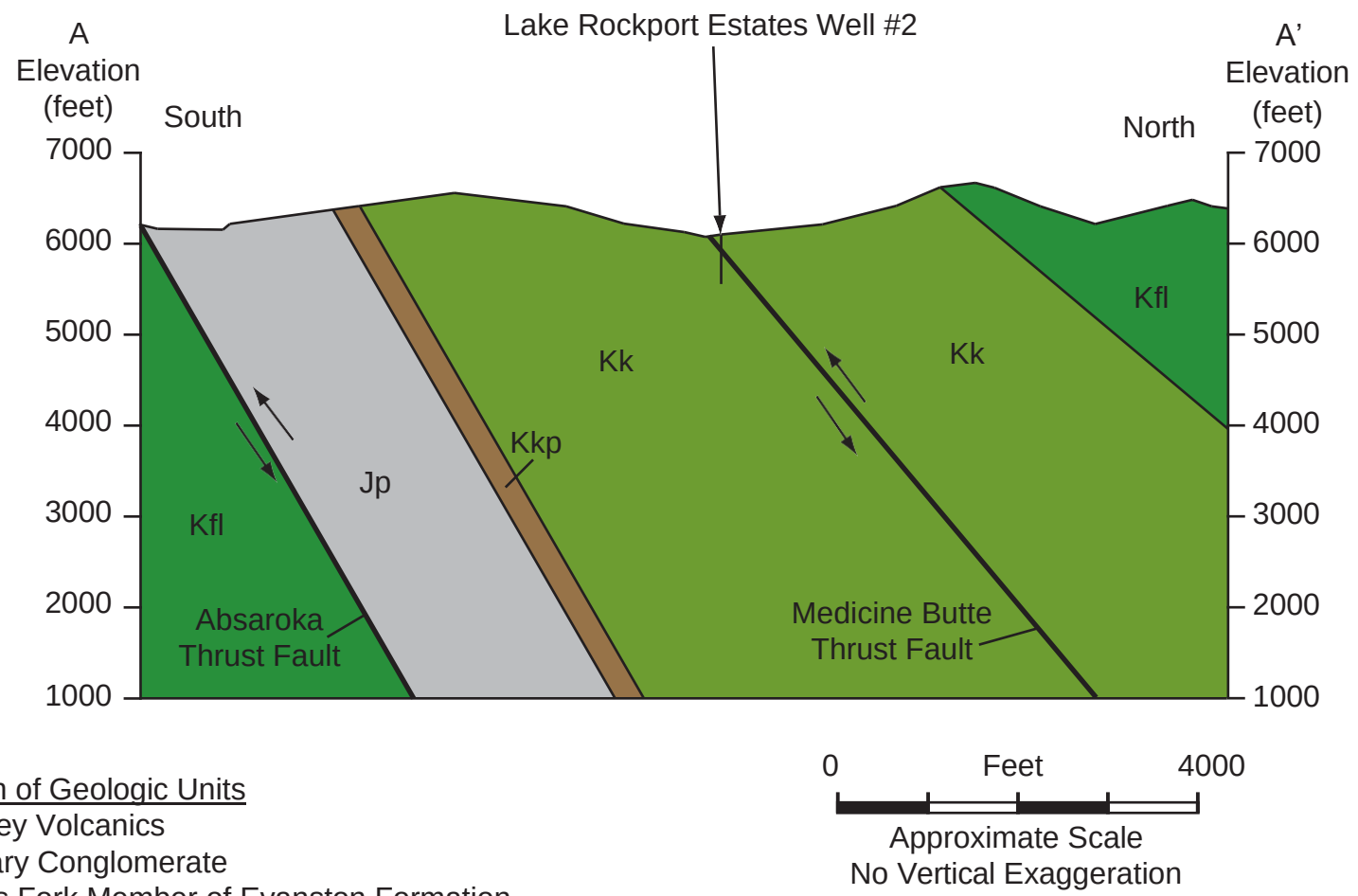
Notes:

See Appendix D for Well Data;

See Figure 3 for Key to Geologic Units.

Lake Rockport Estates Well #2
Geologic Map
Figure 2

LOUGHLIN WATER ASSOCIATES, LLC

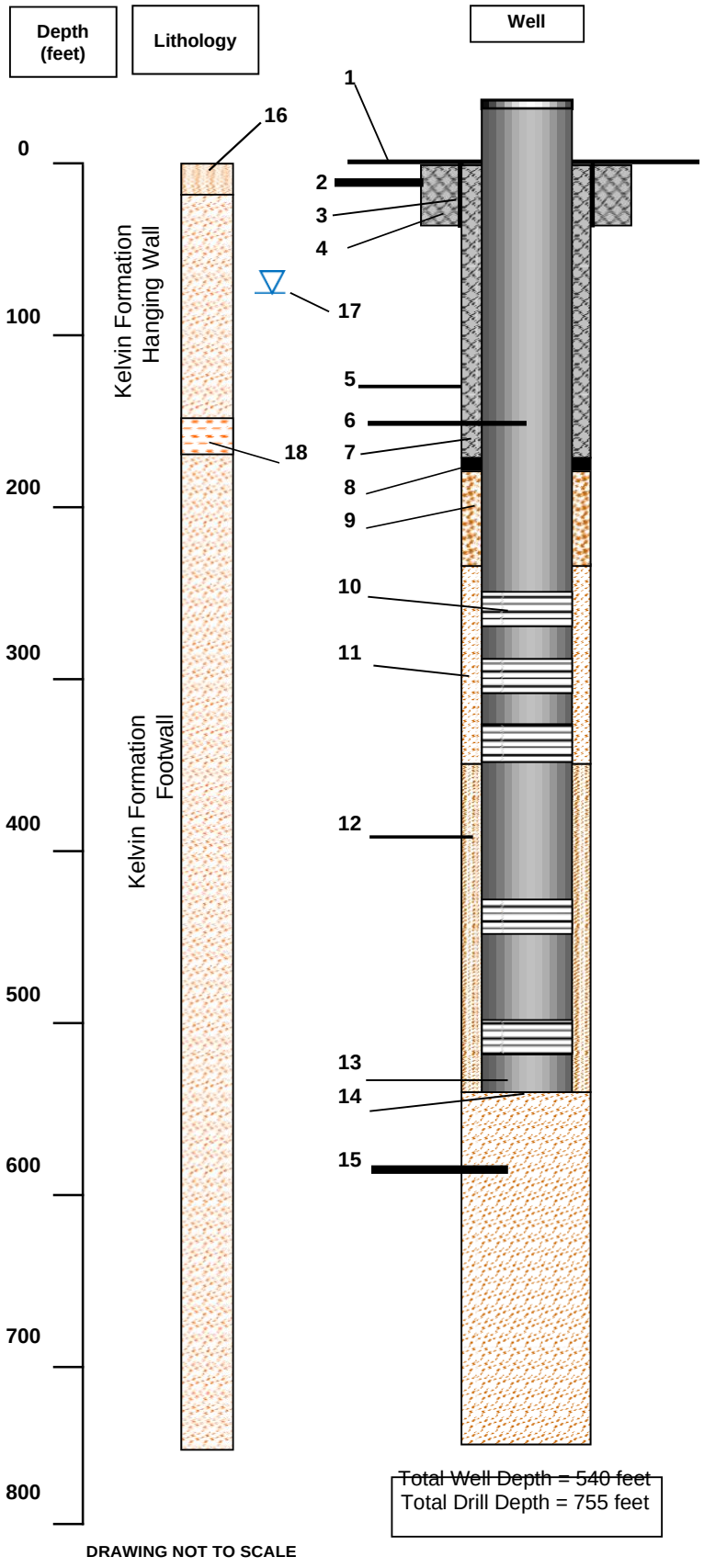


Explanation of Geologic Units

Tkb - Keetley Volcanics
Toc - Tertiary Conglomerate
Keh - Hams Fork Member of Evanston Formation
Kfo - Oyster Ridge Member of Frontier Formation
Kfl - Lower Member of Frontier Formation
Kk - Upper Member of Kelvin Formation
Kkp - Parley's Member of Kelvin Formation
Jp - Preuss Sandstone

LOUGHLIN WATER ASSOCIATES, LLC

Lake Rockport Estates Well #2
Geologic Cross Section
Figure 3



Notes

1 - Ground elevation at well: approx. 6100 feet

2 - 20-inch diameter borehole (0 - 37 feet)

3 - 16-inch diameter steel surface casing (0 - 37 feet)

4 - Neat cement grout (0 - 37 feet)

5 - 14.75-inch diameter borehole (37 - 755 feet)

6 - 8-inch diameter steel production casing

7 - Sand/cement grout (0 - 175 feet)

8 - Bentonite seal (175 - 180 feet)

9 - 3/8-inch gravel pack (180 - 230 feet)

10 - 8-inch diameter stainless steel wire-wrapped 0.040-inch slot well screen (250 - 270 feet; 290 - 310 feet; 330 - 350 feet; 430 - 450 feet; 500 - 520 feet)

11 - 8 - 12 sand pack (230 - 350 feet)

12 - 10 - 20 sand pack (350 - 540 feet)

13 - 20 foot sump with bottom cap (520 - 540 feet)

14 - Total well depth (540 feet)

15 - Native material; hole slough (540 - 755 feet)

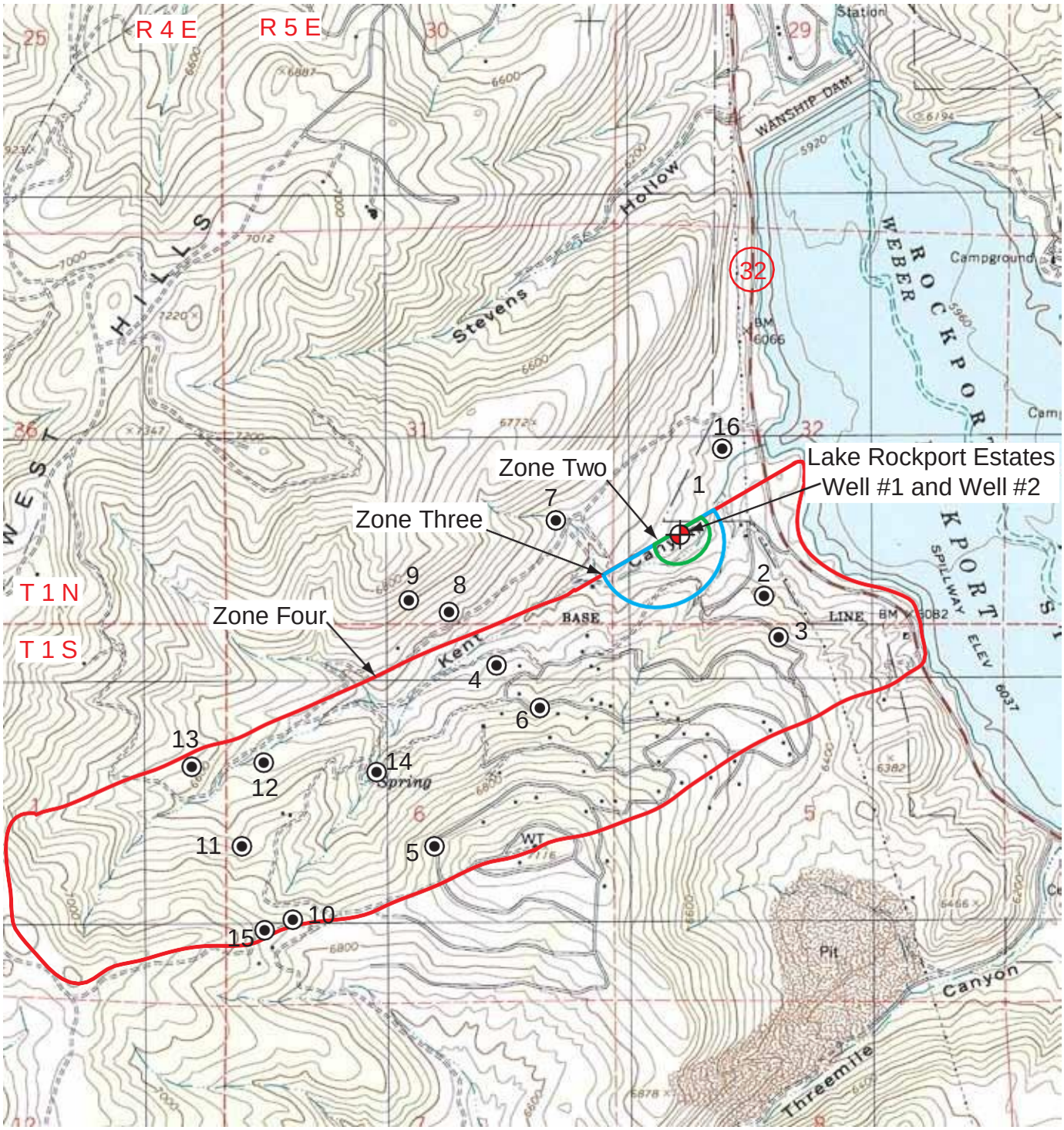
16 - Top soil/alluvium (0 - 20 feet)

17 - Static water level (86.9 feet)

18 - Medicine Butte Thrust fault zone

LOUGHLIN WATER ASSOCIATES, LLC

Lake Rockport Estates Well #2
Well Construction Diagram
Figure 4



Base map: Wanship (1997) USGS 7.5-minute topographic map

◉ 3 Well and Well ID #

0 Feet 4000

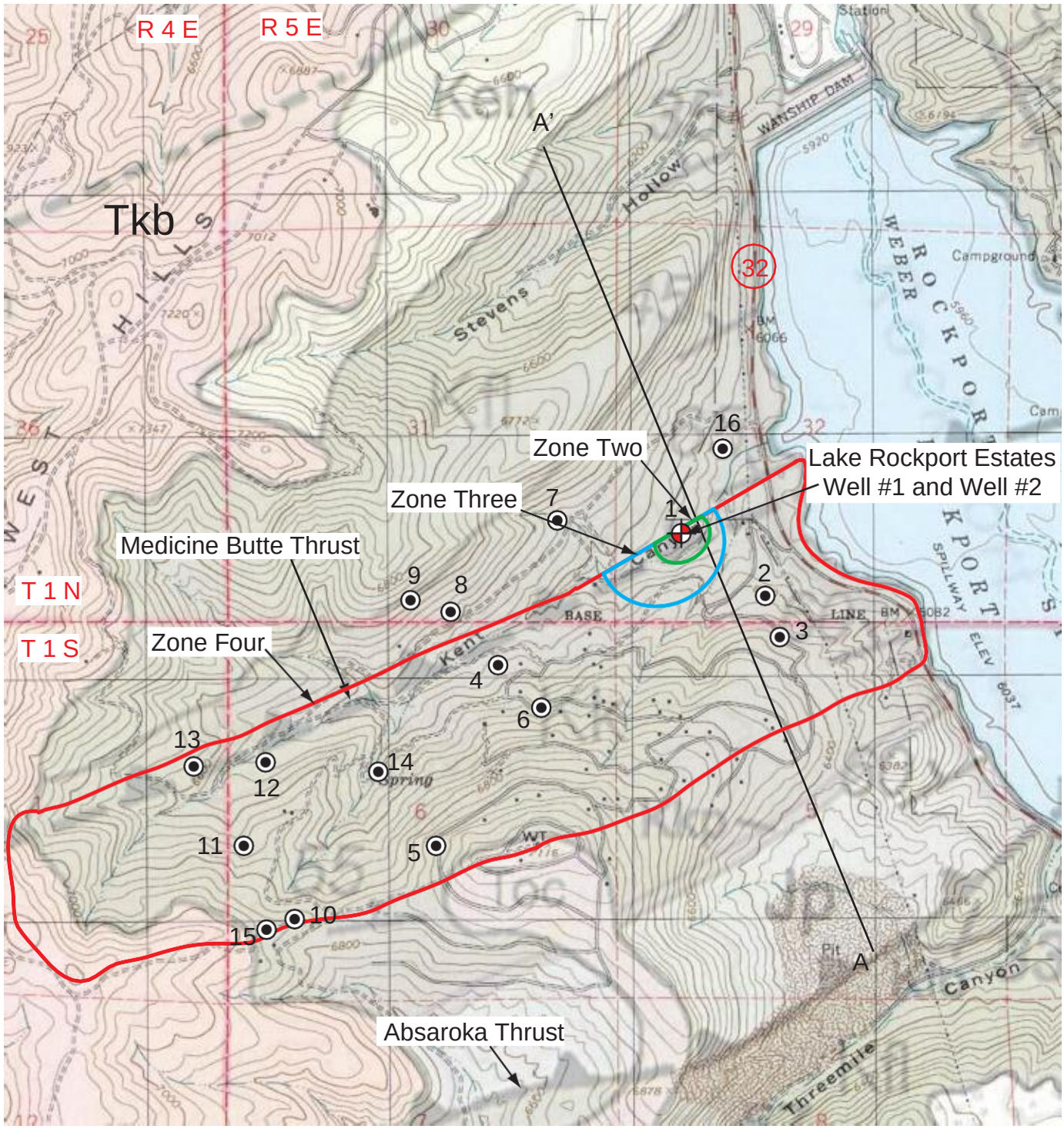
Approximate Scale

N

Notes:
See Appendix D for Well Data.

Lake Rockport Estates Well #2
DWSP Area Boundaries - Topographic Map
Figure 5

LOUGHLIN WATER ASSOCIATES, LLC



Base map: Modified from Hurlow (2002) and Wanship (1997) USGS 7.5-minute topographic map

A ——A' Geologic Cross Section (see Figure 3)

◉ 3 Well and Well ID #

Notes:

See Appendix D for Well Data;

See Figure 3 for Key to Geologic Units.

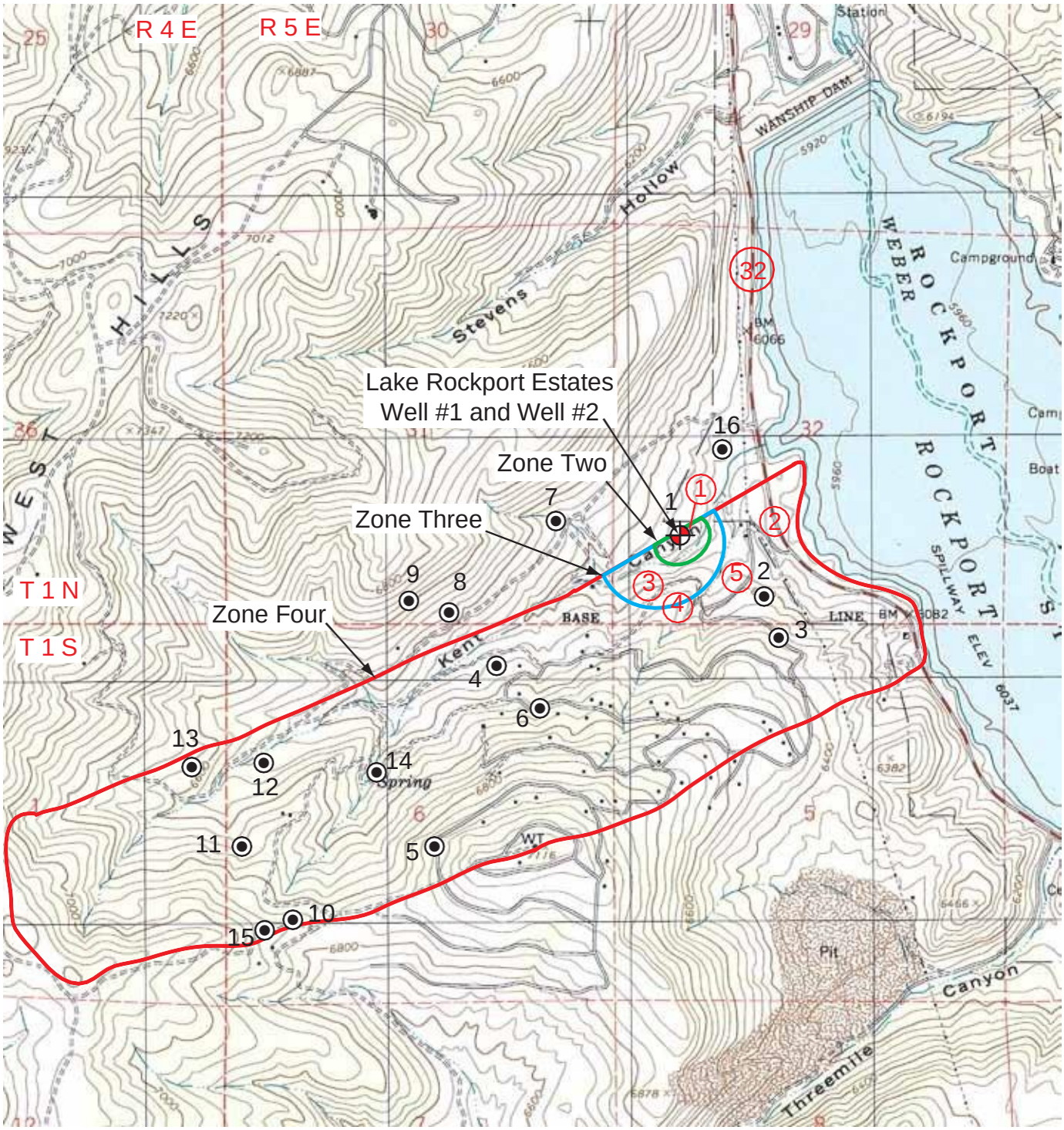
0 Feet 4000

Approximate Scale

N

Lake Rockport Estates Well #2
DWSP Area Boundaries - Geologic Map
Figure 6

LOUGHLIN WATER ASSOCIATES, LLC



Base map: Wanship (1997) USGS 7.5-minute topographic map

◉ 3 Well and Well ID #

(2) PCS and Rank # (see Table 7 in text)

0 Feet 4000

Approximate Scale

N

Notes:
See Appendix D for Well Data.

Lake Rockport Estates Well #2
PCS Location Map
Figure 7

LOUGHLIN WATER ASSOCIATES, LLC

APPENDIX A

PLAN APPROVAL LETTER

ION M. HUNT5MAJ'4, JR.
Governor

GARY HERBERT

State of Utah

Department of
Environmental Quality

Executive Director

DIVISION OF- DREI NG Was
Kenneth H. Bousfield, P.E.
Director

Drinking Water Board
Anne Erickson. Ed,D., *Chair*
Myron *Baieman, Vice-CLair*
den Bassett
Daaiel Fleming
Jay Franson, P.E.
Helen Gmbez, Ph.D.

Rief+ard W. Sgr0tt
David A Stevens. Pb.D-

Kenneth H. Bousfield, P E.
Executive Secretary

April 17, 2008

Alan Lindsley
Homeowners Association
Lake **Rockport** Estates
P.O. Box 58542
Salt Lake City, Utah 84158

Dear Mr. Lindsley:

Subject: Conditional Approval, Well #2 Borehole Drilling (WS002),
File #07408, System #22104

The Division of Drinking Water (the Division) received revised borehole drilling plans for the subject project On March 26, 2008. The project as we understand it consists of drilling a public drinking water well (Well #2, referenced as WS002 in our inventory). This project basically complies with the applicable requirements defined in the Utah Administrative Code (UAC) **R309-**515 and **is hereby approved subject to the following condition:**

> The conductor casing shall be grouted under pressure by means of a positive displacement pump from the bottom of the annular opening and cured for 72 hours before drilling below the depth of the conductor casing.

We have also reviewed your submission of the Preliminary Evaluation Report (PER) for Well #2 provided by your consultant, Stanley Consultants, Inc. The Division concurs with this report. This 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-i3(6) and R309-600-7(1). You must submit proof that land use agreements have been recorded with Summit County before the well can receive an operating permit. The recorded agreements may be submitted to the Division before the DWSP Plan is due.

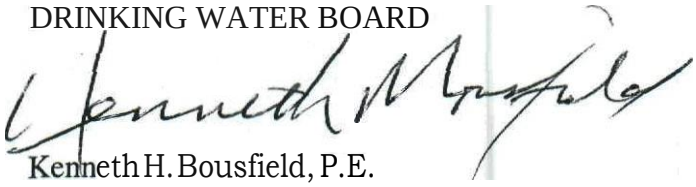
Local of county approvals/permits may be necessary before beginning construction of this project. As the project proceeds, any changes in the approved design must be forwarded to my staff as well as any change affecting the quantity or quality of the delivered water. My staff may also conduct interim and final inspections to ascertain compliance with the approved drawings. Please notify my staff when actual construction begins so these inspections can be scheduled.

This approval pertains to well drilling, development, aquifer testing, and disinfection of the well only. After drilling is completed and prior to equipping the well or constructing discharge piping and infrastructure necessary for introducing water from the well into the existing distribution system, you are required to submit additional information to the Division for review and obtain a 5eparate approval for equipping the well. After well equipping is completed, an Operating Permit must be obtained from the Division before the new well may be put into service. A checklist outlining the well approval process, including the items required for well equipping approval and operating permit, is enclosed for your information.

This well drilling apprOYal must be renewed if constriction has not begun of if substantial equipment has not been ordered within one year of the date of this letter. If you have any questions or need further assistance, please contact Mark Bertelson at (801) 536-0087.

Sincerely,

DRINKING WATER BOARD



Kenneth H. Bousfield, P.E.
ExecutiYe Secretary

Encloses-WeMApprov;Checbit

cc: Ted Mickelsen, Stanley Consultants, **5353** S. 960 E., **SLC, UT** 84117
Robert Swensen, Summit County Health Department, **P.O. Box 128, Coalville, UT** 84017
Mark Berielson, Division of Drinking Water
Jim **Martin,** Division of Drinking Water

F:\Wp\PLAN\Well\Approval\22104 07408b WeIIG2 O5lting AP.dv

APPENDIX B

WELL DRILLER'S REPORT, LITHOLOGIC LOG AND PUMP LOG FOR LAKE ROCKPORT ESTATES WELL #2

WELL DRILLER'S REPORT

Statn of Utah

Division of Water Rights

lvi **additional** space, use "**AddiGonal Well Duta** fiurni" end attach

'flméM

Non-Production Well: 083SO07M00 WIN: 431355

Lake Rockport Estates
PO Box S8B4]
Salt Lake City, UT 84158

Contact Person/Engineer: _____

N 1332 d 1145 from the SW cormer of section 32, Township lN, Range 5E, sL BOM

tmatinn De scripiion: (address, proz imity to buildings, landmark s, ground clcvation,local well it)

Drillers Activity | Start Date: 4130 108 Completion Date: 5/C0Ot

Check all that apply: [X] New ☐ Repair ☐ Deepen ☐ Clean ☐ Replace ☐ Public Nature oftire: _____

If a reg)acemcnr wcl), gzovidc 1ocation of ocw wC1t. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	37	20	Air Rotary	
37	320	14 3/4	DHD Hammer	Water, Foam
320	755	14 3/4	Reverse flooded	Bentonite, Polymer

WeU Log

WATER	PERMEABLE	CS	SILT	SAND	VOID	BOULDER	ROOT	HARD	ROCKTYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistency, water bearing. odor. fraciuri rig. mincrolugy, texture.degree of wcaihcri rig. hardness, water quality. etc.)
									TJERfH(foo() FROM]O		
									ne Gra		
130	170								X Sandstone	Gray/Red	W/dark gray mudstone
									X Mudstone	Gray/BLK	W Some Red/brown SS. Trace Brick red MS
190	195	X							X Sandstone	Gray/BRN	Some Siltstone gray.
195	200										

Baie f II Waicr Level feet Flowing'? O Yes No

Mcthoo of Water level Mea.sureinent _ If Flowing, Capped Pmssurr _____ PSI

Point to Which Wsier Level Me gem t aop4 Etevaaon _____

Height of Wawr r vol reference e '4 surfaces feet Temperature degrees ☐C ☐F

[redacted] [redacted]

SALT LAKE

Construction Information

DEPTH (feet) FROM	TO	CASING MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)
O1	TO			
450	500	Steel	.322	8

SCREEN ☐PERFORATIONS ☐OPEN BOTTOM

DEPTH (feet) FROM	TO	SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH	SCREEN TYPE OR NUMBER PERF
0	500	.040	8	S
330	350	.040	8	SS
90	310	.040	8	SS
[illegible]	270	.040	8	SS

Casing Joint Type:_____

WyyS yp)lnsuMvd7 *** ' 0 '

Perforator Used:_____ fuet

Drive Shoe? ☐Yes ☐No

Surface Seal Material Placement Method:_____

Was a temporary surface casing used? ☐Yes ☐No

_____ feet diameter:_____ inches

SURFACE SEAL / INTERVAL [EAL1£I PACCIPACKER RMAWOM

DEPTH (feet) 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.)
0	37	Neat Cement	57 Bags	47 lbs / 3 gals
175	180	Bent ~~Chips~~ Pellets		
[illegible]	[illegible]	Sand/Cement Grout		

DATE	METHOD	YIELD	Units Check One GPM CFR	DRAWDOWN (ft)	TIME PUMPED hrs & min)
6-16-05	Air Lift				
3/29-3/31	Pump				

Pump (Permanent)

Pump Description: Sub

Approximate Maximum Pumping Rate: 90

Horsepower: 40 Pump Intake Depth: 480 feet

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.*

Development was causing existing well to get dirty- Shut down [illegible] rotary rig & cable tool moved on in Oct and Surged well Installed test pump- did pump test- Ce get dirty- Shut down @ owners requested. started again in Mar

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 ZIMMERMAN, MIKE WELL SERVICE (Person, Firm, or Corporation - Print or Type)

License No. 527

Mike Zimmerman (Licensed Well Driller)

Date 6/4/09

WELL DRILLER'S REPORT ADD'FIONAL DATA FORM

State of Utah
Division of Water Rights

Page ____ of ____

Wel1 Identifieaii•›°

pqn.proaucoion well: 0935007*00

Owner *Note any changes*

Lake Rockport Estates
PO Box 58542
Salt Lake City, UT 84158

Contact Person/Engineer: _____

WeI L0•sti•o) " °″″′ ″

N *332 E 1146 room the SN corner of section 32, Township 1N, Range 5E, SL B&M

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

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.)
200	220											Sandstone	Dark H Gray	w brick red mudstone
220	235											Sandstone	Brn/gray	fine gray Sandstone
235	255										X	Si MStone	Drk gray	w Mudstone and dark gray SS
255	275										X	SS	Gray	w Mudstone
275	300										X	SS	Gray	w Siltstone
300	330										X	SS	Red/gray	w Mudstone and Calcite
330	335										X	Claystone	Red/gray	
335	350										X	Sandstone	Gray/red	
350	405										X	Claystone	Red/Lt Brn	
405	425										X	Siltstone	Red/gray	w red claystone
425	460										X	Sandstone	Gray/red	w red/gray claystone
460	495										X	Claystone	Red/gray	w Siltstone
495	520										X	SS	Red/gray	w Some red Brn Siltstone
520	570										X	Claystone	Gray/red	
570											X	Sandstone	Gy/red	
580	595										X	Claystone	Gray/red	
595	610										X	Si Mstone	Gray/red	Siltstone Pebbles
610	630										X	Claystone	Red/tan	
630	690										X	Claystone	Gray	lt to dark gray, and Gray limestone
690	730										X	Claystone	Drk gray	TO Red
730	755										X	Claystone	Drk gray	Some limestone and calcite

Construction Information (con't)

DEPTH (feet) CASING DEPTH (feet) ☐SCREEN ☐PERFORATIONS ☐OPEN BOTTOM

DKFTH Ac SURPACB SEnL ifNTEnVnL sEAL/r•iLTER PACK PAC R INFORSiATI9i.f

FROM | TO xe#PACHBRFMRBssdDRM]RIRDOE (if applicable) (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,

Lithologic Log
Lake Rockport Estates Well #2

Depth		Lake Rockport Estates Well #2 Lithologic Description (in decreasing order of abundance)
From	To	
0	10	Brown top soil
10	40	Light-brown claystone and mudstone
40	50	Gray fine-grained sandstone with red-brown siltstone
50	95	Light-brown siltstone and mudstone with red and red-brown claystone
95	115	Light-gray fine-grained sandstone
115	130	Gray mudstone with tan-gray and red fine-grained sandstone
130	170	Gray and red fine-grained sandstone with dark-gray mudstone, red and gray siltstone, and calcite
170	190	Medince Butte Thrust Fault Zone; Gray and black mudstone with some red and gray sandstone and trace brick-red mudstone
190	195	Gray and gray-brown fine-grained sandstone with some gray siltstone; conglomerate - rounded pebbles of gray siltstone
195	200	Gray mudstone with brick-red mudstone and calcite
200	220	Dark- and light-gray fine-grained sandstone with brick-red mudstone and calcite
220	235	Brown-gray fine-grained sandstone with some brick-red mudstone and trace calcite
235	255	Dark-gray siltstone and mudstone with dark-gray fine sandstone (pebbles) and brick-red mudstone and trace calcite
255	275	Gray fine-grained sandstone with brick-red mudstone and some calcite
275	300	Gray fine-grained sandstone with red-brown siltstone and some calcite
300	330	Red and gray fine-grained sandstone and mudstone with some calcite
330	335	Red and gray claystone with some red fine-grained sandstone
335	350	Gray and red fine-grained sandstone with some dark-gray siltstone; conglomerate
350	380	Red and red claystone and siltstone with some calcite
380	405	Light-brown-gray and red claystone with gray siltstone and red and gray fine-grained sandstone and trace of calcite
405	425	Red and gray siltstone with light-brown-gray and red claystone
425	460	Gray and red fine-grained sandstone with red and gray claystone and dark-gray siltstone
460	495	Gray and red claystone with some red and gray mudstone and dark-gray and and pink-gray siltstone
495	520	Red and gray fine-grained sandstone with some red-brown-gray claystone and calcite
520	570	Gray and red claytstone with some gray and red fine-grained sandstone and dark-gray mudstone
570	580	Gray and red fine-grained sandstone with tan-gray claystone; conglomerate
580	595	Gray and red claystone with some gray-red-brown siltstone
595	610	Gray and red-brown siltstone pebbles and some calcite; conglomerate
610	620	Gray and red claystone with gray and dark-gray siltstone and calcite
620	630	Red and tan claystone with dark gray siltstone and light-gray limestone (micritic mudstone) and some calcite
630	690	Light- and dark-gray claystone with dark-gray and red silstone and gray-red limestone with calcite veins
690	730	Dark gray and red claystone with red and gray mudstone and dark-gray siltstone and calcite
730	755	Red and dark- and light-gray claystone with dark-gray and red siltstone, red mudstone and gray limestone and calcite

Note: Logged by Neil Burk P.G. of Loughlin Water Associates, LLC.

PUMP INSTALLATION REPORT (PUMP LOG)

UTAN DIVISION OF WATER RIGHTS
PO BOX lza3iio, sLC. UT s4i i upon
f841) S38-7240; t84l) 538-7467 fax; watcrrighte.pt$q.gq

Well Identification (e.g., Water Right or Non-Production Well Number): 08350078M00 Wn2431355

Owner Info (Name and Address): P.O. Box 58542 Salt Lake City 84158

Well Location:

Physical Street Address: Rockport Homeowners Above Rockport Lake

Point of Diversion (Public Land Survey): North ~~South~~ 1332 feet, East ~~West~~ 1145 feet from the SW corner of Section 32, Township 1N, Range 5E, SLB&M ~~USB&M~~

GPS (UTM OR Lat-Long, Incl. Map Datum):

Existing Well Details (if known)

Is a Well Driller's Report available? ☒ Yes ☐ No Well Depth 540 feet Well Diameter 8 inches

Nature of Use: ☐ Domestic ☐ Stock ☐ Industrial ☐ Commercial

Casing Type: ☒ Steel ☐ PVC ☐ Fiberglass ☐ ABS

☒ Screen ☐ Perforations ☐ Open Pipe Screen/Perforation Interval 506-5 250-

Filter Pack ☒ Yes ☐ No

Other details (if known): Well is pumping lots

Pump Installation Details

Type of Installation: ☐ New ☐ Replacement ☒ Repair ☐ Other

Date of Installation (single date or range as applicable): 1-23-2012

Type of Pump: ☒ Submersible ☐ Lineshaft ☐ Jet ☐ Other

Pump Manufacturer: Franklin Pump Model: 10

Number of Stages: 20 Riser/Discharge Pipe Type/Size: 3" SS ov

Height of Casing Above Ground Surface (in): 18" Pump Intake Depth 40 Pump Capacity (gpm): 90

Pump Water Level (ft below top of casing): 292 Shut-in

Artesian Flow (gpm): N/A Drawdown at End

Pitless Installation ☒ Yes ☐ No Manufacturer: Maas Mi

Pitless Type: ☒ Pitless Adapter ☐ Pitless Unit ☐ Screw

Method of Cutting Hole in Casing: Torch Depth of Pitless

Pump Testing? ~~Yes~~ ~~No~~ 60 / 205 DD Test Pump Duration (hrs)

Sounder ☐

watch ☐

☐ Orifice ☐ Volume ☐ Weir-Flume ☐ Other

Down Hole Camera Survey? ☒ Yes ☐ No Water Quality Sample Taken? ☒ Yes ☐ No

Well Pump Works Disinfection Upon Completion in accordance with R655-4? ☒ Yes ☐ No

Well Driller Statement

Comments by Installer: Pipe was wrapped with tape to help stop corrision to pipe. SS pipe was installed in screened area of well

Name: Mike Zimmerman Well Service (Person, Firm or Corporation – Print or Type) License No.: 527

Signature of Licensee: Mike Zimmerman (Licensed Driller or Pump In) Date: 1-24-12

RECEIVED
JAN 26 2012
WATER RIGHTS

Note: All pump work shall be performed in accordance with the provisions of the State of Utah Administrative Rules of Water [illegible]

Pump Log

APPENDIX C

WELL SEAL CERTIFICATION LETTER

Water-Tite Consulting
Jerry L. Bronicel, Consultant
1233 East 6600 South
Salt Lake City, UT. 84121
(801) 207-7821

June 16, 2008

Lake Rockport Estates
c/o Alan Lindsley
P.O. Box 58542
Salt Lake City, Utah 84158

COPY

Dear Mr. Lindsley:

This letter is to certify compliance with Utah Administrative Code ***(UAC) R309- 515-6(5)(b), R515-6(6)(i)*** and ***655-4.9.7-9.11*** as applicable to the surface casing and production casing grout seals installed on the well drilled for Lake Rockport Estates under State Engineer's Provisional well permit #08-35-007-M-00.The well was drilled by Mike Zimmerman Well Service, Utah Driller's License #527 and is located near Wanship Reservoir in Summit County, Utah. A more specific location (see attached maps) was determined using two G.P.S. receivers and the Wanship 7½ minute U.S.G.S. topographic map and found to be located approximately 40° 46.376′ North Latitude & 111° 24.690′ West Longitude or approximately North 1315 feet and East 1135 feet from the SW corner of Section 32, Township 1 North, Range 5 East East, Salt Lake Base & Meridian. The well was drilled, constructed and casing grout sealed in a manner consistent with the appropriate Rules and Construction Standards as required by the Department of Environmental Quality/Division of Drinking Water and the Utah State Engineer's Office/Division of Water Rights. The well surface casing grouting procedures were witnessed on May 2-3, 2008 and production casing grouting installation on June 14, 2008 and certified as compliant with the aforementioned Rules. As the well was drilled under a non-consumptive Provisional Permit, a change or exchange application based on an existing valid water right must be filed with and approved by the Utah State Engineer before ground water can legally be diverted from the well and used for the intended purposes.

The well was drilled with a Speedstar Rotary Rig utilizing air rotary, down-hole-hammer and flooded reverse drilling methods and consists of a 16" diameter steel surface casing installed inside a 20" diameter bore hole down to 37 feet. The annular space between the surface casing and bore hole was completely sealed via a 1¼" diameter tremie line placed at 35 feet in the annular space and pumping the grout using positive displacement pump from a grout paddle/mixing barrel (see attached photos). The grout slurry consisted of neat, Class C, Type I-II Portland Cement conforming to ASTM C-150 standards with a total of 2,679 pounds of cement hydrated to an average weight of 16.25 lbs./gal. and pumped into the annular space. The surface casing seal was installed and witnessed on May 2-3, 2008. The production portion of the well consists of a 8" diameter steel casing placed inside a 14¾" diameter bore hole. The bore hole extends down to a total depth of 755 feet with blank 8" diameter casing from +18" down to 250 feet and then alternating sections of 8" diameter blank casing and 8" continuous wire wrapped stainless steel screen (screen slot size is 0.040") installed at the following intervals: 250 to 270 feet; 290 to 310 feet; 330 to 350 feet; 430 to 450 feet; 500 to 520 feet; and 8" blank A53B steel casing from 520 to total completed well depth of 540 feet. The annular space between the 14¾" bore hole and blank casing and screened sections was artificially gravel packed with 12 cubic yards of well rounded silica sand (size 8/12) from 230 feet to 540 feet and then 3 cubic yards of ⅜" gravel between 180 and 220 feet. Ten fifty pound buckets of ⅜" bentonite chips were placed on top of the upper gravel pack from 180 to 175 feet to prevent migration of the grout down into the intake screens below. The remainder of the annular space was then completely sealed using 16 cubic yards of truck delivered 13 bag cement/sand grout conforming to ASTM C-150 standards and hydrated to a weight of 18.75 lbs./gal. The cement grout slurry was pumped via a 1¼" diameter tremie line placed down to 160 feet and pumped using a positive displacement portable grout pump with good grout 'returns' witnessed at the surface. Samples were taken of the grout slurry mixed on site and delivered and pumped, with all of the samples tested, found to be within allowable tolerances for shear and compressive strength. The production casing grouting process was completed and witnessed on June 14, 2008 with the grouting methods/materials used and the placement procedures incorporated by Mike Zimmerman Well Service found to be in compliance with the above- mentioned Rules and the well is therefore considered certified.

(continued page 2)

This cœtif›catiort, f›owever. does sot gi+'e approval k› usa the well in a public walœ supply system in oonjuri<tieo w4k the Lake Rc›cLport fislatœ dçve]gprrt#nî, fiuçh approva] is gjajjtod by the Mecofrve frigo/rite 7toazd *nfŒ•ir/£/qg haies açnn* rn •cing cœaincriteris rebring boa souzce protecûan plazL puo›p tœt, wcll/pipîfig cguipltwnt andphysical. cfiatiîcal and bactœiological anaiysis o£ the ground wste Îssuing from the well. SpccfFfc mju r¢xnmits aru £ound in £/€ A3/?P•2d¥ and gfi0P-d0dwhich arvavkileblef‹w« the Œperumnt or EnYironmœlal Quality/Divisùxi o£ Lhînking Water.

Jerry L BtoniceJ, Consultant
Water-Tite Cœsuhirig
Salt Lake City Utah

cc: Ying Yin8 Mecaulsy. P,E..
Dcpara»œt oF Enviro›iua«mral Qualirv
Division o£Drfnking Water
sali L«nc City. Utah

Mike 2 Lîcensed DriJlcr
Mike Zimrnœrian W=II S<twîcc
Magna, Utah

To:l Mickclsoc,P.E.
Project Engi»æz
Wsomas Engineering
Salt LaLe Ciry. Uah

Ross Hansæz, P.E.
Regional Engineer
Division où\Vatcr RigftJs
Salt Lake City. UtaA

Wait Rights File
Pmvîsioræl Well Permit
UO&35-007-MÆ0
Division of Water Rights

The attached maps (see attached sheets) shows the location of the well drilled for Lake Rockport Estates under State Engineer's approved Provisional Well Permit #08-35-007-M-00.

and is located near Wanship Reservoir in Summit County, Utah. A more specific location was determined using two G.P.S. receivers and the Wanship 7 1/2 minute U.S.G.S. topographic map and found to be located approximately 40° 46.376' North Latitude & 111° 24.690' West Longitude or approximately North 1315 feet and East 1135 feet from the SW corner of Section 32, Township 1 North, Range 5 East East, Salt Lake Base & Meridian. The well was drilled, constructed and surfacecasing grout sealed in a manner consistent with the appropriate Rules and Construction Standards as required by the

the Utah State Engineer's Office/Division of Water Rights.

7he *'elf* surface cas/np prowling procedures aere w/messed on âłay *;-3, ż008*

and certified as compliant by Jerry L. Bronicel, Consultant,

CANNED

Topographic Location Map: Lake Rockport Estates Provisional Well #08-35-007-M-00

Satellite Location Map: Lake Rockport Estates Provisional Well #08-35-007-M-00

Well Casing Grouting Procedures for

Lake Rockport Estates Provional Permit

08-35-007-M-00

Mike Zimmerman Well Service Utah License #527

Surface Casing May 2-3 and Production Casing June14, 2008









APPENDIX D

WELL DRILLER'S REPORTS FOR NEARBY WELLS

TABLE D1

WELL DATA SUMMARY

Well ID [a]	Owner/Name	Ground Surface Elevation (ft)	Static Water Level (SWL)		Depth Drilled (ft)	Screen Intervals
			SWL Depth (ft)	SWL Elevation (ft)		
1	Lake Rockport Estates Well #1	6100	86	6014	250	180 - 220
1	Lake Rockport Estates Well #2	6100	86.9	6013.1	755	250 - 270; 290 - 310; 330 - 350; 430 - 450; 500 - 520
2	Hugie	6210	30	6180	240	180 - 240
3	Hoffman	6360	90	6270	425	210 - 425
4	Hugie	6340	160	6180	275	200 - 275
5	Rogers	6920	202.8	6717.2	488	408 - 480
6	Ginn	6520	147.5	6372.5	268	200 - 260
7	Wardell	6310	37	6273	200	60 - 100; 140 - 180
8	Thayer	6440	260	6180	320	130 - 320 open hole
9	McNeely	6640	425.9	6214.1	525	465 - 525
10	Norton	6860	28	6832	205	160 - 200
11	Wyckoff	6680	208	6472	345	205 - 225
12	Southwick	6480	89	6391	234	80 - 234 open hole
13	Loeschorn	6630	82	6548	300	260 - 300
14	Loma Linda	6440	8	6432	115	40 - 60; 80 - 100
15	Rockport Properties	6900	100	6800	280	197 - 280 open hole
16	Hansen	6040	121	5919	340	220 - 240; 260 - 280; 300 - 340

[a] See Figure1 for well location.

35 area

Rockport POA original well

Form 113—5M—12-60

Examined 1/22/74 WO
Recorded: B. C. 1/22/74 T. B. WO
Inspection Sheet
Copied 1-22-74 B. M.

REPORT OF WELL DRILLER
STATE OF UTAH

Exchange.
Application No. 532
Claim No.
Coordinate No. (A-1-5) 32-Cdb

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:
Name Rockport Properties
Address S.L.C.

(2) LOCATION OF WELL:
County ..... Ground Water Basin ..... (leave blank)
~~North~~ ..... feet, ~~East~~ South ..... feet, West ..... feet from SW Corner
of Section 32, T 2 N S, R 5 E SLBM (strike out words not needed)

(3) NATURE OF WORK (check): New Well ☑
Replacement Well ☐ Deepening ☐ Repair ☐ Abandon ☐
If abandonment, describe material and procedure:

(4) NATURE OF USE (check):
Domestic ☐ Industrial ☐ Municipal ☐ Stockwater ☐
Irrigation ☐ Mining ☐ Other ☐ Test Well ☑

(5) TYPE OF CONSTRUCTION (check):
Rotary ☐ Dug ☐ Jetted ☐
Cable ☑ Driven ☐ Bored ☐

(6) CASING SCHEDULE: Threaded ☐ Welded ☑
20" Diam. from 0 feet to 12 feet Gage
18" Diam. from 0 feet to 180 feet Gage 4
" Diam. from feet to feet Gage
New ☐ Reject ☐ Used ☐

(7) PERFORATIONS: Perforated? Yes ☑ No ☐
Type of perforator used Cut by torch + rotary
Size of perforations inches by inches
~~perforations from feet to feet~~
perforations from 180 feet to 250 feet
perforations from feet to feet
perforations from feet to feet
perforations from feet to feet

(8) SCREENS: Well screen installed? Yes ☐ No ☑
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to
Diam. Slot size Set from ft. to

(9) CONSTRUCTION:
Was well gravel packed? Yes ☐ No ☑ Size of gravel:
Gravel placed from feet to feet
Was a surface seal provided? Yes ☑ No ☐
To what depth? 100' feet
Material used in seal: Pored Cement
Did any strata contain unusable water? Yes ☐ No ☑
Type of water: Depth of strata
Method of sealing strata off: Pored Cement

Was surface casing used? Yes ☑ No ☐
Was it cemented in place? Yes ☑ No ☐

(10) WATER LEVELS:
Static level 90' feet below land surface Date
Artesian pressure feet above land surface Date

LOG RECEIVED:

(11) FLOWING WELL:
Controlled by (check) Valve ☐
Cap ☐ Plug ☐ No Control ☐
Does well leak around casing? Yes ☐ No ☐

(12) WELL TESTS: Drawdown is the distance in feet the water level is lowered below static level.
Was a pump test made? Yes ☐ No ☐ If so, by whom?
Yield: gal./min. with feet drawdown after hours
" " " " " "
" " " " " "
Bailer test 55 gal./min. with 30 feet drawdown after 2 hours
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? No ☑ Yes ☐

(13) WELL LOG:
Depth drilled 250 feet. Depth of completed well 250 feet.
Diameter of well 16 inches

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	14	✓									✓	top Soil
14	19										✓	Red Shall
19	30										✓	Gray Shall
30	35											Red Shall
35	100											Parli Red Shall
100	105											Red Sandstone
105	110											Red Shall
110	115											Gray Sand Stone
115	120											Gray Shall
120	122											Green Shall Hard
122	126											Green Shall Water
126	136											White lime hard
136	140											Gray Shall
140	145											Red Shall
145	165											Red Soft Shall & Shells
165	170											Red & Gray Shall
170	200											Red Shall
200	250											Red Shall

Work started June 18, 1973 Completed July 22, 1973

(14) PUMP:
Manufacturer's Name
Type: H. P.
Depth to pump or bowles feet

Well Driller's Statement:
This well was drilled under my supervision, and this report is true to the best of my knowledge and belief.
Name Moss Drilling Co (Person, firm, or corporation) (Type or print)
Address P.O. Box 7051 Murray
(Signed) (Well Driller)
License No. 282 Date 1/20, 1974

USE OTHER SIDE FOR ADDITIONAL REMARKS

Rockport POA Replacement Well

Form 113—5M—12-60

Examined .....
Recorded: B. C. ..... T. B. .....
Inspection Sheet .....
Copied .....

REPORT OF WELL DRILLER
STATE OF UTAH

Application No. E532 (35-area)
Claim No. .....
Coordinate No. .....

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:
Name LAKE ROCKPORT ESTATES Property
Address OWNERS ASSOC. C/O AH LISHMAN

(2) LOCATION OF WELL:
County SUMMIT Ground Water Basin (leave blank) .....
North 1100 feet, East 1800 feet from SW Corner
of Section 32, T. 1 N, R. 5 E SLBM (strike out words not needed)

(3) NATURE OF WORK (check): New Well ☐ Replacement Well ☐ Deepening ☒ Repair ☐ Abandon ☐
If abandonment, describe material and procedure: .....

(4) NATURE OF USE (check):
Domestic ☐ Industrial ☐ Municipal ☒ Stockwater ☐
Irrigation ☐ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):
Rotary ☒ Dug ☐ Jetted ☐
Cable ☐ Driven ☐ Bored ☐

(6) CASING SCHEDULE: Threaded ☐ Welded ☒
6 " Diam. from 93 feet to 215 feet Gage 280
..... " Diam. from ..... feet to ..... feet Gage .....
..... " Diam. from ..... feet to ..... feet Gage .....
New ☒ Reject ☐ Used ☐

(7) PERFORATIONS: Perforated? Yes ☒ No ☐
Type of perforator used TORCH
Size of perforations 1/4 inches by 6 inches
120 perforations from 180 feet to 220 feet
..... perforations from ..... feet to ..... feet
..... perforations from ..... feet to ..... feet
..... perforations from ..... feet to ..... feet
..... perforations from ..... feet to ..... feet

(8) SCREENS: Well screen installed? Yes ☐ No ☒
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... Set from ..... ft. to .....
Diam. ..... Slot size ..... Set from ..... ft. to .....

(9) CONSTRUCTION:
Was well gravel packed? Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... feet to ..... feet
Was a surface seal provided? Yes ☒ No ☐
To what depth? IN EXISTING WELL
Material used in seal: .....
Did any strata contain unusable water? Yes ☐ No ☐
Type of water: ..... Depth of strata .....
Method of sealing strata off: .....
Was surface casing used? Yes ☐ No ☐
Was it cemented in place? Yes ☐ No ☐

(10) WATER LEVELS:
Static level 86 feet below land surface Date 10-16-90
Artesian pressure ..... feet above land surface Date .....

LOG RECEIVED: NOV 01 19

(11) FLOWING WELL:
Controlled by (check) Valve ☐
Cap ☐ Plug ☐ No Control ☐
Does well leak around casing? Yes ☐ No ☐

(12) WELL TESTS: Drawdown is the distance in feet the water level is lowered below static level.
Was a pump test made? Yes ☒ No ☐ If so, by whom? DRILLER
Yield: 95 gal./min. with 36 feet drawdown after 3 hours
" ..... " ..... " ..... " .....
" ..... " ..... " ..... " .....
Bailer test ..... gal./min. with ..... feet drawdown after ..... hours
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? No ☒ Yes ☐

(13) WELL LOG: Diameter of well 8 & 6 inches
Depth drilled 215 feet. Depth of completed well 215 feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
115	135									X		SHALE TAN
135	154									X		LIMESTONE BROWN
154	167									X		SHALE RED
167	210									X		SANDY LIMESTONE gray
210	219									X		SANDSTONE BROWN
219	220									X		CLAY - gray

Work started 10-8, 1990 Completed 10-16, 1990

(14) PUMP:
Manufacturer's Name GRUNDFOS
Type: SUBMERSIBLE H. P. 20
Depth to pump or bowles 168 feet

Well Driller's Statement:
This well was drilled under my supervision, and this report is true to the best of my knowledge and belief.
Name ZIMMERMAN WELL SERVICE (Person, firm, or corporation) (Type or print)
Address 7888 W. 2400 SO MAGNA UT.
(Signed) Mike Zimmerman (Well Driller)
License No. 527 Date 10-31, 1990

USE OTHER SIDE FOR ADDITIONAL REMARKS

Well 2

WELL DRILLER'S REPORT

State of Utah
Division of Water **Rights**

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

HEOE19ED

NAY 18 2006

A/ATE R RI GHTS
p A r. T l_A KE

W ntifi a n
Exchange Application: E4706 (35-11986)

WIN• 35649

Owner *Note an(' changes*
Kim Hugie
5810 Aspen Circle
Mountain Green, UT 84050

Contact Person/Engineer: _____

Well oc on *•ieone *rha•8es*
N 356 E 2000 from the SW corner of section 32, Township lN, Range 5E, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground e1evation,local well #)

St Da**omp**et on e

Check all that apply: MX New Repair Deepen Clean Replace Public 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	30	10	Air	air & Water
30	340	8	"	"

Well **Log**

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	K4 CLAY	G(SILT	NS SAND	CI GRAVEL	ID COBBLES	PTSD BOULDER	PTSD OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative to, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, ordor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
D	J‹3i			**										
N«r•	/X»=*				|								
/7D	Zt"z4**		*		\									
‹Sd E	;ydD»	;r-								X				

Static Water Levels

Date ?‘ . . " " -... W Level - IJ feet Flowing? O Yes to
Method of Water Level Measurement If Fl Capped Pressure _____ PSI
Point to Which Water Level Measuremen as Re e enced levation _____
Height of Water Level reference point above ground **surfaces** feet Temperaefre _____ degrees O C F

[redacted] *Well frog* [redacted]

Construction Information

DEPTH (feet) FROM	TO	CASING: CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	TO	GREEN OPERFORATIONS: SCREEN SLOT SIZE OR PERF SIZE	SCREEN DIAM OR PERF LENGTH	OOPEN BOTTOM: SCREEN TYPE
0	180	PVC	17	5"	180	240	PVC	5"	PVC

Well HeadConfiguration: 8" Steel Casing Access Port Provided? D Yes O No

Casing Joint Type: Sertaloc Perforator Used: Screen

Was a Surface Seal Installed? Yes O No Depth of Surface Seal: feet Drive Shoe? O Yes O No

Surface Seal Material Placement Method: Funnel Poured

Was a temporary surface casing used? Yes Z No If yes, depth of casing: ____feet diameter:____inches

DEPTH (feet) FROM	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./ga1., # bag mix, gal./sackec.)
	3		Mud	W

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM CFS	DRA (ft)	OW (ft)	TIME PUMPED (hrs & min)

Pump (Permanent)

Pump Description:_____ Horsepower:_____ Pump Intake Depth:_____feet

Approximate Maximum Pumping Rate:_____ Well Disinfected upon Completion? O Yes O 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 EXTERRA (Person, Firm, or Corporation - Print or Type) License No. 676

Signature _____ Daa 5-17-06

Well 3

~~68-1247~~
~~55-1517~~

Form 113—5M—12-60

Examined MAY 29 1980 RW

Recorded: B. C. ..... T. B. .....

Inspection Sheet .....

Copied .....

REPORT OF WELL DRILLER
STATE OF UTAH

Application No. 1434

Claim No. .....

Coordinate No. (D-1-5) 5bca

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:
Name Alfred Hoffmann 84401
Address 1215 Sego Lily Dr. Sandy

(2) LOCATION OF WELL:
County ..... Ground Water Basin (leave blank) Weber River
North 200 feet, East 400 feet from N¼ Corner
South ..... West .....
of Section 5, T 1 N S, R 5 E SLBM (strike out words not needed)

(3) NATURE OF WORK (check): New Well X
Replacement Well ☐ Deepening ☐ Repair ☐ Abandon ☐
If abandonment, describe material and procedure: .....

(4) NATURE OF USE (check):
Domestic X Industrial ☐ Municipal ☐ Stockwater ☐
Irrigation ☐ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):
Rotary X Dug ☐ Jetted ☐
Cable ☐ Driven ☐ Bored ☐

(6) CASING SCHEDULE: Threaded ☐ Welded X
6 " Diam. from 0 feet to 300 feet Gage .250
..... " Diam. from ..... feet to ..... feet Gage .....
..... " Diam. from ..... feet to ..... feet Gage .....
New X Reject ☐ Used ☐

(7) PERFORATIONS: Perforated? Yes X No ☐
Type of perforator used Cut
Size of perforations ¼ inches by 6 inches
..... perforations from 280 feet to 300 feet
..... perforations from ..... feet to ..... feet
..... perforations from ..... feet to ..... feet
..... perforations from ..... feet to ..... feet
..... perforations from ..... feet to ..... feet

(8) SCREENS: Well screen installed? Yes ☐ No X
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... Set from ..... ft. to .....
Diam. ..... Slot size ..... Set from ..... ft. to .....

(9) CONSTRUCTION:
Was well gravel packed? Yes ☐ No X Size of gravel: .....
Gravel placed from ..... feet to ..... feet
Was a surface seal provided? Yes X No ☐
To what depth? 18 feet
Material used in seal: Clay
Did any strata contain unusable water? Yes ☐ No X
Type of water: ..... Depth of strata .....
Method of sealing strata off: .....

Was surface casing used? Yes X No ☐
Was it cemented in place? Yes ☐ No X

(10) WATER LEVELS:
Static level 240 feet below land surface Date 5/12/80
Artesian pressure ..... feet above land surface Date .....

LOG RECEIVED
MAY 28 1980
WATER RIGHTS

(11) FLOWING WELL:
Controlled by (check) Valve ☐
Cap ☐ Plug ☐ No Control ☐
Does well leak around casing? Yes ☐ No ☐

(12) WELL TESTS: Drawdown is the distance in feet the water level is lowered below static level.
Was a pump test made? Yes ☐ No ☐ If so, by whom? .....
Yield: ..... gal./min. with ..... feet drawdown after ..... hours
" ..... " ..... " ..... "
" ..... " ..... " ..... "
Bailer test ..... gal./min. with ..... feet drawdown after ..... hours
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? No ☐ Yes ☐

(13) WELL LOG: Diameter of well 6 inches
Depth drilled 300 feet. Depth of completed well 300 feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	MATERIAL Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	10	X										
10	20	X										
20	30	X										
30	40	X										
40	50	X										
50	60	X									X	
60	70										X	
70	80							X				
80	100							X				
100	120							X				
120	140							X				
140	160							X				
160	180									X		
180	200									X		
200	220									X		
220	240									X		
240	260									X		
260	280									X		
280	300									X		

Work started 5/9, 1980 Completed 5/12, 1980

(14) PUMP:
Manufacturer's Name .....
Type: ..... H. P. .....
Depth to pump or bowles ..... feet

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

Name Dave's Drilling (Person, firm, or corporation) (Type or print)
Address R.F.D. Box 618E Heber
(Signed) Donnal R Cuellard (Well Driller)
License No. 405 Date 4/12, 1980

USE OTHER SIDE FOR ADDITIONAL REMARKS

Form 113—5M—12-60 Verbal ck From Bronnell

Examined .....
Recorded: B. C. ..... T. B. .....
Inspection Sheet .....
Copied .....

REPORT OF WELL DRILLER

sTAJE OF UTAR

Application _____
cl•lm N•...-.. =...=. .....—_____
No. _____

GENERAL STAT flirt ENT: Report of well drifter is hereby made and filed with the **State Engineer, in accordance with** the laws of Utah. (This report shall be filed with the **State Engineer within 30 daya after** the **completion or abandonment of** the well. Failure to file such **reports constitutes a misdemeanor.)**

(1) WELL OWNER:

Name ALFRED Hoffmann
Address MURRAY Utah

(2) LOCATION OF WELL:

County. 34 f.J. ... ('rround Water Basin ..... (leave blank)
North 1190' feet, East W 4001 feet, Sowlr 5 West
of Section ..., T. 10 N. R. 5E E SLBM
out v'ords not needed) US'

(3) NATURE OF 3VORK (check): N.w«cii o

Replacement 9'ell Deepening O **Repair** O Abandon O
If abandonment:, describe matnrlal and **procedure •.** -.—.-.— .—

(4) NATURE OF USE (eheeh):

Domestic ☑ **lodoatrtal E] MnnJeigal Q 6cockw•c•r** 0

(5) TYPE OF CONSTRUC'I'ION (check):

☑

(6) CASING SCHEDULE: Threaded ☐ Welded ☑

8 " Diam. from 0 feet to 425 feet Gage 268
..... " Diam. from ... feet to ... feet Gag
New ☑ Reject ☐ Used ☐

(7) PERFORATIONS: Perforated? Yes ☑ No ☐

Type of perforator used cutting torch
txe oÉ perf'oratlona.. .....-. ----------l•¢bM b:f'----------l
. ...per£or•iiooa Czoas . ——deet to ——"
...perfOEgtlOng Cgo@ ._– .....–.-.£eeh I .——••— I
.. ... e.....pet•£OZa€€Ong £zo& - —— — —•-HMI —°——————!•
..._... pez§ggatlgng £gQ . ...._...wv.v....w.£eet IQ- .—.—.w-test
__ _ _.perf£orattone £coai- ...- —— .--Feat to — ..-..Y**t

(8) SCREENS: +,» ,,, i . » › v o x›

nufAe Mcer'g I'IAofe —— —•—•—•—•—•—•——————
Type.....
Diam. .....Slot size..... .....Set from..... ...ft. to.
tarn ....BIOS 8txe.....-... eC 2ZOot....-.—— .-. !t• IQ.

(9) COI€S7Rt/C7ION:

Wo6 melt srasmlpeeLodt Ym () Note°° o# B'°"°*•——
)/@y j pj g Q . . .._.. £ to.. e. .. ..+... .teMt
Waa a eur£ace aeal provided 7 Ve* !'fo 0
To ggat put..... ....fI
Material used in seal: cement grout
Dt€l ang a£rata contain tJtiu8•bte 6ateE I V¢a 0 I'f ☑
Type of water: ..... Depth of strata.....
Method of sealing strata off: .....

Was surface casing used? Yes ☐ No ☐
Was it cemented in place? Yes ☐ No fl

(10) WA'I'ER LEVELS:

static level .. . .;feet below **land eurfeee Datu..**—.. —·—
AHegian pk'eS ure .... **.....feHt aboVR lsnd Gurface** D•K.–.—w-.–.

(11) FLOWING WELL:

L :
Controlled by (check) Valve ☐
Doea well leek around cacl•s T" "Dec n« o

(1 j WEEK TESTS:

Drawdown la the dtetanee tn Feet tbe wctaz level (s lowered below static level.

\Yas a pump cest made ? Yes ☑ No ☐ If so, by whom? Russ Huntsman
Yield: 10 gal./min. with 0 feet drawdown after 10 hours
" " o, " " "
Bailer test ..... gal./min. with ..... feet drawdown after ..... hours
Artesian flow ..... g.p.m. Date ...
Temperature of *ou ter*..... ..d.. .- Waes chemlc•1 sn•1yals **ziiu4e** 7 Fo @ **Yer** @

(E L L T Dimm**er of wet] ....* _„ . .....*..... ..]nebeo
Depth drilled ... .fee . Depth o eo2Hplcted hells..... ... .fWt.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	BATERt*L Sa	Gravel	Boulders Cobbles	Hardpan	Conglomerate	edrock	Other	REMARKS
0								Silt clay topsoil
10 425				X	X			this formation did
								Hardpan type clay with layers of limestone encounters about
								Hardpan clays with
								Water - 225 Ft. in Limestone
								Some additional water at 280 ft.

re 1 ..., 19 58 Completed June 8

(14) PUMP:

MSWUfSCtIIFGF'S NSIOG...-.....-. . ..-.....-....-... •..•... —————
Type: ..... H. P. .....
Depth to pump bowls ..... feet

Well Driller's Statement:

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

Name Hiwest DRILLING
(Person, firm, or corporation) (Type or print)
Address P.O. Box 1116 S C U
(Signed) ..... (Well Driller)
License No.-.- ... . Date... Thanks Kelly, 19

USEOTsER 8IDE FOB EDDFFIONELREM*RK8

14 NOV
" ""
WATER RIGHTS
SALT LAKE

Well 4

WELLDRILLER'S REPORT

State of Utah

Division of Water **Rights**

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

CH

tip fi

Exchange Application: E4732 (35-12017) WIN: 428592

Ownee *Notr nnv changes*

Kim D. Hugie
3199 Rockport Blvd
Nanship UT 840k7

Contact Person/Engineer: _____

L ti

S 510 W **1575** from the NE corner section 05, Township lS, Range **SE, SL B&M**
of

Location Description: (address, proximity to buildings, landmarks, ground e1evation,1ocal well f)

tl ers ti it Sta Da Completion Date:

Check all thal apply i New Repair Deepen Clean Replace Public Nature of Use: _____

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

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	30	10	Air Water	Air Water
30	175	8	" "	"

YY'ell Log DEPTH (feet) FROM	TO	ATER	PERMEABL High	Low	IT CLAY	'C(SILT	N SAND	O GRAVEL	ID COBBLES	IT BOULDER	fiD OTHER	CCiNSOI IDATFFI ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative 9r, 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.)
				‹										

Static Water Level

Date ‘ W --) Water Level _____ feet Flowing? fi Yes O No

Method of Water Level Measurement Taped If Flowing, Capped Pressure _____ PSI

Point to Which Water Level Measurement was Referenced Top of Casing Elevation _____

Height of Water Level reference point above ground surface 18" feet Temperature _____ degrees fi C O F

Well Log

Construction Information

DEPTH (feet) FROM	TO	CASING V A AL/GRADE	WALL THICK (in)	NOMINAL DIAM. t‹n)	DEPTH (feet) FROM	TO	CREEN O PERFORATIONS SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	O OPEN BOTTOM SCREEN TYPE OR NUMBER PERF (per round/interval)
0	10	Sta	.250	8	200	275	5000	5	CeRta-LOK

Well Head Configuration: 8 Steel Casing Bentonite Grout Access Port Provided? O Yes D No

Casing Joint Type: Carta-Lok Perforator Used: Sx

Was a Surface Seal Installed? ☑ Yes ☐ No Depth of Surface 3cal: _____ feet Drive Shoe? D Yes

Surface Seal Material Placement Method: Pour Plug

Was a temporary surface casing used? is O No If yes, depth of casing: NwJ feet diameter: N) inches

DEPTH (feet) FROM	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.)
		—		

p n nd T n

DATE	METHOD	YIELD	Units Check One GPM CFS	DRAWDOW (ft)	TIME PUMPED (hrs & min)

Pump (Permanent)

Pump Description: 1½ Hondo Pump Horsepower: 1½ Pump Intake Depth: 260 feet

Approximate Maximum Pumping Rate: 15 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 J 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 EXTERRA (Person, Firm, or Corporation - Print or Type) License No. 676

Signature David R Cantlon (Licensed Well Driller) Date 3-15-0

WL1

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

Well 5

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

Well Identification
EXCHANGE APPLICATION: E3795(35-AREA) 35-10549

Owner *Note any changes*
Rogers, Alan D.
1847 West Teton Drive
Provo, UT 84604

RECEIVED
DEC 01 1998
WATER RIGHTS
SALT LAKE

Contact Person/Engineer:

Well Location *Note any changes*
COUNTY: Summit
NORTH 177 feet WEST 3219 feet from the E¼ Corner of
SECTION 5, TOWNSHIP 1S, RANGE 5E, SLB&M.

Location Description: (address, proximity to buildings, landmarks, ground elevation, local well #)
Rockport Ranches Lot #60

Drillers Activity Start Date: 11-4-98 Completion Date: 11-17-98

Check all that apply:
☒ New ☐ Repair ☐ Deepen ☐ Abandon ☐ Replace ☐ Public Nature of Use:

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	20	12"	AIR ROTARY	
20	488	8"	AIR ROTARY	

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE high	PERMEABLE low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTIONS AND REMARKS (include comments on *water quality* if known.)
0	1											TOPSOIL		
1	22				X								RED	
22	29				X	X					X	SILTSTONE	RED	
29	66					X					X	SILTSTONE	RED, TAN PURPLE	
66	87						X				X	SANDSTONE	TAN	
87	178					X					X	SILTSTONE	RED-TAN	
178	238										X	SANDSTONE	RED-TAN	Hard 187-223
238	305										X	SILTSTONE	RED	
305	307										X	SANDSTONE	GREEN	
307	432	X									X	SILTSTONE	RED & BROWN	1 GPM

Static Water Level
Date 11-17-98 Water Level 202.8 feet Flowing? ☐ Yes ☑ No
Method of Water Level Measurement ELECTRIC SOUNDER If Flowing, Capped Pressure PSI
Point to Which Water Level Measurement was Referenced GROUND LEVEL
Height of Water Level reference point above ground surface feet Temperature ☐ °C ☐ °F

[redacted] *Well Log* [redacted]

Construction Information

DEPTH (feet) FROM	TO	CASING: CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL AM (in)	DEPTH (feet) FROM	TO	SCREEN QI: SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	PERFORATIONS O: SCREEN TYPE OR NUMBER PERP (per round/interval)
+1.5	20	A53B	.250	8	408	480	.060		TORY SLOT.
--8	408	PVC CERT-A-LOC	SDR 17	5"					

Well Head Configuration:_____ Access Port Provided? Yes O No

Casing Joint Type: - J9-LP GJ Perforator Used:

DEPTH (feet) FROM	TO	FILTER PACK / GROUT / PACKER / ABANDONMENT MATERIAL: ANNULAR MATERIAL. ABANDONMENT MATERIAL and/or PACKER DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal.,f bag mix, gal./sack etc.)
		JZrq" n « /fi I ¿z &• < '••»		
		2 'r		

Well Develpment / Pump or 1 Tests

Date	Method	Yield	Units (Check One) GPM	CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
11-16-98	AIR	5+	X		N/A	1 HR.

Pu p Pe anent)

Pump Description:_____ Horsepower:_____ Pump Intake Depth:_____ feet

Approximate maximum pumjping rate:_____ Well disinfected upon completion? O Yes O No

Dtxe ents c pt on of construction activity, additional materials used, problems encountered, extraordinary **circumstances, abandonment** / procedures. *Use additional well data form for more space.*

e Drille S e e t Th e ab on d unde y su o a ording to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name ZIMMERMAN WELL SERVICE **License No.** 55

(Person, Firm, or Corporation Print or Type)

Signature_____ **Date** 11-25-98

(Licensed ' Driller)

ADDITIONAL WILL DAA FORM

Water Right # E3795(2) £a

OWNER NAME Olf! , ALAN D.

Page ___ of ___

g ozevs(i*i) FROM	TO	WATER	PERMEABLE high	PERMEABLE low	CONSOLIDATED CLAY	CONSOLIDATED SILTI	CONSOLIDATED SAND	CONSOLIDATED GRAVEL	CONSOLIDATED COBBLES	CONSOLIDATED BOULDER	CONSOLIDATED OTHER	CONSOLDATED ROCKTYPE	COLOR	DESCRIPTIONS AND REMARKS (inClude Comments on *wpier* quality if known.)
432	459	X									X	SANDSTONE		5 GPM @ 450
459	465				X								RED	
465	488				X							Shale	Gray & Green - Some Red	

WELL DRILLER'S REPORT

State of Utah

Division of Water Rights

Well 6

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

W I **tifi ati** n

Exchange Application: E4845 (35-12149) **WIN: 430483**

Owner | *Note any changes*

Andrew E. and CheryI S. Ginn
7 90 k Weep ing Ash Drive
Eagle Mountain, UT 84005

Contact Person/Engineer: _____

Luoe a *Note any changes*

S **1129 W 984 from the NE corner of section 06, Township lS, Range 5E,** SL B&M

Location Description: (address, proximity to buildings, landmarks, ground e1evation,1ocal well #)

ri e s A **tivi** S Da Co pie o Date

Check all that apply: OX New Repair Deepen Clean Replace Public 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
O	268'	9"	Air rotary	water

Well Log]

DEPTH (feet) FROM TO

WATER BEARING	PERMEABLE High	PERMEABLE Low	CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER
/d3	Izi'								x
1 1	1 Al								x

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.)
shale	Brown grey	
sandStone	some shale	

RECEIVED KAS
SEP 7 2007
WATER RIGHTS
SALT

Static Water Level

Date ‘ t" Water Level ' ' feet Flowing? Yes to
Method of Water Level Measurement t•-John **JnUc** / 6 mIf Flowing, Capped Pressure PSI
Point to Which Water Level Measurement was Referenced **nz7** fi M " Elevation
Height of Water Level reference point above ground surface R ' 'I " feet Temperature Z degrees O C QF

Well Log

Construction Information

DEPTH (feet) FROM	TO	CASING CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	TO	SCREEN O PERFORATIONS OPEN BOTTOM SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)

Well Head Configuration: " NNt K ii fI Access Port Provided? Ji ,Yes O No

Casing Joint Type. W Jm - lfY k Perforator Used: fb cTony Screen

Was a Surface Seal Installed? Yes O No Depth of Surface Seal: 30 fetemp Drive Shoe? O Yes ONo

Surface Seal Material Placement Method: Top load bentonite '05 30'-0

Was a 4empomry surface casing used? Yes ☐No If yes, depth of casing: 4' feet diameter: 10" inches

DEPTH (feet) FROM	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.)
ZJ# ')3C"		>+"v " zz«z• »at<›7	2½ yards	
ya') fi/		Zor/g'«.'/•"<X «	17 -50/b sacks	

tip p d W d T

DATE	METHOD	YIELD	Units Check One GPM CEFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
8-29-07	Air lift	50	X		2hrs

p an n

Pump Description: Horsepower: Pump Intake Depth: feet

Approximate Maximum Pumping Rate: Well Disinfected upon Completion? O Yes O No

Comments] Descripôon of construction activity, additional materials use‹L problems encouniered, 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 ARMSTRONG DRILLING **LiceneNo.** 704

Signature (Licensed Well Driller) **Date** 8-5-07

WELL DRILLER'S REPORT

Well 7

State of Utah
Division of Water Rights
For additional space, use "Additional Well Data Form" and attach

d n o
EXCHANGE APPLICATION: E1772(35-~~AREA~~)

Own r N "' any changes

RECEIVED
JUN 0 6 2002

Wardell, Julia
2246 Marie Avenue
Salt Lake City, UT **84109**
EPS

Well c tio y djs

COUNTY: Summit
NORTH 1400 feet WEST 750 feet from **the SE Corner** of
SECL I ON 31 , TOWNSH I P kN , RANGE 5E, SLBPM.

Location Description: (address, proximity to buildings, landmarks, ground elevation, local well #) fiJ 3s oJ

Drillers Activity — 3 Miles South of Wanship
Start Date: 5-15-02 Completion Date: 5-29-02
Check all that apply: [X] New [ ] Repair [ ] Deepen [ ] Clean [ ] Replace [ ] Public Nature of Use:
It' a replacement well, provide the location of the new wetl. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (t'eet) FROM	TO	BOREHOLE DIAMETER(i)j	DRILLING METHOD	DRILLING FLUID
0	200'	9"	Air rotary	water

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE high	PERMEABLE low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTIONS AND REMARKS (e.g., relative to, grain size, sorting, angularity, bedding, grain composition, density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, miner‹Jogy, texture, degree of weathering, hardness, water quality, etc.)
0	11'				x			x					Brown	I"W p_XOi
11'	37'										x	mudstone	red	
37'	70'										x	" "	grey	
70'	75'	x									x	Sandstone	Tan	
75'	125'										x	mudstone	grey	
125'	165'										x	" "	Brown	
165'	175'	x									x	" "	"	
	200'										x	" "	"	

Static Water Level

Date .1= I I' O U Water Level ~~"~~/ feet Flowing? O Yes BI No
Method of Water Level Measurement f*w Ic >•(7n cfcr Off Flowing, Capped Pressure PSI
Point to Which Water Level Measurement was Referenced BOQ G ' Ground Elevation (If known) a"
Hcight of Water Lnvel reference point above ground surface I feet Temperature A Cl Q ° C ° F

Well Log

aCte s uc n Inf

DEPTH (teet) FROM	TO	CASING CASING TYPE AND MATEk IAL/6iRADE	WALL THICK in	NOMINAL DIAM. (in)	DEPTH feet I°ROM	TO	SCREEN PERFORATIONS [J} OPfiN BOTTOM SCREEN SWOT SIZE tJk PERF SIZE ip	SCREEN DIAM. !Tt PERF LENCTH in	SCREf.N TYPE VIII NUMBER PERF cr round in e a
			2	8"					

Well He‹id Configuration: 8" Steel Casing Access Port Provided? Yes O)4o
Casing Joint Type: Certa-lok Perforator Used: Factory Screen
Was a Surface Seal installed? ☒ Yes ☐ No Depth of Surface Seal: 32' feet rive Shoe? O Yes - No
Surtace Seal Material Placement Method: Top loaded Bentonite chips 32'-0

DEPTH (feet) FROM	TO	SURFACE SEAL//INTERVAL. SEAL / FILTER PACK / PACKER INFORMATION SEAL MATERIAL, FILTER PACK anJ PACKER TYPE and DESCRIPTION	Quantity of Material'Used (if appJicablc)	GROUT DENSITY (lbs./gal.,# bag mix, gal./sack etc.)
200'	32'	pea gravel		
2'	0	Bentonite		

Provide Seal Material description below:

W D d Y d

Date	Method	Yield	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
5-29-02	test pump	15	x		25'	2 hrs

Pump (Permanent)

f'ump Doscripti‹›n: rundfos HoTsepower: Pump Intake Depth: I teei:

Approximate maximum pumping rate:) Well disinfected upon completion? & Yes O No

D dd d p b d
circumstances, abandonment procedures. *Use additiorial d'ell 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 Armstrong Drilling License No. N
(Person, Firm‹›or Corporation-Type or Type)

Signature (Licensed Well Driller) Date 5-30-02

Well 8

Form 113—5M—12-60

Examined .....
Recorded: B. C. ..... T. B. .....
Inspection Sheet .....
Copied .....

REPORT OF WELL DRILLER
STATE OF UTAH

Application No. 1489
Claim No. .....
Coordinate No. .....

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:
Name Jeffrey Cor Kathryn Thayer
Address P.O. Box 1071 Park City Ut

(2) LOCATION OF WELL:
County ..... Ground Water Basin ..... (leave blank)
North 150 feet, East 2100 feet from SE Corner
South West
of Section 31, T. 1 N/S, R. 5 E/W SLBM USM (strike out words not needed)

(3) NATURE OF WORK (check): New Well X
Replacement Well ☐ Deepening ☐ Repair ☐ Abandon ☐
If abandonment, describe material and procedure: .....

(4) NATURE OF USE (check):
Domestic X Industrial ☐ Municipal ☐ Stockwater ☐
Irrigation ☐ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):
Rotary X Dug ☐ Jetted ☐
Cable ☐ Driven ☐ Bored ☐

(6) CASING SCHEDULE: Threaded ☐ Welded X
6 " Diam. from 0 feet to 230 feet Gage .250
..... " Diam. from ..... feet to ..... feet Gage .....
..... " Diam. from ..... feet to ..... feet Gage .....
New X Reject ☐ Used ☐

(7) PERFORATIONS: Perforated? Yes ☐ No X
Type of perforator used .....
Size of perforations ..... inches by ..... inches
..... perforations from ..... feet to ..... feet
..... perforations from ..... feet to ..... feet
..... perforations from ..... feet to ..... feet
..... perforations from ..... feet to ..... feet
..... perforations from ..... feet to ..... feet

(8) SCREENS: Well screen installed? Yes ☐ No X
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... Set from ..... ft. to .....
Diam. ..... Slot size ..... Set from ..... ft. to .....

(9) CONSTRUCTION:
Was well gravel packed? Yes ☐ No X Size of gravel: .....
Gravel placed from ..... feet to ..... feet
Was a surface seal provided? Yes X No ☐
To what depth? 18 feet
Material used in seal: Clay
Did any strata contain unusable water? Yes ☐ No X
Type of water: ..... Depth of strata .....
Method of sealing strata off: .....

Was surface casing used? Yes X No ☐
Was it cemented in place? Yes ☐ No X

(10) WATER LEVELS:
Static level 260 feet below land surface Date 6/1/80
Artesian pressure ..... feet above land surface Date .....

LOG RECEIVED: RECEIVED JUN 12 1980 WATER RIGHTS

(11) FLOWING WELL:
Controlled by (check) Valve ☐
Cap ☐ Plug ☐ No Control ☐
Does well leak around casing? Yes ☐ No ☐

(12) WELL TESTS: Drawdown is the distance in feet the water level is lowered below static level.
Was a pump test made? Yes ☐ No ☐ If so, by whom? .....
Yield: ..... gal./min. with ..... feet drawdown after ..... hours
" " " " " "
" " " " " "
Bailer test ..... gal./min. with ..... feet drawdown after ..... hours
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? No ☐ Yes ☐

(13) WELL LOG: Diameter of well 6 inches
Depth drilled 320 feet. Depth of completed well 320 feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	10	X										
10	20	X										
20	30	X										
30	40	X										
40	50	X										
50	60	X										
60	70										X	
70	80										X	
80	90										X	
90	100										X	
100	120										X	
120	140										X	
140	180										X	
180	200									X		
200	220									X		
220	240									X		
240	260									X		Water
260	280									X		
280	300									X		
300	320									X		

Work started 6/1, 1980 Completed 6/2, 1980

(14) PUMP:
Manufacturer's Name .....
Type: ..... H. P. .....
Depth to pump or bowles ..... feet

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

Name Dave's Drilling (Person, firm, or corporation) (Type or print)
Address RFD Box 618 E Heber
(Signed) David R Collard (Well Driller)
License No. 405 Date 6/9/80, 19

USE OTHER SIDE FOR ADDITIONAL REMARKS

well u RECEIVED

» ciLL DRILLER'S REP€•.«T

FAR 2 2 200j)j\o

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

Well Identification EXCHANGE APPLICATION: E3998(35 AREA)

35 16

Owner *Note any changes*

McNeely, Flo
171 North 100 West
Heber, UT 84032

Contact Person/Engineer:

LaWe *Note un!' changes*

COUNTY: Summit
NORTH 300 feet WEST 2700 feet from the SE Corner of
SECTION 31, TOWNSHIP IN, RANGE 5E, SLB&M.

Locati◦n Descri◦ption: (address, pr◦ximity to buildings, landmarks, *pto*und elevation, local well #)

sDi Ac v t S.. t Date: - /(r - O Completion Date: 3 - k

Check all that apply: New Repair Deepen Clean Replace Publ ic Nature of Use:

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

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
O	!3J	/a'"/	)A•u g>-t»r,/	
35	525	8	Air Rotary	water, foam

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE	UNCONSOLIDATED: CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED: ROCK TYPE	COLOR	DESCRIPTIONS 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.)
												tan	
8	10					X						Yellow	
10	35		X X									Brn	
35	72										Shale		
72	80		X X										
80	84										Shale		

Static Water Levels

13:itc 3 -w Water Level K. feet Flowing? ☐ Yes ☐ No

Methticl of Water Leve1 MeasurementIQ It Flowing, Capped Pressure PSI

Point to Which Water Level Measurement was Referenced L Ground Elevation (If known)

Height of Water Level reference point above ground surface J' I» ' feet Temperature g ° C Q ° F

[redacted] *V"ell ROg* [redacted]

C n n

DEPTH (feet) FROM	TO	CASING MATERANDG RADE	WALL THICK (in)	NOMINAL DIAM. in	DEPTH (feet) FROM	TO	☐ SCREEN ☒ PERFORATIONS ☐ OPEN BOTTOM SCRcEN SWOT Su r sckrcN OR PERF SIZE 'in`	DIAM. HR PER F LENGTH in	SCREE-N TYPE tIIt NUMhkfl Pf ftE her ruund/inlcrv al
	35	A53 B steel	.250	8 5/8	465	525			
1'6	525	A53B steel	.250	6 5/8					lotted

Well Head Configuration: •v•K • Access Port Provided? Yes O No

Casing Joint Type: 0e. 0 ' Perforator Used:

Was a Surface Seal installed? Yes O No Depth of Surface Seal: 35 feet Dri h), Inf Yes O No

Surface Seal Material Placement Method: cI from Surface

" Provide Seal Material description below:

DEPTH (feet) FROM	T	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION SEAL MATERIAL, FILTER PACK and PACKkR TYPE and DESCRIPTION	Quantity of Material Used (if applicable)	G ROUT DENSITY (lbs./aal.,# bag m ix, gal./sack etc.)

TQ D p d d

Date	Method	Yield	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME-PUMPED (hrs & min)
3-8	Air Lift	12	—		—	2 hrs

Pump (Permanent)

Pump Description: Sub 5GPM Horsepower: 1'1/2 Pump Intake Depth: 504 feet

Approximate maximum pumping rate: 7 Well disinfected upon completion? Yes Q No

Comments Description of construction activity, additional materials used, problems encountered, extraordinary circumstances, abandonment procedures. *the additional well data fDrm for more space.*

well was sealed between casings - chips Bridged at unknown depth. Well was Drilled by Steve Zemmerman

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 Mike Zimmerman well Service LC License No. 527

(Person, Firm, or Corporation - Print or Type)

Signature Mike Zimmerman Date 3-21-01

(Licensed Driller)

Water Right # 53998 (35-Area A) DITIONAL WELL DATA FOAM

OwNER NAME Fi• m•xw'•I

Page____of_____

Well Log DEPTH (teet) FROM	TO	WATER	PERMEABLE high	PERMEABLE low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCKTYPE	COLOR	DESCRIPTIONS AND REMARKS (e.g. relative %, grain size, sorting, angularity, bedding, grain composistion, density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture, degree of weathering, hardness, water quality, etc.)
152	155										X	Shale	Gray	
155	158				X							Red		
158	181											Sandstone	Red	
181	248											Sandstone	Tan	
248	252										X	Shale	Gray	
252	292										X	Shale	Gray	
292	320										X	Shale	Gray	
320	326										X	Sandstone	Tan	→
326	350										X	Shale	Gray	in
350	410										X	Shale	Gray	clay lens
410	465										X	Shale	Gray	
465	525	X										Sandstone		Coal seam

MAR 22 2001

WATER RIGHTS
SALT LAKE

V'ell Log

Well 10

WL1

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

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

RECEIVED
OCT 16 1998
WATER RIGHTS
SALT LAKE

Well Identification
EXCHANGE APPLICATION: E3638(35-AREA)
35-10330

Owner *Note any changes*
Norton, Caroline
4405 West Sunrise Dr.
Park City, UT 84098

Contact Person/Engineer:

Well Location *Note any changes*
COUNTY: Summit
NORTH 1150 feet EAST 900 feet from the SW Corner of
SECTION 6, TOWNSHIP 1S, RANGE 5E, SLB&M.

Location Description: (address, proximity to buildings, landmarks, ground elevation, local well #)
Rockport Ranches Lot 55

Drillers Activity Start Date: Oct 7 98 Completion Date: Oct 12 98

Check all that apply:
☑ New ☐ Repair ☐ Deepen ☐ Abandon ☐ Replace ☐ Public Nature of Use:

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	205	7 7/8	Air Rotary	Foam

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE high	PERMEABLE low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTIONS AND REMARKS (include comments on *water quality* if known.)
0	3		✓		✓							Sand Stone	pink	Fractured & weathered
3	35			✓	✓	✓							Red	
35	65											Sandstone	pink	
65	135											Sandstone	pink	fractured
135	175											Sandstone	pink	fine grained
175	205											Sandstone	gray	H2O

Static Water Level
Date Oct 12 98 Water Level 28 feet Flowing? ☐ Yes ☑ No
Method of Water Level Measurement tape If Flowing, Capped Pressure PSI
Point to Which Water Level Measurement was Referenced Ground
Height of Water Level reference point above ground surface 0 feet Temperature ☐ °C ☐ °F

Construction Information

DEPTH (feet) FROM	TO	CASING M: TERA DGRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	TO	SCREEN O PERFORATIONS SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/intervyal)

Well Head Configuration: Cupped Access Port Provided? Yes O No

Casing Joint Type: in sta lo Perforator Used: story

DEPTH (feet) FROM	TO	FILTER PACK / GROUT / PACKER / ABANDONMENT MATERIAL ANNULAR MATERIAL, ABANDONMENT MATERIAL and/or PACKER DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal.,# bag mix, gal./sack etc.)
	5	3/8 Gravel		
0	60	3/8 Bentonite		

Well Development / Pump or Bail Tests

Date	Method	Yield	Units Check One GPM CFSA	DltAWDOWN "	TIME PUMPED (hrs & min)

Pump (Permanent)

Pump Description: None Horsepower: Pump Intake Depth: feet

Approximate maximum pumping rate: Well disinfected upon completion? O Yes O No

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

well

Well Driller S atement This well was drilled or abandoned under my supervision, according to applicable rules' and regulations, and this report is com ancl cor to the best of my knowledge and belief.

Name 'k k License No. 38

(Person, F' Co ration — Prin rType)

Signature Date Oct-14-98

(License elf Driller)

'*W.LL DRL% R REP(V4T

f

Well 11

Division of Water Rights

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

Well Identification: EXCHANGE APPLICATION: E2074 ((35-AREA))

RECEIVED

JUN 0 8 1994

WATER RIGHTS
6ALT LAKE

Owner (Note any changes)
Wyckoff, Edward R.
1896 Parkridge Drive
Salt Lake City, UT 84121

Contact Person/Engineer:

Well Location (Note any changes)
COUNTY: Summit
NORTH 2150 feet EAST 250 feet from the SW Corner of SECTION 6, TOWNSHIP IS, RANGE 5E, SLB&M.

Lotatitem t3escripiitn: (udd rig iqaits;(Q .Jan]gy d etcvation, ltcal wcll #)

Drillers Activity — Start Date: 6-1-94 Completion Date: 6-6-94

Check ull lhul ‹ipply:
New Repair Deepen ,Ahandtxa Replace Publ ie Nature of Use:

DETAIL Itc:ct) FROM	TO	BOREHOLE DIAMETER tin	DRI I.LINEJ M FTHOD	Dk1LL1NGFLt1!D
0	19	12 1/4	Rotary	
19	325	8"	DHD Rotary	Air, water
325	345	5 1/2	DHD Rotary	SAME

Wet I L‹ig

DEPTH (teci) FROM	TO	WATER	PERMEABLE	UNCONSOLIDATED CLAY	SAND	GRAVEL	CONSOLIDATED COBBLES	BOULDERS	OTHER	kOCKTYPE	COLOk	DESCRIPTIONS AN D REMAR KS (include comments on u rif« ‹¿ii‹i/ixv il ku‹›wn.)
	2										BLK	TOPSoil
2	4		X	X							DAK GRN RED/BR	
4	7			X	X							
7	18		X	X	X						GRAY/BL THN	
18	47		X	X							Gray	
47	75		X					X		Shale	Red	Some chirt interbedded
75	80		X	X							white GRAY	SOFT
80	86							X		Shale	Red	
86	131									Sandstone	white TAN	HARD
131	139									Shale	Red	SOFT

Static Water Level

Dute 6-6-94 Water Level 208 feet Flowing? ( ) Yes (X) No

Method of Water Level Measurement Solonist If Flowing, Capped Pressure ____ PSI

P‹›int to Which Water Level Measurement was Referenced GL

Height ot Water Level reference point above ground surface 0 feet Temperature T [ ] ° C [X] ° F

Well Log

Construction Information

DEPTH (feet) FROM	TO	t"ASINti CASING TYPE AND MATERIAL/GRADE	WALL THICK in)	NOMINAL DIAM. (in ›

DEPTH (l'cct 1 FROM	TO	SCREEN ›! SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	PERFORAJ"lONS SCREEN TYPE OR NUMBER PERF (per rfmind/in ierval)

Well Hciitl Ctiiil iguration: % _____ Access Port Provided? ✗ Yes No

€"itsiiig Jtiint Type: 8I 1 Perforator Used: FACTORY

DEPTH (feet)

FROM	TO	FILTER PACK / GROUT / PAC KER / ABAN DON MENU MAT2R IA1. ANNULAR MNTERIAh, ABANDONMENT MA3"ERIAI. and/or PACKER DESCRIPTION	Quantity ‹›l material Used ' (if applicable)	CiRfJUO" UE N$ lTY (lbs./jual..tf bad in ix. gal./siick etc.)
255	325	1/4 GRAVEL	7 bags	100 lbs

TQW p P B

Date	Method	Yield	Units Check One GPM	Units Check One CFS	DkAWOO"N (ft)	TIME PUMPED (hrs & min)
6/6	Air lift	20	✗			1

Pump (Permanent)

Puiiip Llcscriptic›n: _____ Horsepower: Pump Intake Depth: _____li:ei

Approxiinatc iii:ixiiuuin pumping rate: _ _ Wet1 di.sinfected up‹›n cc›nipletion"? Yes No

" !0 ! ".//.F/'t\I'.J!/\i'.\Yi!nJ.."",'/t!/:d\2\!"'/'!"J!fFl2!S./"/?‹.°2.'t!]1./fi'f!!/.)!;f' "'

Wcl I Emil let Si‹itement This well was dril led or abandonerl undcr my supcrvisi‹›n, acc‹›rding to applicable rules and repulalions. unit this rcpc›rt t c‹›iJ [›lctc and corr«t tr tltc hcsl ‹›\ n1y kn‹›w'lcd¿« unit b«lict.

Name Zimmerman well Service License No. 52>

v Iiate
(Liz cusccl We11 Dri llet)

ADDITIONAL WELL DATA FORM

Water Right # E2074 (35-area)

OWNER NAME ED WYCOFF

Page of

Well Log DEPTH (feet) FROM		WATER	PERMEABLE high	PERMEABLE loy	UNCONSOLIDATED CLAY	UNCONSOLIDATED SILT	UNCONSOLIDATED SAND	UNCONSOLIDATED GRAVEL	CONSOLIDATED COBBLES	CONSOLIDATED BOULDER	ROCK TYPE	COLOR	DESCRIPTIONS AND REMARKS (include comments on *water quality* if known.)
1z9	i•ia										Shale	GRAY Brn-Ka	Some SS Interbedded
ist‹	zzr										Shale	Red	SANDY
x›x	=•«v										Shale	Red	Broken
T'is	»n										SANDstone	Red	FINE grained, Low Porosity
zrs	< a			£							Shale	Red	Some Clay
n"is	ék»										Shale	Red	SANDY - GRAY Siltstone Interbedded
,a»v	ti'= fi										Sandstone	TAN	HARD 2> 6 GPM
T›r	ss r	*									Sandstone	Tan	

Well 12

Form 113—5M—12-60

Examined AUG 20 1979 XM

Recorded: B. C. ..... T. B. .....

Inspection Sheet .....

Copied AUG 21 1979

REPORT OF WELL DRILLER
STATE OF UTAH

Application No. 27609 Ex# 1154

Claim No. .....

Coordinate No. (D-1-5) 6 bcc

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.) S 1900 E 600 fr NW cor Sec 6 T1S R5E SLB&M

(1) WELL OWNER:

Name Ray Southwick

Address 70 East 1100 So. Bountiful, Ut.

(2) LOCATION OF WELL:

County Summit Ground Water Basin ..... (leave blank)

North 1760 feet, East 3023 feet from SW Corner

~~South~~ ~~West~~

of Section 29, T 1 N, R 5 E SLBM (strike out words not needed)

(3) NATURE OF WORK (check):

New Well ☒ Replacement Well ☐ Deepening ☒ Repair ☐ Abandon ☐

If abandonment, describe material and procedure: .....

(4) NATURE OF USE (check):

Domestic ☒ Industrial ☐ Municipal ☐ Stockwater ☐

Irrigation ☒ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):

Rotary ☒ Dug ☐ Jetted ☐

Cable ☐ Driven ☐ Bored ☐

(6) CASING SCHEDULE:

Threaded ☐ Welded ☒

8 " Diam. from 0 feet to 80 feet Gage .250

..... " Diam. from ..... feet to ..... feet Gage .....

..... " Diam. from ..... feet to ..... feet Gage .....

New ☒ Reject ☐ Used ☐

(7) PERFORATIONS:

Perforated? Yes ☐ No ☒

Type of perforator used .....

Size of perforations ..... inches by ..... inches

..... perforations from ..... feet to ..... feet

..... perforations from ..... feet to ..... feet

..... perforations from ..... feet to ..... feet

..... perforations from ..... feet to ..... feet

..... perforations from ..... feet to ..... feet

(8) SCREENS:

Well screen installed? Yes ☐ No ☒

Manufacturer's Name .....

Type ..... Model No. .....

Diam. ..... Slot size ..... Set from ..... ft. to .....

Diam. ..... Slot size ..... Set from ..... ft. to .....

(9) CONSTRUCTION:

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

Gravel placed from ..... feet to ..... feet

Was a surface seal provided? Yes ☒ No ☐

To what depth? 70 feet

Material used in seal: cement grout

Did any strata contain unusable water? Yes ☐ No ☒

Type of water: ..... Depth of strata .....

Method of sealing strata off: .....

Was surface casing used? Yes ☐ No ☒

Was it cemented in place? Yes ☐ No ☐

(10) WATER LEVELS:

Static level 89 feet below land surface Date 7-19-79

Artesian pressure ..... feet above land surface Date .....

LOG RECEIVED:

RECEIVED

AUG 07 1979

WATER RIGHTS

(11) FLOWING WELL:

Controlled by (check) Valve ☐

Cap ☐ Plug ☐ No Control ☐

Does well leak around casing? Yes ☐ No ☐

(12) WELL TESTS:

Drawdown is the distance in feet the water level is lowered below static level.

Was a pump test made? Yes ☐ No ☐ If so, by whom? .....

Yield: 50 gal./min. with 40 feet drawdown after ..... hours

" Tested with air compressor " "

" " " "

Bailer test ..... gal./min. with ..... feet drawdown after ..... hours

Artesian flow ..... g.p.m. Date .....

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

(13) WELL LOG:

Diameter of well 8 inches

Depth drilled 234 feet. Depth of completed well 234 feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
76	94									X		Hard Sandstone
94	113									X		RED SHALE
113	167									X		Sandstone (water)
167	175									X		Blue shale
175	193									X		Red Shale
193	?									X		Sandstone (water)

Work started 7-17-79, 19 Completed 7-19-79, 19

(14) PUMP:

Manufacturer's Name .....

Type: ..... H. P. .....

Depth to pump or bowles ..... feet

Well Driller's Statement:

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

Name Wright Drilling Co. (Person, firm, or corporation) (Type or print)

Address 2890 So. Main Nibley, Utah

(Signed) Ron Wright (Well Driller)

License No. 333 Date 7-31-79, 19

USE OTHER SIDE FOR ADDITIONAL REMARKS

Well 13

WELL DRILLER'S REPORT

State of Utah
Division of Water Rights
For additional space, use "Additional Well Data Form" and attach

RP.GF —

NOV 17 2005

WATER RIGHTS

We Idenö

Exchange Application: E4560 (35-11795)

AI-T —

WIN: 34844

Owner) NozeQnyrŒngas
Paul **Loeschorn**
86 **Aspen Circle**
Wanship, UT **84017**

Contact Person/Engineer: _____

olo a
S 1950 W 450 from the NE corner of section 01, Township 1S, Range 4E, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,1ocal well #)

DaÎD S Yi St Co pletio ate

Check all that apply: OX New Repair Q Deepen Clean Replace Public 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	30	12	Air Rotary DR	Air, Foam
30	300	8	Air Rotary, DR	Air, Foam

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, ordor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
A	3‹r		$r					/					x••-	
él	la»		xe							‹		›/»-/L	î	
/«o	Ai¢'!		*‹					!		'		SA›-f'o	ù«x	
z›7	æwl									‹		yAÆ	&iù /• ‹ü' x•o	

Static Water LevelÇ

Date - Watej;_Level ' feet Flowing? O Yes o
Method of Water Level Measurement R I If Flowing, Capped Pressure PSI
Point to Which Water Level Measurement was ReferJnced (Elevation
Height of Water Level reference point above ground surface J & '' feet Temperature Û degrees O C F

[redacted] *Well I og* [redacted]

Construction Information

DEPTH (feet) FROM	TO	CASING CASING TYPE AND MATERIAL/GRADE	WALL THICK (ie)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	TO	SCREEN OPERFORATIONS SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	O OPEN BOTTOM SCREEN TYPE OR NUMBER PERF (per round/interval)
ve“!n' !z'?i .« 6F..f^ !& 1					0Dcl2m! ••:.:=				zz'br-
Boo			50	1					

Well Head Configuration: _____ Access Port Provided? O Yes X No

Casing Joint Type: _____ Perforator Used: _____

Was a Surface Seal Installed? Yes O No Depth of Surface Seal: 30 » feet Drive Shoe? O Yes X No

Surface Seal Material Placement Method: adebul Kom Tom

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

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

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GP CFS	DRAWDOW (ft)	TIME PUMPED (hrs & min)

Pump (Permanent)

Pump Description: N /A Horsepower: _____ Pump Intake Depth: _____ feet

Approximate Maximum Pumping Rate: _____ Well Disinfected upon Completion? O Yes Q 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 ZIMMERMAN, MIKE WELL SERVICE (Person, Firm, or Corporation - Print or Type) **License No.** 527

Signature Mike Zimmerman (Licensed Well Driller) Date 11-15-05

Examined 6-1
Recorded: B. C 6-16-71 V. FO T. B. V. FO
Inspection Sheet 6-17-71 B.M.

REPORT OF WELL DRILLER

SFhTI Of UTAR

Application No. Exch 416
ØØ

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

Name Loma Linda Development Corp.
Address 4th South and MainSt

(2) LOCATION OF WELL:

County Summit Ground Water Basin (leave bl

~~North~~ 2100 feet, ~~East~~ South 2200 feet from NW Corner

of Section 6, T. 1 ~~N~~ S, R 5 ~~W~~ E SLBM (strike out words not needed)

(3) NATURE OF WORK (check):

New Well ☒ Replacement Well ☐ Deepening ☐ Repair ☐ Abandon ☐

If abandonment, describe material and procedure:

(4) NATURE OF USE (check):

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

(5) TYPE OF CONSTEUC'£ION (check :

Dug ☐
Cable ☒ Driven ☐ Bored ☐

(6) CASING SCHEDULE:

Threaded ☐ Welded ☒

8 " Diam. from 0 feet to 105 feet Gage
10 " Diam. from 0 feet to 20 feet Gage
" Diam. from feet to feet Gage

New ☒ Reject ☐ Used ☐

(7) PERFORATIONS:

Perforated? Yes ☒ No ☐

Type of perforator used torch
Size of perforations ¼ inches by 6 inches
50 perforations from 40 feet to 60 feet
50 perforations from 80 feet to 100 feet
perforations from feet to feet
perforations from feet to feet
perforations from feet to feet

(8) SCREENS:

Well screen installed? Yes ☒ No ☐

Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to
Diam. Slot size Set from ft. to

(9) CONSTRUCTION:

Was well gravel packed? Yes ☐ No ☒ Size of gravel:
Gravel placed from feet to feet
Was a surface seal provided? Yes ☒ No ☐
To what depth? 35 feet
Material used in seal: cement
Did any strata contain unusable water? Yes ☐ No ☒
Type of water: Depth of strata
Method of sealing strata off:

Was surface casing used? Yes ☒ No ☐
Was it cemented in place? Yes ☒ No ☐

(10) WATER LEVELS:

Static level 8 feet below land surface Date 5-24-71
Artesian pressure feet above land surface Date

LOG RECEIVED:

(11) FLOWING WELL:

Controlled by (check) Valve ☐
Cap ☐ Plug ☐ No Control ☐
Does well leak around casing? Yes ☐ No ☐

Yes ☐ No ☒ If so, by whom?
Yield: gal./min. with feet drawdown after hours
" " " " "
" " " " "
Bailer test 50 gal./min. with 10 feet drawdown after 1 hours
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? No ☐ Yes ☐

(13) WELL LOG:

Diameter of well 8 inches
Depth drilled 115 feet. Depth of completed well 115 feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	24	X										top soil
24	30										X	tan shale
30	46										X	sand stone water
46	104										X	gray shale
104	115										X	brown shale
												water was in the bottom of the xxx sandstone on top of the shale we started to get water at 44'

Work started 5-12, 1971 Completed 5-26-71, 19

(14) PUMP:

Manufacturer's Name
Type: H. P.
Depth to pump or bowles feet

9'ell Driller'a 9totement:

Thia well was drilled under my supervision, and this report is true to the best of my knowledge and belief.

Name Mess Drilling co. (Person, firm, or corporation) (Type or print)
Address 575 West 5987 se. Murray, Utah
(Signed) William H. Mess (Well Driller)
License No. 282 Date 5-25-71, 19

RECEIVED JUN 7 1971 WATER RIGHTS

USE OTHER SIDE FOR ADDITIONAL REMARKS

MICROFILMED

Examined PM - 8-24-72
Recorded: B. C. 8-24-72 T. B. PM
Inspection Sheet
Copied 8-31-72 B.M.

REPORT OF WELL DRILLER
STATE OF UTAH

Exchange # 465 #474
Application No.
Claim No.
Coordinate No. (D-1-5)6 ccc 6

iirxme c s'r.xrr.vinNT: Report of o'ell dciller Us hereby mede and file I wi•h the 5itate Snglneer. in **accordance ftli tha laws of Utah.** tThis report shell b0 Jiled with fire 8tatn Engineer within 40 days aft r the en mpieri•n or **abandonment PlGe vet. PaMuteto** I'ile eu4F reports constitutes o misd<meanor.)

(1) WELL OWNER:
Name Rockport Properties
Address 1566 So. Main, Salt Lake City

(2) LOCATION OF WELL:
County Summit Ground Water Basin (leave blank)
~~North~~ South 1,000 feet, ~~East~~ West 2,200 feet fro corner
of Section 6, T 1 ~~N~~ S, R 5 ~~W. Meat~~ strike out words not needed)

(3) NATURE OF WORK (check): New Well
If abandonment, describe material and procedure:

(4) NATURE OF U5Fs (cheek) :
Domestic X Industrial ☐ Municipal ☐ Stockwater ☐
Irrigation ☐ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONS'I'BUC'fION (check):
Rotary ☐ Dug ☐ Jetted ☐
Cable X Driven ☐ Bored ☐

t() CASING 6CBEDLLE: o.•* n •-
Diam. from feet to feet Gage
feet Gage
• uiam. rrnm feet Gage
feet to
New ☐ Reject ☐ Used ☐

(7) PERFORATIONS:
Perforated? Yes X No ☐
Type of perforator used Mills
Size of perforations 3/8 inchen by 2 inches
70 perforations from 70 feet to 74 feet
136 feet
perforations from feet to feet
perforations from feet to feet
perforations from feet to feet
perforations from feet to feet

(8) SCREENS:
Well screen installed? Yes ☐ No X
Manufacturer's Name

{9) CONSTRUCTIOI'I:
Was well gravel packed? Yes ☐ No X Size of gravel:
Gravel placed from feet to feet
Was a surface seal provided? Yes X No ☐
To what depth? 34 feet
Material used in seal: Cement Grout
Did any strata contain unusable water? Yes ☐ No X
Type of water? Depth of strata
Method of sealing strata off:
Was surface casing used? 24' Yes X No
Was it cemented in place? Yes ☐ No

(10) WATER LEVELS:
Static level 100 feet below land surface Date 7/21/72
Artesian pressure feet above land surface Date

(11) FLOWING WELL:
Controlled by (check) Valve ☐
Cap ☐ Plug ☐ No Control ☐
Does well leak around casing? Yes ☐ No ☐

(12) 5VE£LTESTS:
Drawdown is the distance in feet the water level is lowered below static level.
Was a pump test made? Yes ☐ No X If so, by whom?
Yield: gal./min. with feet drawdown after hours
" " " " " " " "
" " " " " " " "
Bailer test 12 gal./min. with 85 feet drawdown after 1½ hours
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? No X Yes ☐

(13) WELL LOG:
Diameter of well 6 inches
Depth drilled 280 feet. Depth of completed well 280 feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material ... combination of materials encountered in each depth interval. Under REMARKS make desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH		Silt	Sand	Gravel	Boulders	Clay	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	1	X									
1	1.5			X							
1.5	22	X	X								
	34	X									Sandstone
34	63	X									Red
63	74										Sandstone
74	84	X									Grey
84	135										Sandstone
135	169										Shale Grey
169	192										" Red
192	202										" "
202	214										" Tan
214	226										"
226	243									X	Shale, Dk Brn
243	249									X	Sandstone, Grey
249	256									X	Shale "
256	268									X	" , Red
268	272									X	Sandston, Red
272	280									X	Shale , Red

10" 0 - 24 cemented in
6" 0 - 197
197 to 280 open hole

Work started July 5, 1972 Completed July 25, 1972

(14) PUMP:
Manufacturer's Name

Well Driller's Statement:
This well was drilled nutter my supervision. and thtu rep4rt ia true t4 the best of my knowledge and belief.
Name Jensen Const. & Drilling Co (Person, firm, corporation) (Type or print)
Address RFD Box 187, Springville Ut.
(Signed) J. Duane Jensen (Well Driller)
License No. 228 Date July 25, 1972

Drilled 12" hole to 24'
Drilled -- hole to 100'
Drilled 8" hole to 197'
Drilled 6" hole to 280'

USE OTHER SIDE FOR ADDITIONAL REMARKS

MICROFILMED

WELL DRILLER'S REPORT
State of Utah
DiiionofWaterIüghb

Well 16

For addiöooal space, use "Addiöonal Well Dnta Fortn " aad anech

tir ü

Exchange Application: E914B f35 @S22) **WIN: 434229**

D•nr ; s C . and Ale t a M . Han sen
2479 Camelback Rd
Salt Lake City. UT 84121

eIILoceéoo *'I'm ‹*eve

P 2289 E 1501 from the SW corner of section 32, township lN, Range 5G, SL B&H

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

Drillers Activity Start Date: 9-25-10 Completion Date: 10-5-10

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

If s replacement well, pmv Rdc location gf nc‹' wei1. _____ fcci nortlVsoutli and _____ fœi ennemi ul the ez isting wcil.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	30		Air & Water	
30	340			

Well Log

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	30		Air & Water	
30	340			

DEPTH (feet) FROM	TO	ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative &, grain size. sorting, angularity. bedding. grain composition, density, plasticity, shape, cementation. consistency, wamr bearing, odor. fracluring, mineralspy, texture, drglee of weathering. frankness, water quality, etc.)
200	250		Brown	
250	300			
300	320			
320	340			

OCT 2 6 2010

WAT LH I4Itnf-ITD
!?ALT LAVE

Statie Water Level

Date 10-5-10 Water Level 121 feet Flowing? [ ] Yes [X] No

Sleiliœ4 of Water Level Measurement Tape d If Fñcwing, loappcd £'rcssurc _____ PSI

Point to Whic h **Water** de vel Measuiemc nt was Referenced Top of Casing Elevation _____

He ight of Water Level mfcrencc point abovc gmund surface 1½ feet Temperature 57 dcgrces O C O F

Well Log

Construction Information

DEPTH (feet) FROM	TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL
0	220	PVC	17	5"
240	260	PVC	17	5"
280	300	PVC	17	5"

DEPTH (feet) FROM	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)
220	240	.5000	5	
260	280	"	"	
300	360	"	"	

Well Head Configuration: 6" Steel Casing & Cap — Access Port Provided? ☑Yes ☐No

Casing Joint Type: _____

as a Surface Seal Installed? ☑Yes ☐No — Depth of Surface Seal: 30 feet — Drive Shoe? ☐Yes ☐No

Surface Seal Material Placement Method: From the top

SURFACE SEAL / HU' R VAL SEAN / M — PACK PACKER INFORMATION

DEPTH (feet) FROM	TO	SEAL MATERIAL, FILTER PACK •°‹tPëccesTweSa»ac•ust"RiPTIon	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
		Solids Grout	14 bags	6 to 5 Wa

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
4-10	Pumped					

Pump (Permanent)

Pump Description: 5 hr Pump — Hor*"W+c* — Pump Iniakc Depd, _____feet

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,

••*' t*i• •P"¬" o›mpI•• ='u c‹xrr<ct a ẇ m. i nr r« koowim

Name EXTERRA (Person, Firm, or Corporation - Print or Type)

License No. 676

Signature _____ (Licensed Well Driller)

APPENDIX E

PUMPING TEST DATA

Water Level and Discharge - Pumping Tests - Lake Rockport Estates Well #2

Hand Measurements

Date / Time	Water Level Depth (feet)	Q Discharge (gpm)	t Elapsed Time (minutes)	s Drawdown (feet)	Comment	t' Time Since Pumping Ceased (min)	t/t'
3/23/09 4:38	86.90	0	0	0.00	Step-Rate Test		
3/23/09 4:39	89.00	22	1	2.10			
3/23/09 4:40	103.00	22	2	16.10			
3/23/09 4:41	103.40	22	3	16.50			
3/23/09 4:42	102.80	22	4	15.90			
3/23/09 4:43	102.10	22	5	15.20			
3/23/09 4:44	101.70	22	6	14.80			
3/23/09 4:45	101.50	22	7	14.60			
3/23/09 4:46	101.50	22	8	14.60			
3/23/09 4:47	101.25	22	9	14.35			
3/23/09 4:48	101.35	22	10	14.45			
3/23/09 4:49	101.60	22	11	14.70			
3/23/09 4:50	101.80	22	12	14.90			
3/23/09 4:52	101.90	22	14	15.00			
3/23/09 4:54	102.15	22	16	15.25			
3/23/09 4:56	102.35	22	18	15.45			
3/23/09 4:58	102.55	22	20	15.65			
3/23/09 5:00	102.70	22	22	15.80			
3/23/09 5:05	103.10	22	27	16.20			
3/23/09 5:10	102.39	22	32	15.49			
3/23/09 5:15	102.65	22	37	15.75			
3/23/09 5:16	113.20	59	38	26.30			
3/23/09 5:17	115.70	59	39	28.80			
3/23/09 5:18	115.50	59	40	28.60			
3/23/09 5:19	114.90	59	41	28.00			
3/23/09 5:20	115.10	59	42	28.20			
3/23/09 5:21	113.60	59	43	26.70			
3/23/09 5:22	113.20	59	44	26.30			
3/23/09 5:23	112.70	35	45	25.80			
3/23/09 5:24	112.10	35	46	25.20			
3/23/09 5:25	130.00	62	47	43.10			
3/23/09 5:26	132.15	62	48	45.25			
3/23/09 5:28	134.01	62	50	47.11			
3/23/09 5:30	139.00	62	52	52.10			
3/23/09 5:32	143.15	62	54	56.25			
3/23/09 5:34	147.20	62	56	60.30			
3/23/09 5:36	150.95	62	58	64.05			
3/23/09 5:41	156.90	62	63	70.00			
3/23/09 5:46	162.90	62	68	76.00			
3/23/09 5:51	167.70	62	73	80.80			
3/23/09 5:56	171.20	62	78	84.30			
3/23/09 6:01	174.90	62	83	88.00			
3/23/09 6:06	177.20	62	88	90.30			
3/23/09 6:11	178.10	62	93	91.20			
3/23/09 6:16	176.95	62	98	90.05			
3/23/09 6:21	178.80	62	103	91.90			
3/23/09 6:26	179.90	62	108	93.00			
3/23/09 6:31	180.50	62	113	93.60			
3/23/09 6:32	213.00	130	114	126.10			
3/23/09 6:33	234.70	130	115	147.80			
3/23/09 6:34	245.40	130	116	158.50			
3/23/09 6:35	247.40	115	117	160.50			
3/23/09 6:36	248.30	115	118	161.40			

Water Level and Discharge - Pumping Tests - Lake Rockport Estates Well #2

Hand Measurements

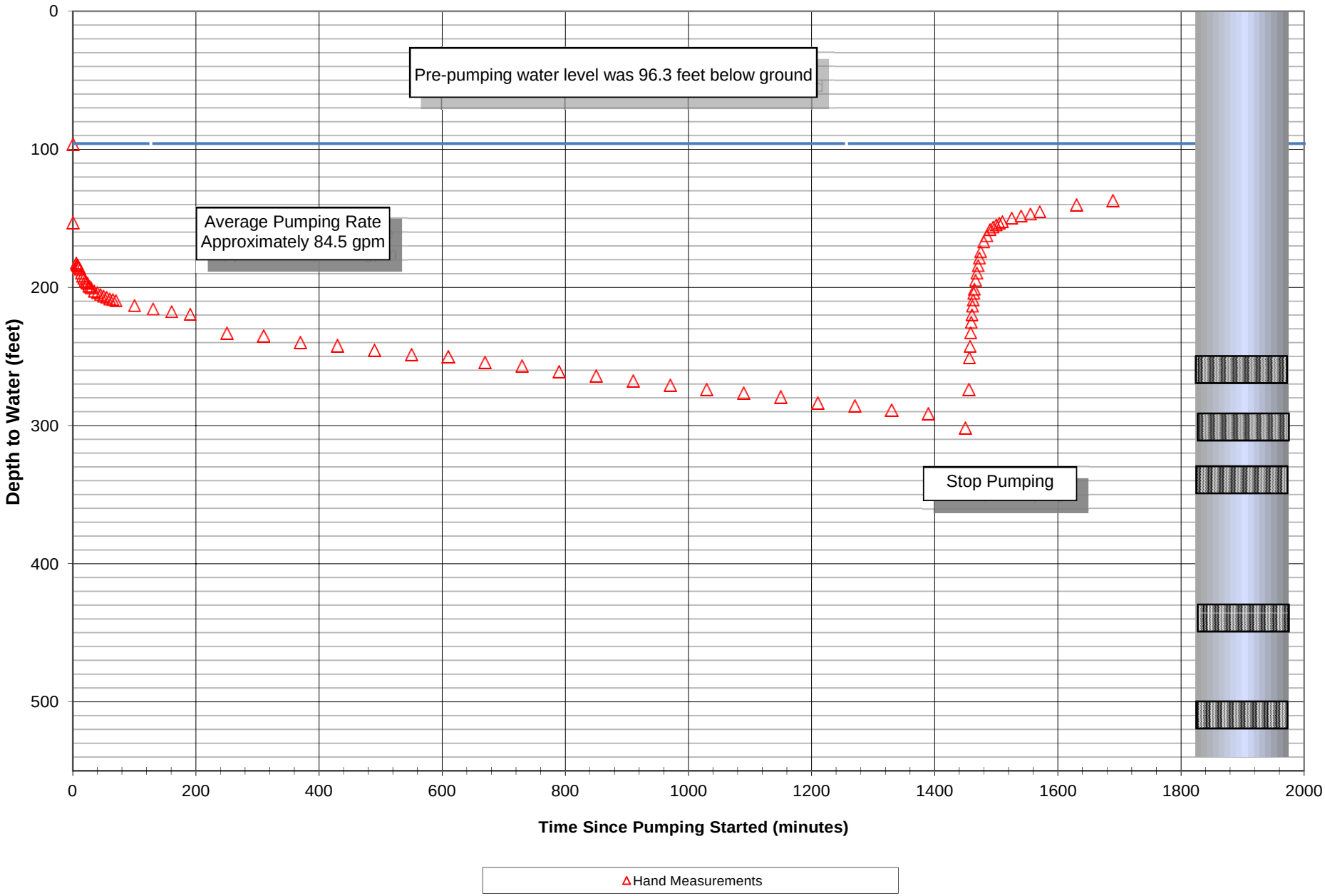
Date / Time	Water Level Depth (feet)	Q Discharge (gpm)	t Elapsed Time (minutes)	s Drawdown (feet)	Comment	t' Time Since Pumping Ceased (min)	t/t'
3/23/09 6:37	249.40	115	119	162.50			
3/23/09 6:38	250.70	115	120	163.80			
3/23/09 6:39	256.40	115	121	169.50			
3/23/09 6:40	262.10	115	122	175.20			
3/23/09 6:41	264.90	115	123	178.00			
3/23/09 6:42	269.00	115	124	182.10			
3/23/09 6:44	278.80	112	126	191.90			
3/23/09 6:46	287.70	112	128	200.80			
3/23/09 6:48	294.30	112	130	207.40			
3/23/09 6:50	301.20	112	132	214.30			
3/23/09 6:52	306.40	112	134	219.50			
3/23/09 6:57	318.10	112	139	231.20			
3/23/09 7:02	330.30	112	144	243.40			
3/23/09 7:07	336.30	103	149	249.40			
3/23/09 7:12	346.50	103	154	259.60			
3/23/09 7:17	352.45	103	159	265.55			
3/23/09 7:22	360.20	103	164	273.30			
3/23/09 7:27	365.90	103	169	279.00			
3/23/09 7:32	372.90	102	174	286.00			
3/23/09 7:37	378.10	102	179	291.20			
3/23/09 7:42	381.70	102	184	294.80			
3/23/09 7:47	385.70	102	189	298.80			
3/23/09 7:51	386.90	102	193	300.00			
3/23/09 7:57	390.00	102	199	303.10	Shut Down		
3/28/09 9:50	96.30	84.00	0	0.00	Constant-Rate Test		
3/28/09 9:51	153.00	84.00	1	56.70			
3/28/09 9:56	182.50	84.00	6	86.20			
3/28/09 9:57	183.70	84.00	7	87.40			
3/28/09 9:58	184.00	84.00	8	87.70			
3/28/09 9:59	184.80	84.00	9	88.50			
3/28/09 10:00	185.90	84.00	10	89.60			
3/28/09 10:02	186.90	84.00	12	90.60			
3/28/09 10:04	189.70	84.00	14	93.40			
3/28/09 10:06	191.90	84.00	16	95.60			
3/28/09 10:08	193.50	84.00	18	97.20			
3/28/09 10:10	195.30	84.00	20	99.00			
3/28/09 10:12	196.30	84.00	22	100.00			
3/28/09 10:14	197.00	84.00	24	100.70			
3/28/09 10:16	199.00	84.00	26	102.70			
3/28/09 10:18	199.50	84.00	28	103.20			
3/28/09 10:20	200.40	84.00	30	104.10			
3/28/09 10:25	202.70	84.00	35	106.40			
3/28/09 10:30	203.70	84.00	40	107.40			
3/28/09 10:35	205.10	84.00	45	108.80			
3/28/09 10:40	206.30	84.00	50	110.00			
3/28/09 10:45	207.10	84.00	55	110.80			
3/28/09 10:50	208.30	84.00	60	112.00			
3/28/09 10:55	208.70	84.00	65	112.40			
3/28/09 11:00	209.50	84.00	70	113.20			
3/28/09 11:30	213.00	84.00	100	116.70			
3/28/09 12:00	215.50	84.00	130	119.20			

Water Level and Discharge - Pumping Tests - Lake Rockport Estates Well #2

Hand Measurements

Date / Time	Water Level Depth (feet)	Q Discharge (gpm)	t Elapsed Time (minutes)	s Drawdown (feet)	Comment	t' Time Since Pumping Ceased (min)	t/t'
3/28/09 12:30	217.40	84.00	160	121.10			
3/28/09 13:00	219.30	84.00	190	123.00			
3/28/09 14:00	233.00	84.00	250	136.70			
3/28/09 15:00	235.30	86.00	310	139.00			
3/28/09 16:00	239.70	86.00	370	143.40			
3/28/09 17:00	242.20	86.00	430	145.90			
3/28/09 18:00	245.50	86.00	490	149.20			
3/28/09 19:00	248.70	86.00	550	152.40			
3/28/09 20:00	250.03	86.40	610	153.73			
3/28/09 21:00	254.30	86.40	670	158.00			
3/28/09 22:00	257.02	86.40	730	160.72			
3/28/09 23:00	260.95	86.40	790	164.65			
3/29/09 0:00	264.35	85.04	850	168.05			
3/29/09 1:00	267.81	85.04	910	171.51			
3/29/09 2:00	271.00	84.56	970	174.70			
3/29/09 3:00	273.95	84.56	1030	177.65			
3/29/09 4:00	276.46	84.56	1090	180.16			
3/29/09 5:00	279.31	84.56	1150	183.01			
3/29/09 6:00	283.55	83.55	1210	187.25			
3/29/09 7:00	286.00	84.26	1270	189.70			
3/29/09 8:00	288.75	84.00	1330	192.45			
3/29/09 9:00	291.43	84.00	1390	195.13			
3/29/09 10:00	301.70	84.00	1450	205.40			
3/29/09 10:05		0	1455		Shut down	0	
3/29/09 10:06	273.80	0	1456	177.50		1	1456.0
3/29/09 10:07	250.90	0	1457	154.60		2	728.5
3/29/09 10:08	242.67	0	1458	146.37		3	486.0
3/29/09 10:09	232.90	0	1459	136.60		4	364.7
3/29/09 10:10	225.30	0	1460	129.00		5	292.0
3/29/09 10:11	220.00	0	1461	123.70		6	243.5
3/29/09 10:12	213.60	0	1462	117.30		7	208.9
3/29/09 10:13	209.20	0	1463	112.90		8	182.9
3/29/09 10:14	204.40	0	1464	108.10		9	162.7
3/29/09 10:15	201.50	0	1465	105.20		10	146.5
3/29/09 10:17	195.10	0	1467	98.80		12	122.3
3/29/09 10:19	189.80	0	1469	93.50		14	104.9
3/29/09 10:21	184.45	0	1471	88.15		16	91.9
3/29/09 10:23	179.00	0	1473	82.70		18	81.8
3/29/09 10:25	174.40	0	1475	78.10		20	73.7
3/29/09 10:30	167.20	0	1480	70.90		25	59.2
3/29/09 10:35	162.90	0	1485	66.60		30	49.5
3/29/09 10:40	158.45	0	1490	62.15		35	42.6
3/29/09 10:45	156.60	0	1495	60.30		40	37.4
3/29/09 10:50	155.15	0	1500	58.85		45	33.3
3/29/09 10:55	153.90	0	1505	57.60		50	30.1
3/29/09 11:00	152.76	0	1510	56.46		55	27.5
3/29/09 11:15	150.20	0	1525	53.90		70	21.8
3/29/09 11:30	148.60	0	1540	52.30		85	18.1
3/29/09 11:45	147.20	0	1555	50.90		100	15.5
3/29/09 12:00	145.60	0	1570	49.30		115	13.7
3/29/09 13:00	140.10	0	1630	43.80		175	9.3
3/29/09 14:00	137.10	0	1690	40.80		235	7.2
3/31/09 7:00	106.15	0	4150	9.85		2695	1.5

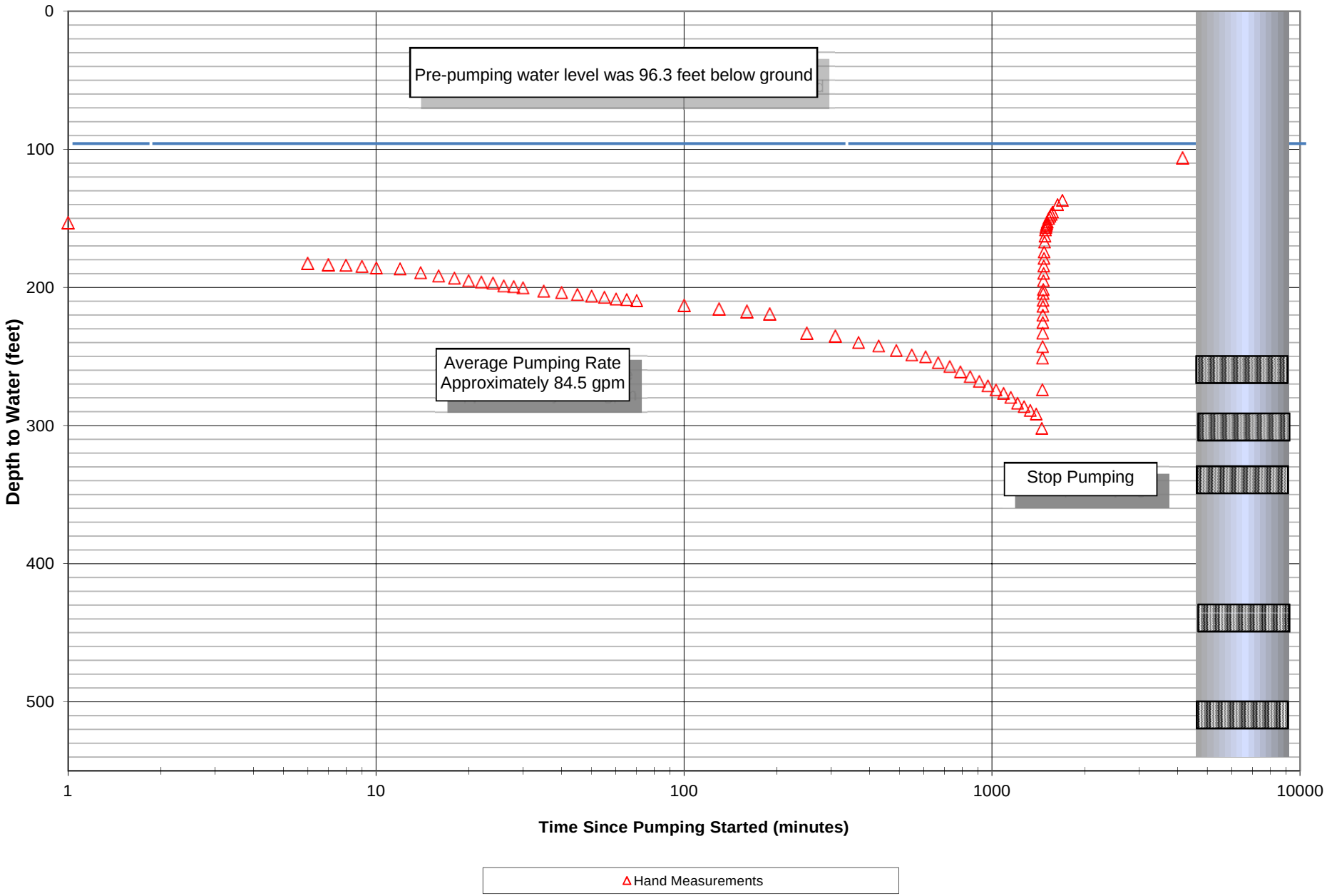
Lake Rockport Estates Well #2 - Pumping Test: Constant-linear (2) 4/4/2013



Drawdown versus Time - Constant-Rate Pumping Test - Lake Rockport Estates Well #2

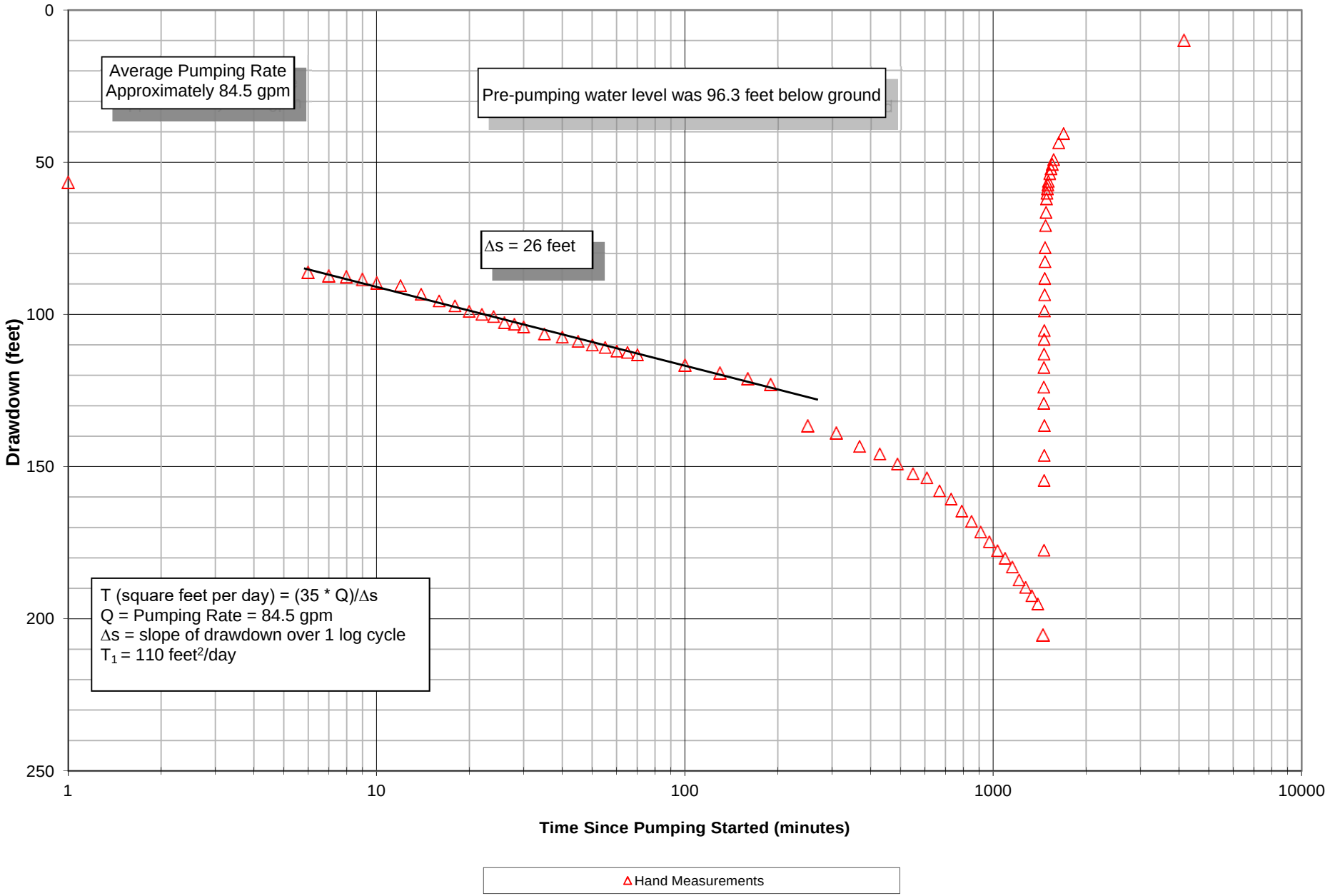
Loughlin Water Associates LLC

Lake Rockport Estates Well #2 - Pumping Test: Constant-linear (3) 4/4/2013



Constant-Rate Pumping Test - Lake Rockport Estates Well #2

Loughlin Water Associates LLC

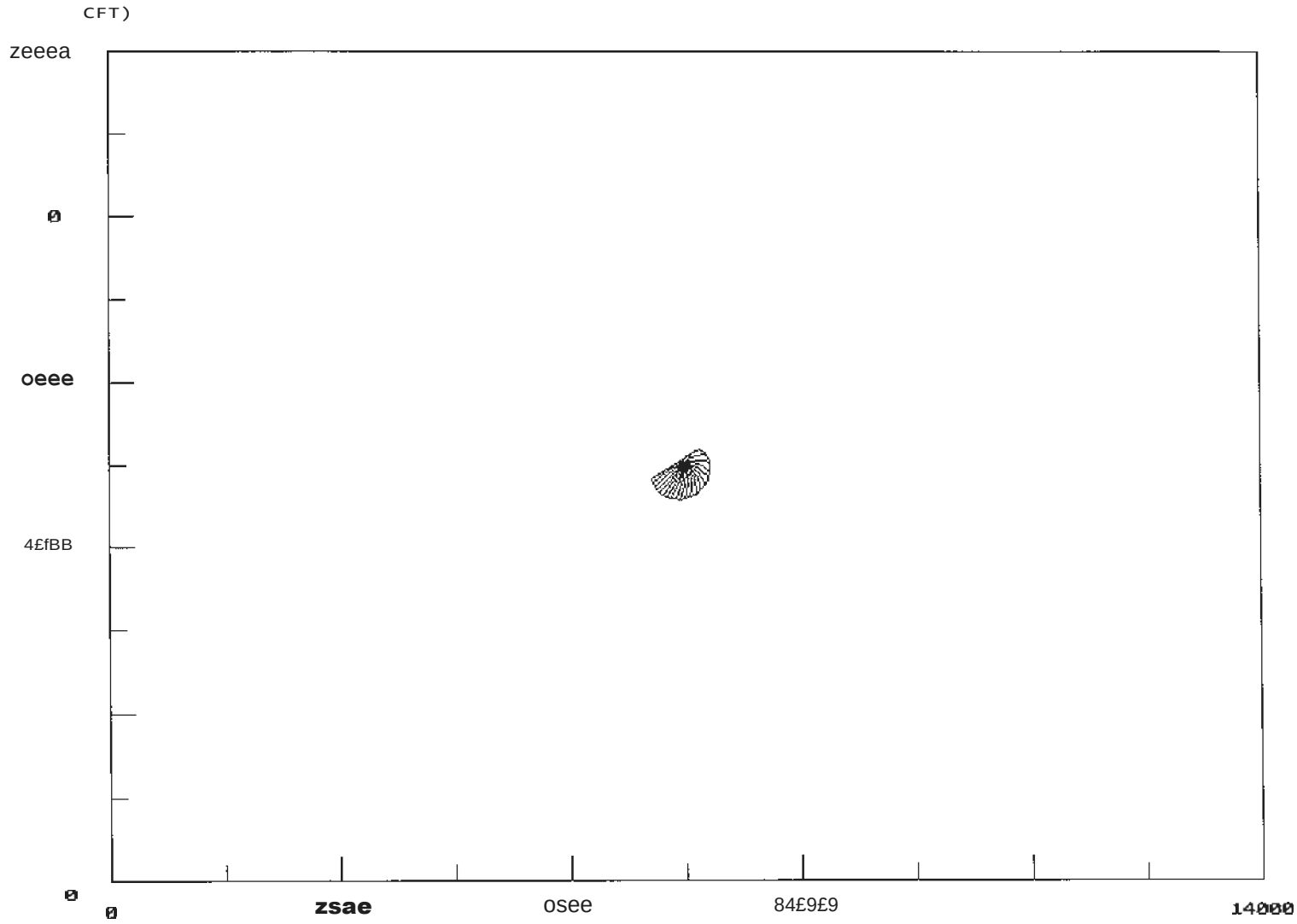


Drawdown versus Log Time - Constant-Rate Pumping Test - Lake Rockport Estates Well #2

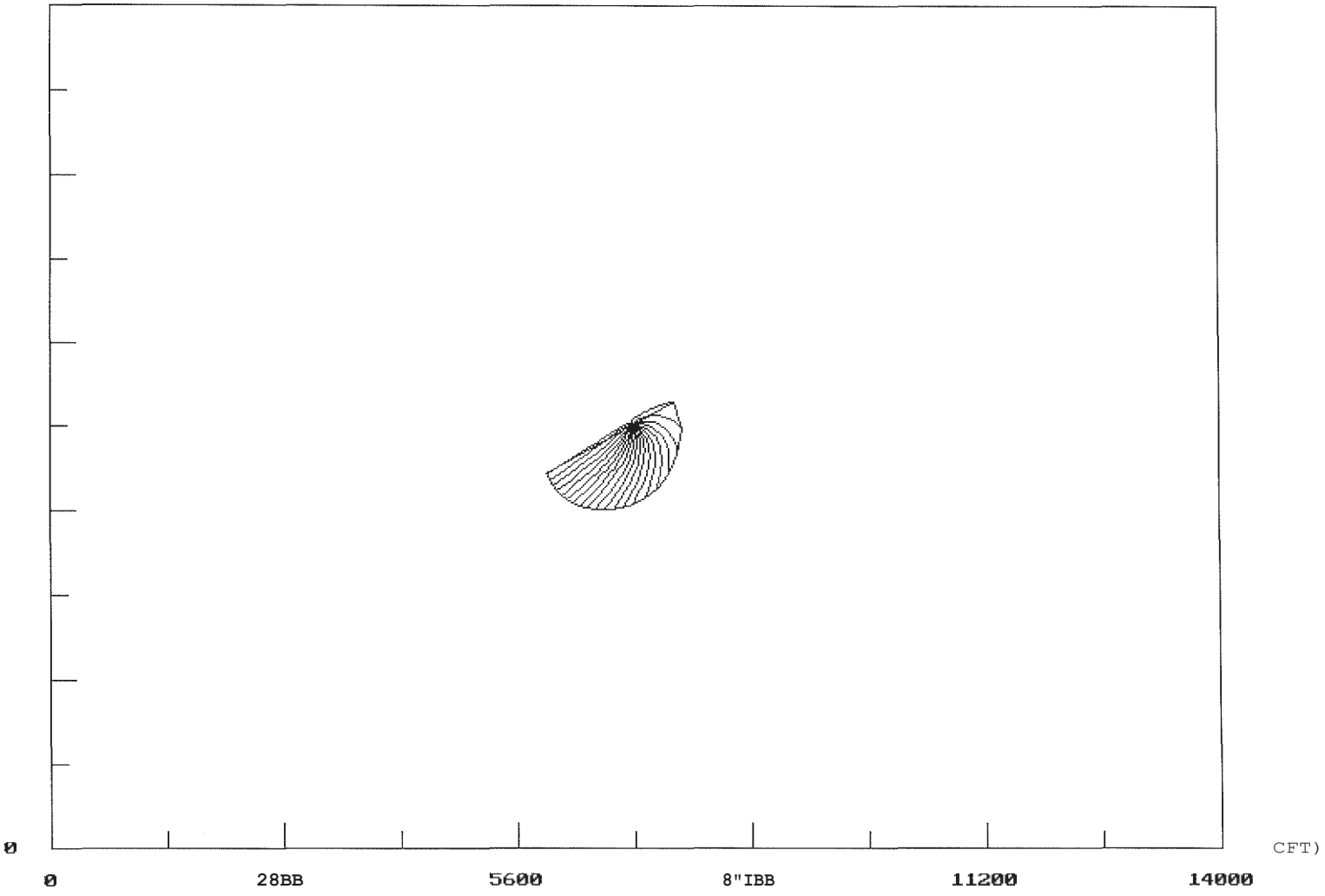
Loughlin Water Associates LLC

APPENDIX F

WHPA PRINTOUT PLOTS



Lake Rockport Estates Well #2
250-Day Time of Travel Plot



Lake Rockport Estates Well #2
3-Year Time of Travel Plot

APPENDIX G

MASTER LIST
OF POSSIBLE POTENTIAL CONTAMINANT SOURCES (PCSs)

Master List of *Possible* Potential Contamination Sources (PCSs)
(List Adapted from the State of Utah DEQ, DDW *September 2012 Ground Water Source Protection User's Guide)*

1. Active and abandoned wells	2. Agricultural pesticide, herbicide, and fertilizer storage, use, filling, and mixing areas
3. Airport maintenance and fueling sites	4. Animal feeding operations with more than ten animal units
5. Animal watering troughs located near unfenced wells and springs that attract livestock	6. Auto washes
7. Beauty salons	8. Boat builders and refinishers
9. Chemical reclamation facilities	10. Chemigation wells
11. Concrete, asphalt, tar, and coal companies	12. Dry cleaners
13. Farm dump sites	14. Farm maintenance garages
15. Feed lots	16. Food processors, meat packers, and slaughter houses
17. Fuel and oil distributors and storers	18. Furniture strippers, painters, finishers, and appliance repairers
19. Grave yards, golf courses, parks, and nurseries	20. Heating oil storers
21. Industrial manufacturers: chemicals, pesticides, herbicides, paper and leather products, textiles, rubber, plastic, fiberglass, silicone, glass, pharmaceutical, and electrical equipment, etc.	22. Industrial waste disposal/impoundment areas and municipal wastewater treatment plants, landfills, dumps, and transfer stations
23. Junk and salvage yards	24. Laundromats
25. Machine shops, metal platers, heat treaters, smelters, annealers, and descalers	26. Manure piles
27. Medical, dental, and veterinarian offices	28. Mortuaries
29. Mining operations	30. Muffler shops
31. Pesticide and herbicide storers and retailers	32. Photo processors
33. Print shops	34. Radiological mining operations
35. Railroad yards	36. Research laboratories
37. Residential pesticide, herbicide, and fertilizer storage, use, filling and mixing areas	38. Residential underground storage tanks
39. Roads, highways, and freeways	40. Salt and sand-salt piles
41. Sand and gravel mining operations	42. School vehicle maintenance barns
43. Sewer lines	44. Single-family septic tank/drain-field systems
45. Sites of reported spills	46. Small engine repair shops
47. Stormwater impoundment sites and snow dumps	48. Subdivisions using subsurface disposal systems (large and individual septic tank/drain-field systems)
49. Submersible pumps used to pump wells	50. Taxi cab maintenance garages
51. Tire shops	52. Toxic chemical and oil pipelines
53. Vehicle chemical supply storers and retailers	54. Vehicle dealerships
55. Vehicle quick lubes	56. Vehicle rental shops
57. Vehicle repair, body shops, and rust proofers	58. Vehicle service stations and terminals
59. Wood preservers	

APPENDIX H

POLLUTION PREVENTION FACT SHEETS

Partnership for the Environment

Utah Department of Environmental Quality

Septic Tank/Drainfield System Fact Sheet

What Are The Potential Hazards?

Septic systems can contaminate ground water if they are misused, improperly maintained, or improperly constructed. The major contaminant discharged from septic systems is disease-causing germs. These germs (bacteria and viruses) - can cause many human diseases. Another contaminant discharged from septic systems is nitrogen in the form of nitrate. If the nitrate level of drinking water is too high, infants, up to the age of six months old, can develop a fatal disease called blue baby syndrome (methemoglobenemia). Additionally, if toxic chemicals are disposed in a septic system, they can percolate through the drainfield and into the ground water.

How Does A Septic Tank/Drainfield System Work?

The basic septic system is composed of a septic tank followed by a drainfield. Wastewater flows out of the house and into the septic tank through the building sewer pipe. Once in the septic tank, most solids in the wastewater settle to the bottom of the tank to form a sludge layer. Other solids float and form a scum layer on top of the wastewater. Some decomposition of solid material takes place here, but the primary function of a septic tank is to trap solids and prevent them from entering the drainfield.

Wastewater treatment is restricted to a rather thin zone of unsaturated soil underlying the drainfield. Many of the harmful bacteria and microbes are filtered out as the wastewater passes through this soil. Some of the smaller microbes (viruses) and nutrients such as phosphorus and some forms of nitrogen are trapped and held (adsorbed) by soil particles. Once the effluent reaches the groundwater table, little treatment occurs. Soils can differ markedly in their pollutant removal efficiency. The ability to which soil can remove pollutants in the wastewater determines how many impurities will eventually reach the groundwater beneath the drainfield.

Site Evaluation And Construction

Current rules require a comprehensive evaluation of the soil and ground water before a septic system can be permitted for construction in a given location. This evaluation must be reviewed and approved by the local health department. The rules require that the bottom of the drainfield trenches be placed at least 12 inches (preferably 24 inches) above the water table. Additionally, there must be adequate amounts of unsaturated soil beneath the trenches to allow sufficient treatment of the wastewater.

Site Considerations

- Trees and deep-rooted shrubs should be as far away from the system as possible.
- Keep the water that runs off of foundation drains, gutters, driveways, and other paved areas away from the drainfield of your septic system.

- Keep the soil over the drainfield covered with grass to prevent soil erosion.
- Don't drive vehicles over the system.
- Don't cover the tank or drainfield with concrete or asphalt and don't build over these areas.

Proper Disposal Practices

- Use only a moderate amount of cleaning products and do not pour solvents or other household hazardous waste down the drains.
- Garbage disposals should not be used because they tend to overload the system with solids. If you have one, you should severely limit its use.
- Do not pour grease or cooking oil down the sink.
- Do not put items down the drain that may clog the septic tank or other parts of the system. These items include cigarette butts, sanitary napkins, tampons, condoms, disposable diapers, paper towels, egg shells, and coffee grounds.

Water Conservation

There are limits to the amount of wastewater a septic system can treat. If you overload the system, wastewater may backup into your home or surface over your drainfield. Problems caused by using too much water can occur periodically throughout the year or be seasonal. For example, the soil beneath your drainfield is wetter in the spring than it is in the summer and its capacity to percolate wastewater is somewhat diminished. If you wash all your laundry in one day, you may have a temporary problem caused by overloading the soil's capacity to percolate wastewater for that day. To reduce the risk of using too much water, try the following:

- Use 1.6 gallons (or less) per flush toilets.
- Fix leaking toilets and faucets immediately.
- Use faucet aerators at sinks and flow reducing nozzles at showers.
- Limit the length of your shower to 10 minutes or less.
- Do not fill the bathtub with more than 6 inches of water.
- Do not wash more than one or two loads of laundry per day.
- Do not use the dishwasher until it is full.

Septic Tank Cleaning

It is recommended that the solids that collect in your septic tank be pumped out and disposed at an approved location every three to five years. If not removed, these solids will eventually be discharged from the septic tank into the drainfield and will clog the soil in the absorption trenches. If the absorption trenches are clogged, sewage will either back up into the house or surface over the drainfield. If this happens, pump the tank will not solve the problem and a new drainfield will probably need to be constructed on a different part of the lot.

For More Information, Contact:

Division of Drinking Water, Source Protection Program - (801) 536-4200
Division of Water Quality - (801) 538-6146
Sonja Wallace, Pollution Prevention Coordinator - (801) 536-4477
Environmental Hotline - 1-800-458-0145

Partnership for the Environment

Utah Department of Environmental Quality

Household Hazardous Waste Fact Sheet

What is Household Hazardous Waste?

Many hazardous products and chemicals such as cleaners, oils and pesticides are used in the home every day. When discarded, these products are called household hazardous waste (HHW). HHWs are discarded materials and products that are ignitable, corrosive, reactive, toxic or otherwise listed as hazardous by the EPA. Products used and disposed of by a typical residence may contain more than 100 hazardous substances including:

- Batteries
- Cleaners
- Cosmetics
- Fluorescent light bulbs
- Glues
- Heating oil
- Insecticides and pesticides
- Ink
- Medicines
- Motor oil and automotive supplies
- Paints, thinners, stains and varnishes
- Polishes
- Swimming pool chemicals
- Smoke detectors
- Thermometers
- Fuel

HHW is a Serious Threat

The U.S. Environmental Protection Agency estimates the average American household generates 20 pounds of HHW each year. As much as 100 pounds of HHW can accumulate in the home and remain there until the resident moves or undertakes a thorough "spring cleaning."

Since the chemicals found in HHW can cause soil and groundwater contamination, generate hazardous emissions at landfills and disrupt water treatment plants, it is important to dispose of HHW properly. Many solid waste treatment facilities are currently required to screen for HHW to avoid operating under restrictive hazardous waste laws. Furthermore, many communities may be required to establish a HHW collection program in order to qualify for permits to manage storm water.

Safe Handling Tips

The best way to handle household hazardous materials is to completely use the product before disposing of the container. If this is not possible, then the next alternative is to return unused portions to your community household hazardous waste clean-up day. Keep products in their original package with all labels intact. If the container is leaking, place it in a thick plastic bag. Pack the products in a plastic-lined cardboard box to prevent leaks and breakage.

Household hazardous waste clean-up days are for household wastes only. No industrial or commercial wastes and no containers larger than five gallons are accepted. Explosives, radioactive

material and medical wastes are also unacceptable.

HHW can be dangerous to people and pets who come in contact with them. HHW can endanger water supplies, damage sewage treatment systems, and cause other environmental damage. Only use the products as directed. **DO NOT:**

- Flush HHWs down the toilet
- Pour HHWs down the sink
- Pour HHWs down a storm drain
- Pour HHWs on the ground

Contact your local health department or the Division of Solid and Hazardous Waste to determine whether your community has a household hazardous waste collection program.

Identify HHW

Reduce the amount of potentially hazardous products in your home and eliminate what you throw away by following these easy steps:

1. Before you buy:

- Read the labels and be aware of what they mean.
- Look for these words on labels; they tell you what products may need special handling or disposal.

Caution	Flammable
Combustible	Poison
Corrosive	Toxic
Danger	Volatile
Explosive	Warning

- Select a product best suited for the job.
- Buy only what you can use entirely.

2. After you buy:

- Read label precautions and follow directions for safe use.
- Recycle/dispose of empty containers properly.
- Share what you can't use with friends or neighbors.
- Store properly.
- Use recommended amounts; more is not necessarily better.
- Use the child-resistant closures and keep them on tightly.

For More Information, Contact:

Division of Solid & Hazardous Waste - (801) 538 - 6170
Division of Drinking Water, Source Protection Program - (801) 536-4200
Environmental Hotline - 1-800-458-0145
Sonja Wallace, Pollution Prevention Coordinator - (801) 536-4477

Partnership for the Environment

Utah Department of Environmental Quality

Pesticides Fact Sheet

What Are The Potential Hazards?

Pesticides applied to plants during crop, lawn, and garden maintenance may leach into the ground water and cause contamination. Proper storage, mixing, application, spill cleanup, watering, and disposal procedures should be included in pesticide best management practices.

Storing Pesticides

The fewer pesticides you buy, the fewer you will have to store. Therefore, only purchase the amount and kind of pesticide that is needed. Pesticides should always be stored in sound, properly labeled, original containers. ***Sound containers are the first defense against spills and leaks.***

- Ensure that there are no holes, tears, or weak seams in the containers and that the label is readable.
- Pesticides should be stored in locked, dry cabinets.
- Be sure to store dry products above liquids to prevent wetting from spills.
- Storage and mixing areas should not be located near floor drains of any kind.
- Storage facilities should have secondary containment, such as a berm or dike, which will hold spills or leaks at:
    1. 10% of the total volume of the containers, or
    2. 110% of the volume of the largest container, whichever is larger.

Mixing Pesticides

- Mix pesticides on an impermeable surface, such as concrete, so any spills will be contained.
- Mix only the amount that you will use:
    1. Measure the total square feet you intend to treat.
    2. Read the label on the pesticide container and follow the instructions. (These are often given in terms of amount of pesticide to use per thousand square feet.)
    3. By properly measuring and calculating, there should be little or no pesticide left in the spray tank when the job is finished and it will be applied at the recommended rate.

Applying Pesticides

Pesticides are used to kill or control weeds (herbicides), insects (insecticides) and fungi (fungicides) that attack plants. Some of these pesticides can move through the soil and into the ground water. Guidelines for the safe use of pesticides are listed below:

- Be willing to accept a low level of weed, insect, and plant disease infestation.

- ❍ Use pesticides only when absolutely necessary.
- ❍ Identify pests correctly. Use the proper pesticides.
- ❍ Read and follow the directions printed on the container labels. Remember, *the label is the law*.
- ❍ Calibrate your spreader and sprayer to keep from applying too much pesticide.
- ❍ Do not spray or apply pesticides near irrigation wells. Wells are conduits to the ground water.
- ❍ Do not spray or apply pesticides near your walks and driveway. This prevents them from washing off into the storm drain system.

Cleaning Up Spills

- ❍ Dry formulated pesticide spills should be swept up and applied to crops, lawns, and gardens at the rate specified on the label.
- ❍ Liquid pesticide spills should be soaked up using absorbent material (such as, soil, sawdust, and cat litter). The contaminated absorbent material should then be put in a sealed container and taken to a household hazardous waste collection site.

Watering

Over-watering your plants can cause excess water to move through the soil. This water can carry pesticides that can contaminate the ground water. The best way to avoid over-watering is simply to measure how much you are adding. Contact your county Extension Service to determine the best way to calculate how much water your plants need and how to measure the amount you are applying.

Disposing of Pesticides

If the pesticide was properly measured and mixed, there should be little or no spray left in the tank. The little that may be left can be safely sprayed over the area that was treated until it is gone. Disposal of "empty" pesticide containers and unused pesticides should be handled as follows:

- ❍ If you are using liquid pesticides, rinse the container three times. Be sure to pour the rinsing into your sprayer and not down a drain or onto the ground. Containers which have been emptied and rinsed can be discarded in the trash.
- ❍ Unused pesticides in their original containers can be recycled at household hazardous waste collection sites.

For More Information, Contact:

Division of Drinking Water, Source Protection Program - (801) 536-4200
Department of Agriculture - (801) 538-7100
Environmental Hotline - 1-800-458-0145
Sonja Wallace, Pollution Prevention Coordinator - (801) 536-4477

Partnership for the Environment

Utah Department of Environmental Quality

Fertilizer Fact Sheet

What Are The Potential Hazards?

Fertilizer applied to plants during crop, lawn, and garden maintenance may leach into the ground water and cause contamination. The main constituent in fertilizer is usually nitrogen. If the nitrate level of drinking water is too high, infants, up to the age of six months, can develop a fatal disease called blue baby syndrome (methemoglobenemia). Drinking water that contains 10 milligrams of nitrate-nitrogen per liter of water exceeds the drinking water standard and should not be used, especially for infant formula. Proper storage, application, and watering procedures should be included in fertilizer best management practices to prevent contamination of ground water.

Storing Fertilizers

The less fertilizer you buy, the less you will have to store. Therefore, only purchase the amount and kind of fertilizer that you need.

- Fertilizer should be stored in locked, dry cabinets.
- Keep fertilizer and pesticides on separate shelves.
- Don't store fertilizer with combustibles, such as gasoline or kerosine, because of explosion hazards.

Application Precautions

The chemical in fertilizer that can most easily pollute ground water is a form of nitrogen called nitrate. Nitrate moves readily in soil to the ground water strata. The best way to prevent the movement of nitrate into the ground water is to apply no more nitrogen than the crops, grass, garden plants, shrubs, or trees can use during the time that the plants are growing.

- Calibrate your spreader and sprayer to keep from applying too much fertilizer.
- Load fertilizer spreaders on the driveway or other hard surfaces so any spills can easily be swept up. Fertilizer that spills should be swept up and applied to the lawn or garden at the right time and amount. This allows the fertilizer to grow plants instead of washing off into the storm drain system and ultimately contaminating nearby streams and lakes.
- If you are using liquid fertilizer on your turf, add fertilizer to the spray tank while on the lawn. This way, if you spill the fertilizer, it will be used by the plants and not run off into the storm drain system.
- Do not spray or apply fertilizer near irrigation wells. Wells are conduits to the ground water.

Application Rates For Lawns

Utah State University's Extension Service recommends the following for Utah lawns: "It is important to fertilize on a regular basis every four to six weeks to maintain an attractive lawn. Begin

when lawns start to green in the spring, mid to late April. Earlier applications may cause a lawn to become greener faster, but may also increase spring disease problems. Summer applications of nitrogen fertilizer will not burn lawns, if you apply them to dry grass and water immediately. Fall applications are important for good winter cold tolerance, extended fall color, and fast spring green-up. A complete fertilizer containing nitrogen, phosphorus and potassium should be applied in the fall every three to four years. This will prepare the lawn for winter conditions and allow the phosphorus to penetrate into the root zone by the next growing season.

For a well-kept lawn in Utah, apply 1 pound of available nitrogen per 1,000 square feet each four to six weeks throughout the growing season. The following chart indicates how much of various fertilizer will supply one pound of nitrogen."

%N on Label	Pounds of Fertilizer Per 1000 Square Feet
12-15	7-8
18-21	5-5 ½
24-28	3 ½-4
30-34	3-3½
45-46	2-2 ¼

Types of Plants

One of the best ways to protect your ground water is to use plants that are drought-tolerant and that are adapted to your area. Drought-tolerant or low-water-use plants can continue to survive once they are established, even during times of little rainfall. Because you do not have to water these plants, there is less chance that nitrate and pesticides will be carried with the water through the soil and into the ground water.

If low-water-use plants are not practical, then try to use medium water use plants. Water these plants only when they begin to show drought stress. Some plants will wilt when they are drought-stressed, while other plants will show marginal leaf burn.

Watering

Over-watering plants can cause excess water to move through the soil. This water can flush fertilizer away from the root zone of your plants and into the ground water. The best way to avoid over-watering is simply to measure how much you are adding. Contact your county Extension Service to determine the best way to calculate how much water your plants need and how to measure the amount you are applying.

For More Information, Contact:

Division of Drinking Water, Source Protection Program - (801) 536-4200
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APPENDIX I

BLANK EMERGENCY NOTIFICATION FORM

EXAMPLE OF EMERGENCY NOTIFICATION FORM

PART 1 - FACTS RELATED TO EMERGENCY

Person or department calling in emergency	
Phone No. or Radio frequency	
Date and Time call received	
Location of emergency	
Street and Home/Building number	
Other (approximate location, distance from landmark, etc.)	
Nature of the emergency (e.g., broken water main, chemical spill, lost pressure in home, etc.)	
Condition at scene	
Actual/Potential damage (briefly describe the situation)	
Access Restrictions (Please list)	
Assistance already on the scene (who, what are they doing, etc.)	

PART 2 - EMERGENCY INVESTIGATION

Personnel investigating emergency	
Reported results of investigation (Attach sheets as necessary)	
Time Assessed	

PART 3 - EMERGENCY ACTION TAKEN

Immediate action taken	
Is immediate action: Permanent or Temporary	
Was an emergency crew dispatched: Yes No Time arrived on scene	
Note all other actions that will be necessary to bring the water supply system back into operation	

APPENDIX J

DISASTER EVALUATION CHECKLIST

DAMAGE ASSESSMENT CHECKLIST

Preliminary Damage Assessment

The **ASSESSMENT COORDINATOR** will oversee or conduct the system assessment immediately after the emergency or disaster occurs. The assessment will address the following items:

1. Identify and assess damage to separate components of entire system:

    - Sources;
    - Pump stations and supply lines;
    - Transmission lines (tanks to distribution system);
    - Storage tanks;
    - Distribution system;
    - Personnel;
    - Power supply;
    - Materials and supplies;
    - Communications;
    - Present emergency plans; and
    - Mutual-aid agreements and/or interconnections.

2. Develop characteristics of disaster:

    - Flood or mud slides;
    - Earthquake;
    - Windstorm; and
    - Explosion.

3. Evaluate effects of disaster on each component of the system.

    - Assess the degree of impact to each system component from disaster to each system component.

4. Estimate water requirements:

    - Fire fighting;
    - Potable water; and
    - Decontamination and sanitary.

5. Estimate capability of system to meet requirements. This point is the "balance point"; if capability exceeds requirements, there is an estimated margin of safety and it could be expected that priorities could be relaxed. If requirements exceed capabilities, there is indicated urgency for improving or "upgrading" the system.

6. Identify critical system components. These components form the basis for immediate restudy for improving capability.

Prioritize Requirements And Specify Program

The **EMERGENCY COORDINATOR**, in association with the **ASSESSMENT COORDINATOR**, will evaluate data gathered during the damage assessment task and prioritize the following system components for repair and replacement:

- Establish baselines on water-quality levels;
- Determine needs and priorities;
- Allocate water under assumed conditions for potable, sanitary decontamination;
- Prepare guidelines for water allowances, priorities, rationing, and time-phasing of estimated water requirements; and
- Establish procedures for emergency treatment, pumping, and distribution of water, and for stations for service of emergency water.