



APR 27 2020

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TRANSMITTAL

DSHW-2020-006767

TO: Allan Moore Utah Division of Waste Management and Radiation Control 195 North 1950 West Salt Lake City, Utah 84116	DATE: 4/27/20 IGES JOB #: 03074-002 SENT VIA: Email
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We are sending you the following:

Copies	Date	Description
1	4/27/20	Preliminary Location Screening Analysis - Gordo Soil Management Facility

<input checked="" type="checkbox"/>	For approval	<input type="checkbox"/>	Approved as submitted	<input type="checkbox"/>	Resubmit	<input type="checkbox"/>	Copies for approval
<input type="checkbox"/>	For your use	<input type="checkbox"/>	Approved as noted	<input type="checkbox"/>	Submit	<input type="checkbox"/>	Copies for distribution
<input type="checkbox"/>	As requested	<input type="checkbox"/>	Returned for corrections	<input type="checkbox"/>	Return	<input type="checkbox"/>	Corrected prints
<input type="checkbox"/>	For your review and comment	<input type="checkbox"/>	Other				

Remarks:

Allan,

Here is a copy of the Preliminary Location Screening Analysis for the Gordo Soil Management Facility near Park City. Please review the Preliminary Location Screening Analysis and let us know if you have any questions or need any additional information. If helpful, perhaps you, Matt, and I can discuss the document prior to review.

SIGNED:

*Butt Wicks*

***PRELIMINARY LOCATION SCREENING ANALYSIS***

**Gordo Soil Management Facility**

For



**Park City Municipal Corporation**

By

Intermountain GeoEnvironmental Services, Inc.  
2702 South 1030 West, Suite 10  
Salt Lake City, UT 84119  
Ph: 801.270.9400

**April 27, 2020**

## Preliminary Location Screening Analysis

The Gordo property owned by Park City Municipal Corporation and is being considered as the location of a permanent soil repository for the metals contaminated soils (Bevill soils) in and around Park City. The location of the Gordo property is as indicated on the Site Vicinity Maps in Appendix A.

The Gordo property is currently being utilized for temporary contaminated soils storage and by Park City for the storage of sand and gravel. The following presents a preliminary screening analysis of the Gordo property to determine if the site meets the location siting criteria for Class I Landfills under UDEQ's regulations, R315-302-1.

### Land Use Compatibility

#### **(R315-302-1(2)(a)(i))**

Under the regulations, a landfill may not be sited within 1,000 feet of a:

- (A) National, state, county, or city park, monument, or recreation area;
- (B) Designated wilderness or wilderness study area;
- (C) Wild and scenic river area; or
- (D) Stream, lake, or reservoir;

**Status: The Gordo site is not located within 1,000 feet of any of the areas stated above. See Site Maps in Appendix B.**

- (A) The closest national, state, county, or city park, monument or recreational area is the Park City park located over 1,300 feet north of the site.
- (B) The closest Wildlife Management Area is the Coyote Little Pole Management Area located south of Jordanelle Reservoir.
- (C) The closest wild and scenic river area is the Green River.
- (D) The closest reservoir is the Jordanelle Reservoir some 15,000 feet southeast of the site.

#### **(R315-302-1(2)(a)(ii))**

Under the regulations, a landfill may not be sited within 1,000 feet of an ecologically and scientifically significant natural areas, including wildlife management areas and habitat for threatened or endangered species as designated pursuant to the Endangered Species Act of 1982;

**Status: The Gordo site is not located within 1,000 feet of any of the areas stated above. See Site Maps in Appendix B.**

- (A) The closest Wildlife Management Area is the Coyote Little Pole Management Area located south of Jordanelle Reservoir.

- (B) The Park City East Quad has 10 endangered species listed; Bonneville Cutthroat Trout (1969), Western Pearlshell (pre 1929), Lewis's Woodpecker (1913), Short-eared Owl (2003), Bald Eagle (2003), Bobolink (2005), Ferruginous Hawk (1988), Columbia Spotted Frog (pre 1931), Greater Sage-grouse (1969), and the Western Toad (1969). Utah Division of Wildlife Resources will be contacted during the permit process to confirm the findings.

**(R315-302-1(2)(a)(iii))**

Under the regulations, a landfill may not be sited within a ¼ miles of:

- (A) Existing permanent dwellings, residential areas and other incompatible structures such as schools or churches unless otherwise allowed by local zoning or ordinance; and
- (B) Historic structures or properties listed or eligible to be listed in the State or National Register of Historic Places;

**Status: The Gordo site is not located within ¼ mile of any of the areas stated above.**

**See Site Maps in Appendix B.**

- (A) The closest structure is a Park City Municipal water treatment plant located southeast of the property approximately 300' across Highway 248. This is a compatible structure as allowed by Park City zoning. The closest residential structure to the property is located southeast of the property approximately 1,500' across Highway 248.
- (B) The closest historic structure is located on Main Street in Park City over 10,000' southwest of the property.

**(R315-302-1(2)(a)(iv))**

Under the regulations, a landfill may not be located within 10,000 feet of any airport runway end used by turbojet aircraft or within 5,000 feet of any airport runway end used by only piston-type aircraft unless the owner or operator demonstrates that the facility design and operation will not increase the likelihood of bird/aircraft collisions;

**Status: The Gordo site is not located within 5,000 feet of any airport.**

- (A) The closest airport is the Russ McDonald Field (Heber Airport) located approximately 13 miles south of the site.

**(R315-302-1(2)(a)(v))**

Under the regulations, a landfill may not be located in areas with respect to archeological sites that would violate Section 9-8-404.

**Status: The Gordo site is not located within an archeological site.**

- (A) The Gordo site has been largely disturbed due to previous soil stockpiling activity and the area around the Gordo property has not being associated with any archeological findings. The State Preservation Officer (SHPO) will be contacted during the permitting process for their concurrence.

## **Geology**

### **(R315-302-1(2)(b)(i))**

No new facility or lateral expansion of an existing facility shall be located in a subsidence area, a dam failure flood area, above an underground mine, above a salt dome, above a salt bed, or on or adjacent to geologic features which could compromise the structural integrity of the facility.

**Status: The Gordo site is not located on or adjacent to geologic features which could compromise the structural integrity of the facility. See Regional Geologic Map in Appendix C.**

(A) None of the geohazards listed above are indicated on the Gordo site.

### **(R315-302-1(2)(b)(ii))**

A new facility or lateral expansions of an existing facility shall not be located within 200 feet of a Holocene fault unless the owner or operator demonstrates to the Director that an alternative setback distance of less than 200 feet will prevent damage to the structural integrity of the unit and will be protective of human health and the environment.

**Status: The Gordo site is not located within 200 feet of a Holocene fault. See Regional Geologic Map in Appendix C.**

(A) No Holocene fault is located near the Gordo site. The closest fault is the Frog Valley Quaternary fault located approximately 4,000 feet south of the site.

### **(R315-302-1(2)(b)(iii))**

No new facility or lateral expansion of an existing facility shall be located in a seismic impact zones unless the owner or operator demonstrates to the satisfaction of the Director that all containment structures, including liners, leachate collection systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth materials for the site.

**Status: The Gordo site is located in a seismic impact zone. See United States Seismic Zones Map in Appendix D. A site specific seismic impact zone analysis will be performed as part of the permit process. All site structures will be designed to resist the maximum horizontal acceleration.**

### **(R315-302-1(2)(b)(iv))**

The owner or operator of an existing facility, a lateral expansion of an existing facility, or a new facility located in an unstable area must demonstrate to the satisfaction of the Director that the engineering measures have been incorporated into the facility design to ensure that the integrity of the structural components of the facility will not be disrupted. The owner or operator must consider the following factors when determining whether an area is unstable:

(A) On-site or local soil conditions that may result in significant differential settling;

- (B) On-site or local geologic or geomorphologic features; and
- (C) On-site or local human-made features or events, both surface and subsurface.

**Status: The Gordo site is located in an unstable area. No geologic, geomorphologic or human-made features are located at or near the Gordo property. See Regional Geologic Map in Appendix C.**

### **Surface Water**

**(R315-302-1(2)(c)(i))**

No new facility or lateral expansion of an existing facility shall be located on public land used by a public water system for watershed control for municipal drinking purposes.

**Status: The Gordo site is not located in located on public land used by a public water system for watershed control for municipal drinking purposes. See Site Vicinity Maps in Appendix A.**

**(R315-302-1(2)(c)(ii))**

Floodplains. No new or existing facility shall be located in a floodplain unless the owner or operator demonstrates to the Director that the unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in a washout of solid waste so as to pose a hazard to human health or the environment.

**Status: The Gordo site is not located in located in a 100-year floodplain. See Site Vicinity Maps in Appendix A.**

### **Wetlands**

**(R315-302-1(2)(d))**

No new facility or lateral expansion of an existing facility shall be located in wetlands unless the owner or operator demonstrates to the Director that:

**(R315-302-1(2)(d)(i))**

Where applicable under section 404 of the Clean Water Act or applicable State wetlands laws, the presumption that a practicable alternative to the proposed landfill is available which does not involve wetlands is clearly rebutted;

**(R315-302-1(2)(d)(ii))**

The unit will not violate any applicable state water quality standard or section 307 of the Clean Water Act;

**(R315-302-1(2)(d)(iii))**

The unit will not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of a critical habitat protected under the Endangered Species Act of 1973;

**(R315-302-1(2)(d)(iv))**

The unit will not cause or contribute to significant degradation of wetlands. The owner or operator must demonstrate the integrity of the unit and its ability to protect ecological resources by addressing the following factors:

- (A) Erosion, stability, and migration potential of native wetland soils, muds, and deposits used to support the unit;
- (B) Erosion, stability and migration potential of dredged and fill materials used to support the unit;
- (C) The volume and chemical nature of the waste managed in the unit;
- (D) Impacts on fish, wildlife, and other aquatic resources and their habitat from release of the solid waste;
- (E) The potential effects of catastrophic release of waste to the wetland and the resulting impacts on the environment; and
- (F) Any additional factors, as necessary, to demonstrate that ecological resources in the wetland are sufficiently protected;

**(R315-302-1(2)(d)(v))**

To the extent required under section 404 of the Clean Water Act or applicable state wetlands laws, steps have been taken to attempt to achieve no net loss of wetlands, as defined by acreage and function, by first avoiding impacts to wetlands to the maximum extent practicable as required by Subsection R315-1(2)(d)(i), then minimizing unavoidable impacts to the maximum extent practicable, and finally offsetting remaining unavoidable wetland impacts through all appropriate and practicable compensatory mitigation actions (e.g., restoration of existing degraded wetlands or creation of man-made wetlands); and

**(R315-302-1(2)(d)(vi))**

Sufficient information is available to make a reasonable determination with respect to these demonstrations.

**Status: Status: The Gordo site is not located in located in a wetland. See Site Vicinity Maps in Appendix A.**

**Groundwater**

**(R315-302-1(2)(e)(i))**

No new facility or lateral expansion of an existing facility shall be located at a site:

- (A) where the bottom of the lowest liner is less than five feet above the historic high level of ground water; or
- (B) For a landfill that is not required to install a liner, the lowest level of waste must be at least ten feet above the historic high level of ground water.

- (C) If the aquifer beneath a landfill contains ground water which has a Total Dissolved Solids (TDS) of 10,000mg/l or greater and the landfill is constructed with a composite liner, the bottom of the lowest liner may be less than five feet above the historical high level of the ground water.

**(R315-302-1(2)(e)(ii))**

No new facility shall be located over a sole source aquifer as designated in 40CFR 149.

**(R315-302-1(2)(e)(iii))**

No new facility shall be located over groundwater classed as IB under Section R3177-6-3.3.

**(R315-302-1(2)(e)(iv))**

Unless all units of the proposed facility are constructed with a composite liner or other equivalent design approved by the Director:

**Status: The Gordo site meets all of the location standards. See Appendix E for the Preliminary Assessment of Groundwater Conditions – Gordo Property.**

**Historic Preservation Survey**

**(R315-302-1(2)(f)(i))**

No new facility or lateral expansion of an existing facility shall be located at a site:

- (A) Have a notice of concurrence issued by the state historic preservation officer as provided in Subsection 9-8-404(3)(a)(i); or
- (B) Show that the state historic preservation officer did not respond within 30 days to the submittal, to the officer, of an evaluation; or
- (C) Have received a joint analysis conducted as required by Subsection 9-8-404(2).

**(R315-302-1(2)(f)(i))**

Each new facility or expansion of an existing facility shall:

- (A) Have a notice of concurrence issued by the state historic preservation officer as provided for in Subsection 9-8-404(3)(a)(i); or
- (B) Show that the state historic preservation officer did not respond within 30 days to the submittal, to the officer, of an evaluation; or
- (C) Have received a joint analysis conducted as required by Subsection 9-8-404(2).

**Status: Status: The Gordo site has been largely disturbed due to previous soil stockpiling activity and the area around the Gordo property has not being associated with any historic preservation findings. The closest historic preservation area is historic Main Street in Park City, located approximately 2 miles southwest of the Gordo property. The State Preservation Officer (SHPO) will be contacted during the permitting process for their concurrence.**

## **Summary**

**The Gordo site meets all the listed location standards with the exception of seismic impact zones.**

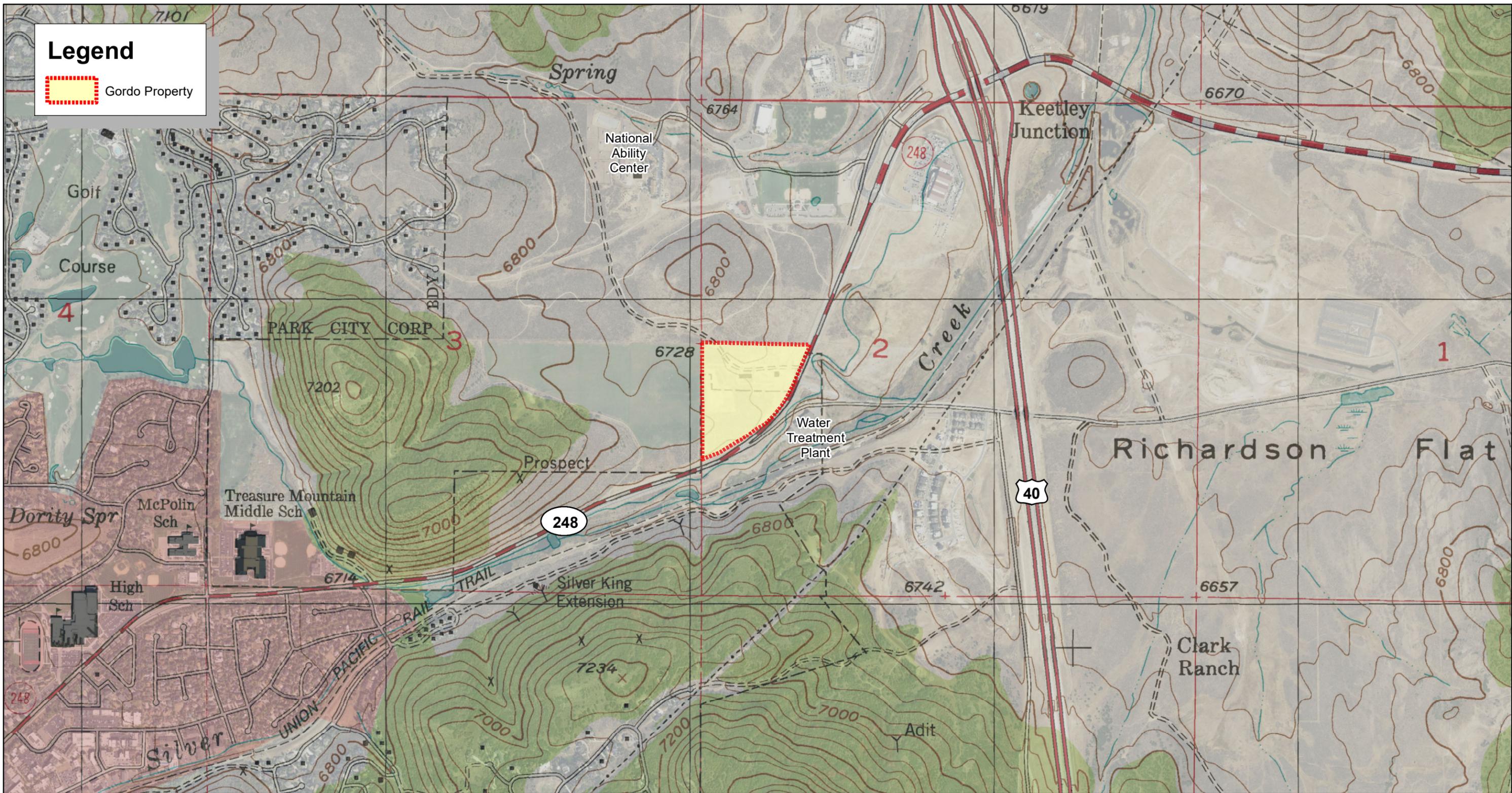
Due to Utah's seismic setting, most, if not all of the Class I facilities are located in a seismic impact Zone. The permitting of these facilities all required that a seismic impact zone analysis be performed. The seismic impact zone analysis is performed to show that the proposed facility structures are designed to resist the potential seismic related stresses. A site specific seismic impact analysis will be performed during the final permitting of the Gordo site.

Documentation regarding the absence of archeological and historic findings will be obtained through a letter from the State Preservation Officer.

Likewise, the Utah Division of Wildlife Resources will be contacted during the permit process to document that the Gordo property is not be sited within 1,000 feet of an ecologically and scientifically significant natural areas, including wildlife management areas and habitat for threatened or endangered species as designated pursuant to the Endangered Species Act of 1982.

# APPENDIX A

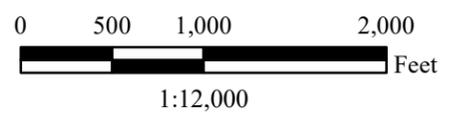
## Site Vicinity Maps



**Legend**

 Gordo Property

BASE MAPS:  
 Park City East Quadrangle, USGS Topo Map, 7.5 Minute Series  
 Aerial Imagery, 2018 NAIP (Utah AGRC WMS)




Project: 03074-002

Park City Municipal Corporation  
 Gordo Soil Repository - Preliminary Site Screening Analysis  
 Summit County, Utah

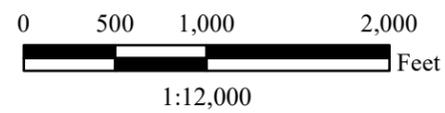
Site Vicinity Map

# Legend

 Gordo Property



BASE MAPS:  
Aerial Imagery, 2018 NAIP (Utah AGRC WMS)



Park City Municipal Corporation  
Gordo Soil Repository - Preliminary Site Screening Analysis  
Summit County, Utah

Site Vicinity Map

## APPENDIX B

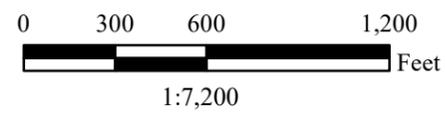
### Site Maps

# Legend

 Gordo Property



BASE MAPS:  
Aerial Imagery, 2018 NAIP (Utah AGRC WMS)



Park City Municipal Corporation  
Gordo Soil Repository - Preliminary Site Screening Analysis  
Summit County, Utah

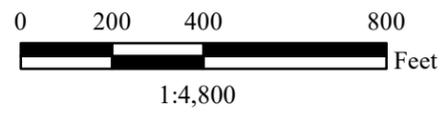
Site Map

# Legend

 Gordo Property



BASE MAPS:  
Aerial Imagery, 2018 NAIP (Utah AGRC WMS)



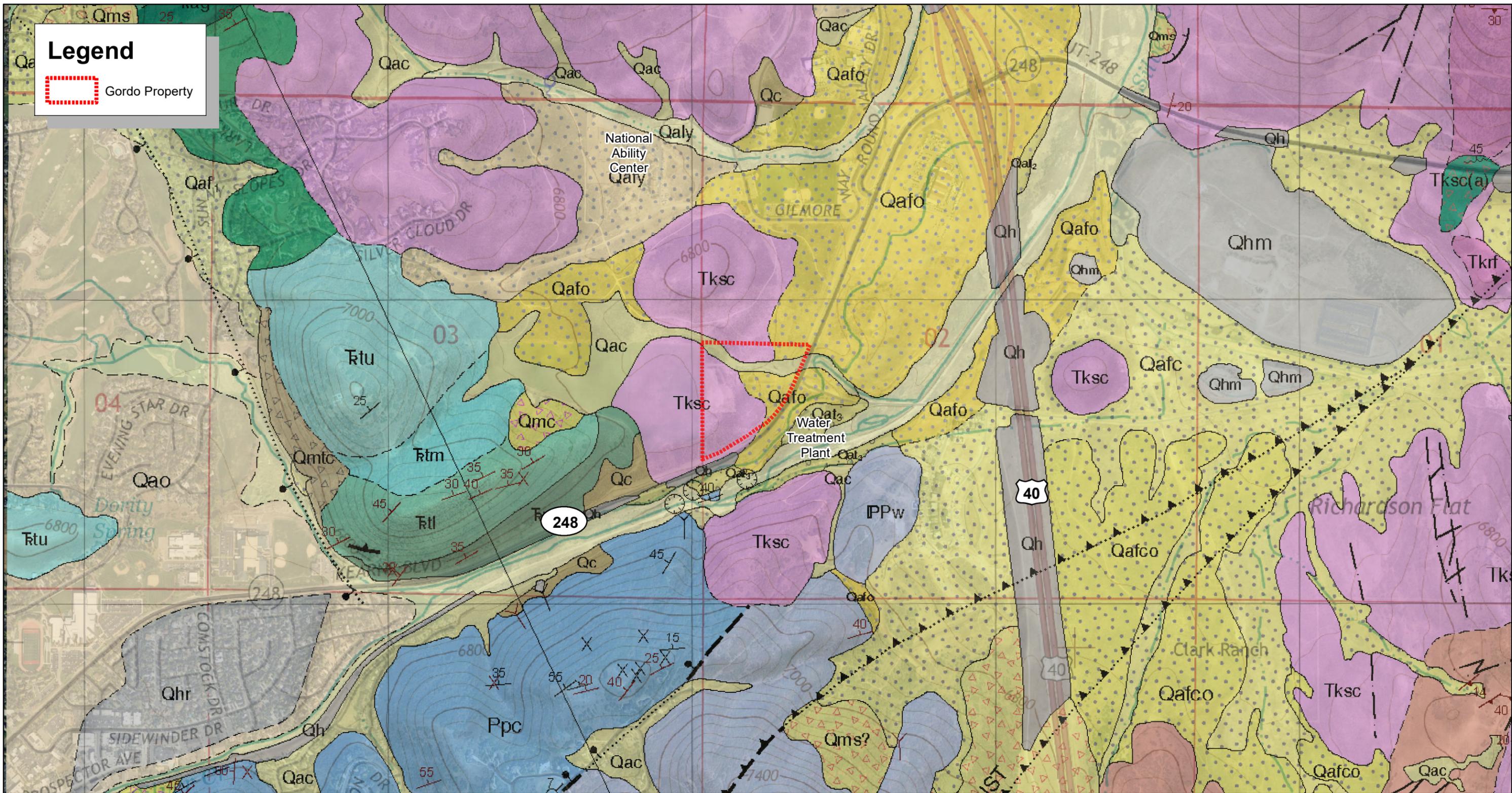
IGES<sup>®</sup>  
Project: 03074-002

Park City Municipal Corporation  
Gordo Soil Repository - Preliminary Site Screening Analysis  
Summit County, Utah

Site Map

## APPENDIX C

### Regional Geologic Map

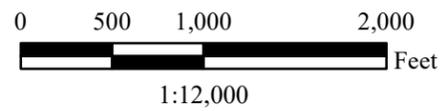


**Legend**

 Gordo Property

BASE MAPS:  
 2017, Biek, R.F., Interim Geologic Map of Park City East Quadrangle, Summit & Wasatch Counties, Utah (UGS OFR 677)

Aerial Imagery, 2018 NAIP (Utah AGRC WMS)



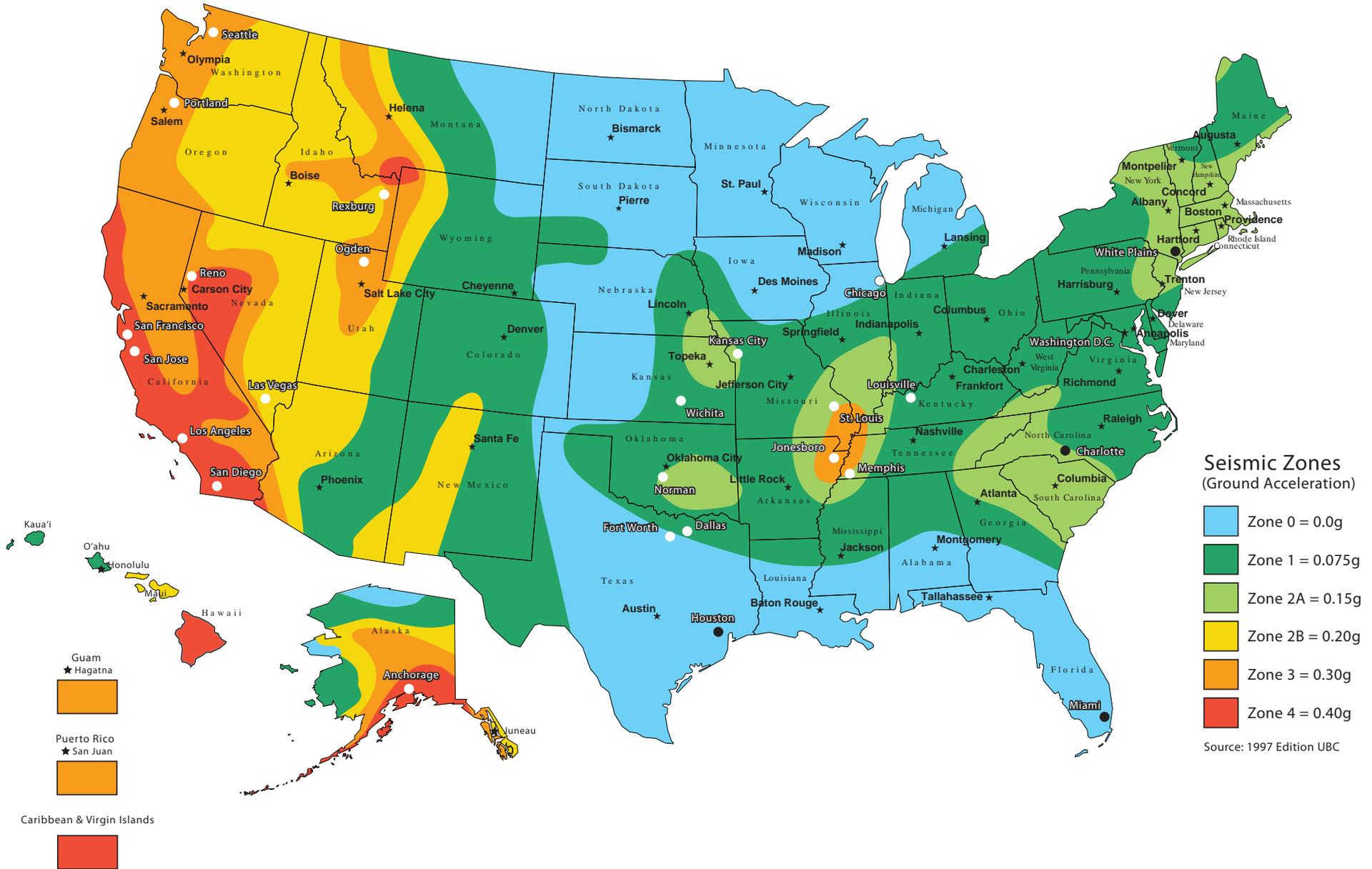
Park City Municipal Corporation  
 Gordo Soil Repository - Preliminary Site Screening Analysis  
 Summit County, Utah

Regional Geologic Map

## APPENDIX D

United States Seismic Zones Map

# United States Seismic Zones Map



## APPENDIX E

### Preliminary Assessment of Groundwater Conditions – Gordo Property



DRAFT - March 26, 2020

Intermountain GeoEnvironmental Services, Inc.

**Attn: Mr. Brett Mickelson, P.E.**

2702 South 1030 West, Suite 10

Salt Lake City, Utah 84119

Subject: **Preliminary Assessment of Groundwater Conditions - Gordo Property**  
Park City Municipal Corporation, Summit County, Utah  
**For Intermountain GeoEnvironmental Services, Inc.**

Dear Brett:

Loughlin Water Associates, LLC (Loughlin Water) is grateful for the opportunity to help Intermountain GeoEnvironmental Services, Inc. (IGES) conduct a preliminary assessment of groundwater conditions at the Gordo Property for Park City Municipal Corporation (Park City), Summit County, Utah. We conducted our assessment in response to your request.

## **BACKGROUND**

Park City is evaluating the Gordo Property as a possible location to dispose of soil that (1) has been impacted by historic mine operations and (2) meets the criteria of the Park City Landscaping and Maintenance Soil Cover Ordinance (the Soil Ordinance). Figures 1 and 2 show the location of the Gordo Property.

Park City will need to obtain a Class 1 Landfill Permit from the Utah Division of Waste Management and Radiation Control (DWMRC) to dispose mine waste at the Gordo Property. Utah Administrative Code (UAC) R315-302-1 specifies the location standards of disposal facilities.

## **PRELIMINARY ASSESSMENT OF GROUNDWATER CONDITIONS**

In order to assess groundwater conditions at the Gordo Property, we:

- Reviewed the local geology;
- Identified and reviewed the logs of local water supply wells;
- Constructed a geologic cross section;
- Estimated the depth to water;
- Inventoried local sources of public drinking water;
- Identified the boundaries of Drinking Water Source Protection (DWSP) areas; and
- Prepared this letter report.

3100 W. Pinebrook Road, Ste. 1100 ▲ Park City, Utah 84098

Phone: 435.649.4005 ▲ Fax: 435.649.4085 ▲ Mobile: 435.659.1752 ▲ [www.LoughlinWater.com](http://www.LoughlinWater.com)

**Loughlin Water Associates, LLC****LOCAL GEOLOGY**

Figure 3 is a geologic map of the area that we modified from Biek (2017). Figure 4 is a geologic cross section that we constructed from the map of Biek (2017) and the logs of local water wells. Table 1 lists, provides a key to map symbols, and describes the geologic units shown on Figures 3 and 4.

**TABLE 1  
DESCRIPTION OF GEOLOGIC UNITS<sup>a</sup>**

<b>Formation Name</b>	<b>Geologic Age</b>	<b>Thickness (feet)</b>	<b>Description</b>
<b>Artificial Fill (Qh)</b>	Historical	> 6	Engineered fill and general barrow material used mostly for major highways and secondary roads that cross drainages.
<b>Mine Dumps and Tailings Ponds (Qhm)</b>	Historical	10s	Includes waste rock from mining operations of the Park City mining district in the Richardson Flat Tailing site southeast of the U.S. Highway 40-Utah Highway 248 interchange.
<b>Young Stream Alluvium (Qaly)</b>	Holocene to Upper Pleistocene	< 30	Moderately- to well-sorted sand, silt, clay, and pebble to boulder gravel mapped in major drainages.
<b>Stream-Terrace Alluvium (Qat<sub>3</sub>)</b>	Holocene to Upper Pleistocene	15 to 25	Moderately- to well-sorted sand, silt, clay, and pebble to boulder gravel that forms level to gently sloping surfaces above, and incised by, Silver Creek.
<b>Young and Middle Fan Alluvium (Qafy)</b>	Holocene to Upper Pleistocene	< 40	Poorly- to moderately-sorted, weakly to non-stratified, clay- to boulder-size sediment deposited principally by debris flow and debris floods at the mouths of active drainages.
<b>Old Fan Alluvium (Qafy)</b>	Upper to Middle Pleistocene	10s	Poorly- to moderately-sorted, weakly to non-stratified, clay- to boulder-size sediment deposited principally by debris flow and debris floods; deeply incised by modern drainages.
<b>Colluvium (Qc)</b>	Holocene to Upper Pleistocene	< 30	Poorly- to moderately-sorted clay- to boulder-size, locally derived sediment deposited on moderate slopes principally by slope wash and soil creep.
<b>Alluvium and Colluvium (Qac)</b>	Holocene to Upper Pleistocene	< 30	Poorly- to moderately-sorted, generally poorly-stratified, clay- to boulder-size, locally derived sediment (Qc) deposited in swales, small drainages, and the upper reaches of larger streams by slope-wash and creep processes.

*Loughlin Water Associates, LLC*

<b>Formation Name</b>	<b>Geologic Age</b>	<b>Thickness (feet)</b>	<b>Description</b>
<b>Landslides (Qms)</b>	Holocene to Upper Pleistocene	Not given	Unsorted, locally derived material deposited by rotational and translational movement; composed of clay- to boulder-sized debris.
<b>Landslides and Colluvium (Qmc)</b>	Holocene to Upper Pleistocene	< 20	Unsorted, locally derived, clay- to boulder-sized material; mapped where possible landslide deposits are difficult to identify and possibly covered by colluvium.
<b>Volcanic Mudflow Breccia of Silver Creek<sup>b</sup> (Tksc)</b>	Lower Oligocene to Upper Eocene	< 1000	Andesite to rhyodacite volcanic mudflow breccia and minor interbedded lava flows and ash flow tuff.
<b>Thaynes Formation (TRtu, TRtm, TRtl)</b>	Lower Triassic	1600	A tri-part unit consisting of (1) an upper medium-gray limestone (TRtu), (2) a middle red siltstone and shale (TRtm), and (3) a lower brown calcareous sandstone and sandy limestone.
<b>Woodside Shale (TRw)</b>	Lower Triassic	300	Moderate- to dark-reddish-brown, laminated to thin-bedded or rarely medium-bedded, micaceous and feldspathic siltstone and fine-grained sandstone
<b>Park City Formation (Ppc)</b>	Middle to Lower Permian	600	Limestone, cherty limestone, calcareous sandstone, phosphatic shale.
<b>Weber Quartzite (Pw)</b>	Lower Permian to Middle Pennsylvanian	1300 to 1500	Very pale orange, grayish-orang, and yellowish-gray, typically thick- to very thick bedded, fine-grained, well cemented quartzitic and less commonly calcareous sandstone with uncommon limestone and dolomite interbeds.

<sup>a</sup> Descriptions are based primarily on Biek (2017).

<sup>b</sup> This unit is sometimes referred to as the "Keetley Volcanics".

Figure 4 shows that, at the Gordo Property, overlies about 200 feet of the Mudflow Breccia of Silver Creek (Tksc). This unit, also known as the Keeley Volcanics, thickens to the north to at least 1000 feet and is underlain at the Gordo Property by the north-dipping (tilting) Woodside Shale (TRw).

## LOCAL GROUNDWATER CONDITIONS

Figures 1, 2, and 3 show the locations of and Table 2 summarizes information for selected area water supply and exploration (provisional) wells.

**TABLE 2**  
**SUMMARY OF SELECTED WELLS IN GORDO PROPERTY AREA <sup>a</sup>**

Well Name and/or WIN	Drilled Depth (feet)	Groundwater Level		Date of Measurement	Depth of Screened/ Perforated Interval(s) (feet)	Geology of Completed Interval
		Depth to Ground-water (feet)	Approximate Elevation of Groundwater <sup>b</sup> (feet)			
6067	222	55	6645 (6700)	8/19/1962	165 to 171 190 to 222	Keetley volcanics <sup>f</sup> Keetley volcanics <sup>f</sup>
6004	220	42	6598 (6640)	5/30/1964	110 to 130 180 to 200	Keetley volcanics <sup>f</sup> Keetley volcanics <sup>f</sup>
11294 <sup>c</sup>	1000	140	6700 (6840)	6/19/1996	160 to 360 560 to 765	Keetley volcanics <sup>f</sup> Keetley volcanics <sup>f</sup>
25336 <sup>d</sup>	1060	225 <sup>e</sup>	6635 <sup>e</sup> (6860)	6/20/2002	<sup>d</sup>	Mahogany Member of Ankareh Formation (TRam) <sup>d</sup>

WIN = Well Identification Number, a unique identifier assigned by the DWRi to each water well.

<sup>a</sup> The well logs and other information were obtained from DWRi online databases

<https://www.waterrights.utah.gov/wellInfo/wellInfo.asp>.

<sup>b</sup> Calculated by subtracting depth to water from ground surface elevation estimated from U.S. Geological Survey (USGS) topographic map; see Figure 2. Estimated ground surface elevation shown in parentheses.

<sup>c</sup> Provisional (exploration) Well (95-35-007-P-01) drilled by Park City, also known as the "Keetley Well", may have been plugged and abandoned after installing well screen or casing due to low yield.

<sup>d</sup> Provisional (exploration) Well (02-35-002-P-01) drilled by Park City and then plugged and abandoned without installing well screen or casing.

<sup>e</sup> Depth to groundwater in WIN 25336 likely reflects water level in the Mahogany Member of Ankareh Formation (TRam), encountered from 970 to 1060 feet at the bottom of well, and not the overlying Volcanic Mudflow Breccia of Silver Creek (Tksc).

<sup>f</sup> Volcanic Mudflow Breccia of Silver Creek (Tksc); see Figures 3 and 4 and Table 1.

<sup>g</sup> The red shale encountered from 970 to 1060 feet at the bottom of well and identified as the Woodside Shale (TRw) is actually the Mahogany Member of the Ankareh Formation (TRam); see Figures 3 and 4 and Table 1.

As indicated on Figures 1, 2, 3, and 4, Well WIN 6067 is located within the Gordo Property. Attachment A provides a copy of the Well Drillers Report (well log) for WIN 6067 (the well). We annotated the well log to highlight the clay layers. Note from the well log and Table 2 that:

- The well was (1) drilled to a depth of 222 feet within the Mudflow Breccia of Silver Creek (Tksc) and (2) completed (perforated) over two intervals (165 to 171 feet and 190 to 222 feet).
- The well was not perforated above 165 feet which indicates that groundwater was not encountered at shallower depths.
- Approximately 54 feet of low-permeability clay was logged (from 3 to 30, 90 to 95, and 108 to 130 feet) in the well above the top of the uppermost perforated interval.
- The uppermost perforated interval of 165 to 171 feet occurs in a 25-foot thick layer (150 to 175 feet) of fractured volcanic rock that is overlain by 22 feet of clay (108 to 130 feet).

**Loughlin Water Associates, LLC**

- The reported depth to water of 55 feet (1) reflects the water level in the perforated intervals and (2) indicates that groundwater in the perforated intervals is confined by the overlying clay layers.
- Although the well was equipped with a submersible pump, no pumping tests were reported and the yield of the well is not known.

Although it discharges a small amount of groundwater to the Spiro Tunnel, Ashland and other (2001) and Hurlow (2002) characterize the Woodside Shale as a regional confining layer.

**PUBLIC DRINKING WATER SOURCES AND DWSP AREA BOUNDARIES**

Figure 5 shows the locations of Public Water System (PWS) drinking water sources and Drinking Water Source Protection (DWSP) area boundaries that are closest to the Gordo Property. We obtained the PWS source location and DWSP area boundary information from the Utah Division of Drinking Water (DDW) online database. Note from Figure 5 that the closest:

- PWS drinking water source is the Park City Middle School Well, which is located about 1 mile to the west of the Gordo Property.
- DWSP area boundaries are the:
  - Park City Middle School, Park Meadows, and Divide wells, which is about 0.6 miles to the west of the Gordo Property and
  - Jordanelle Special Service District (JSSD) Ontario Drain Tunnel No. 2, which is about 1 mile to the south of the Gordo Property.

**COMPLIANCE WITH UAC R315-302-1(2) – LANDFILL LOCATION STANDARDS**

Table 3 evaluates compliance of the Gordo Property with subsections of UAC R315-302-1, Location Standards for Disposal Facilities that relate to surface water and groundwater.

**TABLE 3  
COMPLIANCE OF GORDO PROPERTY AREA WITH LANDFILL LOCATION STANDARDS**

<b>Section</b>	<b>Compliance</b>
R315-302-1(2)(c)(i) Surface Water	The Gordo Property is not located on public land that is being used by a PWS for water shed control for municipal drinking water purposes.
R315-302-1(2)(e)(i) Groundwater	Groundwater beneath the Gordo Property (1) is confined, (2) occurs below an estimated depth of 130 feet, and (3) has an artesian head that is 55 feet below the ground surface.
R315-302-1(2)(e)(ii) Groundwater	The Gordo Property is not located over a sole source aquifer as designated in 40 CFR 149.

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<b>Section</b>	<b>Compliance</b>
R315-302-1(2)(e)(iii) Groundwater	The Gordo Property is not located over groundwater classified as IB under Section R317-6-3.3. Total Dissolved Solids (TDS) concentration of groundwater is not known, but expected to be between 500 and 1,000 milligrams per liter (mg/L).
R315-302-1(2)(e)(iv) Groundwater	Landfill will be constructed with a primary and a secondary liner. TDS of groundwater is not known, but expected to be between 500 and 1,000 mg/L.
R315-302-1(2)(e)(v) Groundwater	The Gordo Property is not located within a designated DWSP area or within a 250-day time-of-travel distance from an existing PWS drinking water well or spring or mine tunnel.
R315-302-1(2)(e)(vi) Groundwater, R315-303-2(1),	Groundwater beneath the Gordo Property occurs below an estimated depth of 130 feet. Approximately 54 feet of low-permeability clay overlying groundwater at the Gordo Property.

Note that we did not address R315-302-1(2)(c)(ii), Floodplains.

### **CONCLUSIONS AND RECOMMENDATIONS**

Based on our preliminary assessment, the Gordo Property meets the location standards related to surface water and groundwater outlined in R315-302, specifically:

- The Gordo Property is not located on public land that is being used by a PWS for water shed control for municipal drinking water purposes.
- Groundwater beneath the Gordo Property (1) is confined by thick layers of low-permeability clay, (2) occurs below an estimated depth of 130 feet, and (3) has an artesian head that is 55 feet below the ground surface.
- The Gordo Property is not located over a sole source aquifer as designated in 40 CFR 149.
- The Gordo Property is not located over groundwater classified as IB under Section R317-6-3.3. Total Dissolved Solids (TDS) concentration of groundwater is not known, but expected to be between 500 and 1,000 milligrams per liter (mg/L).
- The Gordo Property is not located within a designated DWSP area or within a 250-day time-of-travel distance from an existing PWS drinking water well or spring or mine tunnel.

Our assessment of groundwater conditions is preliminary and should be followed up with additional work to confirm our findings. We recommend that additional work include the drilling and logging of at least one exploration boring to a depth of about 200 feet. The purpose of the boring is to characterize subsurface including lithology, groundwater occurrence, groundwater quality, and other factors.

**Loughlin Water Associates, LLC**



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

**Loughlin Water Associates, LLC**

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

- Table 1 – Description of Geologic Units
- Table 2 – Summary of Area Water Wells
- Figure 1 – Aerial Photograph
- Figure 2 – Topographic Map
- Figure 3 – Geologic Map
- Figure 4 – Geologic Cross Section
- Figure 5 – Drinking Water Source Protection Areas

Attachment A – Annotated Well Driller Report for WIN 6067

**REFERENCES CITED**

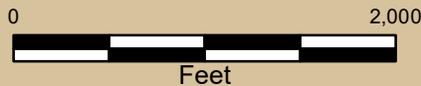
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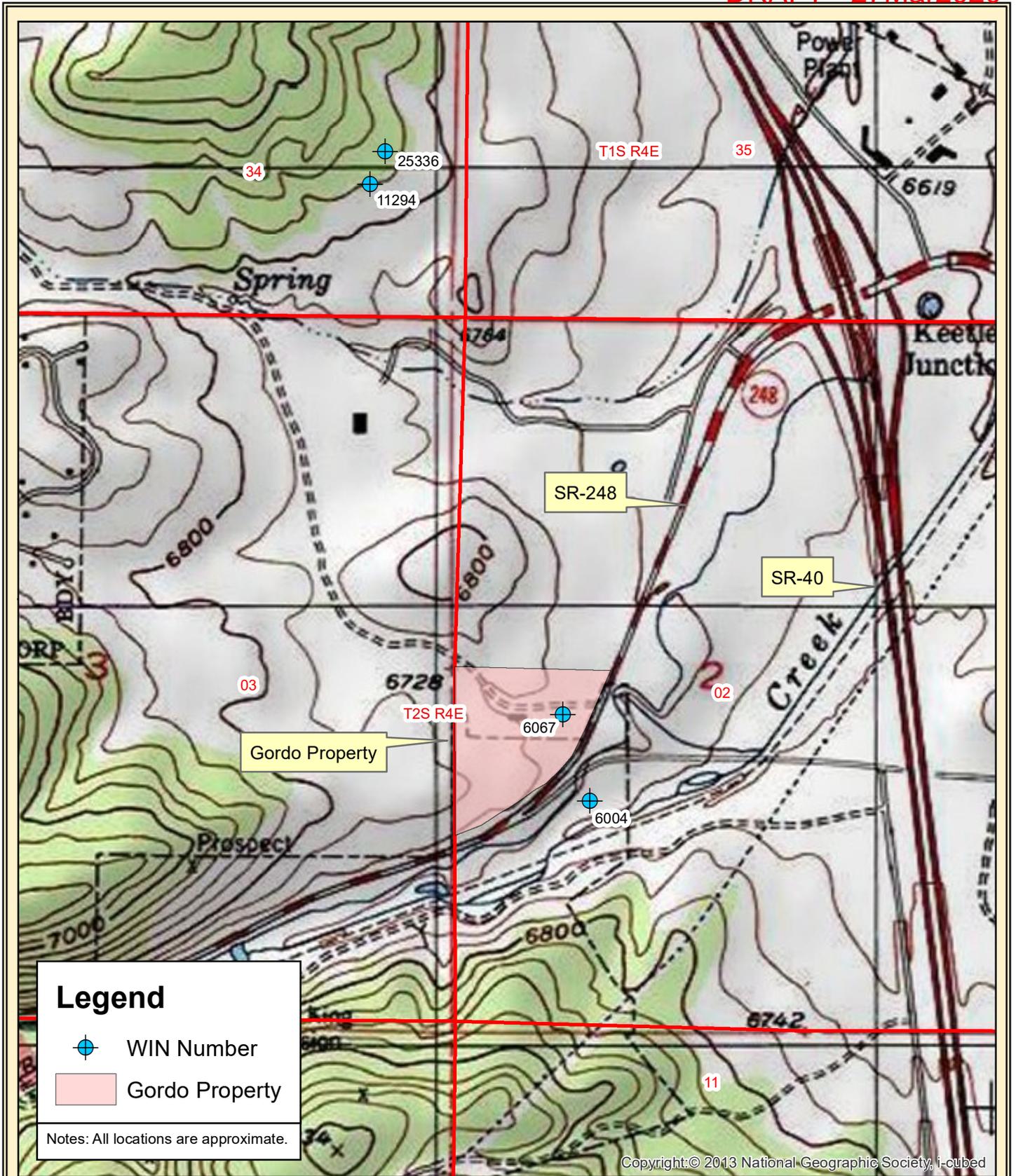
Hurlow, H.A., 2002, The Geology of the Kamas-Coalville Region, Summit County, Utah, and its Relation to Ground-Water Conditions: Utah Geological Survey Water Resources Bulletin 29.



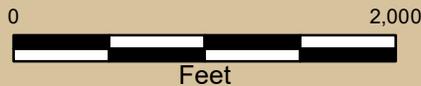
Prepared by Gregory Gavin G.I.T.



**IGES**  
**Gordo Property**  
**Aerial Photograph**  
**Figure 1**

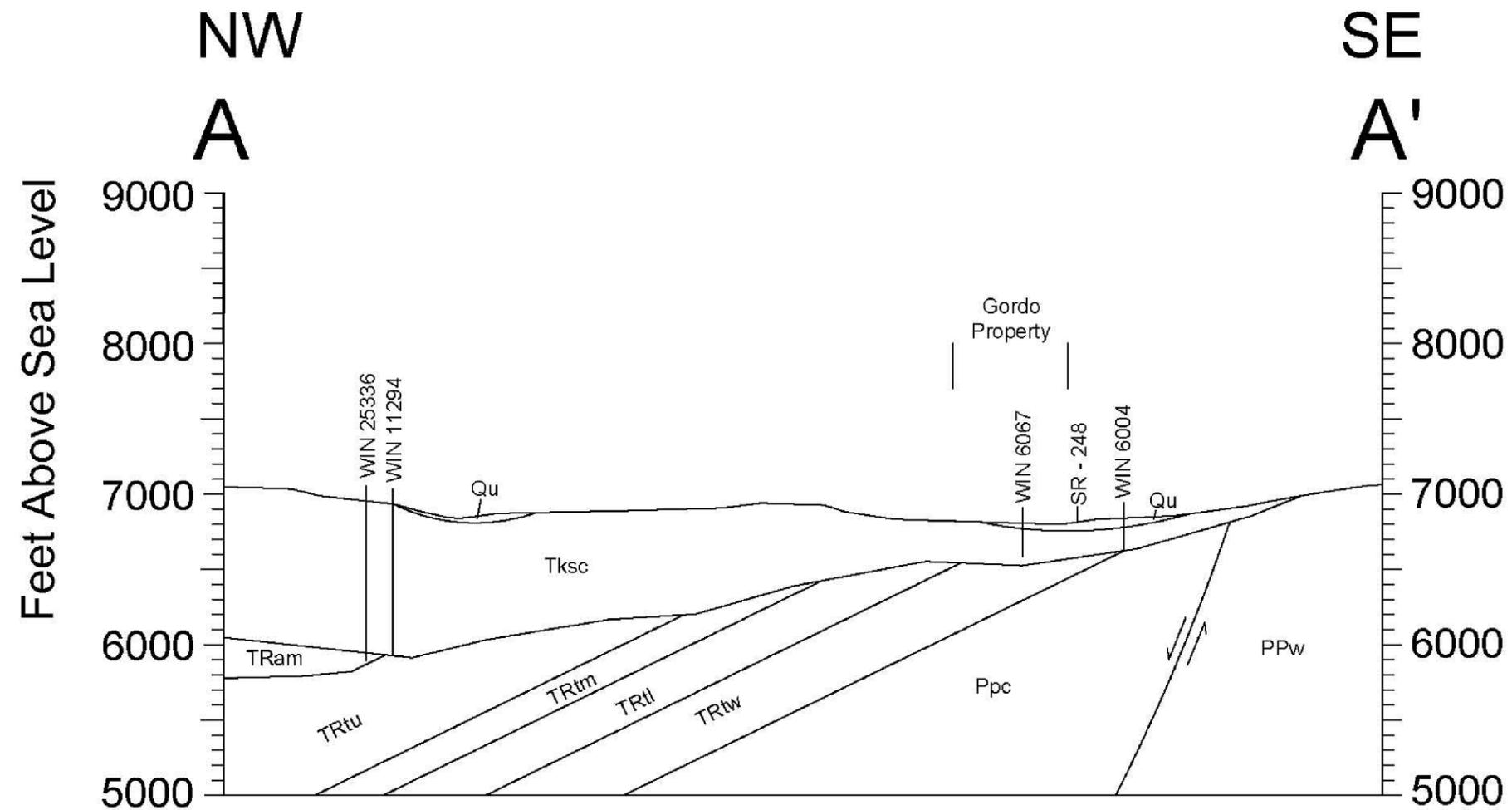


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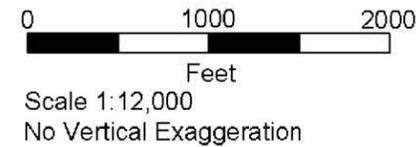
**IGES**  
**Gordo Property**  
**Topographic Map**  
**Figure 2**





- Qu - Quaternary, undivided
- Tksc - Tertiary Keetley Volcanics (Silver Creek Chaos Member)
- TRam - Ankareh Formation (Mohogany Member)
- TRtu - Thaynes Formation (Upper Limestone Member)
- TRtm - Thaynes Formation (Middle Shale Member)
- TRtl - Thaynes Formation (Lower Limestone Member)
- PPc - Park City and Phosphoria Formations (undivided)
- PPw - Weber Quartzite

Refer to report for descriptions of Geologic Formations.



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Park City Municipal Corporation  
Park Meadows, Middle School, and Divide Wells  
Zones 2, 3 and 4 DWSP Area Boundary

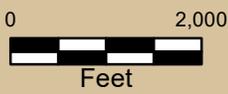
Gordo Property

Jordanelle Special Service District  
Ontario Drain Tunnel (No. 2)  
Zones 2, 3 and 4 DWSP Area Boundary

MIDDLE SCHOOL  
WELL

Notes: All locations are approximate.

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**IGES**  
**Gordo Property**  
**Drinking Water Source Protection Areas**  
**Figure 5**

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**FIGURES**

**ATTACHMENT A**  
**ANNOTATED WELL DRILLER REPORT FOR WIN 6067**

