Notice is hereby given that the
Eastern Summit County Sewer Advisory Committee (ESAC)
will meet
electronically, via zoom, on
Thursday, May 28, 2020
8:30 a.m.

AGENDA

1. Public input not on the agenda

2. Discussion and possible recommendation for the proposed Wastewater Treatment System for the Trail Ridge Subdivision, a 30 Lot Subdivision, plus one outside the subdivision; Parcel NS-227-230 and NS-230-G; Brett Hollberg, applicant. –Amir Caus, AICP, County Planner

Please click the link below to participate in the Zoom Meeting:
https://summitcountyut.zoom.us/j/97120460721?pwd=c1NYUERoVU9nbXcxSDZObXd2SmNsdz09

To listen by phone dial:
US: +1 669 900 9128 or +1 346 248 7799
Zoom Meeting ID: 971 2046 0721

Individuals with questions, comments, or needing special accommodations pursuant to the Americans with Disabilities Act regarding this meeting may contact Melissa Hardy in the Community Development Department at (435) 336-3157.

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STAFF REPORT

To: Eastern Summit County Sewer Advisory Committee (ESAC)
From: Amir Caus, County Planner
Date of Meeting: May 28, 2020
Type of Item: Trail Ridge Subdivision, Master Planned Development (MPD) – Possible Action on Wastewater System
Process: Administrative

RECOMMENDATION: Staff is seeking direction and possible action from ESAC on whether they find that the request for the proposed Large Underground Wastewater System (LUWS) meets the minimum required for approval.

Project Description

Project Name: Trail Ridge Subdivision MPD
Applicant(s): Brett Hollberg
Property Owner(s): Trail Ridge Partners LLC
Location: Parcels NS-227-230 and NS-230-G, Off of Cherry Canyon Drive, Wanship, Summit County, UT
Zone District: AG-10 and AG-20
Parcel Number and Size: NS-227-230 (337.16 acres) and NS-230-G (10.00 acres)
Type of Process: Legislative
Final Land Use Authority: Summit County Council

Proposal

The applicant is requesting a package wastewater system (Per the Exhibit Package). The water is proposed to be provided via a single well designed as a public system per the MPD and State requirements. As part of the request, the Eastern Summit County Sewer Advisory Committee (ESAC) is required to review and recommend approval/denial to the Summit County Council of the use of the proposed Large Underground Wastewater System (LUWS).
Background

Parcel NS-227-230 (337.16 acres) is currently undeveloped while Parcel NS-230-G (10.00 acres) has an existing single-family residence.

Analysis and Findings

The applicant is proposing the use of a Large Underground Wastewater System (LUWS) to service the proposed subdivision. Average lot size for this subdivision is 2.07 acres. According to the applicant, all lots are intended to be used for residential purposes.

The water is proposed to be provided via a single well designed as a public system per the MPD and State requirements.

The Health Department has not issued an official review of the process as the ESAC decided to hold the meeting with representatives from the State wastewater and drinking water divisions present. The Health Department has expressed concern with regards to year-round availability of water.

Perc tests have been completed and the results are attached in the exhibit package.
Trail Ridge Subdivision MPD
May 28, 2020
**Recommendation**

Staff is seeking direction and possible action from ESAC on whether they find that the request for the Large Underground Wastewater System (LUWS) meets the minimum required for approval.

Staff recommends that should the ESAC forward a positive recommendation that the following conditions of approval be included;

- All Service Provider requirements shall be met.
- All wells shall be required to be at least 100 ft. from any structures or septic systems.
- A 100 ft. well protection zone shall be identified on the plat.
- The well sharing shall be legally documented and tied to each lot as per the Summit County Health Department and State of Utah requirements.

**Attachments**

Exhibit A – Applicant Project Description  
Exhibit B – Proposed Plat  
Exhibit C – Applicant LUWS Feasibility Study  
Exhibit D – Supplemental Soil and Perc Information  
Exhibit E – Water Information and DDW Communication
The proposed Trail Ridge Subdivision is located in Cherry Canyon, on the East Wanship bench, and consists of 30 single family lots. The property is 337 acres in size and is currently used for cattle grazing and private recreational uses. The proposed lots are clustered together with a median lot size of 1.8 acres. We plan to set aside 248 acres, or 74% of the total parcel as deed restricted agricultural open space that will be protected from future development.

MPD Requirement Analysis:

1. **Density:** The maximum density permitted on the project site will be determined as a result of a site analysis. The maximum density shall not exceed that set forth in the proposed or existing zone, except as otherwise provided in this section. In cases where a project site contains more than one (1) zone, the County Council may permit the clustering of density irrespective of zone boundaries so long as the relocation results in the project advancing the goals set forth in the General Plan.

The proposed Trail Ridge Subdivision (“TRS”) is located on Parcel NS-227-230 which is in the AG10 and AG20 zones. All of the proposed lots are clustered together in the AG10 zone, allowing for the protection of a larger area for continued agricultural use, which is consistent with the General Plan. Currently the parcel is used for cattle grazing, which will be continued on the undeveloped area of the parcel.
2. **Density Bonus**: A density bonus may be permitted in accordance with appendix B of this title.

The base density of the subdivision parcel is 25 lots. Five additional lots have been proposed using the density bonus, for a total of 30 lots (See calculation on Exhibit A). The TRS sets aside 248.26 acres as permanently restricted agriculture open space, which equals 74% of the total acreage of the development and is 162% larger than required for the density bonus. A note on the subdivision plat will declare that the Agriculture Open Space Parcel is permanently restricted from further development other than is typical for agricultural uses. All undeveloped parcels will continue to be owned by the developer. We plan to continue using the agriculture space, together with adjacent property owned by our family, for cattle grazing and related agriculture uses. In total, Cherry Canyon Ranch has over 5,500 acres of rangeland and pasture, including an interest in 3,800 acres of an adjacent range company. TRS lot owners will have recreational access to the existing private trail system located on Ranch property. The trail system is addressed in #17.3 below.

3. **Setbacks**: The minimum setback around the exterior boundary of an MPD shall match the setbacks of the more restrictive/larger abutting zone setback. In some cases, that setback may be increased to create an adequate buffer to adjacent uses.

The TRS complies with the County setback requirements for the AG10 and AG20 Zone (code:11-3-4,5). There are no floodplains or wetlands within the development, and no other natural features are impacted by the location of the lots that would require additional setbacks.

4. **Building Height**: The maximum building height for all structures within a master planned development shall not exceed the zone standard.

The TRS will comply with the maximum building height requirement of 32 feet (code:11-3-4,5).

5. **Reduction of Minimum Lot Size Requirements**: The County Council may reduce the minimum lot size specified in a zone if it finds the proposed decrease in minimum lot size improves the site design, clustering of buildings, and/or preservation of agricultural land or open space.

We are not requesting a reduction of the minimum lot size. All lots in the TRS meet the minimum one acre lot size requirement for the AG10 and AG20 zones (code:11-3-4,5). The smallest lot is 1.14 acres, and the largest lot is 5.12 acres. The average lot size is 2.07 acres.
6. Open Space: Master planned developments shall provide for open space of at least ten percent (10%) of the site area.

The TRS sets aside 248.26 acres as permanently restricted agriculture open space, which equals 74% of the total acreage of the development and is 162% larger than required for the density bonus. All undeveloped parcels will continue to be owned by the developer, with access provided to lot owners for the use of the private trail system on the Ranch. See the Subdivision Plat submitted with this application and # 2 above for further explanation of Open Space uses.

7. Off-Street Parking: Master planned developments shall meet the following off-street parking standards: 2 spaces per single family dwelling unit.

The CC&R’s and Plat Note will require each home to have a minimum two car garage and outdoor parking space for at least three vehicles. With a large average lot size of two acres, there will be more than adequate room for additional parking. There are no parking lots in the proposed development.

8. Designing with The Topography: Master planned developments shall be designed to fit into the topography of the site. The County Council may consider flexibility in the siting of development so as to best fit into the natural terrain, minimize excessive site grading and mitigate impacts on the natural environment and resources of the surrounding area. The project design shall demonstrate the preservation of watercourses, drainage areas, wooded areas, rough terrain and similar natural features and areas.

The road system and lots in the TRS are laid out so as to follow natural grades and contours as much as possible. Most of the subdivision roads will follow existing dirt roads, which will minimize the required amount of new cut and fill. We have been working closely with County Engineering staff to ensure the project is properly designed. All roads will meet County grade requirements. The development avoids all sensitive areas, including ridgelines, wetlands, watercourses, floodplains and steep slopes. Each lot has plenty of area to locate a
homesite where slopes are under 30% (see slope map). Each lot has been located so that County driveway standards can be met from finished road elevations. See the Site Improvements Plan included with this application.

9. **Designing with Adjacent Uses**: The master planned development plan shall take adjacent land uses into consideration. Development along the project perimeter shall adequately mitigate any potentially adverse effects, including but not limited to flooding, erosion, subsidence, sloping of the soil or other dangers and nuisances.

The TRS is located adjacent to several small Cherry Canyon subdivisions and agriculture lands used for cattle grazing. The adjacent residential lots are of similar size and quality as the proposed lots. Prior to submitting our plans with the County, we invited the homeowners that belong to the Cherry Canyon HOA to review our plans and share their input and concerns. The HOA is responsible for road maintenance, snow removal and the private water systems serving the existing lots in Cherry Canyon (totaling 17). The homeowners overall impression was positive, although the following two concerns were raised:

1. **Water**: Their primary concern was the impact that the TRS would have on their water supply. The Cherry Canyon HOA maintains three separate private water systems using three wells (#'s 1-3 on map below). These systems provide both culinary and secondary water. There have been several instances over the past few summers where two of the wells (#s 2&3) have not recharged fast enough to meet system demand. This issue was overcome by rotating landscape water days between lots and cutting back on landscape watering during peak usage.

The TRS will get its water for culinary and fire protection from an existing well (#6 on the map below) located 0.64 miles East of the closest HOA well. The TRS well and associated water rights have been approved by the Utah State Engineer. Secondary water for the TRS will come from outside Cherry Canyon via an irrigation company. The HOA water concerns are mitigated as follows: 1) The significant distance (nearly 2/3 of a mile) between the HOA wells and the TRS well reduces any potential impact. 2) The TRS well will only be used for culinary and fire water storage, thus significantly reducing peak demand. 3) The existing irrigation supply for
the two homes using wells 5 and 6 will be switched over to the TRS irrigation system, thus removing approximately 18 AF of peak demand from those two wells and therefore reducing any potential impact on the HOA wells. 4) The HOA owners have the option to switch over their irrigation from the HOA wells to the TRS irrigation system. This would significantly reduce the peak demand on the HOA wells. Note: Well #4 was completed last year for a new home on that parcel. This well is restricted to a maximum usage of 2 AF of water. More information on the TRS water system is provided in #16 below.

2. Cherry Canyon Drive: The HOA members were concerned about the width of Cherry Canyon Drive from Old Lincoln Hwy to the entrance to TRS. The current road pavement in that area is typically 18 feet wide. To mitigate their concerns, we have agreed to widen the pavement in that area to 20 feet. The County Engineer also suggested this improvement.

Prior to submitting this updated application to the County, we provided a draft to the Cherry Canyon HOA trustees and requested their input and concerns. They did not express any concerns with our proposed mitigation of these issues.

Regarding adjacent ag uses, the standard note on the subdivision plat will emphasize that the proposed lots are adjacent to active agricultural operations and that lot owners understand and accept those conditions (see Plat Note on #16 below). We have found with the existing homeowners in Cherry Canyon, that most of the people moving to our area actually come because they like the agricultural setting and understand that there may be some related inconveniences.

In order to mitigate any potential flooding or erosion issues, a storm water collection and mitigation plan has been integrated into the site design, and all grading will be properly revegetated according to County standards. See the Storm Water Management Report included with this application.

10. Access: All master planned developments shall have vehicular access from a public road. All projects shall have a secondary point of access/emergency access unless otherwise mitigated to the satisfaction of the County Engineer and/or Fire Marshal. All roads/streets shall follow the natural contours of the site wherever possible to minimize the amount of grading.

The TRS has vehicular access from Old Lincoln Highway via Cherry Canyon Drive, a private road. A deeded right of way will be recorded for the subdivision. Secondary emergency access is provided via Elk Hollow Drive. The Fire Marshal and the County Engineer have stated that the proposed design is acceptable. The subdivision roads are designed to follow existing contours and will be 20 feet wide with a two-foot shoulder. All roads and turnarounds will meet North Summit Fire District requirements and County grade requirements. Snow removal and maintenance of subdivision roads will be managed by the HOA. See access map below.
11. **Utilities**: Existing or proposed utilities, including private and public services for master planned developments will be adequate to support the proposed project at normal service levels and will be designed in a manner to avoid adverse impacts on adjacent land uses, public services, and utility resources. Unless otherwise permitted by this chapter, all master planned developments shall comply with all requisite infrastructure standards found in chapter 6 of this title.

The proposed subdivision will be served by the following utilities: Rocky Mountain Power and Dominion Energy will provide underground electric and gas. All West Communications will provide telecom, plus there are several other broadband providers available. These utilities will provide will-serve letters for the project. Culinary and secondary water providers are discussed in #16 below.

**Infrastructure Standards, Chapter 6:**

*Fire Protection Standards*: The TRS is located in the Wildland Urban Interface Zone and has been inspected by Fire Marshall Boyer. A Fire Hazard Severity rating score of 43 was given to the development, which ranks it as below a Moderate Hazard (50-75 score). The Fire Marshall Letter and Rating Form is included with this application.

*Wildfire Hazard Guidelines*: The TRS will be served by the North Summit Fire station in Wanship, which is 1.2 miles away. The North Summit Fire District has reviewed and approved the fire protection plan for the subdivision which includes 60,000 gallons of reserve capacity in a 115,000 gallon concrete storage tank. Fire hydrants will be located within 500 feet of each homesite. Homes that meet this criteria will not be required to have fire suppression sprinklers installed. The CC&Rs and a Plat Note will require maintenance...
of a 50-foot defensible space around each home. See the Fire Protection Plan submitted with this application.

**Road Standards:** All roads in the TRS will be built to County standards for a private road, and will have a 20’ paved surface with two foot shoulders. For more information, see the Site Improvements Plan included with this application.

**Road Grades:** All subdivision roads will meet County road grade standards for a private road. For more information, see the Site Improvements Plan included with this application.

**Intersections:** All private road intersections will be designed to meet grade and turn angle standards set by the County.

**Turnaround / Cul-de-Sacs:** All private roads that dead end will have a Cul-de-Sac or hammerhead that has been approved by the North Summit Fire District.

**Bridges and Culverts:** There are no bridges located in the proposed subdivision. All culverts have been designed and approved according to County standards. For more information, see the Site Improvements Plan included with this application. Culverts required as part of new home construction will be approved with the home construction plans.

**Driveway Access:** All driveways in the proposed subdivision will be built to County standards for grade and width. Each lot has been located so that County driveway standards can be met from finished road elevations. For more information, see the Site Improvements Plan included with this application.

**Irrigation Ditch Easements:** There are no irrigation ditches located in the proposed subdivision.

**Water Storage for Firefighting Purposes:** The North Summit Fire District has reviewed and approved the fire protection plan for the subdivision which includes 60,000 gallons of reserve capacity in a 115,000 gallon concrete storage tank. The water tank and water distribution system design has been submitted with this application.

**Revised Standards Applicable:** The proposed development is subject to general engineering standards and ordinances which are in effect at the time the application is submitted for review and approval by the County.

12. **Building Locations:** All buildings shall be located to avoid, to the extent practicable, wetlands, riparian areas, steep slopes and ridgelines. Building locations and associated lot configurations should be oriented to encourage active and passive solar design principles wherever practicable.

There are no ridgelines, riparian areas or wetlands located in the development area. The CC&R’s and County code will not permit homes to be located where slopes exceed 30%. Each lot is located and sized so that there is more than adequate area to locate a home in a buildable area. The CC&R’s and Plat Note will also
require home designs to include passive solar features that take advantage of the building's site, climate, and materials to minimize energy use. Every lot in the TRS is located so as to include opportunities for passive solar features.

13. Connectivity: Internal and external vehicular/pedestrian/bicycle circulation should be demonstrated at the time of application as deemed necessary by the County Council. Pedestrian/equestrian/bicycle circulation should be separated from vehicular circulation wherever reasonable.

Because this is a small rural subdivision, bike lanes and sidewalks are not included in the road design. The low volume of traffic generated by the development, and wide paved roads and shoulders make Pedestrian/equestrian/bicycle circulation safe on the roads. In addition, there will be a three foot wide single track trail alongside the main subdivision roads. The trail surface will be road-base material which is typically better for equestrian use. This trail system can also be used for pedestrian and bicycle access, and will connect to the existing Cherry Canyon trail system and the Rail Trail via Old Lincoln Hwy (see map right, and the Trail Map on #17.3). Utilizing the paved roads and trail system access, the TRS provides excellent internal and external circulation for all modes of transportation.

14. Snow Storage: Master planned developments shall include adequate areas for snow removal and snow storage. An appropriate form of landscaping plan shall allow for snow storage areas. Structures shall be set back from any hard surfaces so as to provide adequate areas to remove and store snow. The assumption is that snow should be able to be stored on site and not removed to an off-site location.

With the large lot sizes (two acre average) and 60 foot wide road easements, there is ample room for snow storage on site. There are no parking lots or other public areas that will require additional snow storage capacity.

15. Outdoor Lighting: All outdoor lighting shall be down directed and fully shielded. All outdoor lighting shall be designed and installed to prevent light trespass on adjacent properties. Lighting of the United States flag is exempt from this provision.

The TRS will comply with the County Lighting Ordinances.
16. Compliance with Development Evaluation Standards: Unless otherwise permitted by this chapter, all master planned developments shall comply with all requisite development evaluation standards found in chapter 2 of this title.

Development Evaluation Standards, Chapter 2:

**Agriculture Plat Notes:** The following note shall be placed on the Plat prior to recordation: The owners of property within Eastern Summit County recognize the importance of agricultural lands and operations and small rural business enterprises. It is recognized that agricultural lands and operations and rural business enterprises have unique operating characteristics that must be respected. (Owners of each lot platted in this subdivision/the owner of the residence constructed upon this lot) have/has been given notice and recognizes that there are active agriculture lands and operations and rural business enterprises within Eastern Summit County and acknowledges and accepts that, so long as such lands and operations exist, there may be dust, noise, odor, prolonged work hours, use of roadways for the purposes of herding/moving animals, and other attributes associated with normal agricultural operations and rural businesses.

**Fencing:** Subdivision livestock fences shall be wildlife friendly. This will be stated on a Plat Note.

**Preservation of Agricultural Land:** A total of 248.26 acres, equal to 74% of the development, will be permanently set aside as agricultural lands which will be owned by the developer. We plan to continue using the ag space, together with adjacent property owned by our family, for cattle grazing and related ag uses. In total, Cherry Canyon Ranch has over 5,500 acres of rangeland and pasture, including an interest in 3,800 acres of an adjacent range company. TRS lot owners will have recreational access to the private trail system located on Ranch property.

**Irrigation Patterns and Systems:** The proposed subdivision does not affect any existing irrigation systems, and there is no irrigated property in the development area.

**Water, Indoor Uses:** Water for indoor use and fire protection will be provided by a Public Water Company (PWC) that will be operated by the HOA. The well for the PWC has been completed and flow tested according to State regulations. The water quality has also been tested and meets state standards. Sufficient water rights for 30 lots have been approved for the well by the State Engineer as water right number 35-12468, totaling 18 AF. Each home is required by the state to have 0.45 AF for indoor uses, for a total of 13.5 AF (0.45 x 30). The engineering design for the water system has been completed and the
Construction Plan Approval Request has been submitted to the State for approval. See PWS information and Site Plan submitted with this application. Water for each home will be metered, and a tiered rate plan will be used to encourage conservation. Water meters will provide detailed information on water usage for each lot.

**Water, Secondary:** Secondary water for outdoor uses will be provided by Elkhorn Irrigation, a non-profit irrigation company. This water will be provided through the North Summit Pressurized Irrigation waterline using water right number 35-12963 for 60 AF. Each lot will be limited to a maximum 0.18 acres of irrigated landscape, which is the equivalent of 0.55 AF per lot, for a total of 16.5 AF (0.55 x 30). Each lot will be metered, and a tiered rate plan will be used to encourage conservation. Water meters will provide detailed information on water usage for each lot. The CC&R’s will require that native vegetation be maintained on the remainder of the lot.

**Wastewater:** Wastewater for the TRS will be treated using an effluent sewer system as approved by the State DWQ and the County Council. An effluent treatment system has proved very effective and has been used in communities for many years. Each home in the subdivision would have a precast concrete septic tank where solids are passively digested in the same manner as a typical septic system. Rather than dispersing the effluent through a drain field on the lot, it is transported through small diameter pressure mains to a central treatment system for the development. These systems are much more energy efficient and are less expensive to maintain than standard sewer treatment facilities. They are also much less likely to leak contaminants into the groundwater between the home and the treatment facility. For more information, see the LUWS Feasibility Report submitted with this application.

**Erosion:** All grading shall be completed and revegetated according to County standards. For more information, see the Site Improvements Plan included with this application.

**Highly Visible Home Placement:** The proposed subdivision is set back a half mile on the East Wanship bench where the homes will be minimally visible from below. The CC&R’s will require exterior colors that blend in with the natural surroundings, which will further reduce visibility. See the white arrows on the photo below pointing to existing homes with similar color restrictions. This demonstrates the effectiveness of using natural colors to reduce visibility.
100 Year Floodplain: The development is not located in the floodplain.

Wetlands: The development is not located on wetlands.

Slopes: There are adequate development areas outside of 30% slopes (see slope map with # 8 above).

Ridgetops: No homesites extend into the skyline.

Air Quality: All County regulations will be followed. Woodburning fireplaces and stoves will not be permitted per the CC&R’s and a Plat Note.

Traffic Volume: The addition of 30 lots will not cause traffic volume on Old Lincoln Highway to increase above design capacity.

Fire Hazard: The North Summit Fire District has approved the fire protection plan for the proposed subdivision.

Remote Locations: The proposed subdivision is not in a remote location.
**Locked Gate:** It is anticipated that the proposed subdivision will have an automatic gate for at least the early construction period of the development. All emergency services will be provided access.

**17. Site Design Narrative:** An application for a master planned development shall include a written explanation of how the project plan addresses the following design questions:

a. **Neighborhood Connectivity:** How does the proposed development interconnect with the surrounding properties, neighborhood, and area? Including but not limited to:

(1) **Where will vehicles enter and exit the site?**

The proposed subdivision has vehicular access from Old Lincoln Highway via Cherry Canyon Drive. Secondary emergency access is provided via Elk Hollow Drive. See Access Map with #10 above.

The subdivision is approximately one mile from the Old Lincoln Highway, a County maintained road just East of Wanship. Cherry Canyon Drive, the private road that will provide access to the subdivision, also serves four other existing subdivisions with a total of 20 residential lots. Cherry Canyon Drive is only 1.4 miles from the Wanship entrance to Interstate 80, giving residents of the subdivision excellent access to the Coalville, Park City and Salt Lake City areas.

(2) **Where will new streets be developed?**

See Subdivision Plat and Site Improvements Plan submitted with application. Also see Access Map with #10 above and Slope Map with #8 above.

(3) **Is there a need for pedestrian and bicycle routes (including trails and sidewalks) through the project area? If so, how are such needs addressed?**

Because this is a small rural subdivision, bike lanes and sidewalks are not included in the road design. However, there will be a single track trail along the main subdivision roads. This trail system will be used for foot, horseback and bicycle access, and will connect to the existing Cherry Canyon Ranch trail system that also provides access to the Old Lincoln Highway. From there it is only a half-mile to the Weber River and the Rail Trail, which runs from Park City to Coalville (see Trail Map below). The HOA has a use agreement with Cherry Canyon Ranch for trails on ranch.
property. This is a private trail system that includes both single track and double track trails that have been significantly expanded and improved over the past 20 years, and provides excellent opportunities to enjoy the beautiful surroundings in Cherry Canyon. The homeowners in the TRS will have the same access to this trail system through the HOA.

b. Availability of Neighborhood Facilities and Services: Is the location of the proposed development within reasonable proximity (including walking and biking) to community facilities such as schools, retail centers, parks, etc.?

As is typical in a rural area like Eastern Summit County, most residents expect to drive some distance to get to retail centers, schools and other public facilities. Indeed, most residents prefer to be away from the traffic and crowds associated with successful retail centers. This is why the small town feel of the Wanship area is a major draw for many of its residents. The proposed subdivision is ideally located near the Wanship entrance to I-80, providing quick access to public schools and shopping in Coalville, as well as an exceptional variety of retail and recreational opportunities just 12 minutes away in the Silver Creek and Kimball’s Junction areas. In addition, the North Summit School District provides school bus service to the entrance of Cherry Canyon. For those who prefer to walk or bike, the Cherry Canyon trail system provides easy access to the Rail Trail, which leads to Park City and Coalville.
c. Meeting Housing Needs: How does the proposed development advance the community need for a mix of housing types and affordability?

The TRS consists of 30 single-family residential lots, ranging in size from just over one acre to more than five acres. This mix of lot size and location will offer a good range of lot pricing, and because the TRS is not designed as a resort community with all of the associated facilities, the HOA assessments and other use fees will make the housing more affordable. The home prices will also be more affordable because the high capital costs of amenities like golf courses and club houses will not be included in this project. The subdivision is zoned for single family housing in the 10 and 20 acre zones, which limits the ability to offer lower cost housing found in a high density setting. We are essentially proposing the most affordable housing that we can within the zoning, infrastructure and design constraints established by the development code.

d. Character: What are the architectural design character objectives of the proposed development? How do these design objectives address the local context, climate, and/or community needs?

The TRS will include CC&R's that require exterior colors and building materials that will blend in with the natural surroundings. White exteriors and fencing will not be permitted. This will help the project blend in and complement its surroundings (see Lot Visibility and Street Layout exhibits on #16 above). In addition, exterior lighting must be shielded so as to minimize glare and illumination of adjacent property.

The CC&R’s will also require home designs to include passive solar features that take advantage of the building's site, climate, and materials to minimize energy use. Every lot in the TRS is located so as to include opportunities for passive solar features.

As part of our previous development in Cherry Canyon, we have refurbished and improved the agriculture buildings and pasture located at the entrance to Cherry Canyon Drive, all of which are now actively used as part of the ranch. We plan to install new fencing and landscaping at the entrance to the TRS on Trail Ridge Drive, which will further enhance the visual appeal of the development.
e. **Site Design**: How is the proposed development designed to take advantage of the existing topography, landscape features, trees, wildlife corridors, existing structures, minimize site grading, etc.?

The road system and lots in the proposed subdivision are laid out so as to follow natural grades and contours as much as possible. Most of the subdivision roads will follow existing dirt roads, which will minimize the required amount of new cut and fill. The development avoids all sensitive areas, including ridgelines, wetlands, watercourses, floodplains and steep slopes. All subdivision interior fencing will be wildlife friendly. There are no existing structures in the development. The proposed lots are set back on the East Wanship bench, thus providing a buffer between the pastures and river bottom of the Weber River valley below. Also see Access Map #10 above, the Slope Map on #8 and the Site Improvements Plan included with this application.

f. **Complete Street Design**: How is the proposed development street/circulation system designed to accommodate a variety of transportation modes (where appropriate), easy route finding, and safe speeds?

See #3 above for street design and layout. All subdivision roads will have street name signs safety related signs and speed limit signs. The maximum speed limit for subdivision roads will be 25 MPH.

g. **Parking Areas**: How does the proposed development balance the need for parking with the need to design parking areas in a manner that minimize visibility, site grading, and exterior lighting?

There will be no need for other parking areas because there will only be residential uses in the proposed subdivision, and each home will be required to have a minimum of a two car garage and exterior space to park three cars.

h. **Public and Private Outdoor Spaces**: What are the proposed development’s need(s) for outdoor space, open space, habitat/wildlife areas, parks, or outdoor amenity areas? How does the proposed development address these needs?

The TRS is adjacent to the Cherry Canyon Ranch, which is an active agricultural operation. The Ranch allows TRS homeowners access to trails on the property for hiking, biking and horseback riding. The subdivision also has excellent access to the Rail Trail, Rockport and Echo Reservoirs, and numerous other recreational activities in the surrounding area.

The TRS sets aside 74% of its total acreage as permanent agriculture land which will not be used for future development. The large lots, averaging two acres in size, will also provide an open feel to the community.
Together, the trail system, open space and large lots give homeowners abundant outdoor space to enjoy, while also preserving plenty of room for wildlife.

As we reviewed our plans with the current HOA members, we also surveyed their interest in adding new amenities to the area. These included a tennis / pickle ball court, basketball / sport court, playground / park, pool / spa, and a horse riding arena (both covered and uncovered). There was no interest in any of these amenities, except for a couple of owners who thought the riding arena may be nice. The general feeling that we received from the owners was that they did not want to be part of a recreational development like Promontory Ranch where the HOA and recreation fees are very high. More importantly they do not want to be part of a second home community, which is what those developments tend to be. They loved the fact that nearly all of their neighbors are full time residents with whom they can associate on a regular basis. They feel like they already live in a park with ample wildlife and room to roam right out of their back door. We have also received similar input from people who have inquired about lot availability in Cherry Canyon, which is why we have designed the TRS to have an attractive rural community feel. This is also compatible with the theme of the General Plan.

**i. External Storage:** How does the proposed project address needs for garbage collection, equipment storage, etc.?

Garbage and recycle dumpsters for resident use are located at the bottom of Cherry Canyon Drive. Mailboxes are also located in this area. An easement for these uses will be included in the access ROW. The CC&R’s and Plat Note will only allow each lot to have one recreation vehicle, including a boat, to be parked outside of a garage. This vehicle must also be in working order and with good exterior condition. All other equipment must be stored inside a garage or off site. Carports and other similar open structures are not permitted.

**Additional reports submitted with this application:**

- Subdivision Plat
- Site Improvements Plan
- Storm Water Management Report
- Fire Marshall Letter and Rating Form
- Fire Protection Plan
- LUWS Feasibility Report
- PWS Documents
Exhibit A

Trail Ridge Subdivision
Density and Open Space Calculation

Introduction: We propose setting aside all of Parcel "C" on the subdivision plat, totaling 248.26 acres, as deed restricted Agriculture Space. This will result in 74% of the total subdivision area being permanent agriculture open space. See below for all calculations.

Parcel "C" is located in the AG-10 and AG-20 zones. The Open Space calculation for 30 lots requires 153 acres of open space, of which a minimum of 50% or 77 acres must be developable land.

We have completed the slope map for the parcel, and reviewed for other undevelopable areas, and have calculated a total of 88 acres of developable land in Parcel C.

Subdivision Zoning and Density

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<tr>
<th>Zone</th>
<th>Acres</th>
<th>Lots</th>
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<tr>
<td>AG 10</td>
<td>182.79</td>
<td>18.279</td>
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<tr>
<td>AG 20</td>
<td>154.38</td>
<td>7.719</td>
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<tr>
<td>Total Acres</td>
<td>337.17</td>
<td>25.998</td>
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</table>

Combined Zone Density: 12.97 \( \frac{337.17}{25.998} \)

MPD Open Space Formula: \( OS = Z \times L - 0.7 \times A \)

Open Space Calculations:

Total Proposed Lots: 30 from "12.97 Zone"
Total Required Open Space 153 \( (12.97 \times 30 - (0.7 \times 337.17)) \)

Total Proposed Open Space 248 162% of Required Open Space

Minimum acres of developable land: 77 \( (153 \times 0.50) \)
Actual acres of developable land: 88 115% of requirement

Open space as a percentage of total Subdivision acreage: 74% \( \frac{248.26}{337.17} \)
Large Underground Wastewater System
Feasibility Report

Trail Ridge Subdivision
Summit County, Utah

Date: September, 2019
to 5.20.20

Project No. 18008

Prepared By: Canyon Engineering
Park City, Utah
# Table of Contents

Large Underground Wastewater System  
Trail Ridge Subdivision  
Summit County, Utah

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**EXECUTIVE SUMMARY**

**PROJECT DESCRIPTION**

**OVERVIEW MAP**

**CONCEPT PLAN**

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**SOIL EVALUATION AND PERC DATA**

**FEMA FLOODPLAIN MAP**

**BODY POLITIC**

**UTAH DEQ RULE R317-5**

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Under Separate Cover:

Hydrologic Study dated October 30, 2019, prepared by Cascade Water Resources
Executive Summary

Large Underground Wastewater System
Trail Ridge Subdivision
Summit County, Utah

Based on site reconnaissance, research, site engineering, and soil evaluations / perc tests we performed, and with reference to the checklist below, the information contained herein, and the Cascade Water Resources Hydrologic Study, we conclude that a Large Underground Wastewater System to serve the proposed Trail Ridge residential subdivision is eminently feasible on the site under study.

FEASIBILITY CHECKLIST

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<th>Design Code Requirements</th>
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<td>Absorption Area</td>
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Trail Ridge Subdivision is a proposed residential development located about 1.5 miles north of Wanship Dam, just south of Cherry Canyon. Based on discussions with Summit County subsequent to filing of the Master Planned Development application, the proposed development plan now depicts 30 lots, with the potential for future development east of the site.

The proposed large underground wastewater system (LUWS) is located immediately west of proposed home sites on the south end of parcel ID no. NS-227. This parcel comprises the NE 1/4 of the NW 1/4 of S 21 T1N R5E. The site is not encumbered by the regulatory floodplain. See FEMA Floodplain Map included herein.

The existing sanitary sewer main closest to the project is an 8-inch diameter main located on Hoytsville Road in Coalville, some 500 feet south of 630 South. This point is 5.9 miles (straight line distance) north of the intersection of East Wanship Road and Cherry Canyon Drive. This sewer is owned and maintained by Coalville City. The subject property is not located within the Coalville City service boundary.

There are no existing or proposed public water supplies or PWS protection zones within 1,500 feet of the proposed absorption area. See drawing entitled "Overview Plan" herein.

The water supply for the subdivision would be provided via the existing well (WIN 30481) located well east and upgradient of the 1,500-foot perimeter. For more information, see the accompanying Hydrologic Study completed by Cascade Water Resources dated October 30, 2019.

Based on soil evaluations and perc tests we performed, and the hydrologic study referenced above, soils are well suited for disposal of domestic wastewater.

With reference to R317-5-1.3.A., there are no constraints that dictate inclusion of secondary wastewater treatment prior to dispersal. Total design flow is under 15,000 gallons per day (12,000 GPD) and actual flow, which will be metered, will be less than 12,000 GPD. Further, all requirements contained in R317-4 for absorption area sizing, setbacks, offset to groundwater, ground slope and perc rate can be met. That said, the developer has opted to include secondary treatment to further enhance groundwater protection.

Disposal will be via pressure distribution to deep wall trenches, extending to 5-foot effective depth, leaving four or more feet of mineral soil below bottom trench elevations. Based on observations at bottom of soil evaluation pits, we expect that such mineral soils extend significantly deeper still.

See drawings entitled "Overview Map" and "Concept Plan" included herein.
EXHIBIT C.6

ABSORPTION AREA SIZE

1. Design based on State of Utah TDC Requirements for Large Underground Wastewater Systems, except as follows:
   SECONDARY TREATMENT SIZE REQUIRED BY CODE, OWNER CHOOSES TO ADD SECONDARY TREATMENT TO FURTHER MINIMIZE OVERGROUND PROTECTION.

2. OVERALL AREA SIZE:
   • RESIDENCE PROPERTIES = 50
   • TOTAL AVERAGE DAILY FLOW = 30 x 400 = 12,000 GPD
   • LEAKING AREA: (5 ft. 3 in. x 5 ft. 3 in.) x (5 ft. 3 in. x 5 ft. 3 in.) = 15000
   • DESIGN FLOW RATE = 15 GPM PER INCH
   • HYDRAULIC LOSSE= 0.775' DEEP: (91.7% x 5, Table 8-1.5 = 21.75' RISE) x 7.7' INVERT = 7.7' DEEP
   • REDUCTION FOR SECONDARY TREATMENT = 0 MQ
   • TRENCH USAGE REQUIRED = (12.5' DEEP x 12.5' DEEP x 21.75') = 1.71 ENF.

3. Trench Arrangement: 3 trenches (2) arrays, each containing 3 trenches (2) 12' pit trenches x 1.1:100 (2) 1:100, 3 trenches (2) 12' pit trenches x 1.1:100 (2) 1:100, 3 trenches (2) 12' pit trenches x 1.1:100 (2) 1:100, 3 trenches (2) 12' pit trenches x 1.1:100 (2) 1:100, 3 trenches (2) 12' pit trenches x 1.1:100 (2) 1:100

4. WALLS OUT LAY Trenches INFILL = 1.5'
SOIL EVALUATION AND PERC DATA
# SOIL EVALUATION LOG

**Client:** Brett Hollberg  
**PLS Grid Location:** S21 T1N R5E  
**Tax ID No:** NS-227  
**Conducted By:** Gus Sharry, PE  
**Witness:** Rocky Pace, Robert Beers  
**Contractor / Equip:** Brett Hollberg mini-ex  
**No. & Location**

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<th>No. &amp; Location</th>
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**ABBREVIATIONS**
- RTH: rubber tire backhoe; EXC: track excavator; DEH: Dept of Environmental Health; ESHGW: estimated seasonal high groundwater; OGW: observed groundwater; GW: groundwater; BG: below grade; P: pebbles; C: cobbles; B: boulders; FR: fractured rock; LD: largest dimension; POC: pockets;

**TEXTURE**
- S: sand; CS: coarse sand; LS: loamy sand; SL: sandy loam; MSL: medium sandy loam; FSL: fine sandy loam; L: loam; SIL: silt loam; FSC: fine sandy clay; CL: clay; SC: sandy clay;

**STRUCTURE**
- M: massive; PL: platy; BL: blocky; PR: prismatic; SG: single grain; RL: restrictive layer;

**CONSISTENCE**
- LS: loose; GR: granular; DH: dry, hard; DVFI: dry, very firm; DFI: dry, firm; DFR: dry, friable; MVFI: moist, very firm; MFI: moist, firm; MFR: moist, friable; CM: cemented; W: wet;

**MOTTLES**
- abundance: F: few (<2% soil surface); C: common (2-20% soil surface); M: many (>20% soil surface)  
- size: F: fine (<5mm); M: medium (5-15mm); C: coarse (>15mm)  
- contrast: F: faint; D: distinct; P: prominent
### Soil Evaluation Log

**Client:** Brett Hollberg  
**PLS Grid Location:** S21 T1N R5E  
**Tax ID No.:** NS-227  
**Property Address:** none assigned  
**Conducted By:** Gus Sharry, PE  
**UT On-site Prof. No.:** 00422-OSP-3  
**Witness:** Rocky Pace, Robert Beers  
**Contractor / Equip:** Brett Hollberg  
**Job No.:** 18008  
**Date:** 7/25-7/26/19  
**Weather:** clear  

#### No. & Location

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- mottling: no  
- OGW: no  
- ESHGW: no  
- refusal: no  

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#### Abbreviations
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- MFR: moist, friable  
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- W: wet  

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- abundance: F-few (<2% soil surface); C-common (2-20% soil surface); M-many (>20% soil surface)  
- size: F-fine (<5mm); M-medium (5-15mm); C-coarse (>15mm)  
- contrast: F-faint; D-distinct; P-prominent
PERC TEST CERTIFICATE

CANYON ENGINEERING
PO Box 982131, Park City, UT  84098

Owner: Brett Hollberg
PLS Grid Location: S21 T1N R5E
Tax ID No. NS-227
Property Address: none assigned
Conducted By: Gus Sharry, PE
UT On-site Prof. No. 00422-OSP-3
Witnessed By: Rocky Pace, Robert Beers
Job No. 18008
Weather: clear

No. & Location
719-A

Date 7/25/19

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Date 7/26/19

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first 12-inch drop > 10 minutes; hold water over gravel at least 4 hours; 16 to 30-hour swell required

perc rate: 0:13
(rate in hours : minutes per inch)

ACCEPTABLE PERC RATE RANGES

conventional systems 1 to 60 MPI
alternative systems 1 to 120 MPI

Certified in conformance with
Utah Administrative Code section R317-4, Appendix D, and local Health Dept rules

NOTES

[1] An acceptable perc rate does not guarantee buildability of land. On-site wastewater system designs must meet state and local code requirements for absorption area location, size and type, slope distance, depth to seasonal high groundwater and bedrock, depth of parent soil, setbacks to property lines and physical constraints, and other requirements. A site exhibiting a perc rate between 1 and 60 MPI may require an alternative system if other conventional system design requirements cannot be met.

[2] All depths and drops are in inches. Times indicated in tables are in hours:minutes:seconds.

ABBREVIATIONS

RTH-rubber tire backhoe; EXC-track excavator; BOH-Board of Health; ESHGW-estimated seasonal high groundwater; OGW-observed groundwater; GW-groundwater; BG-below grade; MPI-minutes per inch; IN-inches; MIN-minutes; RL-restrictive layer
## PERC TEST CERTIFICATE

**Owner:** Brett Hollberg  
**PLS Grid Location:** S21 T1N R5E  
**Tax ID No.:** NS-227  
**Property Address:** none assigned  
**Conducted By:** Gus Sharry, PE  
**UT On-site Prof. No.:** 00422-OSP-3  
**Witnessed By:** Rocky Pace, Robert Beers  
**Job No.:** 18008  
**Weather:** clear

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First 12-inch drop > 10 minutes; hold water over gravel at least 4 hours; 16 to 30-hour swell required.

### Date 7/26/19

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perc rate: 0:10

(rate in hours : minutes per inch)

**ACCEPTABLE PERC RATE RANGES**

- conventional systems: 1 to 60 MPI
- alternative systems: 1 to 120 MPI

Certified in conformance with Utah Administrative Code section R317-4, Appendix D, and local Health Dept rules

### NOTES

1. An acceptable perc rate does not guarantee buildability of land. On-site wastewater system designs must meet state and local code requirements for absorption area location, size and type, slope distance, depth to seasonal high groundwater and bedrock, depth of parent soil, setbacks to property lines and physical constraints, and other requirements. A site exhibiting a perc rate between 1 and 60 MPI may require an alternative system if other conventional system design requirements cannot be met.

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- BOH-Board of Health
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- OGW-observed groundwater
- GW-groundwater
- BG-below grade
- MPI-minutes per inch
- IN-inches
- MIN-minutes
- RL-restrictive layer
WELL LOGS (1,500-FOOT OFFSET)
WELLPRT Well Log Information Listing

Version: 2003.09.18.00  Rundate: 10/08/2003 05:36 PM

Utah Division of Water Rights

Water Well Log

LOCATION:
S 1070 ft W, 180 ft from NE CORNER of SECTION 20 T 1N R 5E BASE SL
Elevation: feet

DRILLER ACTIVITIES:
ACTIVITY # 1 WELL REPLACEMENT
DRILLER: Five B Drilling Company LICENSE #: 614
START DATE: 03/06/1992 COMPLETION DATE: 03/22/1992
ACTIVITY # 2 WELL ABANDONMENT
DRILLER: Five B Drilling Company LICENSE #: 614
START DATE: / / COMPLETION DATE: 03/22/1992

BOREHOLE INFORMATION:
Depth(ft)  Diameter(in) Drilling Method  Drilling Fluid
From  To
0   62  6  CABLE

LITHOLOGY:

<table>
<thead>
<tr>
<th>Depth(ft)</th>
<th>Lithologic Description</th>
<th>Color</th>
<th>Rock Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>5</td>
<td>OTHER</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td>CLAY</td>
<td>GRAY</td>
</tr>
<tr>
<td>15</td>
<td>25</td>
<td>SAND,GRAVEL,BOULDERS</td>
<td>GRAY</td>
</tr>
<tr>
<td>25</td>
<td>45</td>
<td>GRAVEL,BOULDERS</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>62</td>
<td>GRAVEL,BOULDERS</td>
<td></td>
</tr>
</tbody>
</table>

WATER LEVEL DATA:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Water Level (feet)</th>
<th>Status (-)above ground</th>
</tr>
</thead>
<tbody>
<tr>
<td>03/22/1992</td>
<td></td>
<td>14.50</td>
<td>STATIC</td>
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</table>

CONSTRUCTION - CASING:

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<tr>
<th>Depth(ft)</th>
<th>Material</th>
<th>Gauge(in)</th>
<th>Diameter(in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>62</td>
<td>.280</td>
<td>6</td>
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CONSTRUCTION - SCREENS/PERFORATIONS:

<table>
<thead>
<tr>
<th>Depth(ft)</th>
<th>Screen(S) or Perforation(P)</th>
<th>Slot/Perf. siz</th>
<th>Screen Diam/Length Perf(in)</th>
<th>Screen Type/# Perf.</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>61</td>
<td>PERFORATION</td>
<td>2.25</td>
<td>4 SHOTS</td>
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CONSTRUCTION - FILTER PACK/ANNULAR SEALS

<table>
<thead>
<tr>
<th>Depth(ft)</th>
<th>Material</th>
<th>Amount</th>
<th>Density(pcf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>18</td>
<td></td>
<td>BENTONITE</td>
</tr>
</tbody>
</table>

WELL TESTS:

<table>
<thead>
<tr>
<th>Date</th>
<th>Test Method</th>
<th>Yield (CFS)</th>
<th>Drawdown (ft)</th>
<th>Time Pumped (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>03/22/1992</td>
<td>PUMP TEST</td>
<td>.045</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

WATER QUALITY DATA AVAILABLE

GENERAL COMMENTS:
*ABANDONED - Old well was abandoned with 15 cu/yds neat cement.
Casing diameter - 24 " depth - 35 ' Completely sealed.
REPLACEMENT - letter is from 1974 with no expiration date. It does not include amended point of diversion. Letter and application indicate new well is 10 feet from old well but doesn't specify which direction.
**Utah Division of Water Rights**

**WELLPRRT Well Log Information Listing**

Version: 2003.09.18.00   Rundate: 10/09/2003 06:00 PM

**Utah Division of Water Rights**

**Water Well Log**

**LOCATION:**

S 1937 ft E  50 ft from NW CORNER of SECTION 21  T  1N  R  5E BASE SL  Elevation:  feet

**DRILLER ACTIVITIES:**

- ACTIVITY # 1  WELL REPLACEMENT
- DRILLER: ZIMMERMAN, MIKE (WELL SERVICE)  LICENSE #: 527
- START DATE: 02/17/1994  COMPLETION DATE:  /  /

**BOREHOLE INFORMATION:**

<table>
<thead>
<tr>
<th>Depth(ft)</th>
<th>Diameter(in)</th>
<th>Drilling Method</th>
<th>Drilling Fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>213</td>
<td>6.00</td>
<td>CABLE TOOL</td>
</tr>
<tr>
<td>213</td>
<td>440</td>
<td>6.00</td>
<td>MUD ROTARY</td>
</tr>
<tr>
<td>440</td>
<td>520</td>
<td>4.00</td>
<td>AIR ROTARY</td>
</tr>
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</table>

**LITHOLOGY:**

<table>
<thead>
<tr>
<th>Depth(ft)</th>
<th>Lithologic Description</th>
<th>Color</th>
<th>Rock Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td>OTHER</td>
<td>FILL</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>COBBLES</td>
<td>RED</td>
</tr>
<tr>
<td>10</td>
<td>13</td>
<td>CLAY,GRAVEL</td>
<td>RED</td>
</tr>
<tr>
<td>13</td>
<td>15</td>
<td>CLAY</td>
<td>RED</td>
</tr>
<tr>
<td>15</td>
<td>33</td>
<td>WATER-BEARING,CLAY,SAND,GRAVEL,COBBLES</td>
<td>RED</td>
</tr>
<tr>
<td>33</td>
<td>61</td>
<td>CLAY,OTHER</td>
<td>RED</td>
</tr>
<tr>
<td>61</td>
<td>65</td>
<td>WATER-BEARING,OTHER</td>
<td>BROWN</td>
</tr>
<tr>
<td>65</td>
<td>69</td>
<td>OTHER</td>
<td>SHALE</td>
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<td>RED</td>
</tr>
<tr>
<td>74</td>
<td>86</td>
<td>OTHER</td>
<td>SHALE/SS</td>
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<tr>
<td>86</td>
<td>88</td>
<td>LOW-PERMEABILITY,CLAY</td>
<td>RED</td>
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<tr>
<td>88</td>
<td>98</td>
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<td>BROWN</td>
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<td>98</td>
<td>100</td>
<td>LOW-PERMEABILITY,CLAY</td>
<td>BLUE/WHITE</td>
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<tr>
<td>100</td>
<td>105</td>
<td>OTHER</td>
<td>RED</td>
</tr>
<tr>
<td>105</td>
<td>135</td>
<td>OTHER</td>
<td>SHALE</td>
</tr>
<tr>
<td>135</td>
<td>210</td>
<td>OTHER</td>
<td>RED</td>
</tr>
<tr>
<td>210</td>
<td>213</td>
<td>OTHER</td>
<td>RED</td>
</tr>
<tr>
<td>213</td>
<td>440</td>
<td>HOLE CAVING, MOVE CABLE RIG OFF ON 3-12-94, MOVE ROTARY ON 3-31-94.</td>
<td>GREEN</td>
</tr>
<tr>
<td>440</td>
<td>496</td>
<td>SANDY SOME GREEN SHALES INTERBEDDED</td>
<td>RED/GREEN</td>
</tr>
<tr>
<td>496</td>
<td>500</td>
<td>OTHER</td>
<td>RED</td>
</tr>
<tr>
<td>500</td>
<td>520</td>
<td>OTHER</td>
<td>RED/GREEN</td>
</tr>
</tbody>
</table>

**CONSTRUCTION - CASING:**

<table>
<thead>
<tr>
<th>Depth(ft)</th>
<th>Material</th>
<th>Gage(in)</th>
<th>Diameter(in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td>A53B</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>56</td>
<td>A53B</td>
<td></td>
</tr>
</tbody>
</table>

**CONSTRUCTION - SCREENS/PERFORATIONS:**

- SCREEN(S) or Perforation(P)  Slot/Perf. siz  Screen Diam/Length Perf(in)  Screen Type/# Perf.
- From  To  54 60  PERFORATION  44 PERFS
### CONSTRUCTION - FILTER PACK/ANNULAR SEALS

<table>
<thead>
<tr>
<th>Depth(ft)</th>
<th>Material</th>
<th>Amount</th>
<th>Density(pcf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>18</td>
<td>BENSEAL</td>
<td></td>
</tr>
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</table>

### WELL TESTS:

<table>
<thead>
<tr>
<th>Date</th>
<th>Test Method</th>
<th>Yield (CFS)</th>
<th>Drawdown (ft)</th>
<th>Time Pumped (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/18/1994</td>
<td>AIR LIFT</td>
<td>.009</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### GENERAL COMMENTS:

CONSTRUCTION INFORMATION:
- Well head configuration: welded cap
- Casing joint type: Weld, threaded
- Perforator used: Torch
- Pump: N/A
- Comments: No data
- Additional data not available
Utah Division of Water Rights

WELLPRT Well Log Information Listing

Version: 2003.09.18.00        Rundate: 10/10/2003 03:18 PM

Utah Division of Water Rights

Water Well Log

LOCATION:
N 3632 ft W 262 ft from SE CORNER of SECTION 20 T 1N R 5E BASE SL Elevation: feet

DRILLER ACTIVITIES:
ACTIVITY # 1 WELL REPLACEMENT
DRILLER: MIDWAY DRILLING LICENSE #: 432
START DATE: 06/09/1987 COMPLETION DATE: 06/12/1987

ACTIVITY # 2 WELL REPLACEMENT
DRILLER: DOXEY DRILLING LICENSE #: 400
START DATE: 10/24/1995 COMPLETION DATE: 10/30/1995

BOREHOLE INFORMATION:

<table>
<thead>
<tr>
<th>Depth(ft)</th>
<th>Diameter(in)</th>
<th>Drilling Method</th>
<th>Drilling Fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>149</td>
<td>8.75</td>
<td>ROTARY TRI CONE WATER/QUICK GEL</td>
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</tbody>
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LITHOLOGY:

<table>
<thead>
<tr>
<th>Depth(ft)</th>
<th>Lithologic Description</th>
<th>Color</th>
<th>Rock Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>30</td>
<td>CLAY,GRAVEL,BOULDERS</td>
<td>DARK BROWN</td>
</tr>
<tr>
<td>30</td>
<td>34</td>
<td>CLAY,GRAVEL,COBBLES</td>
<td>TAN</td>
</tr>
<tr>
<td>34</td>
<td>115</td>
<td>CLAY,GRAVEL,COBBLES,BOULDERS</td>
<td>REDDISH CLAYS</td>
</tr>
<tr>
<td>115</td>
<td>149</td>
<td>WATER-BEARING,HIGH-PERMEABILITY,CLAY,SAND,GRAVEL</td>
<td>TAN CLAYS</td>
</tr>
</tbody>
</table>

WATER LEVEL DATA:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Water Level (feet)</th>
<th>Status</th>
<th>(-)above ground</th>
</tr>
</thead>
</table>

ADDITIONAL DATA AVAILABLE, USE OTHER PRINT OPTION

CONSTRUCTION - SCREENS/PERFORATIONS:

<table>
<thead>
<tr>
<th>Depth(ft)</th>
<th>Screen(S) or Perforation(P)</th>
<th>Slot/Perf. siz</th>
<th>Screen Diam/Length Perf(in)</th>
<th>Screen Type/# Perf.</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>149</td>
<td>PERFORATION</td>
<td>.125</td>
<td>1.25</td>
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CONSTRUCTION - FILTER PACK/ANNULAR SEALS

<table>
<thead>
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<th>Depth(ft)</th>
<th>Material</th>
<th>Amount</th>
<th>Density(pcf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
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</tr>
<tr>
<td>0</td>
<td>29</td>
<td>BAROID HOLE PLUG/CEMEN</td>
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<tr>
<td>29</td>
<td>149</td>
<td>1-1/4 RND WSHD GRAVEL</td>
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WELL TESTS:

<table>
<thead>
<tr>
<th>Date</th>
<th>Test Method</th>
<th>Yield (CFS)</th>
<th>Drawdown (ft)</th>
<th>Time Pumped (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/29/1995</td>
<td>AIR LIFTING</td>
<td>.031</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

GENERAL COMMENTS:

CONSTRUCTION INFORMATION:
Well head configuration: Alu cap w/conduit
Casing joint Type: Solvent Weld
Perforator used: Slots
Access Port: No data
Pump: Sub
Intake Depth: 110 feet
Approx max pump rate: 14
Well disinfected: yes
Additional data not available
*WELL LOG 7-6-1987 FOR REPLACEMENT

BOREHOLE
0 to 139' Diameter: 6 5/8" Method: rotary

WELL LOG
0 to 10' clay, gravel, red
10 to 20' clay, cobbles, cobble rock set in silty clay
20 to 35' clay,
35 to 50' cobbles
50 to 95' clay, boulders, siltstone
95 to 139' gravel, cobbles. Water in this level

WATER LEVELS
Static level: 45' below land surface 6-12-1987

CASING
0 to 139' Gage: .250" Diameter: 6 5/8"
Welded

PERF
Perforator: cutting torch
Size of perforations: 5" x 3/8"
50 perforations from 100' to 139'

CONSTRUCTION
Well gravel packed: yes
Size of gravel: 1/2
Gravel placed from 20' to 139'
Surface seal: yes, 20'
Material: cement grout
Did any strata contain unusable water: no
Surface casing used: no

WELL TESTS
Yield: 25 gpm (tested with air on rig)
Temperature: norm
Additional data not available.
Utah Division of Water Rights

WELLPRT Well Log Information Listing


Utah Division of Water Rights

Water Well Log

LOCATION:

S 500 ft E 1300 ft from NW CORNER of SECTION 21 T 1N R 5E BASE SL Elevation: feet

DRILLER ACTIVITIES:

ACTIVITY # 1 NEW WELL
DRILLER: ZIMMERMAN, MIKE (WELL SERVICE) LICENSE #: 527
START DATE: 06/20/1997 COMPLETION DATE: 06/24/1997

BOREHOLE INFORMATION:

Depth(ft) Diameter(in) Drilling Method Drilling Fluid
From  To
0 27 12.0 AIR ROTARY
27 185 8.00 AIR ROTARY/CSG HMR

LITHOLOGY:

Depth(ft) Lithologic Description Color Rock Type
From  To
0 3 TOP SOIL BROWN
3 6 TAN RED/BROWN
6 126 SAND,GRAVEL BROWN
126 185 OTHER TAN SANDSTONE

126' 1ST WATER
160' 10 GPM
185' 20 GPM

WATER LEVEL DATA:

Date Time Water Level (feet) Status (+) above ground
06/24/1997 122.00 STATIC

CONSTRUCTION - CASING:

Depth(ft) Material Gage(in) Diameter(in)
From  To
-16 145 SDR 17 CERTA LOK 5.00
+1.5 137 A53B .250 8.00

CONSTRUCTION - SCREENS/PERFORATIONS:

Depth(ft) Screen(S) or Perforation(P) Slot/Perf. siz Screen Diam/Length Perf(in) Screen Type/# Perf.
From  To
145 185 PERFORATION .030 40.0 FACTORY

CONSTRUCTION - FILTER PACK/ANNULAR SEALS:

Depth(ft) Material Amount Density(pcf)
From  To
0 27 CS GRANULAR 6 24
135 185 3/8 CRS GRAVEL 30

WELL TESTS:

Date Test Method Yield (CFS) Drawdown (ft) Time Pumped (hrs)
06/23/1997 AIR .045 2

GENERAL COMMENTS:

CONSTRUCTION IFNORAMTION:
Well head configuration: No data
Casing Joint Type: Welded & Certalok
Perforator used: No
Additional data not available
**Water Well Log**

**LOCATION:**

| N 4100 ft E | 50 ft from SW CORNER of SECTION 21 T | 1N R 5E BASE SL | Elevation: | feet |

**DRILLER ACTIVITIES:**

- ACTIVITY # 1 NEW WELL
- DRILLER: EXTERRA
- LICENSE #: 676
- START DATE: 10/06/1997
- COMPLETION DATE: 10/07/1997

**BOREHOLE INFORMATION:**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Diameter (in)</th>
<th>Drilling Method</th>
<th>Drilling Fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td>0</td>
<td>120</td>
</tr>
</tbody>
</table>

**LITHOLOGY:**

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<th>Depth (ft)</th>
<th>Lithologic Description</th>
<th>Color</th>
<th>Rock Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
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<td>0</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>CLAY, SAND, GRAVEL</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>25</td>
<td>FRACTURED</td>
<td></td>
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<tr>
<td>25</td>
<td>60</td>
<td>WATER-BEARING</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>90</td>
<td>WATER-BEARING</td>
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<tr>
<td>90</td>
<td>120</td>
<td>WATER-BEARING</td>
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**WATER LEVEL DATA:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Water Level (feet)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/07/1997</td>
<td>47.00</td>
<td>(-)above ground</td>
<td>STATIC</td>
</tr>
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</table>

**CONSTRUCTION - CASING:**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Material</th>
<th>Gage (in)</th>
<th>Diameter (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>17</td>
<td>120</td>
<td>STEEL</td>
<td>.250</td>
</tr>
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</table>

**CONSTRUCTION - SCREENS/PERFORATIONS:**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Screen (S) or Perforation (P)</th>
<th>Slot/Perf. siz</th>
<th>Screen Diam/Length Perf (in)</th>
<th>Screen Type/# Perf.</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td>60</td>
<td>120</td>
<td>PERFORATION</td>
</tr>
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</table>

**CONSTRUCTION - FILTER PACK/ANNULAR SEALS:**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Material</th>
<th>Amount</th>
<th>Density (pcf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
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<td>20</td>
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</table>

**WELL TESTS:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Test Method</th>
<th>Yield (CFS)</th>
<th>Drawdown (ft)</th>
<th>Time Pumped (hrs)</th>
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<tbody>
<tr>
<td>10/07/1997</td>
<td>AIR LIFT</td>
<td>.056</td>
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</tbody>
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---

Exhibit C.20
**WELL DRILLER'S REPORT**

**State of Utah**

**Division of Water Rights**

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

---

**Well Identification**

Exchange Application: E3748  (35-10482)  WIN: 16668

---

**Owner**

Michael Richard Lahage  
1977 East Marshep Road  
Manshep UT 84017

---

**Contact Person/Engineer:**

---

**Well Location:**

N 180 E 700 from the SW corner of section 16, Township 1N, Range 5E, SL B&M

---

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

---

**Drillers Activity**

Start Date: 7-5-04  Completion Date: 7-8-04

---

**Check all that apply:**  
☐ New  ☐ Stepup  ☐ Deeper  ☐ Clean  ☐ Replace  ☐ Public  Nature of Use:

---

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

---

**Well Log**

<table>
<thead>
<tr>
<th>DEPTH (feet) FROM TO</th>
<th>BOREHOLE DIAMETER (in)</th>
<th>DRILLING METHOD</th>
<th>DRILLING FLUID</th>
<th>DESCRIPTION AND REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistency, water bearing, odor, fracturing, mineralogy, texture, degree of weathering, hardness, water quality, etc.)</td>
</tr>
</tbody>
</table>

---

---

**Static Water Level**

Date: 7-8-04  Water Level: 55.45 feet  Flowing: ☐ Yes ☑ No

Method of Water Level Measurement: Elec. Sounder  If Flowing, Capped Pressure: 41 PSI

Point to Which Water Level Measurement was Referenced: Top of casing  Elevation: 

Height of Water Level reference point above ground surface: 1.5 feet  Temperature: degrees ☐ C ☑ F

---

**Well Log**
### Construction Information

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>CASING</th>
<th>DEPTH (feet)</th>
<th>SCREEN</th>
<th>REFORPORATIONS</th>
<th>OPEN BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td>FROM TO</td>
<td>FROM TO</td>
<td>TO</td>
<td>FROM TO</td>
<td>TO</td>
</tr>
<tr>
<td>+1.5 - 140</td>
<td>250</td>
<td>54' - 60'</td>
<td>3/8'</td>
<td>2'</td>
<td>33'</td>
</tr>
</tbody>
</table>

**Well Head Configuration:** Baker, ptless, well cap

**Access Port Provided:** Yes

**Casing Joint Type:** N/A

**Perforator Used:**

**Was a Surface Seal Installed:** Yes

**Depth of Surface Seal:**

**Drive Shoe:** Yes

**Surface Seal Material Placement Method:**

### Surface Seal / Interval Seal / Filter Pack / Packard Information

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>SEASON SEAL, FILTER PACK, PACKER TYPE AND DESCRIPTION</th>
<th>QUANTITY OF MATERIAL USED (if applicable)</th>
<th>GROUT DENSITY (lbs/gal, # bag mix, gal/sack etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Well Development and Well Yield Test Information

<table>
<thead>
<tr>
<th>DATE</th>
<th>METHOD</th>
<th>YIELD</th>
<th>FROM Check One</th>
<th>FROM DRAWDOWN</th>
<th>FROM TIME</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-7-04</td>
<td>Bailey</td>
<td>25</td>
<td>✔</td>
<td>5'</td>
<td>1 HR</td>
<td></td>
</tr>
<tr>
<td>7-8-04</td>
<td>Pump</td>
<td>15</td>
<td>✔</td>
<td>3'</td>
<td>3 HRS</td>
<td></td>
</tr>
</tbody>
</table>

**Pump (Permanent):** STA Rate: 10GPM  

**Well Disinfected upon Completion:** Yes

**Pump Description:** STA Rate: 10GPM  

**Pump Intake Depth:** 120 feet

**Approximate Maximum Pumping Rate:** 15Gpm

**Comments:** Description of construction activity, additional materials used, problems encountered, extraordinary circumstances, abandonment procedures.

Removed 5 in. iron 240' of perforated 8 in. steel from 1.6 - 54'. Surged and bailed well

### 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 WELLMASTER  

**License No.:** 727  

**Signature:** [Signature]  

**Date:** 7-13-04
# Water Well Log

## Location:
N 500 ft E 1100 ft from SW CORNER of SECTION 16 T 1N R 5E BASE SL

## Driller Activities:
**Activity # 1 NEW WELL**

**Driller:** ZIMMERMAN, MIKE (WELL SERVICE)

**License #:** 527

**Start Date:** 08/03/2000  
**Completion Date:** 08/04/2000

## Borehole Information:

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Diameter (in)</th>
<th>Drilling Method</th>
<th>Drilling Fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>22</td>
<td>12.5</td>
<td>AIR ROTARY</td>
</tr>
<tr>
<td>22</td>
<td>209</td>
<td>8</td>
<td>AIR ROTARY, CASING</td>
</tr>
</tbody>
</table>

## Lithology:

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Lithologic Description</th>
<th>Color</th>
<th>Rock Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>20</td>
<td>SAND, COBBLES</td>
<td>RED</td>
</tr>
<tr>
<td>20</td>
<td>47</td>
<td>SAND, COBBLES</td>
<td>RED</td>
</tr>
<tr>
<td>47</td>
<td>209</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Water Level Data:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Water Level (feet)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>08/04/2000</td>
<td></td>
<td>37.00</td>
<td>STATIC</td>
</tr>
</tbody>
</table>

## Construction - Casing:

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Material</th>
<th>Gage (in)</th>
<th>Diameter (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-9</td>
<td>169</td>
<td>CERTA-LOC PVC SD417</td>
<td>5</td>
</tr>
<tr>
<td>1.5</td>
<td>58</td>
<td>A53B STEEL</td>
<td>.250</td>
</tr>
</tbody>
</table>

## Construction - Screens/Perforations:

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Screen(S) or Perforation(P)</th>
<th>Slot/Perf. siz</th>
<th>Screen Diam/Length Perf(in)</th>
<th>Screen Type/# Perf.</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>169</td>
<td>209</td>
<td>SCREEN</td>
<td>.32</td>
<td>5</td>
</tr>
</tbody>
</table>

## Construction - Filter Pack/Annular Seals:

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Material</th>
<th>Amount</th>
<th>Density (pcf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>10</td>
<td>HOLEPLUG CHIPS</td>
<td>8 BAGS</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
<td>C/S GRANULAR</td>
<td>50 LBS 25 GALS</td>
</tr>
</tbody>
</table>

## Well Tests:

<table>
<thead>
<tr>
<th>Date</th>
<th>Test Method</th>
<th>Yield (CFS)</th>
<th>Drawdown (ft)</th>
<th>Time Pumped (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>08/04/2000</td>
<td>AIR LIFT</td>
<td>.134</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

## General Comments:

**Construction Information:**

- Well Head Configuration: Welded Cap
- Casing Joint Type: Steel-welded PVC certa loc
- Surface Seal: yes
Depth of Seal: 22 feet
Drive Shoe: yes
Method of Placement: installed from surface
ADDITIONAL DATA NOT AVAILABLE
LOCATION:
N 10 ft E 630 ft from SW CORNER of SECTION 16 T 1N R 5E BASE SL Elevation: feet

DRILLER ACTIVITIES:
ACTIVITY # 1 NEW WELL
DRILLER: ZIMMERMAN, MIKE WELL SERVICE LICENSE #: 727
START DATE: 12/03/2002 COMPLETION DATE: 12/24/2002

BOREHOLE INFORMATION:
Depth(ft) Diameter(in) Drilling Method Drilling Fluid
From To 0 53 12 CABLE TOOL WATER
53 155 8 CABLE TOOL WATER

LITHOLOGY:
Depth(ft) Lithologic Description Color Rock Type
From To 0 35 SILT,SAND,GRAVEL,COBBLES BROWN
35 49 SAND,GRAVEL BROWN
49 56 CLAY,SILT RED
56 66 SILT,SAND,GRAVEL BROWN
66 72 CLAY,SILT,SAND,GRAVEL BROWN
72 84 WATER-BEARING,SAND,GRAVEL BROWN
84 86 CLAY RED
86 94 WATER-BEARING,CLAY,SAND,GRAVEL RED
94 96 WATER-BEARING,SAND,GRAVEL RED
96 97 LOW-PERMEABILITY,CLAY,SAND,GRAVEL RED
97 131 LOW-PERMEABILITY,CLAY,SAND RED
131 155 LOW-PERMEABILITY RED SANDY SILTSTONE
SANDY SILTSTONE

WATER LEVEL DATA:
Date Time Water Level (feet) Status
12/24/2002 70.15 STATIC

CONSTRUCTION - CASING:
Depth(ft) Material Gage(in) Diameter(in)
From To +1.5 142 STEEL A53B .250 8

CONSTRUCTION - SCREENS/PERFORATIONS:
Depth(ft) Screen(S) or Perforation(P) Slot/Perf. siz Screen Diam/Length Perf(in) Screen Type/# Perf.
From To 73 95 PERFORATION .375 3 135 PERF

CONSTRUCTION - FILTER PACK/ANNULAR SEALS:
Depth(ft) Material Amount Density(pcf)
From To 0 53 3/8 BENTONITE CHIPS 85-50#BG

WELL TESTS:
Date Test Method Yield (CFS) Drawdown (ft) Time Pumped (hrs)
12/24/2002 PUMP TEST .111 7.45 3

GENERAL COMMENTS:
CONSTRUCTION INFORMATION:
Well head configuration: Welded Plate
Casing type: Welded
Perforator: No data 135 perfs 5 per no 8" int.
Surface seal: Yes, 53 ft.
Drive shoe: Yes
Surface seal placement method: Gravity
NO PUMP
Install 12" steel to 48' - Remove 12" while installing bentonite chips
Lot 5 Cherry Canyon Estates
WELL DRILLER'S REPORT  
State of Utah  
Division of Water Rights  
For additional space, use "Additional Well Data Form" and attach

**Well Identification**

Exchange Application: B4673 (35-11946)

**Owner**

Curtis A. and Kami R. Cox  
1482 7th Street  
Ogden, Utah 84404

**Contact Person/Engineer:**

#2

**Well Location**

N 585 E 943 from the SW corner of section 16, Township 1N, Range 5E, SL B&M

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

**Drillers Activity**

<table>
<thead>
<tr>
<th>Start Date</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-8-06</td>
<td>2-14-06</td>
</tr>
</tbody>
</table>

Check all that apply:

- [X] New  
- [ ] Repair  
- [ ] Deepen  
- [ ] Clean  
- [ ] Replace  
- [ ] Public  

Nature of Use:  

If a replacement well, provide location of new well:  

- feet north/south  
- feet east/west of the existing well.

**DEPTH (feet) FROM TO**

<table>
<thead>
<tr>
<th>DEPTH (feet) FROM TO</th>
<th>BOREHOLE DIAMETER (in)</th>
<th>DRILLING METHOD</th>
<th>DRILLING FLUID</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 30</td>
<td>12&quot;</td>
<td>Air rotary</td>
<td>water</td>
</tr>
<tr>
<td>30 - 300</td>
<td>8&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Well Log**

**DEPTH (feet) FROM TO**

<table>
<thead>
<tr>
<th>DEPTH (feet) FROM TO</th>
<th>WATER</th>
<th>GRANUL</th>
<th>UNCONSOLIDATED</th>
<th>CONSOLIDATED</th>
<th>ROCK TYPE</th>
<th>COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 - 33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33 - 80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 - 130</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130 - 149</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>149 - 185</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>185 - 246</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>246 - 265</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>265 - 300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DESCRIPTION AND REMARKS**

(e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, ordo, fracturing, minerology, texture, degree of weathering, hardness, water quality, etc.)

- Top Soil 1

- Not much clay

- Small amount clay + gravel

**Static Water Level**

Date 12-13-06  
Water Level 60 feet  
Flowing? [☐] Yes  [X] No

Method of Water Level Measurement: Water level meter  
If Flowing, Capped Pressure:  
Top of 8" Elevation: 6922

Point to Which Water Level Measurement was Referenced:

Height of Water Level Reference point above ground surface: 2 feet  
Temperature:  degrees  
[☐] C  [☐] F

**Well Log**

---
# Construction Information

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>CASING</th>
<th>DEPTH (feet)</th>
<th>SCREEN</th>
<th>PERFORATIONS</th>
<th>OPEN BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td>CASING TYPE AND MATERIAL GRADE</td>
<td>WALL THICK (in)</td>
<td>NOMINAL DIAM. (in)</td>
<td>FROM TO</td>
<td>SCREEN SLOT SIZE OR PERF SIZE (in)</td>
</tr>
<tr>
<td>+2 60'</td>
<td>Steel</td>
<td>.322</td>
<td>8'</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>-2 60'</td>
<td>after abandon</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Well Head Configuration: 8' Steel casing
Casing Joint Type: welded
Perforator Used: -
Access Port Provided? Yes No

Was a Surface Seal Installed? Yes No
Depth of Surface Seal: 30' feet
Drive Shoe? Yes No

Surface Seal Material Placement Method: Topload Bentonite chips 30'-0

Was a temporary surface casing used? Yes No
If yes, depth of casing: 10' feet
Diameter: 12'' inches

## Surface Seal / Interval Seal / Filter Pack / Packers Information

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION</th>
<th>Quantity of Material Used (if applicable)</th>
<th>GROUT DENSITY (lbs/gal, # bag mix, gal/ack etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td>Seal Material Filter Pack and Packers Type and Description</td>
<td>Quantity of Material Used</td>
<td>GROUT DENSITY</td>
</tr>
<tr>
<td>30 0</td>
<td>bentonite chips</td>
<td>33-50 lbsacks</td>
<td>-</td>
</tr>
<tr>
<td>300 10</td>
<td>bentonite chips</td>
<td>136-50 lbsacks</td>
<td>-</td>
</tr>
<tr>
<td>10 -2</td>
<td>cement</td>
<td>3 cubic ft</td>
<td>14 lbs per gal</td>
</tr>
</tbody>
</table>

## Well Development and Well Yield Test Information

<table>
<thead>
<tr>
<th>DATE</th>
<th>METHOD</th>
<th>YIELD</th>
<th>DRAWDOWN</th>
<th>TIME PUMPED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>GPM</td>
<td>(ft)</td>
<td>hrs &amp; min</td>
</tr>
</tbody>
</table>

## Pump (Permanent)

Pump Description:
Horsepower:
Pump Intake Depth:
Approximate Maximum Pumping Rate:
Well Disinfected upon Completion? Yes No

## Comments

Hole fills up with water over night, not enough to make a well. Going to drill another hole, so we abandoned this hole fill with bentonite chips 360'-10', neat cement 10'-2', cut off 8''.

## 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. 704

Signature: [signature]
(Licensed Well Driller)
Date: 2-21-04
EXHIBIT C.28

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

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

Well Identification
Exchange Application: E5094 (35-12455) WIN: 434651

Owner
Sargent Leasing, LLC
30719 Old Lincoln Highway
Coalville UT 84017

Contact Person/Engineer:

Well Location
N 390 E 400 from the SW corner of section 16, Township 1N, Range 5E, SL B&M

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

Drillers Activity

<table>
<thead>
<tr>
<th>Start Date</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1-11</td>
<td>4-8-11</td>
</tr>
</tbody>
</table>

Check all that apply: [X] 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.

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>BOREHOLE DIAMETER (in)</th>
<th>DRILLING METHOD</th>
<th>DRILLING FLUID</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>30</td>
<td>Air roster</td>
<td>Water</td>
</tr>
<tr>
<td>30'</td>
<td>337'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Well Log

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>WATER MATERIAL</th>
<th>MATERIAL CONSOLIDATED</th>
<th>UNCONSOLIDATED</th>
<th>CONSOLIDATED</th>
<th>ROCK TYPE</th>
<th>COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td>High Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Brown</td>
</tr>
<tr>
<td>27'</td>
<td>31'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tan</td>
</tr>
<tr>
<td>31'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>White/Brown</td>
<td></td>
</tr>
<tr>
<td>33'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Small amount Gravel</td>
</tr>
<tr>
<td>138'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Small amount Clay</td>
</tr>
<tr>
<td>260'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>337'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RECEIVED
APR 1 1 2011

Static Water Level

<table>
<thead>
<tr>
<th>Date</th>
<th>Water Level</th>
<th>Flowing</th>
<th>Method of Water Level Measurement</th>
<th>Height of Water Level reference point above ground surface</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-8-11</td>
<td>49' feet</td>
<td>No</td>
<td>Water level meter</td>
<td>18' feet</td>
<td>50 degrees</td>
</tr>
</tbody>
</table>

WATER HEIGHT
SALT LAKE
## Construction Information

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>CASING</th>
<th>WALL THICK (in)</th>
<th>NOMINAL DIAM. (in)</th>
<th>DEPTH (feet)</th>
<th>SCREEN</th>
<th>PERFORATIONS</th>
<th>OPEN BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td>Casing Type and Material/Grade</td>
<td>32</td>
<td>8.0</td>
<td>FROM TO</td>
<td>Screen Slot Size or Perfor Size (in)</td>
<td>Screen Diameter or Perfor Length (in)</td>
<td>Screen Type or Number Perf (per round/interval)</td>
</tr>
<tr>
<td>+18&quot; 177'</td>
<td>Steel</td>
<td>32</td>
<td>8.0</td>
<td>230' 330'</td>
<td>0.30</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>-10 330'</td>
<td>PVC</td>
<td>5Dx</td>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Well Head Configuration:**
- 8" Steel Casing
- Access Port Provided? ✗ Yes □ No
- Casing Joint Type: 8" Rolled Joint
- Depth of Seal: 30' feet
- Drive Shoe? ✗ Yes □ No
- Surface Seal Material Placement Method: Top Load Bentonite Chips 30'-0
- Was a temporary surface casing used? ✗ Yes □ No
- If yes, depth of casing: 10' feet
- Diameter: 12" inches

## Surface Seal / Interval Seal / Filter Pack / Packer Information

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION</th>
<th>Quantity of Material Used (if applicable)</th>
<th>GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30' 0</td>
<td>Bentonite Chips</td>
<td>27.50 lbs/sacks</td>
<td></td>
</tr>
<tr>
<td>337' 175'</td>
<td>#8 silica sand</td>
<td>65.50 lbs/sacks</td>
<td></td>
</tr>
<tr>
<td>175' 10'</td>
<td>Bentonite Chips</td>
<td>32.50 lbs/sacks</td>
<td></td>
</tr>
</tbody>
</table>

## Well Development and Well Yield Test Information

<table>
<thead>
<tr>
<th>DATE</th>
<th>METHOD</th>
<th>YIELD</th>
<th>Units Check One</th>
<th>DRAWDOWN</th>
<th>TIME PUMPED</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-7-11</td>
<td>Air</td>
<td>25</td>
<td>GPM/CPS</td>
<td>3 hrs 5 min</td>
<td></td>
</tr>
</tbody>
</table>

## Pump (Permanent)

- Horsepower: 
- Pump Intake Depth: 
- Well Disinfected upon Completion? ✗ Yes □ No

## Comments

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

## Well Driller Statement

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

**Name:** ARMSTRONG DRILLING  
**License No.:** 794

**Signature:**

**Date:** 4-8-11
# EXHIBIT C.30
## WELL DRILLER'S REPORT
### State of Utah
#### Division of Water Rights
For additional space, use "Additional Well Data Form" and attach

### Well Identification
- **Exchange Application:** E5094 (35-12455)
- **WIN:** 435579

### Owner
- **Note any changes**
- Sargent Leasing, LLC
- 30719 Old Lincoln Highway
- Coalville UT 84017

### Contact Person/Engineer:

### Well Location
- **Note any changes**
- N 490 E 400 from the SW corner of section 16, Township 1N, Range 5E, SL B&M

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

### Drillers Activity
<table>
<thead>
<tr>
<th>Start Date: 1-3-12</th>
<th>Completion Date: 1-16-12</th>
</tr>
</thead>
</table>

Check all that apply: □ New □ Repair □ Deepen □ Clean □ Replace □ Public Nature of Use:

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

### DEPTH (feet) FROM TO
| 0' | 30' |
| 30' | 65' |

### BOREHOLE DIAMETER (in)
| 12' | 8' |

### DRILLING METHOD
- Air rotary

### DRILLING FLUID
- Water

### Well Log
<table>
<thead>
<tr>
<th>DEPTH (feet) FROM TO</th>
<th>WATER</th>
<th>UNCONSOLIDATED</th>
<th>CONSOLIDATED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HIGH</td>
<td>LOW</td>
<td></td>
</tr>
</tbody>
</table>

### ROCK TYPE
- Brown
- Red

### COLOR
- X

### DESCRIPTION AND REMARKS
(e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistency, water bearing, odor, fracturing, minerology, texture, degree of weathering, hardness, water quality, etc.)

### RECEIVED
- **FEB 06 2012 JH**

### WATER RIGHTS
- SALT LAKE

### Static Water Level
- **Date:** 1-16-12
- **Water Level:** 25' feet
- **Flowing?** □ Yes □ No
- **Method of Water Level Measurement:** Tape
- **If Flowing, Capped Pressure:** ___ PSI
- **Point to Which Water Level Measurement was Referenced:** Top of 8" Elevation: 5375'
- **Height of Water Level reference point above ground surface:** 2' feet
- **Temperature:** 52° degrees □ C □ F

### Well Log
### Construction Information

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>CASING</th>
<th>WALL THICK (in)</th>
<th>NOMINAL DIAM. (in)</th>
<th>DEPTH (feet)</th>
<th>SCREEN</th>
<th>PERFORATIONS</th>
<th>OPEN BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td>75' Steel</td>
<td>8&quot;</td>
<td>35' 40'</td>
<td>1/4&quot; 1&quot;</td>
<td>20 holes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Well Head Configuration: 8" Steel casing

Casing Joint Type: Welded

Perforator Used: Holtec blade

Was a Surface Seal Installed? [ ] Yes [ ] No

Depth of Surface Seal: 30' feet

Was a temporary surface casing used? [ ] Yes [ ] No

If yes, depth of casing: 10' feet

Surface Seal Material Placement Method: Top load Bentonite chips

Diameter: 12" inches

### Surface Seal / Interval Seal / Filter Pack / Packer Information

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION</th>
<th>QUANTITY of Material Used (if applicable)</th>
<th>GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td>Bentonite chips</td>
<td>24 - 50 lb bags</td>
<td></td>
</tr>
</tbody>
</table>

### Well Development and Well Yield Test Information

<table>
<thead>
<tr>
<th>DATE</th>
<th>METHOD</th>
<th>YIELD</th>
<th>UNITS</th>
<th>CHECK ONE</th>
<th>DRAWDOWN (ft)</th>
<th>TIME PUMPED (hrs &amp; min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-16-12</td>
<td>Airlift</td>
<td>20</td>
<td>GPM</td>
<td>4 x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Pump (Permanent)

Pump Description: Horsepower: Pump Intake Depth: feet

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

Comments: Description of construction activity, additional materials used, problems encountered, extraordinary circumstances, abandonment procedures. Use additional wells data form for more space.

**RECEIVED**

FEB 06 2012  JH

WATER RIGHTS

SALT LAKE

### 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.: 704

Signature: [Signature]
Date: 2-3-12
UTAH WATER RIGHTS AND DEQ MAPS
FEMA FLOODPLAIN MAP
Chapter 20
EASTERN SUMMIT COUNTY WATER CONSERVANCY SPECIAL SERVICE DISTRICT

2-20-1: PURPOSE:

To provide for the public health, safety, and general welfare of the residents living within the jurisdictional boundaries of the eastern Summit County water conservancy special service district, the district is authorized to provide a system for the collection, treatment, and disposition of sewage through facilities or systems acquired or constructed for that purpose through construction, purchase, lease, contract, gift or condemnation or any combination thereof. (Ord. 749-A, 12-15-2010)

2-20-2: DEFINITIONS:

COUNTY: Summit County, Utah.

COUNTY COUNCIL: The Summit County council who exercises legislative authority in the county.

COUNTY MANAGER: The chief executive officer of the county.

DISTRICT: The eastern Summit County water conservancy special service district.

ESAC: The eastern Summit County sewer advisory committee or "the committee" comprised of Summit County staff from the community development department, engineering department, the health department, and two (2) members from the public at large.

GOVERNING BOARD: The county council of Summit County.

OWNERS: The owners of property within the boundaries of the eastern Summit County water conservancy special service district. (Ord. 749-A, 12-15-2010)

2-20-3: GOVERNING BOARD:

As provided pursuant to Utah Code Annotated sections 17D-1-102(5) and 17D-1-301, the district is hereby governed by the county council and is considered the governing board of the district. (Ord. 749-A, 12-15-2010)

2-20-4: POWERS AND DUTIES:
The governing board of the district hereby has all rights, powers, authority and duties to exercise all or any of the powers provided for in Utah Code Annotated sections 17D-1-103, 17D-1-105, 17D-1-106, 17D-1-301, and 17D-1-501 et seq. The governing board has control and supervisory authority of the district and may delegate such further powers and authority as provided by statute. In addition, the governing board shall have the following authority and duties:

A. The board shall conduct its business according to bylaws, which it shall adopt, with the board meeting as needed to act on the business of the district. The bylaws may be amended from time to time by a majority vote of the board.

B. The board shall appoint the county manager as the general manager for the district, who shall have the duties described in section 2-20-5 of this chapter.

C. The board shall appoint members of ESAC, on recommendation by the general manager.

D. The board, with the guidance of the general manager and ESAC, shall adopt policies, procedures, and regulations for the district. (Ord. 749-A, 12-15-2010)

2-20-5: GENERAL MANAGER:

The governing board hereby delegates the following powers, authorities and duties to a general manager, who shall oversee the district:

A. To govern the day to day operations of the district;

B. To prepare, in cooperation with the governing board, an annual budget for the district, which will conform to Utah Code Annotated section 17B-1-601 et seq., "fiscal procedures for local district" and recommend the budget so prepared to the county council. The budget shall demonstrate all proposed expenditures and the fees to be established and collected as revenue to the district's budget;

C. To provide a recommendation to the board as to the operation of the district, including policies, procedures, and regulations for the district;

D. To provide a recommendation to the governing board as to the establishment and collection of the fees and charges for the various wastewater management services provided to the owners with the fee schedules reviewed and approved by the county council.
E. To be the "final approval" for wastewater systems that serve ten (10) or fewer lots, as that term is defined in title 11, appendix A of this code. The county council, as the governing board of the district, shall be the final approval for any and all wastewater systems that serve more than ten (10) lots. This duty shall be made a part of the policies, procedures, and regulations, once adopted, for the district as described in section 2-20-4 of this chapter. (Ord. 749-A, 12-15-2010)

2-20-6: SEWER ADVISORY COMMITTEE:

A. Creation, Purpose, And Authority: The governing board hereby creates the "eastern Summit County sewer advisory committee", which shall act in an advisory capacity to the governing board and the general manager. ESAC shall generally advise the governing board and the general manager on wastewater issues and systems within eastern Summit County. There shall be no actual or apparent authority vested in this committee except for the authority granted herein.

B. Guiding Principles For ESAC: The following guiding principles shall exist for ESAC:

1. In conjunction with the Summit County health department and the municipalities of eastern Summit County, analyze the existing wastewater systems and conduct an inventory of existing wastewater systems.

2. Create an efficient process for the approval by either the general manager or the governing board of wastewater systems in eastern Summit County.

3. Jointly review all proposed wastewater systems with staff of the Summit County community development department, engineering department, and health department, who shall address regional impacts and opportunities of wastewater systems.

C. Powers And Duties: The governing board hereby delegates the following powers and duties to ESAC:

1. To assist the general manager in governing the day to day operations of the district.

2. To assist the general manager with providing a recommendation to the governing board as to the operation of the district, including policies, procedures, and regulations for the district.

3. To assist the general manager with providing a recommendation to the governing board as to the establishment and collection of the fees and charges for the various wastewater management services provided to the owners with the fee schedules reviewed and approved by the county council.

4. To provide a recommendation to either the general manager or the governing board on wastewater systems, as described in subsection 2-20-5E of this chapter.
5. To act in an advisory role to the general manager and the governing board or to other officials and departments in any matters pertaining to wastewater issues within eastern Summit County.

6. ESAC, through its chair, or his/her designee, shall make both an oral and written report annually to the governing board concerning its activities during the past year and its proposals for the coming year.

7. ESAC shall not have the power to obligate the county for funds and/or expenditures or incur any debt on behalf of the county.

8. All powers and duties prescribed and delegated herein are delegated to ESAC as a unit, and all action hereunder shall be of ESAC acting as a whole. No action of any individual committee member is authorized, except through the approval of the governing board.

9. ESAC shall have any other power and/or duty as prescribed and authorized by the governing board.

D. Membership:

1. ESAC shall consist of five (5) members who shall be appointed by the governing board, on the recommendation of the general manager.

2. Membership of ESAC shall be as follows:
   a. One member from the community development department.
   b. One member from the engineering department.
   c. One member from the health department.
   d. Two (2) members from the public at large.

3. One representative of the county attorney's office shall serve as ex officio member of ESAC, but shall have no right to vote on any matter before the committee.

4. ESAC may, in its discretion, add up to three (3) ex officio members, to assist with the communications and functions of the committee. Said ex officio members shall not have any voting rights.

5. Members of ESAC serve at the pleasure of the general manager and may be removed and replaced at any time. There are no terms limits.

E. Officers:

1. The voting members of ESAC shall appoint a chair and vice chair. The chair shall prepare meeting agendas and shall preside over and conduct all meetings. The chair, or his/her designee, shall act as the representative to the general manager and the
governing board for all committee transactions and shall have the responsibility of presenting all proposals from ESAC to the general manager and/or the governing board. The chair and vice chair shall serve a term of one year.

F. Meetings And Procedures:

1. ESAC shall meet as needed. A notice of the time and place of each meeting shall be given to ESAC members not less than three (3) days in advance of the meeting.

2. All meetings of ESAC shall comply with the Utah open meetings laws as found in section 52-4-101 et seq., Utah Code Annotated (1953), as amended.

3. Executive closed sessions may be scheduled whenever the chair deems such action permissible under the Utah open meetings act, and with the concurrence of the county attorney.

4. Written minutes of each open meeting shall be prepared, preserved and made available for public inspection.

5. A majority of the voting committee members shall constitute a quorum and the action of the majority of the members present shall be the action of the committee.

6. Committee members shall attend all meetings unless their absence is excused by the chairperson.

7. All recommendations shall be made at a public meeting by motion, made and seconded and by a voice vote. The motion shall be in the form of findings of fact and shall state the reason for the findings by the committee and a statement of any conditions to be attached to the action. (Ord. 749-A, 12-15-2010)

2-20-7: OPERATION:

The district may utilize the services of the county treasurer and auditor to assist in financial matters. All collections, investments, disbursements, procurement, and other financial transactions will be managed by the county treasurer, who is delegated the role of district treasurer. The governing board delegates the recording and safeguarding of all minutes of meetings of the board to the county clerk of Summit County, who shall act as secretary of the district. (Ord. 749-A, 12-15-2010)

2-20-8: INDEMNIFICATION:

The district shall indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending, or completed action, suit, or proceeding, whether civil or criminal, administrative or investigative, by reason of the fact that he or she is or was the general manager, a director, officer, employee, or agent of the district. The indemnification shall be for all expenses (including attorney fees), judgments, fines, and amount paid in
settlement, actually and reasonably incurred by him or her in connection with the action, suit, or proceeding, including any appeal of the action, suit or proceeding, if he or she acted in good faith or in a manner he or she reasonably believed to be in or not opposed to the best interests of the district, and with respect to any criminal action or proceeding, if he or she had no reasonable cause to believe the conduct was unlawful.

Determination of any action, suit, or proceeding by judgment, order, settlement, conviction or on a plea of nolo contendere or its equivalent, shall not, of itself, create a presumption that the party did not meet the applicable standard of conduct. Indemnification under this section may be paid by the district in advance of the final disposition of any action, suit, or proceeding, on a preliminary determination that the director, officer, employee, or agent met the applicable standard of conduct and on receipt of an undertaking by or on behalf of the general manager, director, officer, employee, or agent to repay the amount, unless it is ultimately determined that he or she is not entitled to be indemnified by the district as authorized in this section.

The district shall also indemnify any director, officer, employee, or agent who has been successful on the merits or otherwise, in defense of any action, suit, or proceeding, or in defense of any claim, issue, or matter in the action, suit, or proceeding, against all expenses, including attorney fees, actually and reasonably incurred, without the necessity of an independent determination that the general manager, a director, officer, employee, or agent met any appropriate standard of conduct.

The indemnification provided for in this section shall continue as to any person who has ceased to be the general manager, a director, officer, employee, or agent, and shall inure to the benefit of the heirs, executors, and administrators of that person. (Ord. 749-A, 12-15-2010)

2-20-9: INSURANCE:

The district shall have power to purchase and maintain insurance on behalf of any person who is the general manager, a director, officer, employee, or agent of the district against any liability asserted against him or her and incurred by him or her in any such capacity, or arising out of his or her status as such, whether or not the district would have authority to indemnify him or her against the liability under the provisions of this section, or under law. (Ord. 749-A, 12-15-2010)

2-20-10: ANNUAL REPORT:

The district shall make an annual presentation to the county council of its goals, budget and activities. (Ord. 749-A, 12-15-2010)
R317-5-1. Authority, Purpose, Scope, Jurisdiction, Waiver Approval and Administrative Requirements.

1.1. Authority.

Construction and operating permits and approvals are issued pursuant to the provisions of Utah Water Quality Act Sections 19-5-104, 19-5-106, 19-5-107 and 19-5-108. Violation of these permits or approvals including compliance with the conditions thereof, or beginning construction, or modification without the director's approval, is subject to the penalties provided in Section 19-5-115.

1.2. Purpose.

A. The purpose of this rule is to protect the public health and the environment from potential adverse effects from large underground wastewater disposal systems within the boundaries of Utah.

B. This rule incorporates specific provisions contained in Rule R317-4 that are referenced herein, and pertinent to large underground wastewater disposal (LUWD) systems for the purpose of providing minimum design standards. Where the engineered design includes information supporting a deviation from the minimum requirements within this rule or referenced to in Rule R317-4, then the engineer may request a waiver.

This rule also establishes the administrative requirements for obtaining from the division a LUWD system:

1. approval-in-concept;
2. construction permit;
3. authorization to use; and
4. operating permit

1.3. Scope.

This rule applies to large underground wastewater disposal systems designed to handle more than 5,000 gallons per day of domestic wastewater, or wastewater that originates in multiple units under separate ownership (except condominiums), or any other underground wastewater disposal system not covered under the definition of an onsite wastewater system per Rule R317-4.

A. The engineer shall use recognized practice standards for wastewater treatment to increase long term performance and lessen potential impacts to public health and the environment. Depending on site-specific characteristics, the division may require a LUWD system to pretreat effluent prior to disposal in the absorption system.

In general, systems with high waste strength or flows over 15,000 gpd should consider pretreatment. Factors that should be evaluated include, but are not limited to, the following:

1. design flow (gpd)
2. highly variable flows, including seasonal fluctuations;
3. wastewater strength characteristics;
4. site characteristics.
5. proximity to ground water table, considering various soil types and separation distance;
6. ground water classification;
7. proximity to nearby drinking water sources, or location within a drinking water source protection zone; and
8. anticipated system life expectancy.

1.4. Jurisdiction. Large underground wastewater disposal systems are under the jurisdiction of the Division of Water Quality.
Local Health Departments may petition the division to require local review for compliance with local requirements prior to the division initiating its review.

1.5 Waiver.

The director may grant a waiver from the minimum requirements stated in this rule, subject to site-specific consideration and justification, but not overriding the safeguarding of public health, protection of water quality or engineering practice. The intent of the waiver is to allow the engineer to utilize site specific information, recognized practice standards, or other acceptable justification while designing an appropriate LUWD system for the property. The engineer is encouraged to discuss waivers with the division staff prior to formal application for feasibility determination review.


2.1. Definitions found in Rules R317-1 and R317-4 apply to large underground wastewater disposal systems except where specifically replaced by the following definitions:

"Alternative system" means a LUWD system that is not a conventional system.

"Building sewer" means the pipe that carries wastewater from the building to a public sewer, a LUWD system, or other point of dispersal. It sometimes is synonymous with "house sewer".

"Conventional system" means a LUWD system typically consisting of a building sewer, septic tank, and an absorption system utilizing absorption trenches, absorption beds, or deep wall trenches.

"Curtain drain" means any ground water interceptor or drainage system that is backfilled with gravel or other suitable material and is intended to interrupt or divert the course of shallow ground water or surface water away from the LUWD system.

"Malfunctioning or failing system" means a LUWD system that is not functioning in compliance with the requirements of this rule and may include:
1. absorption systems that seep or flow to the surface of the ground or into waters of the state;
2. systems that overflow from any of their components;
3. systems that cause backflow into any portion of a building drainage system;
4. systems discharging effluent that does not comply with applicable effluent discharge standards of its operating permit;
5. leaking septic tanks; or
6. noncompliance with standards stipulated in or by the construction permit, operating permit, or both.

"Maximum ground water table" means the highest elevation that the top of the "ground water table" or "ground water table, perched" is expected to reach for any reason over the full operating life of a LUWD system at that site.

"Mound system" means an alternative LUWD system where the bottom of the absorption system is placed above the elevation of the original site, and the absorption system is contained in a mounded fill body above that grade.

"Packed bed media system" means an alternative LUWD system that uses natural or synthetic media to treat wastewater. Biological
treatment is facilitated via microbial growth on the surface of the media. The system may include a pump tank, a recirculation tank, or both.

"Public health hazard" means, for the purpose of this rule, a condition whereby there are sufficient types and amounts of biological, chemical, or physical agents relating to water or sewage that are likely to cause human illness, disorders or disability. These may include pathogenic viruses and bacteria, parasites, toxic chemicals and radioactive isotopes. A malfunctioning LUWD system constitutes a public health hazard.

"Sand lined trench system" means an alternative LUWD system consisting of a series of narrow excavated trenches utilizing sand media and pressure distribution.

"Unapproved LUWD system" means any LUWD system that is deemed by the division to be any of the following:
1. installation without the required division oversight, permits, or inspections;
2. repairs to an existing system without the required division oversight, permits, or inspections; or
3. alteration to an existing system without the required division oversight, permits, or inspections.

"Waiver" means an acceptable deviation from the requirements established within this rule or referenced rules. The waiver must be acceptable to division staff based on the engineer providing adequate design justification to demonstrate that the deviation proposed will not override the safeguarding of public health, the protection of water quality, or the protection of the receiving environment. Waiver requests should be based on acceptable engineering practice and standards.


3.1. Failure to Comply With Rules.
Any person failing to comply with this rule shall be subject to enforcement action as specified in Sections 19-5-115 and 26A-1-123.

3.2. Feasibility.
LUWD systems are not feasible in some areas and situations. If property characteristics indicate conditions that may fail in any way to meet the requirements specified herein, the use of a LUWD system shall be prohibited.

3.3. Prohibited Flows.
No ground water drainage, drainage from roofs, roads, yards, or other similar sources shall discharge into any portion of a LUWD system, but shall be disposed of so they will in no way affect the system. Non-domestic wastes such as chemicals, paints, or other substances that are detrimental to the proper functioning of a LUWD system may not be disposed of in such systems.

3.4. Increased Flows Prohibited.
Wastewater flow may not exceed the design flow of a LUWD system.

3.5. Property Lines Crossed.
Privately owned LUWD systems, including replacement areas, shall be located on the same lot as the building served unless, when approved by the division, a perpetual utility easement and right-of-way is established and recorded on an adjacent or nearby lot for the
construction, operation, and continued maintenance, repair, alteration, inspection, relocation, and replacement of a LUWD system, including all rights to ingress and egress necessary or convenient for the full or complete use, occupation, and enjoyment of the granted easement. The easement shall be large enough to accommodate the proposed LUWD system and replacement area. The easement shall meet the setbacks specified in Section R317-4-13 Table 2.

3.6. Initial Absorption Area and Replacement Area.
A. All properties that utilize LUWD systems shall be required to have a replacement area.
B. The absorption area, including installed system and replacement area, may not be subject to activity that is likely to adversely affect the soil or the functioning of the system. This may include vehicular traffic, covering the area with asphalt, concrete, or structures, filling, cutting or other soil modifications.

3.7. Operation and Maintenance.
Owners of a LUWD systems shall operate, maintain, and service their systems according to the standards of this rule.

3.8. No Discharge to Surface Waters or Ground Surface.
Effluent from any LUWD system may not be discharged to surface waters or upon the surface of the ground. Wastewater may not be discharged into any abandoned or unused well, or into any crevice, sinkhole, or similar opening, either natural or artificial.

3.9. Repair of a Malfunctioning or Unapproved System.
Upon determination by the regulatory authority that a malfunctioning or unapproved LUWD wastewater system creates or contributes to any dangerous or unsanitary condition that may involve a public health hazard, or noncompliance with this rule, the regulatory authority shall order the owner to take the necessary action to cause the condition to be corrected, eliminated or otherwise come into compliance.
A. For malfunctioning systems, the regulatory authority shall require and order:
1. all necessary steps, such as maintenance, servicing, repairs, and replacement of system components to correct the malfunctioning system, to meet all rule requirements to the extent possible and may not create any new risk to the environment or public health;
2. effluent quality testing as required by Subsection R317-5-9.2.D;
3. evaluation of the system design including non-approved changes to the system, the wastewater flow, and biological and chemical loading to the system;
4. additional tests or samples to troubleshoot the system malfunction.

3.10. Procedure for Wastewater System Abandonment. Whenever the use of a LUWD system has been abandoned or discontinued, the owner of the real property on which such wastewater system is located shall render it safe by having the septic tank, any other tanks, hollow seepage pit, or cesspool wastes pumped out or otherwise disposed of in an approved manner. Within 30 days the tanks shall be:
A. crushed in place and the void filled;
B. completely filled with earth, sand, or gravel; or
C. removed and backfilled.
3.11. Septage Management.
A person shall only dispose of septage, or sewage contaminated materials in a location or manner in accordance with the requirements of the division and any local agencies having jurisdiction.


The common components of the LUWD system, including the reserve absorption area, shall be under the sponsorship of a body politic.

A. The subsurface absorption system shall be designed and constructed to provide duplicate capacity, meaning two independent systems. Each system shall be designed to accommodate the total anticipated maximum daily flow. The duplicate system shall be designed with appropriate valving, etc., to allow for periodic alternation of the use of each system.

B. Sufficient land area with suitable characteristics shall be planned and available to provide for a third absorption system capable of handling the total maximum daily wastewater flow. This area shall be kept free of permanent structures, traffic or soil modification.


Large underground wastewater disposal (LUWD) systems with design flow rates of 5,000 gallons per day or more are co-regulated by the Utah 1422 Underground Injection Control (UIC) Program in Rule R317-7. LUWD systems are authorized-by-rule under the UIC program provided they remain in compliance with the construction and operating permits issued according to Rule R317-5. However, if any noncompliance with these permits results in the potential for or demonstration of actual exceedance of any Utah Maximum Contaminant Levels (MCLs) in a receiving ground water, the noncompliance may also be a violation of the Utah UIC administrative rules and therefore be subject to enforcement action. Owners and operators of a large underground wastewater disposal system are required to submit UIC inventory information according to Subsection R317-7-6.4(C) using the approved form for a LUWD system.


The division shall determine the feasibility of using a LUWD system. Upon favorable determination for feasibility an approval-in-concept will be granted by the division.

A. General Information. The required information shall include:
1. situs address if available;
2. name and address of the property owner and person requesting feasibility;
3. the location, type, and depth of all existing and proposed private and public drinking water wells, and other water supply sources within 1500 feet of the proposed LUWD system;
4. the location of all drinking water source protection zones delineated on the project site;
5. the location of all existing creeks, drainages, irrigation ditches, canals, and other surface and subsurface water conveyances within 1500 feet of the proposed LUWD system;
6. the location and distance to nearest sewer, owner of sewer, whether property is located within service boundary, and size of sewer; and
7. statement of proposed use if other than a single-family dwelling.

B. If the proposed LUWD system is located in aquifer recharge areas or areas of other particular geologic concern, the division may require such additional information relative to ground water movement, or possible subsurface wastewater flow.

C. Soil and Site Evaluation.
   1. Soil Exploration Pit and Percolation Test.
      a. A minimum of five soil exploration pits shall be excavated to allow the evaluation of the soils. The soil exploration pits shall be constructed and soil logs recorded as detailed in Section R317-4-14 Appendix C.
      b. The division may require percolation tests in addition to the soil exploration pits.
      c. The division may require additional pits, tests, or both where:
         i. soil structure varies;
         ii. limiting geologic conditions are encountered; or
         iii. the division deems it necessary.
      d. The percolation test shall be conducted as detailed in Section R317-4-14 Appendix D.
      e. Soil exploration pits and percolation tests shall be conducted as closely as possible to the proposed absorption system site. The division shall have the option of inspecting the open soil exploration pits and monitoring the percolation test procedure. All soil logs and percolation test results shall be submitted to the division.
      f. When there is a substantial discrepancy between the percolation rate and the soil classification, it shall be resolved through additional soil exploration pits, percolation tests, or both.
      g. Absorption system feasibility and sizing shall be based on Section R317-4-13 Table 5 or 6.

2. Wind-Blown Sand.
   The extremely fine grained wind-blown sand found in some parts of Utah shall be deemed not feasible for LUWD systems unless pretreatment is provided, as percolation test results in wind-blown sand will generally be rapid, but experience has shown that this soil has a tendency to become sealed with minute organic particles within a short period of time.

3. Suitable Soil Depth.
   For conventional systems, effective suitable soil depth shall extend at least 48 inches or more below the bottom of the dispersal system to bedrock formations, impervious strata, or excessively permeable soil. Some alternative LUWD systems may have other requirements.

   The elevation of the anticipated maximum ground water table shall meet the separation requirements of the anticipated absorption systems.
      Maximum ground water table shall be determined where the anticipated maximum ground water table, including irrigation induced water table, might be expected to rise closer than 48 inches to the elevation of the bottom of a LUWD system. Maximum ground water table
shall be determined where alternative LUWD wastewater systems may be considered based on groundwater elevations. The maximum ground water table shall be determined by the following.

i. Regular monitoring of the ground water table, or ground water table, perched, in an observation well for a period of one year, or for the period of the maximum groundwater table.
   (1) Previous ground water records and climatological or other information may be consulted for each site proposed for a LUWDS system and may be used to adjust the observed maximum ground water table elevation.
   (2) Direct visual observation of the maximum ground water table in a soil exploration pit for:
       (1) evidence of crystals of salt left by the maximum ground water table;
       (2) chemically reduced iron in the soil, reflected by redoximorphic features i.e., a mottled coloring.
   (3) Previous ground water records and climatological or other information may be consulted for each site proposed for a LUWD system and may be used to adjust the observed maximum ground water table elevation in determining the anticipated maximum ground water table elevation.

iii. In cases where the anticipated maximum ground water table is expected to rise to closer than 34 inches from the original ground surface and an alternative LUWD system would be considered, previous ground water records and climatological or other information shall be used to adjust the observed maximum ground water table in determining the anticipated maximum ground water table.

b. Curtain Drains.
   A curtain drain or other effective ground water interceptor may be allowed as an attempt to lower the groundwater table to meet the requirements of this rule. The division shall require that the effectiveness of such devices in lowering the ground water table be demonstrated during the season of maximum ground water table.

5. Ground Slope.
   Absorption systems may not be placed on slopes where the addition of fluids is judged to create an unstable slope.
   a. Absorption systems may be placed on slopes between 0% and 25%, inclusive.
   b. Absorption systems may be placed on slopes greater than 25% but not exceeding 35% if:
      i. all other requirements of this rule can be met;
      ii. effluent from the proposed system will not contaminate ground water or surface water, and will not surface or move off site before it is adequately treated to protect public health and the environment;
      iii. no slope will fail, and there will be no other landslide or structural failure if the system is constructed and operated adequately, even if all properties in the vicinity are developed with a LUWD system; and
      iv. a report is submitted by a professional engineer or professional geologist that is licensed to practice in Utah. The report shall be imprinted with the engineer's or geologist's registration seal and signature and shall include the following.
         (1) Predictions and supporting information of ground water
transport from the proposed system and of expected areas of ground water mounding.

(2) A slope stability analysis that shall include information about the geology of the site and surrounding area, soil exploration and testing, and the effects of adding effluent.

(3) The cumulative effect on slope stability of added effluent if all properties in the vicinity were developed with LUWD systems.
   c. Absorption systems may not be placed on slopes greater than 35%.

6. Other Factors Affecting a LUWD System Feasibility.
   a. The locations of all rivers, streams, creeks, dry or ephemeral washes, lakes, canals, marshes, subsurface drains, natural storm water drains, lagoons, artificial impoundments, either existing or proposed, that will affect building sites, shall be provided.
   b. Areas proposed for LUWD wastewater systems shall comply with the setbacks in Section R317-4-13 Table 2.
   c. If any part of a property lies within or abuts a flood plain area, the flood plain shall be shown within a contour line and shall be clearly labeled on the plan with the words "flood plain area".

7. Unsuitable.
   Where soil and other site conditions are clearly unsuitable for the placement of a LUWD system, there is no need for conducting soil exploration pits or percolation tests.


All engineering reports, plans and specifications shall be prepared by a registered professional engineer licensed to practice in the State of Utah and certified Level 3 in accordance with Rule R317-11.

5.1 Engineering Report.

An engineering report shall be submitted which shall contain design criteria along with all other information necessary to clearly describe the proposed project and demonstrate project feasibility as described in feasibility determination and approval-in-concept of Section R317-5-4.

5.2. Plan Review.

Submission of plans for review. Plans for new, alterations, repairs and replacements of large underground wastewater disposal systems shall be submitted to the division for review as required by Rule R317-1 and include the following:

A. Local Health Departments Requirements.

It is the applicant's responsibility to ensure that a LUWD System application to the division is in compliance with local health department requirements regarding the location, design, construction and maintenance of a LUWD system prior to the applicant submitting a request for a construction permit to the division. Where the petition has been approved by the director, the applicant is required to submit documentation that the local health department has approved the proposed LUWD system before a construction permit may be issued.

B. Information Required.

Plans submitted for review shall be drawn to scale, 1" = 10', 20' or 30', or other scale as approved by the division. Plans shall be prepared in such a manner that the contractor can read and follow them in order to install the system properly. Depending on the
individual site and circumstances, or as determined by the division, some or all of the following information may be required.

1. Applicant Information.
   a. The name, current address, and telephone number of the applicant.
   b. Complete address, legal description of the property, or both to be served by this LUWD system.

2. LUWD System Site Plan.
   a. Submittal date of plan.
   b. North arrow.
   c. Lot size and dimensions.
   d. Legal description of property.
   e. Ground surface contours, preferably at 2 foot intervals, of both the original and proposed final grades of the property, or relative elevations using an established bench mark.
   f. Location and explanation of type of dwelling(s) or structure(s) to be served by a LUWD system.
   g. Location and dimensions of paved and unpaved driveways, roadways and parking areas.
   h. Location and dimensions of the essential components of the wastewater system including the replacement area for the absorption system.
   i. Location of all soil exploration pits and all percolation test holes.
   j. Location of building sewer and water service line to serve the building.
   k. Location of sewer mains, manholes, clean-outs, and other appurtenances.
   l. Location of easements or drainage right-of-ways affecting the property.
   m. Location of all intermittent or year-round streams, ditches, watercourses, ponds, subsurface drains, etc. within 100 feet of proposed LUWD system.
   n. The location, type, and depth of all existing and proposed water supply sources.
   o. Delineation of all drinking water source protection zones located on the project site.
   p. Distance to nearest public water main and size of main.
   q. Distance to nearest public sewer, size of sewer, and whether accessible by gravity.

3. Statement with Site Plan.
   Statement indicating the source of culinary water supply, whether a well, spring, non-public or public system, its location and distances from all LUWD systems.

   a. Soil Logs, Percolation Test Certificates, or both.
   b. Statement with supporting evidence indicating the maximum anticipated ground water table and the flooding potential for LUWD system sites.

5. Relative Elevations.
   Show relative elevations of the following, using an established bench mark.
   a. Building drain outlet.
   b. The inlet and outlet inverts of any septic tanks.
c. Septic tank access cover, including height and diameter of riser, if used.

d. Pump tank inlet, if used, including height and diameter of riser.

e. The outlet invert of the distribution box, if provided, and the ends or corners of each distribution pipe lateral in the absorption system.

f. The final ground surface over the absorption system.


Details for said site, plans, and specifications are listed in Design in Section R317-4-6.

a. Schedule or grade, material, diameter, and minimum slope of building sewer and effluent sewer.

b. Septic tank and pump tank capacity, design, cross sections, etc., materials, and dimensions. If tank is commercially manufactured, state the name and address of manufacturer.

c. Absorption system details, including the following:

i. details of drop boxes or distribution boxes, if provided;

ii. schedule or grade, material, and diameter of distribution pipes;

iii. length, slope, and spacing of each absorption system component;

iv. maximum slope across ground surface of absorption system area;

v. distance of absorption system from trees, cut banks, fills, or subsurface drains; and cross section of absorption system showing the:

1. depth and width of absorption system excavation;

2. depth of distribution pipe;

3. depth of filter material;

4. barrier material, i.e., synthetic filter fabric, straw, etc., used to separate filter material from cover; and

5. depth of cover.

d. Pump, if provided, details as referenced in Section R317-4-14 Appendix B.

e. If an alternative LUWD system is designed, include all pertinent information to allow plan review and permitting for compliance with this rule.

C. Plans Submitted.

1. All applicants requesting plan approval for a LUWD shall submit two copies of the above required information to enable the division to retain one copy as a permanent record.

2. Applications may be rejected if proper information is not submitted.

5.3. Construction Permit Required.

No person shall make or construct any device for treatment or discharge of wastewater without first receiving a permit to do so from the director.

R317-5-6. Design Requirements.

6.1. Shall meet the requirements of Section R317-4-6, with these exceptions:

A. When a LUWD serves multiple single family dwellings the wastewater flow shall be estimated at 400 gpd per dwelling.
B. Minimum separation distance from the bottom of the absorption trenches to the anticipated maximum ground water table is 48 inches. If a mound, sand lined trench, or packed bed pretreatment unit is designed and installed on the LUWD system, the horizontal separation distance may be reduced to 24 inches.

6.2. Components Required in a LUWD System:
A. A septic tank;
B. An effluent filter;
C. A pressurized subsurface disposal system.
1. This may be an absorption field, deep wall trenches, absorption beds, or, for packed bed media applications, drip irrigation dispersal, depending on location, topography, soil conditions and maximum ground water level.
2. Pressurized systems require cleanouts at the end of pressurized laterals and typically require a dosing chamber or dosing tank.
3. The Utah Guidance for Performance, Application, Design, Operation and Maintenance: Pressure Distribution Systems document shall be used for design requirements, along with the following:
   a. Dosing pumps, controls and alarms shall comply with Section R317-4-14 Appendix B.
   b. Pressure distribution piping.
      i. All pressure transport, manifold, lateral piping, and fittings shall meet PVC Schedule 40 standards or equivalent.
      ii. The ends of lateral piping shall be constructed with sweep elbows or an equivalent method to bring the end of the pipe to the final grade. The ends of the pipe shall be provided with threaded plugs, caps, or other devices acceptable to the division to allow for access and flushing of the lateral.
D. Accessibility components to insure proper maintenance and servicing. These include that all tanks shall have access risers to the surface of the ground; and absorption field inspection ports.
E. Additional components may also be required depending on the waste stream characteristics and the need to provide adequate protection to groundwater. These components may include pretreatment devices such as grease traps, or may involve secondary treatment using packed bed media systems.

Shall meet the requirements of Section R317-4-7.

8.1. Final inspection.
Upon completion of construction, but before backfilling, the system designer must notify the division of completion and schedule a final inspection with the division. Where the local health department has the authority to issue operating permits they shall be included in the final inspection. The final inspection shall meet the requirements of Section R317-4-8. No wastewater may be introduced into a LUWD system until an authorization to use has been issued by the division.
8.2. Authorization to Use
The following documents, sealed by the engineer, must be provided to the division in order to receive authorization to use:
A. Written certification that the system was installed in accordance with the construction permit and any approved change orders.
B. Two record drawings of the completed system.
C. Two Operation and Maintenance Manuals. Manuals must include details of:
   1. individuals of contact for the installed system;
   2. list of all key components of the system;
   3. maintenance and service instructions of each component;
   4. schedule of maintenance inspections and servicing.
D. Written recommendation to the owner to place the facilities into service, pending issuance of the authorization to use by the division.


9.1. Operation and maintenance shall be provided by the owner to ensure the disposal system is functioning properly at all times.

9.2. The owner is responsible for maintaining a LUWD system and for performing periodic inspections, servicing and monitoring of its system as detailed in the issued operating permit, including the following:
   A. Any new system installed after April 2009 must have a written operation and maintenance manual document describing the treatment and disposal system and outlining routine maintenance procedures, including checklists and maintenance logs needed for proper operation of the system.
   B. Each LUWD Conventional System shall be assessed after the first year of operation and annually thereafter.
   C. Each LUWD Pressure Distribution System shall be inspected as outlined in Section R317-4-23 Tables 7.1 and 7.2.
   D. LUWD Alternative Systems.
      1. Each alternative system shall be inspected as outlined in Section R317-4-13 Tables 7.1 and 7.2.
      2. Each packed bed media system shall be sampled a minimum of every six months as outlined in Section R317-4-13 Table 7.3.
         a. The grab sample shall be taken before discharge to an absorption system.
         b. Effluent not meeting the standards of Section R317-4-13 Table 7.3, shall be followed with two successive weekly tests of the same type within a 30 day period from the first exceedance.
      3. If two successive samples exceed the minimum standards, the system shall be deemed to be malfunctioning, and shall require further evaluation and a corrective action plan, see Subsection R317-5-3.9.

R317-5-10. Operating Permits and Annual Inspection Reports.

10.1. Operating Permit required.

An operating permit is required for all LUWD systems to monitor that proper operation and maintenance is occurring for the protection of the environment and public health. The operating permit shall be issued by the director or, by delegated authority, the local health department having jurisdiction, and shall be effective for a period not to exceed 5 years from the date of issuance.

10.2. Local Health Department Authority to Issue Operating Permits.

Local health departments may request delegated authority to
administer the operating permit program. The request must include an agreement to implement and enforce inspection, servicing, monitoring, and reporting requirements of this rule. The local health department must submit an annual report on or before September 1 of each calendar year, to the division containing:

A. A list of LUWD systems under delegation.
B. A summary listing the compliance status of each system, showing those systems that are currently failing, and those systems that have been repaired.
C. A summary of any enforcement actions taken, identifying those actions that are still pending, and those that been resolved.

10.3. Annual Inspection Report.

The owner of a LUWD system shall summit an annual inspection report covering the period of July 1 to June 30, the "reporting year", to the permitting agency no later than August 1 of each year. In this report, the owner shall report on all requirements listed in the operating permit. As a minimum, the report shall include the following items:

A. Facility name and address; owner name, address, and phone number;
B. List of facility components, e.g., septic tank, pump tank, gravel drainfield trench, gravelless chambers, pressure drainfield, etc.;
C. Design flow in gallons per day and number and type of connections;
D. Type of waste treated and disposed, i.e., residential, restaurant, other commercial establishment, etc.;
E. Checklist of inspections performed including the date of the inspection and a list of findings. The report must include, where pertinent:
   1. measured sludge and scum levels;
   2. date tanks were last pumped;
   3. verify pumps, floats; and control panel are operating as designed;
   4. date pump filter last cleaned;
   5. date pressure laterals last cleaned and flushed and squirt height recorded;
   6. any surfacing in absorption field; and
   7. any observed or suspected system malfunction;
F. Packed Bed media system sampling results, where pertinent;
G. Name of the certified individual per Rule R317-11 conducting the inspection;
H. Signature of owner or certified operator, and date.

KEY: water pollution, large underground wastewater, sewerage, engineering

Date of Enactment or Last Substantive Amendment: March 26, 2014
Notice of Continuation: April 25, 2017
Authorizing, and Implemented or Interpreted Law: 19-5
**SOIL TEST PIT LOG**

Owner: LRH, Inc.  
Grid Location: S22, T1N, R5E  
Tax ID No.: NS-230  
Property Address: off Cherry Canyon, Summit County, Utah  
Conducted By: Gus Sharry, PE  
Witness: Brett Hollberg  
Contractor / Equip: Hollberg / mini-ex  
Date: 11/10/09  
Job No.: 09009  
Weather: PC

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**ABBREVIATIONS**  
RTH-rubber tire backhoe; EXC-track excavator; BOH-Board of Health; ESHGW-estimated seasonal high groundwater; OGW-observed groundwater; GW-groundwater; GR-gravel; BG-below grade; P-pebbles; C-cobbles; B-boulders; FR-fractured rock; LD-largest dimension; RL-restrictive layer

**TEXTURE**  
S-sand; LS-loamy sand; SL-sandy loam; MSL-medium sandy loam; FSL-fine sandy loam; L-loam; SiL-silt loam; CL-clay loam; C-clay

**CONSISTENCE**  
LS-loose; SG-single grain; DH-dry, hard; DVFI-dry, very firm; DFI-dry, firm; DFR-dry, friable; MVFI-moist, very firm; MFI-moist, firm; MFR-mo friable; CM-cemented;

**STRUCTURE**  
M-massive; P-platy; B-blocky; PR-prismatic; RL-restrictive layer;

**MOTTLES**  
abundance: F-few (<2% soil surface); C-common (2-20% soil surface); M-many (>20% soil surface)  
size: F-fine (<5mm); M-medium (5-15mm); C-coarse (>15mm)  
contrast: F-faint; D-distinct; P-prominent
### SOIL TEST PIT LOG

**Owner:** LRH, Inc.  
**Grid Location:** S22, T1N, R5E  
**Tax ID No.:** NS-230  
**Property Address:** off Cherry Canyon, Summit County, Utah  
**Conducted By:** Gus Sharry, PE  
**Witness:** Brett Hollberg  
**Contractor / Equip.:** Hollberg / mini-ex  
**Job No.:** 09009  
**Date:** 11/10/09  
**Weather:** PC

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<td>OGW none</td>
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<tr>
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<td></td>
<td></td>
<td>ESHGW none</td>
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</table>

**ABBREVIATIONS**
- RTH: rubber tire backhoe  
- EXC: track excavator  
- BOH: Board of Health  
- ESHGW: estimated seasonal high groundwater  
- OGW: observed groundwater  
- GW: groundwater  
- GR: gravel  
- BG: below grade  
- P: pebbles  
- C: cobbles  
- B: boulders  
- FR: fractured rock  
- LD: largest dimension  
- RL: restrictive layer

**TEXTURE**
- S: sand  
- LS: loamy sand  
- SL: sandy loam  
- MSL: medium sandy loam  
- FSL: fine sandy loam  
- L: loam  
- SIl: silt loam  
- CL: clay loam  
- C: clay

**CONSISTENCE**
- LS: loose  
- SG: single grain  
- DH: dry, hard  
- DVFI: dry, very firm  
- DFI: dry, firm  
- DFR: dry, friable  
- MVFI: moist, very firm  
- MFI: moist, firm  
- MFR: moist, friable  
- CM: cemented

**STRUCTURE**
- M: massive  
- P: platy  
- B: blocky  
- PR: prismatic  
- RL: restrictive layer

**MOTTLES**
- abundance: F-few (<2% soil surface); C-common (2-20% soil surface); M-many (>20% soil surface)
- size: F-fine (<5mm); M-medium (5-15mm); C-coarse (>15mm)
- contrast: F-faint; D-distinct; P-prominent
### SOIL TEST PIT LOG

**Owner:** LRH, Inc.  
**Grid Location:** S22, T1N, R5E  
**Tax ID No.:** NS-230  
**Property Address:** off Cherry Canyon, Summit County, Utah  
**Conducted By:** Gus Sharry, PE  
**Witness:** Brett Hollberg  
**Contractor / Equip.:** Hollberg / mini-ex  
**Date:** 11/10/09  
**Job No.:** 09009

#### No. Depth Horizon Texture Color Description

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</table>

### ABBREVIATIONS

- RTH-rubber tire backhoe; EXC-track excavator; BOH-Board of Health; ESHGW-estimated seasonal high groundwater; OGW-observed groundwater; GW-groundwater; GR-gravel; BG-below grade; P-pebbles; C-cobbles; B-boulders; FR-fractured rock; LD-largest dimension; RL-restrictive layer

### TEXTURE

- S-sand; LS-loamy sand; SL-sandy loam; MSL-medium sandy loam; FSL-fine sandy loam; L-loam; SiL-silt loam; CL-clay loam; C-clay

### CONSISTENCE

- LS-loose; SG-single grain; DH-dry, hard; DVF-Dry, very firm; DFI-dry, firm; DFR-dry, friable; MVFI-moist, very firm; MFI-moist, firm; MFR-mo friable; CM-cemented

### STRUCTURE

- M-massive; P-platy; B-blocky; PR-prismatic; RL-restrictive layer

### MOTTLES

- abundance: F-few (<2% soil surface); C-common (2-20% soil surface); M-many (>20% soil surface)  
- size: F-fine (<5mm); M-medium (5-15mm); C-coarse (>15mm)  
- contrast: F-faint; D-distinct; P-prominent
SOIL TEST PIT LOG

Owner: LRH, Inc.
Grid Location: S22, T1N, R5E
Tax ID No.: NS-230
Property Address: off Cherry Canyon, Summit County, Utah
Conducted By: Gus Sharry, PE
Witness: Brett Hollberg
Contractor / Equip: Hollberg / mini-ex
Job No.: 09009
Date: 11/10/09
Weather: PC

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<td>1109-10</td>
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<td>L</td>
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<td>C1</td>
<td>SI</td>
<td>7YR4/2</td>
<td>DFR-DFI; few roots; no stone</td>
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<tr>
<td></td>
<td>58-88</td>
<td>C2</td>
<td>SI</td>
<td>10YR4/6</td>
<td>DFI-DVFI; M; no roots; no stone</td>
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</tbody>
</table>

mottling none
ESHGW none
OGW none
refusal none

ABBREVIATIONS
RTH-rubber tire backhoe; EXC-track excavator; BOH-Board of Health; ESHGW-estimated seasonal high groundwater; OGW-observed groundwater; GW-groundwater; GR-gravel; BG-below grade; P-pebbles; C-cobbles; B-boulders; FR-fractured rock; LD-largest dimension; RL-restrictive layer

TEXTURE
S-sand; LS-loamy sand; SL-sandy loam; MSL-medium sandy loam; FSL-fine sandy loam; L-loam; SI-silt loam; CL-clay loam; C-clay

CONSISTENCE
LS-loose; SG-single grain; DH-dry, hard; DVFI-dry, very firm; DFI-dry, firm; DFR-dry, friable; MVFI-moist, very firm; MFI-moist, firm; MFR-moist, friable; CM-cemented;

STRUCTURE
M-massive; P-platy; B-blocky; PR-prismatic; RL-restrictive layer;

MOTTLES
abundance: F-few (<2% soil surface); C-common (2-20% soil surface); M-many (>20% soil surface)
size: F-fine (<5mm); M-medium (5-15mm); C-coarse (>15mm)
contrast: F-faint; D-distinct; P-prominent
**PERC TEST CERTIFICATE**

**Owner:** LRH, Inc.  
**Grid Location:** S22, T1N, R5E  
**Tax ID No.:** NS-230  
**Property Address:** off Cherry Canyon, Summit County, Utah  
**Conducted By:** Gus Sharry, PE  
**Purpose:** subdivision

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**No.**

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< two 12-inch drainouts in 10 minutes...  
4-hour soak and overnight swell required

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<td>6</td>
</tr>
<tr>
<td>11/11/09</td>
<td>11:23:00</td>
<td>4 1/8</td>
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<tr>
<td>11/11/09</td>
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stable drop IN 4/8  
time period MIN 30  
stable perc rate MPI 60

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<td>11/11/09</td>
<td>10:53:00</td>
<td>5 1/8</td>
</tr>
<tr>
<td>11/11/09</td>
<td>11:53:00</td>
<td>4 5/8</td>
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< two 12-inch drainouts in 10 minutes...  
4-hour soak and overnight swell required

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<td></td>
<td>11:23:00</td>
<td>4 5/8</td>
</tr>
<tr>
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<td>11:53:00</td>
<td>4 1/8</td>
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</table>

stable drop IN 4/8  
time period MIN 30  
stable perc rate MPI 60

Certified in conformance with R317-4.11

**NOTES**

[1] A successful perc test does not guarantee buildability of land. Septic system designs must meet local and state code requirements for system size, slope distance, depth to seasonal high groundwater and bedrock, depth of parent soil, and setbacks to property lines and physical constraints.  

**ABBREVIATIONS**

RTH—rubber tire backhoe; EXC—track excavator; BOH—Board of Health; ESHGW—estimated seasonal high groundwater; OGW—observed groundwater; GW—groundwater; GR—gravel; BG—below grade; MPI—minutes per inch; IN—inches; MIN—minutes; RL—restrictive layer;
**PERC TEST CERTIFICATE**

**Owner:** LRH, Inc.
**Grid Location:** S22, T1N, R5E
**Tax ID No.:** NS-230
**Property Address:** off Cherry Canyon, Summit County, Utah
**Conducted By:** Gus Sharry, PE

**Purpose:** subdivision

---

### C

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*< two 12-inch drainouts in 10 minutes... 4-hour soak and overnight swell required*

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<td>10:15:00</td>
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<tr>
<td>9</td>
<td>7 4/8</td>
<td>5 4/8</td>
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**stable drop IN 1**
**time period MIN 30**
**stable perc rate MPI 30**

---

### D

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*< two 12-inch drainouts in 10 minutes... 4-hour soak and overnight swell required*

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<td>6</td>
<td>4 6/8</td>
<td>2 6/8</td>
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</table>

**stable drop IN 6/8**
**time period MIN 30**
**stable perc rate MPI 40**

---

**Certified in conformance with R317-4.11**

**NOTES**

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**ABBREVIATIONS**

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## PERC TEST CERTIFICATE

### Canyon Engineering
PO Box 982131
Park City, Utah 84098

**Owner:** LRH, Inc.
**Voice:** 435.640.7373
**Email:** gsharry@canyoneng.com

**Grid Location:** S22, T1N, R5E
**Tax ID No.:** NS-230

**Property Address:** off Cherry Canyon, Summit County, Utah

**Conducted By:** Gus Sharry, PE

**Purpose:** subdivision

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### No.

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<td>7:02</td>
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<tr>
<td>Depth</td>
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<td>Date</td>
<td>11/11/09</td>
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<tr>
<td>Time</td>
<td>3:58</td>
<td>7:58</td>
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<tr>
<td>Depth</td>
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- < two 12-inch drainouts in 10 minutes...
- 4-hour soak and overnight swell required

### F

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- < two 12-inch drainouts in 10 minutes...
- 4-hour soak and overnight swell required

---

**Certified in conformance with R317-4.11**

### NOTES

[1] A successful perc test does not guarantee buildability of land. Septic system designs must meet local and state code requirements for system size, slope distance, depth to seasonal high groundwater and bedrock, depth of parent soil, and setbacks to property lines and physical constraints.


### ABBREVIATIONS

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## PERC TEST CERTIFICATE

### Details
- **Owner**: LRH, Inc.
- **Grid Location**: S22, T1N, R5E
- **Tax ID No.**: NS-230
- **Property Address**: off Cherry Canyon, Summit County, Utah
- **Conducted By**: Gus Sharry, PE
- **Purpose**: subdivision

### GCertified in conformance with R317-4.11

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### NOTES
- [1] A successful perc test does not guarantee buildability of land. Septic system designs must meet local and state code requirements for system size, slope distance, depth to seasonal high groundwater and bedrock, depth of parent soil, and setbacks to property lines and physical constraints.
SOIL PROFILE AND
PERC TEST DATA

TRAIL RIDGE SUBDIVISION
SUMMIT COUNTY, UTAH

DATE: October, 2014

PROJECT NO. 14025

PREPARED BY: CANYON ENGINEERING
PARK CITY, UTAH
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<td>10-34</td>
<td>C1</td>
<td>SL</td>
<td>10YR 5/6</td>
<td>POC GR</td>
<td>MFR-DFR; roots to 24&quot;; isolated P;</td>
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**ABBREVIATIONS**

- RTH—rubber tire backhoe; EXC—track excavator; DEH—Dept of Environmental Health; ESHGW—estimated seasonal high groundwater; OGW—observed groundwater; GW—groundwater; BG—below grade; P—pebbles; C—cobbles; B—boulders; FR—fractured rock; LD—largest dimension; POC—pockets;

**TEXTURE**

- S—sand; CS—coarse sand; SL—sandy loam; MSL—medium sandy loam; FSL—fine sandy loam; L—loam; SiL—silt loam; FSC—fine sandy clay; CL—clay loam; C—clay;

**STRUCTURE**

- M—massive; PL—platy; BL—blocky; PR—prismatic; GR—granular; RL—restrictive layer;

**CONSISTENCE**

- LS—loose; SG—single grain; DH—dry, hard; DVFI—dry, very firm; DFI—dry, firm; DFR—dry, friable; MVFI—moist, very firm; MFI—moist, firm; MFR—moist, friable; CM—cemented; W—wet;

**MOTTLES**

- abundance: F—few (<2% soil surface); C—common (2-20% soil surface); M—many (>20% soil surface)
- size: F—fine (<5mm); M—medium (5-15mm); C—coarse (>15mm)
- contrast: F—faint; D—distinct; P—prominent
**SOIL TEST PIT LOG**

**Client:** Brett Hollberg  
**PLS Grid Location:** S21 T1N R5E  
**Tax ID No.:** NS-227-D; NS-227-L-1  
**Property Address:** to be determined  
**Conducted By:** Gus Sharry, PE  
**Witness:** Brent Ovard; Rebecka Hullinger  
**Contractor / Equip:** Hollberg  
**Date:** 10/9 - 10/10/14  
**Contractor / Equip:** Hollberg  
**No. & Location**  
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**ABBREVIATIONS**  
RTH-rubber tire backhoe; EXC-track excavator; DEH-Dept of Environmental Health; ESHGW-estimated seasonal high groundwater; OGW-observed groundwater; GW-groundwater; BG-below grade; P-pebbles; C-cobbles; B-boulders; FR-fractured rock; LD-largest dimension; POC-pockets;  

**TEXTURE**  
S-sand; CS-coarse sand; LS-loamy sand; SL-sandy loam; MSL-medium sandy loam; FSL-fine sandy loam; L-loam; SiL-silt loam; FSC-fine sandy clay; CL-clay loam; C-clay;  

**STRUCTURE**  
M-massive; PL-platy; BL-blocky; PR-prismatic; GR-granular; RL-restrictive layer;  

**CONSISTENCE**  
LS-loose; SG-single grain; DH-dry, hard; DVFI-dry, very firm; DFI-dry, firm; DFR-dry, friable; MVFI-moist, very firm; MFI-moist, firm; MFR-moist, friable; CM-cemented; W-wet;  

**MOTTLES**  
abundance: F-few (<2% soil surface); C-common (2-20% soil surface); M-many (>20% soil surface)  
size: F-fine (<5mm); M-medium (5-15mm); C-coarse (>15mm)  
contrast: F-faint; D-distinct; P-prominent
### SOIL TEST PIT LOG

**Client:** Brett Hollberg  
**PLS Grid Location:** S21 T1N R5E  
**Tax ID No.:** NS-227-D; NS-227-L-1  
**Property Address:** to be determined  
**Conducted By:** Gus Sharry, PE  
**Witness:** Brent Ovard; Rebecka Hullinger  
**Contractor / Equip:** Hollberg RTH  
**Job No.:** 14025  
**Date:** 10/9 - 10/10/14  
**Weather:** clear

### Solutions For Land

#### Conducted By: Gus Sharry, PE  
**Job No.:** 14025  
**Date:** 10/9 - 10/10/14  
**Weather:** clear

#### No. & Location Depth Horizon Texture Color Struc Description

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#### ABBREVIATIONS
- RTH: rubber tire backhoe; EXC: track excavator; DEH: Dept of Environmental Health; ESHGW: estimated seasonal high groundwater; OGW: observed groundwater; GW: groundwater; BG: below grade; P: pebbles; C: cobbles; B: boulders; FR: fractured rock; LD: largest dimension; POC: pockets;

#### TEXTURE
- S: sand; CS: coarse sand; LS: loamy sand; SL: sandy loam; MSL: medium sandy loam; FSL: fine sandy loam; L: loam; SiL: silt loam; FSC: fine sandy clay; CL: clay loam; C: clay;

#### STRUCTURE
- M: massive; PL: platy; BL: blocky; PR: prismatic; GR: granular; RL: restrictive layer;

#### CONSISTENCE
- LS: loose; SG: single grain; DH: dry, hard; DVFI: dry, very firm; DFI: dry, firm; DFR: dry, friable; MVFI: moist, very firm; MFI: moist, firm; MFR: moist, friable; CM: cemented; W: wet;

#### MOTTLES
- abundance: F-few (<2% soil surface); C-common (2-20% soil surface); M-many (>20% soil surface)
- size: F-fine (<5mm); M-medium (5-15mm); C-coarse (>15mm)
- contrast: F-faint; D-distinct; P-prominent
PERC TEST CERTIFICATE

Owner: Brett Hollberg
PLS Grid Location: S21 T1N R5E
Tax ID No.: NS-227-D; NS-227-L-1
Property Address: to be determined
Conducted By: Gus Sharry, PE
Witnessed By: Brent Ovard; Rebecka Hullinger
Job No.: 14025
Weather: clear

No. & Location
1014-A (lot 1) Bottom of perc to grade (IN) 26

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Certified in conformance with
Utah Administrative Code section R317-4, Appendix D, and local Health Dept rules

NOTES
[1] An acceptable perc rate does not guarantee buildability of land. On-site wastewater system designs must meet state and local code requirements for absorption area location, size and type, slope distance, depth to seasonal high groundwater and bedrock, depth of parent soil, setbacks to property lines and physical constraints, and other requirements. A site exhibiting a perc rate between 1 and 60 MPI may require an alternative system if other conventional system design requirements cannot be met.
[2] All depths in inches. All times are to the second.

ABBREVIATIONS
RTH-rubber tire backhoe; EXC-track excavator; BOH-Board of Health; ESHGW-estimated seasonal high groundwater; OGW-observed groundwater; GW-groundwater; BG-below grade; MPI-minutes per inch; IN-inches; MIN-minutes; RL-restrictive layer;

ACCEPTABLE PERC RATE RANGES

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<td>1 to 120 MPI</td>
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EXHIBIT D.14
## PERC TEST CERTIFICATE

**Owner:** Brett Hollberg  
**PLS Grid Location:** S21 T1N R5E  
**Tax ID No.:** NS-227-D; NS-227-L-1  
**Property Address:** to be determined  
**Conducted By:** Gus Sharry, PE  
**Witnessed By:** Brent Ovard; Rebecka Hullinger  
**Job No.:** 14025  
**Weather:** clear

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**Certified in conformance with**  
Utah Administrative Code section R317-4, Appendix D, and local Health Dept rules

### Acceptable Perc Rate Ranges

- **Conventional systems:** 1 to 60 MPI
- **Alternative systems:** 1 to 120 MPI

### Notes

1. An acceptable perc rate does not guarantee buildability of land. On-site wastewater system designs must meet state and local code requirements for absorption area location, size and type, slope distance, depth to seasonal high groundwater and bedrock, depth of parent soil, setbacks to property lines and physical constraints, and other requirements. A site exhibiting a perc rate between 1 and 60 MPI may require an alternative system if other conventional system design requirements cannot be met.

2. All depths in inches. All times are to the second.

### Abbreviations

- RTH-rubber tire backhoe; EXC-track excavator; BOH-Board of Health; ESHGW-estimated seasonal high groundwater; OGW-observed groundwater; GW-groundwater; BG-below grade; MPI-minutes per inch; IN-inches; MIN-minutes; RL-restrictive layer.
**PERC TEST CERTIFICATE**

**Owner:** Brett Hollberg  
**PLS Grid Location:** S21 T1N R5E  
**Tax ID No.:** NS-227-D; NS-227-L-1  
**Property Address:** to be determined  
**Conducted By:** Gus Sharry, PE  
**Witnessed By:** Brent Ovard; Rebecka Hullinger  
**Job No.:** 14025  
**Weather:** clear

---

**No. & Location**  
1014-F (lot 3)  
Bottom of perc to grade (IN)  
24

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<tr>
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</table>

| drop | IN | 1 | time period | MIN | 30 | perc rate: 30 MPI |

**ACCEPTABLE PERC RATE RANGES**

- conventional systems 1 to 60 MPI
- alternative systems 1 to 120 MPI

**NOTES**

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[2] All depths in inches. All times are to the second.

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## PERC TEST CERTIFICATE

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- **PLS Grid Location:** S21 T1N R5E
- **Tax ID No.:** NS-227-D; NS-227-L-1
- **Property Address:** to be determined
- **Conducted By:** Gus Sharry, PE
- **Witnessed By:** Brent Ovard; Rebecka Hullinger
- **Job No.:** 14025
- **Weather:** clear

### No. & Location

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First 12-inch drainout > 10 minutes; held water over gravel at least 4 hours; 16 to 30-hour swell required

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**perc rate:** 80 MPI

---

**ACCEPTABLE PERC RATE RANGES**

- **conventional systems:** 1 to 60 MPI
- **alternative systems:** 1 to 120 MPI

---

**NOTES**

1. An acceptable perc rate does not guarantee buildability of land. On-site wastewater system designs must meet state and local code requirements for absorption area location, size and type, slope distance, depth to seasonal high groundwater and bedrock, depth of parent soil, setbacks to property lines and physical constraints, and other requirements. A site exhibiting a perc rate between 1 and 60 MPI may require an alternative system if other conventional system design requirements cannot be met.

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# PERC TEST CERTIFICATE

**Owner:** Brett Hollberg  
**PLS Grid Location:** S21 T1N R5E  
**Tax ID No.:** NS-227-D; NS-227-L-1  
**Property Address:** to be determined  
**Conducted By:** Gus Sharry, PE  
**Witnessed By:** Brent Ovard; Rebecka Hullinger  
**Job No.:** 14025  
**Weather:** clear

## No. & Location

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First 12-inch drainout > 10 minutes; held water over gravel at least 4 hours; 16 to 30-hour swell required

| Date       | 10/13/14   |
| Time       | 3:02:00    | 3:32:00 | 4:02:00 | 4:03:00 | 4:33:00 | 5:03:00 |
| Depth      | 6          | 3 5/8   | 2 6/8   | 6       | 4 2/8   | 2 4/8   |

## NOTES

1. An acceptable perc rate does not guarantee buildability of land. On-site wastewater system designs must meet state and local code requirements for absorption area location, size and type, slope distance, depth to seasonal high groundwater and bedrock, depth of parent soil, setbacks to property lines and physical constraints, and other requirements. A site exhibiting a perc rate between 1 and 60 MPI may require an alternative system if other conventional system design requirements cannot be met.

2. All depths in inches. All times are to the second.

## ABBREVIATIONS

- RTH: rubber tire backhoe; EXC: track excavator; BOH: Board of Health; ESHGW: estimated seasonal high groundwater; OGW: observed groundwater; GW: groundwater; BG: below grade; MPI: minutes per inch; IN: inches; MIN: minutes; RL: restrictive layer;
### PERC TEST CERTIFICATE

**Owner:** Brett Hollberg  
**PLS Grid Location:** S21 T1N R5E  
**Tax ID No:** NS-227-D; NS-227-L-1  
**Property Address:** to be determined  
**Conducted By:** Gus Sharry, PE  
**Witnessed By:** Brent Ovard; Rebecka Hullinger  
**Job No:** 14025  
**Weather:** clear

---

### No. & Location

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| N 40.80965  
| W 111.38390 | Time: 0:57:10  
| Depth: 12 | 1:55:00  
| Depth: 6 | 3:27:20  
| Depth: 8/6 | first 12-inch drainout > 10 minutes;  
| Depth: 7 | held water over gravel at least 4 hours;  
| Depth: 16 to 30-hour swell required |  
| Date: 10/10/14  
| Time: 0:00:40 |  
| Time: 0:30:40 |  
| Time: 1:00:40 |  
| Depth: 6 |  
| Depth: 5  
| Depth: 4/8 |  
| Time: 5 |  
| Time: 30 | perc rate: 60 MPI |

---

### ACCEPTABLE PERC RATE RANGES

- **conventional systems:** 1 to 60 MPI  
- **alternative systems:** 1 to 120 MPI

---

### NOTES

[1] An acceptable perc rate does not guarantee buildability of land. On-site wastewater system designs must meet state and local code requirements for absorption area location, size and type, slope distance, depth to seasonal high groundwater and bedrock, depth of parent soil, setbacks to property lines and physical constraints, and other requirements. A site exhibiting a perc rate between 1 and 60 MPI may require an alternative system if other conventional system design requirements cannot be met.

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## PERC TEST CERTIFICATE

**Owner:** Brett Hollberg  
**PLS Grid Location:** S21 T1N R5E  
**Tax ID No.:** NS-227-D; NS-227-L-1  
**Property Address:** to be determined  
**Conducted By:** Gus Sharry, PE  
**Witnessed By:** Brent Ovard; Rebecka Hullinger  
**Job No.:** 14025  
**Weather:** clear

### No. & Location

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- **Depth:** 12
- **Time:** 9
- **Date:** 10/10/14
- **Time:** 1:15:00 1:45:00 2:15:00 2:45:00
- **Depth:** 6 5 5/8 5 2/8 4 7/8

### Depth Drop

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<td></td>
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</tbody>
</table>

**perc rate:** 80 MPI

## ACCEPTABLE PERC RATE RANGES

- **conventional systems:** 1 to 60 MPI
- **alternative systems:** 1 to 120 MPI

## NOTES

1. An acceptable perc rate does not guarantee buildability of land. On-site wastewater system designs must meet state and local code requirements for absorption area location, size and type, slope distance, depth to seasonal high groundwater and bedrock, depth of parent soil, setbacks to property lines and physical constraints, and other requirements. A site exhibiting a perc rate between 1 and 60 MPI may require an alternative system if other conventional system design requirements cannot be met.

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- BG: below grade
- MPI: minutes per inch
- IN: inches
- MIN: minutes
- RL: restrictive layer

Certified in conformance with Utah Administrative Code section R317-4, Appendix D, and local Health Dept rules.
**PERC TEST CERTIFICATE**

**Owner:** Brett Hollberg  
**PLS Grid Location:** S21 T1N R5E  
**Tax ID No.:** NS-227-D; NS-227-L-1  
**Property Address:** to be determined  
**Conducted By:** Gus Sharry, PE  
**Witnessed By:** Brent Ovard; Rebecka Hullinger  
**Job No.:** 14025  
**Weather:** clear

---

<table>
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<th>No. &amp; Location</th>
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<th>Time</th>
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<tbody>
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<td></td>
<td>3:20:00</td>
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</table>

**Notes:**

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**Abbreviations:**

RTH - rubber tire backhoe; EXC - track excavator; BOH - Board of Health; ESHGW - estimated seasonal high groundwater; OGW - observed groundwater; GW - groundwater; BG - below grade; MPI - minutes per inch; IN - inches; MIN - minutes; RL - restrictive layer.
PERC TEST CERTIFICATE

Owner: Brett Hollberg
PLS Grid Location: S21 T1N R5E
Tax ID No.: NS-227-D; NS-227-L-1
Property Address: to be determined
Conducted By: Gus Sharry, PE
Witnessed By: Brent Ovard; Rebecka Hullinger
Job No.: 14025
Weather: clear

No. & Location
1014-I (lot 9) Bottom of perc to grade (IN) 23
N 40.80830 W 111.38573

Date          Time          Depth
10/14/14      0:00:00      12
0:45:00       10 5/8        9 7/8
1:35:40

Date          Time          Depth
10/15/14      0:00:00      6
0:30:00       5 6/8        5 4/8
1:00:00

drop IN 2/8

perc rate: 120 MPI

Certified in conformance with
Utah Administrative Code section R317-4, Appendix D, and local Health Dept rules

NOTES
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PERC TEST CERTIFICATE

Owner: Brett Hollberg
PLS Grid Location: S21 T1N R5E
Tax ID No.: NS-227-D; NS-227-L-1
Property Address: to be determined
Conducted By: Gus Sharry, PE
Witnessed By: Brent Ovard; Rebecka Hullinger
Job No.: 14025
Weather: clear

No. & Location
1014-J (lot 10) Bottom of perc to grade (IN) 20

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first 12-inch drainout > 10 minutes;
held water over gravel at least 4 hours;
16 to 30-hour swell required

perc rate: 40 MPI

Certified in conformance with
Utah Administrative Code section R317-4, Appendix D, and local Health Dept rules

NOTES
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Pursuant to the Summit County Code of Health (the “Code”) §1-1-9 (February 2018), Canyon Engineering on behalf of the Trail Ridge Master Planned Development Subdivision and its owner, Brett Hollberg (the “Appellant”) appealed that certain letter decision of the Summit County Health Officer (the “County Health Officer”), dated December 17, 2018 (the “Decision Letter”), wherein the Summit County Health Department (the “Health Department”) denied the Appellant’s application for individual on-site wastewater systems in the Trail Ridge Master Planned Development Subdivision (the “Appeal”). The Appellant was represented by Gus Sharry, President of Canyon Engineering, and the Health Department was represented by Phil Bondurant, the Director of Environmental Health. The Board of Health (the “Board”) was represented by David L. Thomas, Chief Civil Deputy County Attorney.

Evidence and materials were presented by way of testimony, statements, documents and memorandum for consideration by the Board. Having considered the evidence presented by all

1. Decision Letter, dated December 17, 2018 from Richard C. Bullough, County Health Officer, to Gus Sharry, Canyon Engineering.
interested parties and the entire record relating to this Appeal, the Board rendered its decision as part of its regularly scheduled agenda on January 7, 2019, **DENYING** the Appeal, with that decision to become final following the adoption of these findings and conclusions. The vote was 6-0 with one abstention. In support of that decision, the Board adopts the following Findings of Fact and Conclusions of Law:

**Findings of Fact**

1. The proposed Trail Ridge Master Planned Development Subdivision is comprised of twenty-five (25) lots located in Sections 21 and 22, Township 1 North, Range 5 East, in Wanship, Summit County, Utah (the “Trail Ridge Subdivision”). The Trail Ridge Subdivision has been filed under the Master Planned Development provisions of the Eastern Summit County Development Code, but has not yet received approval from either the Eastern Summit County Planning Commission or the Summit County Council.

2. On or about October 10, 2014, Appellant conducted percolation tests on ten (10) lots within the Trail Ridge Subdivision to determine suitability for individual on-site wastewater systems (“Septic Systems”). Four of the lots (Lots 4, 6, 7 & 9) tested at or above sixty (60) Minutes Per Inch (“MPI”) and were therefore deemed not suitable for Septic Systems. Such is documented in “Soil Profile and Perc Test Data, Trail Ridge Subdivision, Summit County, Utah, October 2014, Project No. 14025, Canyon Engineering” (the “2014 Perc Tests”).

3. The Utah Department of Environmental Quality (“DEQ”) conducted a study entitled “Total Maximum Daily Load (TMDL) for Rockport Reservoir (2014),” in which it...

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estimated that “19% of the nitrogen load, and a smaller portion of phosphorus, [within] the Rockport Reservoir comes from septic systems within the watershed” (the “2014 DEQ Study”). The Trail Ridge Subdivision lies within the Rockport Reservoir watershed. The 2014 DEQ Study is an example of how these Septic Systems cumulatively impact the watershed of an area in a negative manner. According to Richard Bullough, the County Health Officer, the dangers to water quality and public health from high nutrient loads that are derived from Septic Systems was recently demonstrated in the summer of 2018 from an Algal Bloom which occurred within the Rockport Reservoir itself.³

4. In 2016, the Health Department commissioned a study of Septic Systems within Summit County. That study was prepared by SWCA Environmental Consultants and is entitled “Septic Development in Summit County: An Evaluation of the Past in the Face of Future Development (November 30, 2016)” (the “2016 Study”).⁴ The 2016 Study concluded that “[b]ased on criteria adopted from the State of Utah Administrative Code, a portion of the county does not appear to be well suited for conventional septic development . . . .”⁵ As part of the 2016 Study, a spatial analysis was conducted in eastern Summit County wherein certain areas were found to be “unsuitable” for septic development due to “proximity to protected waters, floodplains or slopes steeper than 35%.”⁶ Further, a “Septic Suitability Model” was constructed “based on criteria in the Utah Administrative Code Rule R317-4 for Onsite Wastewater Systems.

³ Decision Letter, dated December 17, 2018 from Richard C. Bullough, County Health Officer, to Gus Sharry, Canyon Engineering.
⁵ SWCA Environmental Consultants, pp. i.
⁶ SWCA Environmental Consultants, pp. 24-35.
According to the Septic Suitability Model, the Trail Ridge Subdivision compromises lands for which ~10% are designated as “most suitable” for the installation of Septic Systems, while ~60% are designated as “less suitable” and ~30% are designated as “least suitable.”

5. On or about November 15, 2018, in accordance with Chapter 3 of the Code, Appellant sought approval from the Health Department for the installation of twenty-five (25) Septic Systems within the Trail Ridge Subdivision (the “Application”).

6. On November 19, 2018, Phil Bondurant, Director of Environmental Health, denied the Application, citing the failed 2014 Perc Tests and the 2016 Study. Instead, Mr. Bondurant advised the Appellant that a “community wastewater system” would be required.

7. On November 29, 2018, Appellant appealed Mr. Bondurant’s decision to the County Health Officer who affirmed Mr. Bondurant’s decision in his Decision Letter. In said Decision Letter, the County Health Officer also cited to the 2014 DEQ Study on the cumulative impacts of Septic Systems on the Rockport Reservoir watershed.

8. Thereafter, Appellant appealed the Decision Letter to the Board.

7. SWCA Environmental Consultants, pp. 29, *Figure 11.*

8. *Id.* (emphasis added).


10. Letter, dated November 19, 2018, from Phil Bondurant, Director of Environmental Health, to Gus Sharry, Canyon Engineering.


12. Decision Letter, dated December 17, 2018 from Richard C. Bullough, County Health Officer, to Gus Sharry, Canyon Engineering.
9. A hearing was held on January 7, 2018 before the Board.

10. During the hearing, Appellant argued that:

   • A community wastewater system or “package sewer plant” is economically
     unviable for the Trail Ridge Subdivision.
   
   • Individual conventional Septic Systems are reliable and have a sound
     scientific basis.
   
   • R317-4 and §1-3-9 of the Code allow Septic Systems on lots in excess of one
     (1) acre.
   
   • The 2016 Study is too generalized to be applied in this circumstance.

11. In rebuttal, Mr. Bondurant argued that:

   • The 2016 Study provided a Septic Suitability Model (Map) with a basis in
     scientific data which indicates that ~90% of the Trail Ridge Subdivision is
     unsuitable for Septic Systems.
   
   • 40% of the perc tests done in 2014 for the Trail Ridge Subdivision failed.
   
   • None of the 2014 Perc Tests are currently valid.

Conclusions of Law

1. Procedural due process for this Appeal is governed by §1-1-9 of the Code.

2. Substantive due process for this Appeal is governed by R317-4 (On-site
   Wastewater Systems) and Chapter 3 of the Code. The Board incorporated by reference Utah
   Administrative Rule, Environmental Equality, Water Quality, R317 into the Code.13

---

13. §1-3-1 of the Code.
3. “The standard of proof to be used by the Board . . . in deciding the issues at an administrative hearing is whether a *preponderance of the evidence* shows that a violation exists or existed.”

4. All percolation test results are “valid for a period of two years from the date the test was performed.” Consequently, the 2014 Perc Tests are no longer valid for purposes of approving Septic Systems.

5. All individual on-site wastewater systems require a Wastewater Permit issued by the Health Department.

6. “[O]nsite wastewater systems are not feasible in some areas and situations. If property characteristics indicate conditions that may fail in any way to meet the requirements specified herein [R317-4], the use of onsite wastewater systems shall be prohibited.”

7. The Utah Department of Health has conferred legal jurisdiction upon the Board to determine the “feasibility of using an onsite wastewater system.” In doing so, the Board evaluates the soil and site of the proposed Septic System.

8. Onsite wastewater system feasibility may be impacted by “rivers, streams, creeks, dry or ephemeral washes, lakes, canals, marshes, subsurface drains, natural storm water drains, lagoons, [and] artificial impoundments,” as well as “flood plains.”

---

14. §1-1-9(F)(4) of the Code (emphasis added).

15. §1-3-2(A) of the Code.

16. §1-3-4(A) & (B) of the Code.

17. R317-4-3.2.

18. R317-4-4.1.

19. R317-4-4.1(B)(5).
9. “Where soil and other site conditions are clearly unsuitable for the placement of an onsite wastewater system,” the Health Department can deny a permit for a Septic System.\textsuperscript{20}

10. Utah law prohibits absorption systems on slopes exceeding 35\%.\textsuperscript{21}

11. The 2016 Study produced a Septic Suitability Model based upon the criteria found in R317-4-4.1, including accounting for water bodies, floodplains and slopes exceeding 35\%.\textsuperscript{22}

12. The Septic Suitability Model shows that ~90\% of the land area within the Trail Ridge Subdivision is either “less suitable” or “least suitable” for the installation of Septic Systems.\textsuperscript{23}

13. Given (a) the results of the Septic Suitability Model\textsuperscript{24}, (b) the 2014 DEQ Study on the cumulative impacts of Septic Systems on the Rockport Reservoir watershed\textsuperscript{25}, and (c) the 2014 Perc Test failure of 40\% of the lots tested within the Trail Ridge Subdivision\textsuperscript{26}, the Board concludes that there is a \textit{preponderance of evidence} which substantiates the Decision Letter of the County Health Officer.\textsuperscript{27}

\textsuperscript{20} R317-4-4.1(B)(6).
\textsuperscript{21} R317-4-4.1(B)(4).
\textsuperscript{22} SWCA Environmental Consultants, pp. 24-35.
\textsuperscript{23} SWCA Environmental Consultants, pp. 29, \textit{Figure} 11.
\textsuperscript{24} Id.
\textsuperscript{25} Decision Letter, dated December 17, 2018 from Richard C. Bullough, County Health Officer, to Gus Sharry, Canyon Engineering.
\textsuperscript{26} Canyon Engineering, “Soil Profile and Perc Test Data, Trail Ridge Subdivision, Summit County, Utah” (October 2014).
\textsuperscript{27} Decision Letter, dated December 17, 2018 from Richard C. Bullough, County Health Officer, to Gus Sharry, Canyon Engineering.
14. The Board concludes that the Appellant’s arguments to the contrary are not compelling.

- Economic viability is not a criteria that the Board can consider when assessing the public health as it relates to Septic Systems.
- Appellant’s generalized assertions with respect to the 2016 Study are not substantiated by actual evidence presented to the Board.
- While it is true that individual conventional Septic Systems and minimum lot sizes for such systems are based upon sound scientific principles, part of that scientific analysis includes feasibility, which recognizes that there are cases and circumstances where such a Septic System is not appropriate.\(^{28}\)
- The 2016 Study is a valid scientific analysis with a Septic Suitability Model which is based upon sound scientific principles. We conclude that there is no compelling reason not to follow the results of that analysis.

**Administrative Enforcement Order**

The Appeal is DENIED.

The Findings of Fact, Conclusions of Law, and Administrative Enforcement Order may be appealed by filing a petition for review within thirty (30) calendar days to the Third Judicial District Court in and for Summit County, State of Utah, in accordance with Code §1-1-9(H)(3).

---

Dated this 18th day of January 2019.

BOARD OF HEALTH

Gary Resnick
Chair

Approved as to form:

David L. Thomas
Chief Civil Deputy
Preliminary Evaluation Report

Trail Ridge Well 1

Summit County, UT

June 20, 2018

Prepared for:
LRH Inc. & Utah Division of Drinking Water

PWS # No PWS assigned yet

Prepared By:
CASCADE WATER RESOURCES
PO BOX 982948
PARK CITY, UT 84098
## TABLE OF CONTENTS

**EXECUTIVE SUMMARY** .............................................................................................................. ii

**INTRODUCTION** ......................................................................................................................... 1
  1.1 System Information .................................................................................................................. 1
  1.2 Source Information .................................................................................................................. 1
  1.3 Designated Person .................................................................................................................... 1

**2.0 DELINEATION REPORT** ........................................................................................................ 3
  2.1 Geologic Data .......................................................................................................................... 3
  2.2 Well Materials, Design, and Construction .............................................................................. 5
  2.3 Aquifer Data ........................................................................................................................... 7
  2.4 Hydrogeologic Methods and Calculations .............................................................................. 8
  2.5 Boundaries of DWSP Zones .................................................................................................... 8
  2.6 Status of the Aquifer ............................................................................................................... 9

**3.0 INVENTORY OF POTENTIAL CONTAMINATION SOURCES** ............................................... 9
  3.1 Survey Methods and PCS List ............................................................................................... 9
  3.2 Hazard Identification ............................................................................................................. 10
  3.3 Priority and Location of PCSs .............................................................................................. 10

**4.0 IDENTIFICATION AND ASSESSMENT OF POTENTIAL CONTAMINATION SOURCE HAZARD CONTROLS** ............................................................................................................. 12

**5.0 LAND OWNERSHIP** ............................................................................................................. 13

**6.0 LAND USE AGREEMENTS, LETTERS OF INTENT, ZONING ORDINANCES** .................... 13

**7.0 REFERENCES** ..................................................................................................................... 14

### LIST OF FIGURES

Figure 1: Location Map ..................................................................................................................... 2
Figure 2: Local Geology ................................................................................................................... 4
Figure 3: Proposed Well Construction Diagram ............................................................................... 6
Figure 4: Protection Zone, PCS Location, and Flow Direction Map .............................................. 11

### LIST OF APPENDIXES

Appendix A Hollberg and Evans Trust Well Logs
Appendix B Intent to Sign Land Use Agreement
EXECUTIVE SUMMARY

This document will serve as the Preliminary Evaluation Report (PER) for the Trail Ridge Public Water Supply System Well 1.
The designated person responsible for this Preliminary Evaluation Report is:

Brett Hollberg
LRH, Inc
PO Box 171003
Salt Lake City, UT 84117
Phone: (801) 558-7647
bretthollberg@me.com

Well Location and Design

The new drinking water source will be a single groundwater well identified as the Trail Ridge Public Water Supply System Well 1, with a common name of Well 1. The well will be located in Cherry Creek Canyon approximately 1320 feet south 400 feet east from the north quarter corner of section 22 T1N R5E SL B&M. LRH Inc proposes to start drilling in late summer of 2018.

Source Protection Zone Delineation

The approximate 250-day (Zone 2), 3-year (Zone 3), and the 15-year (Zone 4) groundwater travel time protection zones for Well 1 are shown on Figure 4. The generalized dimensions of the protection zones are summarized in Table 2. The Protection Zones are shown on Figure 4. The protection zones are small due to the low pumping rate and conservative estimates as to the size have been made.

Table 2: Well 1 Protection Zone Dimensions

<table>
<thead>
<tr>
<th>Protection Zone</th>
<th>Length of Protection Zone&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Width of Protection Zone&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Distance Upgradient of Well</th>
<th>Distance Downgradient of Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 2</td>
<td>300 ft.</td>
<td>250 ft.</td>
<td>230 ft.</td>
<td>70 ft.</td>
</tr>
<tr>
<td>Zone 3</td>
<td>580 ft.</td>
<td>500 ft.</td>
<td>470 ft.</td>
<td>110 ft.</td>
</tr>
<tr>
<td>Zone 4</td>
<td>1435 ft.</td>
<td>875 ft.</td>
<td>1315 ft.</td>
<td>120 ft.</td>
</tr>
</tbody>
</table>

<sup>a</sup> - Total length measured parallel to the direction of groundwater flow
<sup>b</sup> - Total width measured perpendicular to the direction of groundwater flow

Potential Contamination Source (PCS) Inventory and Assessment

Five PCSs were identified. The Hollberg residence septic system, the Hollberg domestic well, the Hollberg pond, dirt roads, and intermittent streams.

Ordinances

Brett Hollberg has signed an intent to sign a Land Use Agreement if the well proves up. The intent is included in Appendix B.
INTRODUCTION

LRH Inc is in the process of starting a new Public Water System near Wanship, Utah. The well will serve a proposed 48 recreational homes with 400 gallons per day each of culinary water in the Trail Ridge Subdivision in the Cherry Creek Canyon area. LRH Inc is proposing to drill a new well to enable them to hook up new homes for domestic use. This well is the first step to the start of the system, as the water supply is the most critical part of any system.

This document is presented to the State of Utah Department of Environmental Quality, Division of Drinking Water (DDW) as a Preliminary Evaluation Report (PER) for the proposed Trail Ridge Well 1. This document is intended to meet the requirements of a PER as set forth in Utah Administrative Code R309-600 (UDEQ-DDW, 2000).

1.1 System Information

The system will supply culinary water to future residences in the Trail Ridge Subdivision. LRH Inc is in the planning stage with Summit County to build out 48 lots in the Cherry Creek Canyon area. LRH Inc has applied for a water right exchange 35-13383 (e5776). The system has not been assigned a PWS number yet.

1.2 Source Information

The new drinking water source will be a single groundwater well identified as the Trail Ridge Well 1, with a common name of Well 1. The system currently has an exchange application to transfer an existing water right from Wanship Reservoir to this well. LRH Inc proposes to start drilling in late summer 2018.
Figure 1 shows the location of Well 1. We are assuming the site will be WS001 for the new system.

1.3 Designated Person

The designated person responsible for this Preliminary Evaluation Report is:

Brett Hollberg
LRH, Inc
PO Box 171003
Salt Lake City, UT 84117
Phone: (801) 558-7647
bretthollberg@me.com
Figure 1.
Location of Trail Ridge Well 1

Drawn By: G3 Mapping
Rich Emerson

Project Manager: John Files

Date: June 2018
2.0 Delineation Report

The delineation report contains the following information: geologic data, aquifer data, proposed well construction data, summary of the data and methods used to establish the groundwater protection zones, and appropriate maps of the protection zones.

The Preferred Delineation Procedure was used to define protection zones for Well 1.

2.1 Geologic Data

The local geology and hydrology has been defined from 2003 to recent by studies and reports by the Utah Geologic Survey (UGS), United States Geologic Survey (USGS), and Cascade Water Resources. The area near the Well 1 was studied for the location of a culinary supply well for the Trail Ridge Subdivision. It was determined from evaluation of wells in the area that the recharge would be enough to sustain the needed flow for culinary purposes.

2.1.1 Local Geology

The target for the culinary production well will be sandstone and siltstone of the Hams Fork member of the Evanston Formation in Cherry Canyon. Pump tests and well logs in this area indicate favorable odds that there will be sustainable flow from this local aquifer for the culinary purposes for Trail Ridge. Figure 2 is the local geology from the area.

The estimated total depth of the well will be 250 feet with an estimated water table of 12 feet. This information was extrapolated from the nearby Evans Trust (WRN 35-12081) and Hollberg (WRN 35-12468) domestic wells (Appendix A). Data from these well logs indicate siltstone and fine-grained sandstone with some shale bedrock possible in the upper portion covered by approximately 30-60 feet of alluvium. Evaluation of the Salt Lake City 30’ x 60’ quadrangle geologic maps (Bryant, 2003) and the Crandall Canyon and Hidden Lakes quadrangle (Bradley, 2001) geologic maps indicate that the formation is likely in the middle of the Hams Fork member of the Evanston Formation.

Studies conducted by the Utah Geological Survey indicate that these sandstone and siltstone beds have the greatest potential for aquifer development within the Hams Fork member due to the likelihood that the rocks retained their primary porosity and permeability with a large joint density (Hurlow, 2002).
Figure 2. Geology of the Cherry Canyon Area

- Qal: Alluvium
- Qtg: Terrace gravels
- Qof: Older alluvial-fan and debris-fan deposits
- Tw: Wasatch Formation
- Keh: Hams Fork Member of the Evanston Formation
- Kfl: Lower member of Frontier Formation
- Kk: Upper member of Kelvin Formation
- Kkp: Parleys Member of Kelvin Formation
- Jp: Preuss Sandstone

Drawn By: G3 Mapping
Rich Emerson

Project Manager: John Files

Date: June 2018
2.2 Well Materials, Design, and Construction

Figure 3 is a proposed well construction diagram of the Well 1. The well will be drilled by using dual rotary method. The selected driller will drill, construct, develop, and perform a 24-hour to week long aquifer test. The sanitary surface seal will be witnessed by a representative of DDW.

2.2.1 ANSI/NSF Standards 60 and 61 Certification

All interior surfaces of the well will consist of products complying with ANSI/NSF Standard 61. This standard will apply to casing, drop pipes, well screens, coatings, adhesives, solders, fluxes, pumps, switches, electrical wire, sensors, and all other equipment that may contact drinking water.

All substances introduced into the well during construction or development shall be certified to comply with ANSI/NSF Standard 60. This applies to all drilling fluids, circulation materials, lubricants, weighting agents and any other fluids used during drilling. This will also apply to well grouting and sealing materials that may contact drinking water.

2.2.2 Permanent Steel Casing Pipe

The steel casing pipe will meet the following requirements:

a. Be new, single steel casing pipe meeting AWWA Standard A-100, ASTM or API specifications having a minimum weight and thickness as described in Table 1 found in Utah Administrative Code R655-4-7.21: Administrative Rules for Water Well Drillers, as in effect on December 1, 2000;

b. Have additional thickness and weight if minimum thickness is not considered sufficient to assure reasonable life expectancy of the well;

c. Be capable of withstanding forces to which it is subjected;

d. Have full circumferential welds; and

e. Project at least 18 inches above the final ground surface.

2.2.3 Disposal of Cuttings

Cuttings and waste from the well will be discharged in a manner consistent with rules and regulations of the Utah Division of Water Quality.

2.2.4 Plumbness and Alignment Requirements

The well will be tested for plumbness during drilling and after completion for vertical alignment in accordance with AWWA Standard A100 by the selected driller.
Figure 3: Proposed Well Construction Diagram

Potential geology based on Evans Trust well log

- 0 - 45': Silt, sand, and gravel. Coarsens with depth.
- 45' - 120': Silty shale bedrock with interbedded lenses of sandstone.
- 120' - TD: Silty sandstone.

Proposed Well Construction Diagram for Trail Ridge Well 1

- 0 - 110': Minimum 10" Borehole
- 0 - 110': Sanitary Seal
- 1.5' agl to 150' bgl 6" casing
- 110' - 250' 6" Dual rotary case driven borehole
- 150' - 250' 6" Diameter perforated casing

12' Estimated water level

Note: Depths shown on this diagram will change based on geology encountered in drilling the borehole.
2.2.5 **Grouting Techniques and Requirements**

As shown on the well construction diagram (Figure 3), cement grout will be installed in the well from ground level to a minimum of 110 feet below ground surface (bgs). The grout will consist of equal parts of sand and cement grout which conforms to ASTM Standard C150 and not more than six gallons of water per sack of cement. All grout will be pumped into the annular space via tremie rod (1.25-inch diameter pipe) that is no more than 40 feet above the grout level in the well. After the cement grout is installed, work on the well will be discontinued until the grout has properly set.

2.2.6 **Water Entering the Well During Construction**

All water used in the well during construction will be obtained from Wanship City.

2.2.7 **Well Development and Pump Testing**

The following steps will be taken during development and testing of this well:

a) Well will be developed first by surge blocks and later by surging with a pump in order to remove native silts and clays, drilling muds, and the finer fraction of the sand pack.

b) Water level will be monitored during surge and pump cycles to ensure that the maximum specific capacity is achieved.

c) Testing will not include a step-drawdown test as well efficiency will be determined from development activity. A constant-rate aquifer test will be performed for a minimum of 24 hours to one week, or until drawdown has stabilized for at least six hours. The pumping rate will be determined after development. Results will be used to calculate aquifer parameters necessary for completion of the Drinking Water Source Protection Plan and properly equip the well.

2.3 **Aquifer Data**

The closest well to the Well 1 site that had a pump test on the well log was the Evans Trust Well (WRN 35-12081). According to the well log the well was tested at 20 gpm with a drawdown of 17 feet, yielding a specific capacity of 1.18 gpm/ft. The geology of the well log though vague, appeared to be drilled into the Hams Fork member of the Evanston Formation.

2.3.1 **Transmissivity**

The transmissivity was calculated from the specific capacity of the Evans Trust Well.

Method: Use drawdown information from the pump test. Use empirical relationship given in Driscoll, 1986, Groundwater and Wells, 2nd ed., pg. 1021, which uses specific capacity to estimate transmissivity (T).

\[
T = \frac{Q}{S} \times 1500 \\
= \frac{20 \text{ gpm}}{17 \text{ feet}} \times 1500 \\
= 1,765 \text{ gpd/ft or 236 ft}^2/\text{day}
\]

This is what was used for the protection zone modeling.
2.3.2 **Hydraulic Gradient and Flow Direction**

The flow direction and gradient were determined from well logs in Cherry Creek Canyon which resulted in a flow direction approximately W10ºN at 0.050 ft/ft.

2.3.3 **Effective Porosity**

There is no site-specific porosity information available. Driscoll (1989) estimates fractured bedrock at being 5 to 35%. A value of 20% was used for the Well 1 PER.

2.3.4 **Saturated Thickness**

A saturated thickness of 100 feet was used for modeling purposes. This is the estimated thickness of the well screen. This thickness will likely change when the exact geology of the well is known.

2.3.5 **Discharge Rate**

For purposes of modeling an annual flow of 20 gpm will be used. This may change after the drilling and testing of the well if aquifer parameters are different than assumed. All zones were modeled at 20 gpm.

2.4 **Hydrogeologic Methods and Calculations**

Four protection zones for Well 1 were delineated for management purposes using the Preferred Delineation Procedure as described in UAC R309-600-9. Zone 1 is pre-defined and encloses a 100-foot radius surrounding the wellhead. Zones 2, 3, and 4 were defined using the Environmental Protection Agency's (EPA) software Wellhead Protection Area (WHPA) (Blandford and Huyakorn, 1991). The semi-analytical option of the MWCAP module of this software was selected because it delineates groundwater travel time (capture zones) to the pumping well. The aquifer is thought to respond as a homogenous aquifer which is why this method of modeling was selected. After the aquifer test has been completed for the new well the type and method will be re-evaluated for the Drinking Water Source Protection Plan. Table 1 lists the parameters and model domain used in the WHPA model.

**Table 1: Model Inputs**

<table>
<thead>
<tr>
<th>Model Domain (arbitrary grid)</th>
<th>Aquifer Parameters</th>
<th>Pump Inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>x coordinate minimum 0 ft.</td>
<td>Transmissivity: 236 ft²/day</td>
<td>x coordinate: 2,500 ft.</td>
</tr>
<tr>
<td>x coordinate maximum 5,000 ft.</td>
<td>Aquifer thickness: 100 ft.</td>
<td>y coordinate: 2,500 ft.</td>
</tr>
<tr>
<td>y coordinate minimum 0 ft.</td>
<td>Aquifer porosity: 20%</td>
<td>Discharge: 20 gpm</td>
</tr>
<tr>
<td>y coordinate maximum 5,000 ft.</td>
<td>Hydraulic gradient: 0.050ft/ft</td>
<td>Flow Direction: W10ºN</td>
</tr>
</tbody>
</table>

2.5 **Boundaries of DWSP Zones**

The approximate 250-day (Zone 2), 3-year (Zone 3), and the 15-year (Zone 4) groundwater travel time protection zones for Well 1 are shown on Figure 4. The generalized dimensions of the protection zones are summarized in Table 2. The Protection Zones are shown on Figure 4. The protection zones are small due to the low pumping rate and conservative estimates as to the size have been made.
Table 2: Well 1 Protection Zone Dimensions

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<tr>
<td>Zone 4</td>
<td>1435 ft.</td>
<td>875 ft.</td>
<td>1315 ft.</td>
<td>120 ft.</td>
</tr>
</tbody>
</table>

\(^a\)-Total length measured parallel to the direction of groundwater flow
\(^b\)-Total width measured perpendicular to the direction of groundwater flow

2.6 Status of the Aquifer

The aquifer in the area of Well 1 does not meet the requirements of a Protected Aquifer as defined in UAC R309-600-6(1)(x).

3.0 INVENTORY OF POTENTIAL CONTAMINATION SOURCES

This section identifies the potential contamination sources (PCSs) that exist within the protection zones defined in the previous section. Included in this section are the following:

- Survey methods used to identify PCSs
- Location of each PCS relative to the protection zone
- Identification of the hazards associated with each PCS
- Rank of each PCS relative to the risk posed

3.1 Survey Methods and PCS List

Five PCS were identified from field surveys, examination of aerial photography, and analysis of reports and GIS layers provided by the Utah Division of Drinking Water, Water Rights, and Water Resources. The Hollberg residence septic system, the Hollberg domestic well, the Hollberg pond, dirt roads, and intermittent streams.
3.2 Hazard Identification

Identified activities and hazards associated with the PCSs found in the protection zones for Well #1:

<table>
<thead>
<tr>
<th>Name of Possible PCS</th>
<th>Identified Activity</th>
<th>PCS No. in DDW Guidance for Activity</th>
<th>Identified Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hollberg Well</td>
<td>Private well for culinary supply</td>
<td>1</td>
<td>Potential for dumping waste into well.</td>
</tr>
<tr>
<td>Dirt Road</td>
<td>Accidental spills</td>
<td>39</td>
<td>Hydrocarbons, oil, and antifreeze</td>
</tr>
<tr>
<td>Hollberg Septic System</td>
<td>Single family sewage movement and treatment</td>
<td>44</td>
<td>Bacteriological hazardous substances if system is not working properly</td>
</tr>
<tr>
<td>Pond</td>
<td>Private recreation pond</td>
<td>Not listed</td>
<td>Potential for introducing waste to the well</td>
</tr>
<tr>
<td>Ephemeral Streams</td>
<td>Cherry Creek and tributaries</td>
<td>Not listed</td>
<td>Potential for transporting and introducing waste to the well</td>
</tr>
</tbody>
</table>

3.3 Priority and Location of PCSs

Using the semi-quantitative approach of assigning a numerical risk to each PCS or using professional judgment, all five PCS’s have about equal risk which is negligible to low of contaminating Well 1.

Given the actual chance of a release, the septic system located in Zone 4 would be considered low risk. The Hollberg Well located in Zone 4 and would also be considered low risk. Private roads would be considered very low risk and are in Zones 1 thru 4. Ephemeral streams are in zones 3 and 4 and would be considered negligible risk.

Refer to Figure 4 for the locations of each PCS, the protection zones, flow direction, and land map. The only land-use identified from GIS was the pond in the Utah Related Land Use layer from the Utah Division of Water Resources.
Figure 4: Trail Ridge Well 1 Drinking Water Source Protection Zones and Potential Contaminant Sources

Source Protection Zones:
- Zone 2
- Zone 3
- Zone 4
- Groundwater Flow Direction

Drawn By: G3 Mapping Rich Emerson
Project Manager: John Files
Date: June 2018

Scale = 1:24,000
4.0 IDENTIFICATION AND ASSESSMENT OF POTENTIAL CONTAMINATION SOURCE HAZARD CONTROLS

Below is the identified control for each PCS hazard assessed to Well #1.

4.1.1 Septic Tank

The Septic Tank and associated drain field owned and maintained by Brett Hollberg. A punctured or leaking pipeline or septic tank has potential to leak sewage containing human waste, detergents, oil and grease, harmful bacteria and other pathogens such as *Giardia lamblia* and *Cryptosporidium*, household hazardous wastes, and/or other substances that have been disposed into the sewer system into the aquifer. This PCS is not thought to be adequately controlled.

4.1.2 Hollberg Well

The Hollberg Well is located in Zone 4 of Well 1. The well poses a threat through either accident or vandalism of dumping materials into the wells. The well was sealed from 7 to 47 feet and constructed with a Pitless Adapter in accordance with Utah Administrative Code R655-11.4: Administrative Rules for Water Well Construction Requirements. This PCS is thought to be adequately controlled.

4.1.3 Private Road

The private road that access the residences run through of the protection zone 1 thru 4. The most serious threat is hazardous material release from a transport vehicle resulting from a leaking container or an accident on the roadway. Harmful substances involved include any substance that may be transported by roadway. It is unlikely but not impossible that tanker-trucks transporting gasoline, oil, and a variety of other hazardous materials also use this road, although less frequently than garbage trucks. Minor threat of contamination exists from infiltration of motor oils, antifreeze, and other automobile fluids from road surface run-off. This PCS is thought to be adequately controlled.

4.1.4 Ephemeral streams

The ephemeral streams run through zones 3 and 4. The most serious threat is the transport of hazardous material from upstream, infiltrating the well during a flood. This is not thought to be a serious threat as upstream land use is limited to livestock grazing with no industrial uses known. This PCS is thought to be adequately controlled.

4.1.5 Pond

The pond on the Hollberg property occupies zone 4. The most serious threat is the possibility of collection of hazardous waste and acting as a conduit to the well. This is not thought to be a serious threat as the pond is not used in any industrial or commercial processes and no known hazard exists upstream from the pond. This PCS is thought to be adequately controlled.
5.0 LAND OWNERSHIP

Land in Zones 1 thru 4 is owned by LRH Inc., the applicant for this water right.

6.0 LAND USE AGREEMENTS, LETTERS OF INTENT, ZONING ORDINANCES

Brett Hollberg has signed an intent to sign a Land Use Agreement if the well proves up. The intent is included in Appendix B.


7.0 REFERENCES


Bryant, 1990, Geologic Map of the Salt Lake City 30’ x 60’ Quadrangle, North-Central Utah and Uintah County, Wyoming.

Driscoll, Fletcher G., 1986, Groundwater and Wells, Published by Johnson Filtrations Systems Inc.


Hurlow, Hugh, 2002. The Geology of the Kamas-Coalville Region, Summit County, Utah, and its relation to ground-water conditions.


Appendix A
Hollberg and Evans Trust Well Logs
## WELL DRILLER’S REPORT

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

**Well Identification**

| Exchange Application: E4212 (35-11215) | WIN: 30481 |

**Owner**

| LK Th Inc. | P.O. Box 1711003 |
| Salt Lake City UT 84117 |

**Well Location**

| S 1386 E 786 from the N4 corner of section 22, Township 1N, Range 5E, SL R&M |

**Contact Person/Engineer:** WATER RIGHTS SALT LAKE

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

### Drillers Activity

| Start Date: 9-15-04 | Completion Date: 9-17-04 |

Check all that apply:

- [x] 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.

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>BOREHOLE DIAMETER (in)</th>
<th>DRILLING METHOD</th>
<th>DRILLING FLUID</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-40</td>
<td>12</td>
<td>Air Rotary Casing Hammer</td>
<td>Air, Water</td>
</tr>
<tr>
<td>40-200</td>
<td>8</td>
<td>Air Rotary Casing Hammer</td>
<td>Air, Water</td>
</tr>
</tbody>
</table>

### Well Log

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>ROCK TYPE</th>
<th>COLOR</th>
<th>DESCRIPTION AND REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24</td>
<td>Gravel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-33</td>
<td>Gravel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33-41</td>
<td>Gravel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41-58</td>
<td>Gravel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>58-72</td>
<td>Gravel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72-101</td>
<td>Sand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>101-120</td>
<td>Sand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>120-130</td>
<td>Sand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>130-178</td>
<td>Sand</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Static Water Level

<table>
<thead>
<tr>
<th>Date: 9-17</th>
<th>Water Level 12.3 feet</th>
<th>Flowing? Yes No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method of Water Level Measurement: E-Top</td>
<td>If Flowing, Capped Pressure: 70 C</td>
<td></td>
</tr>
<tr>
<td>Point to Which Water Level Measurement was Referenced: 70 C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height of Water Level reference point above ground surface: 15 feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature: 60 degrees F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Well Log**
### Construction Information

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>CASING TYPE AND MATERIALGRADE</th>
<th>WALL THICK (in)</th>
<th>NOMINAL DIA (in)</th>
<th>DEPTH (feet)</th>
<th>SCREEN TYPE</th>
<th>SCREEN SLOT SIZE</th>
<th>OPEN BOTTOM</th>
<th>PERFORATIONS</th>
<th>FROM</th>
<th>TO</th>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.6” 7”</td>
<td>A53B Steel</td>
<td>0.322 8</td>
<td></td>
<td>140 180</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>PVC</td>
<td></td>
<td>5BA 9.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>PVC</td>
<td></td>
<td>5BA 9.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Well Head Configuration:** Welded Cap
- **Access Port Provided:** Yes
- **Casing Joint Type:** Welded - Central for PVC
- **Perforator Used:** Economy Slotted
- **Was a Surface Seal Installed?** Yes
- **Depth of Surface Seal:** 40 feet
- **Drive Shoe:** Yes
- **Surface Seal Material Placement Method:** Pressure Pumped through stem

### Surface Seal / Interval Seal / Filter Pack / Packers Information

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>SEAL MATERIAL, FILTER PACK AND PACKER TYPE AND DESCRIPTION</th>
<th>Quantity of Material Used (if applicable)</th>
<th>GROUT DENSITY (lbs/gal, lb bag mix, galsack etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 40</td>
<td>High Solids Grout</td>
<td>20 bags</td>
<td>14 gal 150 lbs</td>
</tr>
<tr>
<td>0 7</td>
<td>3/8 Chips</td>
<td>5 bags</td>
<td>250 LBS</td>
</tr>
<tr>
<td>87 200</td>
<td>8-12 Silica Sand</td>
<td>40 bags</td>
<td>2000 LBS</td>
</tr>
<tr>
<td>80 87</td>
<td>3/8 Chips</td>
<td>4 bags</td>
<td>200 LBS</td>
</tr>
</tbody>
</table>

### Well Development and Well Yield Test Information

<table>
<thead>
<tr>
<th>DATE</th>
<th>METHOD</th>
<th>YIELD</th>
<th>UNITS</th>
<th>DRAWDOWN (ft)</th>
<th>TIME PUMPED (hrs &amp; mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-16</td>
<td>Air Lift</td>
<td>40+</td>
<td>GPM</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

- **Pump (Permanent):** N/A
- **Pump Description:** N/A
- **Horsepower:** N/A
- **Pump Intake Depth:** N/A
- **Approximate Maximum Pumping Rate:** N/A
- **Well Disinfected upon Completion?** Yes

### 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

- Name: Zimmerman, Mike (Well Service)
- License No.: 527
- Signature: Mike Zimmerman
- Date: 9-15-04

---

**ZIMMERMAN, MIKE (WELL SERVICE)**

Name: Zimmerman, Mike (Well Service)

License No.: 527

Signature: Mike Zimmerman

Date: 9-15-04
WELL DRILLER'S REPORT ADDITIONAL DATA FORM
State of Utah
Division of Water Rights

Well Identification
Exchange Application: E4212 (35-11215)

Owner

LKH Inc.
P.O. Box 171003
Salt Lake City UT 84117

Contact Person/Engineer:

Well Location
S 1386 E 786 from the N4 corner of section 22, Township 1N, Range 5E, SL B&M

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

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>WATER LAYER</th>
<th>CONSOLIDATED</th>
<th>ROCK TYPE</th>
<th>COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>178 181</td>
<td>X</td>
<td>X 55</td>
<td>Sand</td>
<td></td>
</tr>
<tr>
<td>181 200</td>
<td>X</td>
<td>X Shale</td>
<td>Buckley</td>
<td></td>
</tr>
</tbody>
</table>
WELL DRILLER'S REPORT  
State of Utah  
Division of Water Rights

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

---

**Well Identification**

<table>
<thead>
<tr>
<th>Exchange Application: E4788 (35-12081)</th>
<th>WIN: 430257</th>
</tr>
</thead>
</table>

**Owner**  
Michael Melvin Evans Trust  
c/o Michael M. and Suzanne Evans, Trustees  
232 East 1875 North  
Centerville UT 84014  
Contact Person/Engineer:

---

**Well Location**

S 972 E 1984 from the NW corner of section 22, Township 1N, Range 5E, SL B&M

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

---

**Drillers Activity**

Start Date: 1-15-2007  
Completion Date: 9-20-07

Check all that apply:  
\[ \text{New} \quad \text{Repair} \quad \text{Deepen} \quad \text{Clean} \quad \text{Replace} \quad \text{Public} \quad \text{Nature of Use:} \]

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

---

**Drilling Details**

<table>
<thead>
<tr>
<th>DEPTH (feet) FROM</th>
<th>TO</th>
<th>BOREHOLE DIAMETER (in)</th>
<th>DRILLING METHOD</th>
<th>DRILLING FLUID</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>30</td>
<td>12.4</td>
<td>Air, Rotary</td>
<td>Air, Foam</td>
</tr>
<tr>
<td>30</td>
<td>130</td>
<td>8</td>
<td>DR, Rotary</td>
<td>Air, Foam</td>
</tr>
</tbody>
</table>

---

**Well Log**

<table>
<thead>
<tr>
<th>DEPTH (feet) FROM</th>
<th>TO</th>
<th>UNCONSOLIDATED</th>
<th>CONSOLIDATED</th>
<th>ROCK TYPE</th>
<th>COLOR</th>
<th>DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grass composition density, plasticity, shape, cementation, consistency, water bearing, odor, fracturing, mineralogy, texture, degree of weathering, hardness, water quality, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Topsoil</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very few gravel</td>
</tr>
<tr>
<td>60</td>
<td>130</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sandstone</td>
</tr>
</tbody>
</table>

---

**Static Water Level**

Date: 9-20-07  
Water Level: 11.9 feet  
Flowing?  
\[ \text{Yes} \quad \text{No} \]

Method of Water Level Measurement: E-Type  
If Flowing, Capped Pressure:  
\[ 10 \text{ PSI} \]

Point to Which Water Level Measurement was Referenced:  
\[ 70^\circ \text{C} \]

Height of Water Level reference point above ground surface: 17 feet  
Temperature: 50 degrees  
\[ C \quad F \]

---

EXHIBIT E.22
## Construction Information

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>CASING TYPE AND MATERIALGRADE</th>
<th>WALL-THICKNESS (in.)</th>
<th>DEPTH (feet)</th>
<th>SCREEN</th>
<th>PERFORATIONS</th>
<th>OPEN BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM</td>
<td>TO</td>
<td></td>
<td>FROM</td>
<td>TO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19'</td>
<td>19</td>
<td>Steel</td>
<td>322</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>90</td>
<td>PVC coated</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Well Head Configuration:** Nouteur Cap  
**Casing Joint Type:** G3LC  
**Perforator Used:**  
**Was a Surface Seal Installed?** Yes  
**Depth of Surface Seal:** 30 feet  
**Drive Shoe?** No  
**Surface Seal Material Placement Method:** Chips Added from Surface  
**Was a temporary surface casing used?** No  
**If yes, depth of casing:** 30 feet  
**Wall Thickness:** 10 inches

## Depth (feet)  
**Surface Seal / Interval Seal / Filter Pack / Packer Information**

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
<th>SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION</th>
<th>Quantity of Material Used (if applicable)</th>
<th>GROUT DENSITY (lbs/gal, % bag mix, gal/bag etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>180</td>
<td>1:1 Cement</td>
<td>56 bags</td>
<td>2,800 lbs</td>
</tr>
<tr>
<td>0</td>
<td>30</td>
<td>3:1 Chips</td>
<td>25 bags</td>
<td>1,250 lbs</td>
</tr>
</tbody>
</table>

## Well Development and Well Yield Test Information

<table>
<thead>
<tr>
<th>DATE</th>
<th>METHOD</th>
<th>YIELD</th>
<th>Units</th>
<th>DRAWDOWN (ft)</th>
<th>TIME PUMPED (hrs &amp; min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-17</td>
<td>Air Lift</td>
<td>50</td>
<td>GPM</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>9-10</td>
<td>Pump</td>
<td>20</td>
<td>GPM</td>
<td>17</td>
<td>1/4</td>
</tr>
</tbody>
</table>

**Pump (Permanent):** Sub  
**Horsepower:** 3  
**Pump Intake Depth:** 100 feet  
**Approximate Maximum Pumping Rate:** 30  
**Well Disinfected upon Completion?** Yes  
**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  
**License No.:** 527  
**Signature:** Mike  
**Date:** 9/28/07
Appendix B
Intent to Sign Land Use Agreement

Deidre Beck
Department of Environmental Quality
Drinking Water Source Protection
P.O. Box 144830
Salt Lake City, Utah 84114-4830

June 3, 2018

Dear Deidre,

We are currently working on a new well to serve the Trail Ridge Subdivision, Wanship, UT. We have prepared the following letter to show our intent to record a land use agreement with Summit County if the well proves up. This letter will not be recorded until the work is complete and we are confident the source can be added to our system.

To Whom It May Concern:

I (we) the undersigned landowner(s), acknowledge the Preliminary Evaluation Report and Drinking Water Source Protection Plan for the Trail Ridge Well 1. We agree not to locate or allow the location of any uncontrolled potential contamination sources as defined in R309-600-6(1)(w) of the Utah Administrative Code, within Zone one. We also agree not to locate or allow the location of any pollution sources, as defined in R309-600-6(1)(w) of the Utah Administrative Code, within zone two unless design standards are implemented to prevent contaminated discharges. This agreement is binding on all heirs, successors, and assigns.

By: LRH, Inc.

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

Approved By: Reed Hendricks, Senior Project Manager
**Certificate of Analysis**

**Lab Sample No.: 18I0099-01**

**Name:** Cascade Water  
**Sample Site:** Trail Ridge Well 1  
**Sample Matrix:** Drinking Water  
**PO Number:**  
**Source Code:** WS001  
**Sample Point:** WS001  
**Report to State:** Y

**Comments:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sample Result</th>
<th>EPA Max Contaminant Level (MCL)</th>
<th>Minimum Reporting Limit</th>
<th>Units</th>
<th>Analytical Method</th>
<th>Preparation Date/Time</th>
<th>Analysis Date/Time</th>
<th>Flag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiochemistry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross Alpha</td>
<td>-0.3</td>
<td>15</td>
<td>pCi/L</td>
<td></td>
<td>EPA 900.0</td>
<td>09/26/2018</td>
<td>09/26/2018</td>
<td>SL-17</td>
</tr>
<tr>
<td>Gross Alpha LLD</td>
<td>2.0</td>
<td></td>
<td>pCi/L</td>
<td></td>
<td>EPA 900.0</td>
<td>09/26/2018</td>
<td>09/26/2018</td>
<td>SL-17</td>
</tr>
<tr>
<td>Gross Alpha Variance</td>
<td>1.3</td>
<td></td>
<td>pCi/L</td>
<td></td>
<td>EPA 900.0</td>
<td>09/26/2018</td>
<td>09/26/2018</td>
<td>SL-17</td>
</tr>
<tr>
<td>Gross Beta</td>
<td>2.2</td>
<td></td>
<td>pCi/L</td>
<td></td>
<td>EPA 900.0</td>
<td>09/26/2018</td>
<td>09/26/2018</td>
<td>SL-17</td>
</tr>
<tr>
<td>Gross Beta LLD</td>
<td>2.0</td>
<td></td>
<td>pCi/L</td>
<td></td>
<td>EPA 900.0</td>
<td>09/26/2018</td>
<td>09/26/2018</td>
<td>SL-17</td>
</tr>
<tr>
<td>Gross Beta Variance</td>
<td>2.0</td>
<td></td>
<td>pCi/L</td>
<td></td>
<td>EPA 900.0</td>
<td>09/26/2018</td>
<td>09/26/2018</td>
<td>SL-17</td>
</tr>
<tr>
<td>Radium-228</td>
<td>0.62</td>
<td></td>
<td>pCi/L</td>
<td></td>
<td>EPA 904.0</td>
<td>10/03/2018</td>
<td>10/03/2018</td>
<td>SL-17</td>
</tr>
<tr>
<td>Radium-228 LLD</td>
<td>0.37</td>
<td></td>
<td>pCi/L</td>
<td></td>
<td>EPA 904.0</td>
<td>10/03/2018</td>
<td>10/03/2018</td>
<td>SL-17</td>
</tr>
<tr>
<td>Radium-228 Variance</td>
<td>0.36</td>
<td></td>
<td>pCi/L</td>
<td></td>
<td>EPA 904.0</td>
<td>10/03/2018</td>
<td>10/03/2018</td>
<td>SL-17</td>
</tr>
</tbody>
</table>
Report Footnotes

**Abbreviations**

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

**Data Comparisons**

Values reported in **RED** exceed Primary Drinking Water standards.
Values reported in **BLUE** exceed Secondary Drinking Water standards.
**BLANK** values in the MCL column indicate no standard.

**Flag Descriptions**

SL-17 = Analysis performed by ACZ Laboratories, 2773 Downhill Drive, Steamboat Springs, CO 80487.
**CLIENT SAMPLE INFORMATION**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DATE</th>
<th>TIME</th>
<th>FACILITY ID (source code)</th>
<th>POINT CODE (OCB)</th>
<th>Field: Residual Chlorine</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 Trail Ridge Well 1 (WS001)</td>
<td>9-5-18</td>
<td>9:20</td>
<td>WS001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Payment Terms are net 30 days OAC. 1.5% interest charge per month (19% per annum).

Client agrees to pay collection costs and attorney's fees.
**Delivery Method:**
- [ ] UPS
- [ ] USPS
- [ ] FedEx
- [x] Walk-in
- [ ] Chemtech Courier
- [ ] Customer Courier

**Sample Condition (check if y/n):**
- [ ] Custody Seals
- [ ] Containers Intact
- [ ] COD/Labels Agree
- [ ] Preservation Confirmed
- [ ] Received on Ice
- [ ] Correct Containers(s)
- [ ] Sufficient Sample Volume
- [ ] Headspace Present (VOC)
- [ ] Temperature Blank
- [ ] Received within Holding Time

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Container</th>
<th>Chemtech Lot #</th>
<th>Preservation</th>
<th>Misc Volume</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>(2)</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Plastic Containers:**
- A: Plastic Unpreserved
- B: Miscellaneous Plastic
- C: Cyanide Gt (NaOH)
- D: Coliform/Ecoli/HPC
- E: Sulfide Gt (Zn Acetate)
- F: Mercury 1631
- G: Metals Pint (HNO3)
- H: Nutrient Pint (H2SO4)
- I: Radiological (HNO3)
- J: Sludge Cups/Tubs
- K: Plastic Bag

**Glass Containers:**
- D: 625 (Na2SO3)
- G: Glass Unpreserved
- H: HAAs (NH4C)
- I: 508/515/525 (Na2SO3)
- K: 515.3 Herbicides
- O: Oil & Grease (HCl)
- P: Phenols (H2SO4)
- T: T0C/T0X (H2PO4)
- U: 533 (MCA, Na2SO3)
- V: 524/ThMs (Ascorbic Acid)
- W: 8260 VOC (1:1 HCl)
- X: Vial Unpreserved
- Y: 624/504 (Na2SO3)
- Z: Miscellaneous Glass
The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.

Approved By: Reed Hendricks, Senior Project Manager
**Certificate of Analysis**

**Lab Sample No.:** 18I0102-01

**Name:** Cascade Water  
**Sample Site:** Trail Ridge Well 1  
**Comments:**  
**Sample Matrix:** Drinking Water  
**PO Number:**  
**Source Code:** WS001  
**Sample Point:** WS001  
**Project:** Trail Ridge PWS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sample Result</th>
<th>EPA Max Contaminant Level (MCL)</th>
<th>Minimum Reporting Limit</th>
<th>Units</th>
<th>Analytical Method</th>
<th>Preparation Date/Time</th>
<th>Analysis Date/Time</th>
<th>Flag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Langelier Index @ 22 Deg. C</td>
<td>-0.09</td>
<td>None</td>
<td>None</td>
<td></td>
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**Lab Sample Site:** Trail Ridge Well 1  
**Sample Date:** 9/5/2018  
**Receipt Date:** 9/5/2018  
**Samplers:** John Files  
**Comments:**  
**Sample Matrix:** Drinking Water  
**Project:** Trail Ridge PWS  
**System No.:** UTAH22151  
**Source Code:** WS001  
**Sample Point:** WS001  
**Report to State:** Y

---

**Calculations**

- **Langelier Index @ 22 Deg. C**
  - Result: -0.09
  - Method: Calculation
  - Date/Time: 09/13/2018

- **Hardness, Total as CaCO3**
  - Result: 330 mg/L
  - Method: SM 2340 B
  - Date/Time: 09/06/2018
## Certificate of Analysis

**Lab Sample No.:** 18I0102-01

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### Certificate of Analysis

Lab Sample No.: 18I0102-01

| Name: Cascade Water | Sample Date: 9/5/2018 8:20 AM |
| Sample Site: Trail Ridge Well 1 | Receipt Date: 9/5/2018 9:07 AM |
| Comments: | Sampler: John Files |
| Sample Matrix: Drinking Water | Project: Trail Ridge PWS |
| PO Number: | System No.: UTAH22151 |

| Source Code: WS001 | Sample Point: WS001 | Report to State: Y |

#### Pesticides (cont.)

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#### Volatile Organic Compounds

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<td>ug/L</td>
<td>EPA 524.2</td>
<td>09/10/2018</td>
<td>09/10/2018</td>
<td></td>
</tr>
<tr>
<td>n-Propyl Benzene</td>
<td>ND</td>
<td>1</td>
<td>1.0</td>
<td>ug/L</td>
<td>EPA 524.2</td>
<td>09/10/2018</td>
<td>09/10/2018</td>
<td></td>
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<tr>
<td>p-Isopropyltoluene</td>
<td>ND</td>
<td>1</td>
<td>1.0</td>
<td>ug/L</td>
<td>EPA 524.2</td>
<td>09/10/2018</td>
<td>09/10/2018</td>
<td></td>
</tr>
<tr>
<td>sec-Butyl Benzene</td>
<td>ND</td>
<td>1</td>
<td>1.0</td>
<td>ug/L</td>
<td>EPA 524.2</td>
<td>09/10/2018</td>
<td>09/10/2018</td>
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</tr>
<tr>
<td>Styrene</td>
<td>ND</td>
<td>100</td>
<td>0.5</td>
<td>ug/L</td>
<td>EPA 524.2</td>
<td>09/10/2018</td>
<td>09/10/2018</td>
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<tr>
<td>tert-Butylbenzene</td>
<td>ND</td>
<td>1</td>
<td>1.0</td>
<td>ug/L</td>
<td>EPA 524.2</td>
<td>09/10/2018</td>
<td>09/10/2018</td>
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<tr>
<td>Tetrachloroethene</td>
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<td>5</td>
<td>0.5</td>
<td>ug/L</td>
<td>EPA 524.2</td>
<td>09/10/2018</td>
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<tr>
<td>Toluene</td>
<td>ND</td>
<td>1000</td>
<td>0.5</td>
<td>ug/L</td>
<td>EPA 524.2</td>
<td>09/10/2018</td>
<td>09/10/2018</td>
<td></td>
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<td>trans-1,2-Dichloroethene</td>
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<td>100</td>
<td>0.5</td>
<td>ug/L</td>
<td>EPA 524.2</td>
<td>09/10/2018</td>
<td>09/10/2018</td>
<td></td>
</tr>
</tbody>
</table>
## Certificate of Analysis

Lab Sample No.: 18I0102-01

### Sample Information
- **Name:** Cascade Water
- **Sample Site:** Trail Ridge Well 1
- **Sample Date:** 9/5/2018 8:20 AM
- **Receipt Date:** 9/5/2018 9:07 AM
- **Sampler:** John Files
- **Sample Matrix:** Drinking Water
- **PO Number:** Trail Ridge PWS
- **System No.:** UTAH22151
- **Source Code:** WS001
- **Sample Point:** WS001
- **Report to State:** Y

### Contaminant Levels

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sample Result</th>
<th>EPA Max Contaminant Level (MCL)</th>
<th>Minimum Reporting Limit</th>
<th>Units</th>
<th>Analytical Method</th>
<th>Preparation Date/Time</th>
<th>Analysis Date/Time</th>
<th>Flag</th>
</tr>
</thead>
<tbody>
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<td>trans-1,3-Dichloropropene</td>
<td>ND</td>
<td>1.0</td>
<td>ug/L</td>
<td></td>
<td>EPA 524.2</td>
<td>09/10/2018</td>
<td>09/10/2018</td>
<td></td>
</tr>
<tr>
<td>Trichloroethene</td>
<td>ND</td>
<td>5</td>
<td>0.5 ug/L</td>
<td></td>
<td>EPA 524.2</td>
<td>09/10/2018</td>
<td>09/10/2018</td>
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<td>Trichlorofluoromethane</td>
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<td>0.5 ug/L</td>
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<td>EPA 524.2</td>
<td>09/10/2018</td>
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<td>Xylenes, total</td>
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<td>EPA 524.2</td>
<td>09/10/2018</td>
<td>09/10/2018</td>
<td></td>
</tr>
</tbody>
</table>
**Report Footnotes**

**Abbreviations**

ND = Not detected at the corresponding Minimum Reporting Limit.

1 mg/L = one milligram per liter or 1 mg/Kg = one milligram per kilogram = 1 part per million.

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

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

**Data Comparisons**

Values reported in **RED** exceed Primary Drinking Water standards.

Values reported in **BLUE** exceed Secondary Drinking Water standards.

**BLANK** values in the MCL column indicate no standard.

**Flag Descriptions**

SPH = Sample submitted past method specified holding time.
**CLIENT SAMPLE INFORMATION**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DATE</th>
<th>TIME</th>
<th>FACILITY ID (Source code)</th>
<th>POINT CODE (OSS)</th>
<th>Test Requested</th>
<th>Temp (°C):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trail Ridge Well 1 (WS001)</td>
<td>9-5-18</td>
<td>8:20</td>
<td>WS001</td>
<td></td>
<td></td>
<td>2.2</td>
</tr>
</tbody>
</table>

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

---

**EXHIBIT E.37**

---

**DRINKING WATER SAMPLES ONLY**

**COMPANY:** Trail Ridge PWS

**ADDRESS:** PO Box 171003

**PHONE #:**

**EMAIL:** John Files

**PROJECT:** Trail Ridge PWS

**STATE SYSTEM NUMBER:** # 22151

**Send to State:** Yes

**TESTS REQUESTED**

<table>
<thead>
<tr>
<th>Time</th>
<th>Test Requested</th>
<th>Temp (°C):</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:20</td>
<td></td>
<td>2.2</td>
</tr>
</tbody>
</table>

---

**REPEAT**

**OR = Original Location**

**UP = Upstream**

**DN = Downstream**

---

**BACTERIA**

<table>
<thead>
<tr>
<th>R = Routine</th>
<th>I = Investigative</th>
<th>TR = Trigger Source</th>
<th>RP = Repeat</th>
</tr>
</thead>
</table>

---

**PAID**

**Check Date:** 4-5-18

**Cash Amount:** 50.00

**VISA/AMC Initials:** 50

---

**BILLING ADDRESS:** Cascade Water Resources

**BILLING CITY/STATE/ZIP:** CC on file

---

**TURNAROUND TIME REQUIRED:**

* Expedited turnaround subject to additional charge
### CHEMTECH FORD LABORATORIES

**Sample Receipt**

**Work Order #** 0102

**Delivery Method:**
- [ ] UPS
- [ ] USPS
- [ ] FedEx
- [ ] Chemtech Courier
- [x] Walk-in
- [ ] Customer Courier

**Receiving Temperature** 2.2 °C

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Container</th>
<th>Chemtech Lot # or Preservative</th>
<th>Number of Subsamples</th>
<th>Preserved in Receive/Client</th>
<th>Misc Volume (mL)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>J (3)</td>
<td>852</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>K (3)</td>
<td>890</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>H (2)</td>
<td>864</td>
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<tr>
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<td>V (2)</td>
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<td>5723</td>
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<tr>
<td></td>
<td>A (1)</td>
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<td></td>
<td>M</td>
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<td></td>
<td></td>
<td></td>
<td>1L</td>
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<tr>
<td></td>
<td>G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Sample Condition**
  - [ ] Custody Seals
  - [ ] Containers Intact
  - [ ] COC-labels Agree
  - [ ] Preservation Confirmed
  - [ ] Received on Ice
  - [ ] Correct Container(s)
  - [ ] Sufficient Sample Volume
  - [ ] Headspace Present (VOC)
  - [ ] Temperature Blank
  - [ ] Received within Holding Time

- **Plastic Containers**
  - A: Plastic Unpreserved
  - B: Miscellaneous Plastic
  - C: Cyanide Q1 (NaCN)
  - D: Coliform + E. coli + HPC
  - F: Sulfite Q2 (En Acetate)
  - L: Mercury 1051
  - M: Metals First (Ni/Co)
  - N: Nutrient B (HiSO4)
  - R: Radiological (HiNO3)
  - S: Sludge Cups/Tubes
  - Q: Plastic Bag

- **Glass Containers**
  - D: 250 mL (Na2SO4)
  - E: Glass Unpreserved
  - H: HAAs (NH4Cl)
  - I: 508/15/15 (Na2SO4)
  - K: 313.3 Herbicides
  - O: Oil & Grease (HCl)
  - P: Phenols (HiSO4)
  - T: TOC/TOX (HiSO4)
  - U: 035 (MCAA, Na2SO4)
  - V: 244/7HMa (Ascorbic Acid)
  - W: 2600 VOC (1:1:1 HCl)
  - X: Val Unpreserved
  - Y: 024/104 (Na2SO4)
  - Z: Miscellaneous Glass
October 23, 2018

Brett Hollberg  
Trail Ridge Public Water System  
PO Box 171003  
Salt Lake City, UT  84117

Subject: Concurrence, Drinking Water Source Protection Plan for the System Well 1; Trail Ridge Public Water System; System #22151, Source No. WS001

Dear Mr. Hollberg:

The Division of Drinking Water (the Division) received the Drinking Water Source Protection (DWSP) plan for the System Well 1 from your consultant, Richard Emerson and Cascade Water Resources on October 9, 2018.

We have completed our review of the DWSP plan, stamped and signed by Richard Emerson, P.G., and dated October 8, 2018, and find that the plan basically complies with the applicable portions of Utah’s Administrative Rules for Public Drinking Water Systems. The Division concurs with this plan. We commend you for establishing a program to protect this source from present and future contamination. This plan must be updated often enough to ensure that it reflects current conditions in your protection zones.

The due date for submitting the next updated plan is December 31, 2022.

Reminders

As stated in R309-600 and 605: Implementing DWSP Plans - Each Public Water System (PWS) shall begin implementing each of its DWSP Plans in accordance with the implementation schedule within 180 days after submittal, if the plan is not disapproved. Be prepared to describe these efforts in your next update, which should include documentation of how the land management strategies identified for existing and future potential contamination sources were implemented. For items not completed, provide an explanation of your plans for this item in the future. Improvement Priority System (IPS) points may be assigned for failure to comply with this requirement.
As stated in R309-600 and 605: Recordkeeping - As a DWSP Plan is executed, the PWS shall document any land management strategies that are implemented. Please provide actual copies of memoranda of understanding, public education programs, bill stuffers, newsletters, or other correspondence documenting implementation of each land management strategy as it occurs, in this section of your updated plan.

Please contact Melissa Noble at (801) 536-4224 or at mnoble@utah.gov if you have questions or concerns about the review of your DWSP plan. Contact Emily Frary at (801) 536-0070 or at emilyfrary@utah.gov if you have any questions about your monitoring schedule. To help us serve you more efficiently, please use the water system number (22151) in your correspondence.

Sincerely,

Nathan Lunstad, P.E.
Permitting Section Manager

MNN/nl/dg//LL

c:  Phil Bondurant, Summit County Health Department Director, pbondurant@summitcounty.org
    Richard Emerson, Cascade Water Resources, rich.geomapper@gmail.com
    Brett Hollberg, Trail Ridge Public Water System, bretthollberg@me.com
    Melissa Noble, Division of Drinking Water, mnoble@utah.gov

DDW-2018-011125
April 3, 2020

Brett Hollberg  
Trail Ridge Public Water Supply System  
PO Box 171003  
Salt Lake City, Utah  84117

Subject:  **Plan Approval**, Water Distribution System (DS001), Reservoir No.1 (ST001) and System Well 1 Equipping (WS001); Trail Ridge Public Water System, System #22151, Files #11257 and 11967

Dear Mr. Hollberg:

The Division of Drinking Water (the Division) received the plans and specifications for the Trail Ridge Water System from your consultant, Kent Jones, P.E. with Jones and Associates Consulting Engineers on December 10, 2019. The Division issued Plan Approval for drilling the System Well 1 on August 16, 2018. The Trail Ridge Water System plans include the infrastructure for the entire water system including well equipping, transmission and distribution lines, and a storage facility. Review comments were sent on January 13, 2020 and revised plans were received on March 13, 2020. In addition, a Hydraulic Analysis Summary Report and Certification were submitted by Kent Jones, P.E., for the Trail Ridge Water System project.

Our understanding of the project is that the proposed Trail Ridge Water System will supply drinking water to a potential of 31 year round homes. North Summit Pressurized Irrigation Company will provide water for irrigation purposes. Fire suppression requirements for this system have been determined by the North Summit Fire District to be 1,000 gallons per minute (gpm) for 60 minutes.

The plans and specifications for the proposed Trail Ridge Water System involve the following components:

1. Distribution System (identified as DS001 in the Division’s database) — The distribution system will include 7,850 linear feet of 8-inch PVC C900 water lines to serve a potential of 31 lots. The distribution system also includes appurtenant valves, a pressure reducing...
station and fire hydrants. Fire hydrant locations have been approved by the North Summit Fire District.

2. Reservoir No. 1 (ST001) — A new 115,000-gallon concrete storage tank will be constructed.

3. System Well 1 Equipping (WS001) — The well will be completed with a MAAS Model J pitless adapter and Baker watertight cap. The well will be equipped with a 3 horsepower motor and submersible pump capable of delivering 25 gpm against 339 feet of head. The well discharge appurtenances will be located in two below-ground vaults. The well will deliver water to Reservoir No. 1 through 2,700 feet of 2-inch HDPE transmission line.

We have also received the following information for System Well 1:

1. Certification of well seal.
2. Well driller’s report (well log).
3. Aquifer drawdown test results (step drawdown test and constant-rate test).
4. New Source Chemical Analyses of the well water.
5. Plans and specifications for equipping the well.
   a. Grundfos pump specifications, pump curve and operating point.
   b. Well head discharge piping.
   c. Pitless adaptor information.

Based on the constant-rate test and analysis submitted to the Division, the safe yield of System Well 1 (WS001) appears to be 17 gpm, which is the basis for determining the maximum number of connections that System Well 1 (WS001) can serve. According to R309-510-7 and R309-510-8, source capacity requirements for a community water system are 800 gallons per day per connection for indoor use. Based on this requirement, the safe yield of 17 gpm for the System Well 1 (WS001) could potentially support up to 30 connections. It is our understanding your development may have 31 connections at build-out, which would require you to either develop a second source or demonstrate that your system demand is less than the requirements outlined in the current Rule in order for the Division to establish a system-specific sizing standard for your system.

Please note that if you wish to have the Division establish a system-specific source and storage minimum sizing standard, the water system must submit 3-years of water use data (peak day source demand, average annual demand, number of equivalent residential connections, and quantify of non-revenue water) to the Division of Water Rights and work with the Division of Drinking Water to have system specific minimum source and storage sizing requirements established.

We have completed our review of the plans and specifications, stamped and signed by Kent Jones, P. E., and dated March 12, 2020, and find they basically comply with the applicable portions of Utah’s Administrative Rules for Public Drinking Water Systems in R309. On this basis, the plans for the Trail Ridge Water System are hereby approved.
This approval pertains to construction only. **An Operating Permit must be obtained from the Director before the Trail Ridge Water System infrastructure may be put into service.** A checklist outlining the well approval process, including the items required for issuing an operating permit for this well is enclosed for your information. Enclosed please also find an Operating permit Checklist for other components of this project.

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

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

Please note that the submitted new source chemistry result showed a manganese level of 0.069 mg/L, and an iron level of 0.78 mg/L. The EPA’s secondary standard for manganese is 0.05 mg/L (or 50 μg/L) and the secondary standard for iron is 0.3 mg/L. These standards address potential staining of plumbing fixtures and laundry, taste, and color effects that may occur above that concentration. Please contact Emily Frary at (801) 536-0070 or emilyfrary@utah.gov with questions.

If you have any questions regarding this approval, please contact Julie Cobleigh, of this office, at (385) 214-9770, or Nathan Lunstad, Engineering Manager, at (385) 239-5974.

Sincerely,

Nathan Lunstad, P.E.
Engineering Manager

JJC/nl/mdb

Enclosures — Well Approval Checklist; Operating Permit Checklist

cc:  Nathan Brooks, Summit County Public Health Department, nbrooks@summitcounty.org
     Brett Hollberg, Trail Ridge Public Water Supply System, bretthollberg@me.com
     Kent Jones, Jones and Associates, kanddjones1@gmail.com
     Mark Robertson, North Summit Fire District, captainat23@gmail.com
     Julie Cobleigh, Division of Drinking Water, jjcobleigh@utah.gov
     Emily Frary, Division of Drinking Water, emilyfrary@utah.gov
     Nagendra Dev, Division of Drinking Water, ndev@utah.gov

DDW-2020-006078
Division of Drinking Water  
Checklist for New Public Drinking Water Wells  
(Per Utah Administrative Code, Rule R309-515-6)

System Name: ______________________ System Number: ____________

Well Name & Description: ______________________

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

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

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

Water System Name: ______________________________ System Number: ______

Project Description: ______________________________ File Number: ______

Items 1 through 8 below must be submitted to the Division and found to be acceptable prior to operating permit issuance (unless a water line project meets the requirements of R309-500-7 and is not required to obtain an Operating Permit).

Distribution lines (not including in-line booster pump stations) requiring Plan Approval may be placed into service prior to submitting all of the following items and receipt of Operating Permit if the water system has received items 1 and 4 below.

☐ 1. Certification of Rule Conformance by a professional engineer (P.E.) that all conditions of Plan Approval were accomplished, and if applicable, changes made during construction were in conformance with rules R309-500 through 550

☐ 2. As-built or record drawings incorporating all changes to approved plans and specifications (unless no changes were made to the previously approved plans during construction)

☐ 3. Confirmation that as-built or record drawings have been received by the water system

☐ 4. Satisfactory bacteriological samples as evidence of proper disinfection and flushing in accordance with the appropriate ANSI/AWWA standards:
   □ ANSI/AWWA C651-14 AWWA Standard for Disinfecting Water Mains
     Two consecutive sample sets at least 16 hours apart, none positive (every 1200 feet, end-of-line, each branch, etc.)
   □ ANSI/AWWA C652-11 AWWA Standard for Disinfection of Water-Storage Facilities
     One or more samples, none positive
   □ ANSI/AWWA C653-13 AWWA Standard for Disinfection of Water Treatment Plants
     Two consecutive samples per unit, none positive, no less than 30 minutes apart
   □ ANSI/AWWA C654-13 AWWA Standard for Disinfection of Wells
     Two consecutive samples, none positive, no less than 30 minutes apart

☐ 5. Water quality data, where appropriate [For example, water quality data showing MCL compliance; raw and finished water data that demonstrate satisfactory performance of the new treatment facility.]

☐ 6. If applicable, all other documentation that may have been required during the plan review process

☐ 7. If applicable, confirmation that the water system owner has received the O&M manual for the new facility

☐ 8. If applicable, location data of new storage tank, treatment facility, or source
Trail Ridge Subdivision
Located in Sections 21 & 22, Township 1 North, Range 5 East, Salt Lake Base & Meridian
Wanship, Summit County, Utah

COUNTY ASSESSOR
ROCKY MOUNTAIN POWER
QUAILSTAR GAS COMPANY
GOVERNING BODY APPROVAL AND ACCEPTANCE
NORTH SUMMIT FIRE DISTRICT

PREPARED BY:
COUNTY ENGINEER
SUMMIT COUNTY HEALTH
PLANNING COMMISSION
APPROVAL AS TO FORM
COUNTY RECORDER

COUNTY ASSESSOR
Approval and accepted by the Summit County Assessor this day of __, 20__

COUNTY ENGINEER
Approval and accepted by the Summit County Engineering Department this day of __, 20__

SUMMIT COUNTY HEALTH
Approval and accepted by the Department of Health this day of __, 20__

PLANNING COMMISSION
The Eastern Summit Planning Commission forwarded a positive recommendation for approval of the plat pursuant to a public hearing held on day of __, 20__

COUNTY ATTORNEY
Approved as to form this day of __, 20__

COUNTY RECORDER
Recorded and filed at the request of

STATE OF UTAH, COUNTY OF SUMMIT
THE UNDERWRITING TITLE COMPANY OF THE COUNTY OF SUMMIT, COUNTY ENGINEER

COUNTY RECORDER
Date: Time:
Entry #: Fee:

COUNTY RECORDER
