DRAFT CEDAR VALLEY AND NORTHERN UTAH VALLEY GROUNDWATER MANAGEMENT PLAN

Introduction

The *Cedar Valley and Northern Utah Valley Groundwater Management Plan* amends the northern Utah Valley portions of the *Utah/Goshen Valley Groundwater Management Plan*, November 15, 1995, and the *Cedar Valley Ground-Water Policy*, November 15, 1995. This plan also amends actions adopted in correspondence from Jerry D. Olds, State Engineer, dated November 2, 2004 regarding the management of groundwater in Cedar Valley.

The objectives of this groundwater management plan are to ensure groundwater withdrawals do not exceed safe yield, to safeguard the physical integrity of the aquifer, and to protect water quality in northern Utah and Cedar Valleys. Studies and water right records indicate if all known water rights were fully exercised, groundwater withdrawals in Cedar and northern Utah Valleys would exceed recharge. Groundwater withdrawals do not currently exceed recharge.

The intent of this plan is to provide specific management guidelines for northern Utah and Cedar Valleys under Section 73-5-15 of the Utah Code. The 1995 *Utah/Goshen Valley Groundwater Management Plan* remains in effect for Goshen Valley and portions of Utah Valley not included in this plan.

Affected Area

This groundwater management plan applies to Cedar Valley and northern Utah Valley comprising Water Right Area 54 and a portion of Water Right Area 55 as shown in Figure 1. For purposes of this plan, Water Right Area 54 is divided into 54 East and 54 West. Area 54 West is defined in the November 15, 1995 *Cedar Valley Groundwater Policy* as the alluvial valley west of Utah Lake which is bounded on the north by the Traverse Range, on the west by the Oquirrh and East Tintic Mountains, and in the east by the Lake Mountains. Area 54 East is the remaining portions of Water Right Area 54 not included in Area 54 West. The *Cedar Valley and Northern Utah Valley Groundwater Management Area Boundaries* can be found on the Division of Water Rights webpage.

Background

The United States Geologic Survey (USGS) published two reports entitled "Hydrology of Northern Utah Valley, Utah County, Utah, 1975 – 2005" (Jay R. Cederberg, Phillip M. Gardner, Susan A. Thiros, 2009) and "Three-Dimensional Numerical Model of Ground-Water Flow in northern Utah Valley, Utah County, Utah" (Gardner, 2009). The Utah Geological Survey (UGS) analyzed the hydrogeology of Cedar Valley in a report "Hydrogeology and Simulation of Groundwater Flow in Cedar Valley, Utah County, Utah." (Jordan and Sabbah, 2012). These documents, used in conjunction, describe the hydrogeology in northern Utah Valley and Cedar Valley.

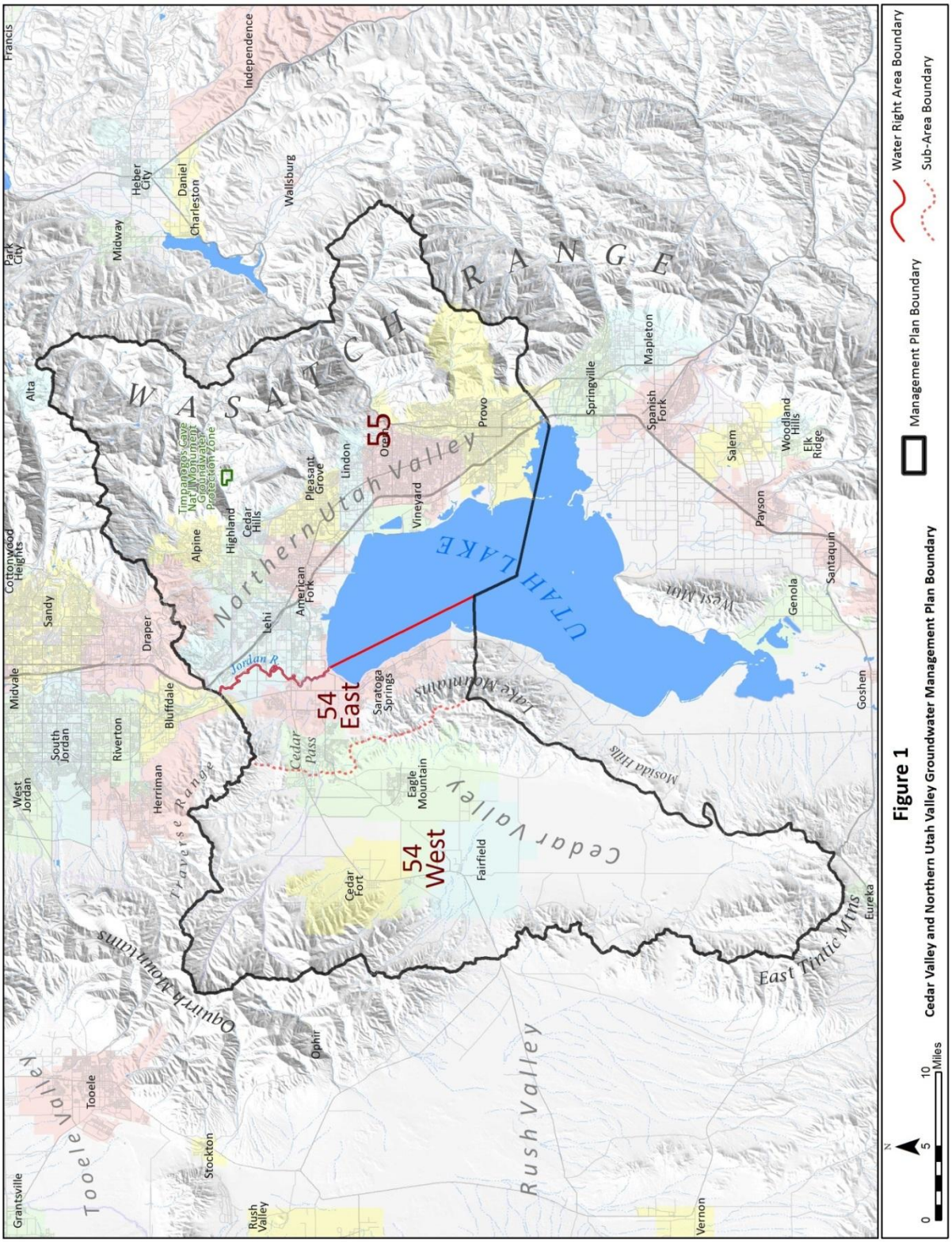

Figure 1

Cedar Valley and Northern Utah Valley Groundwater Management Plan Boundary

This groundwater management plan encompasses two hydrologic groundwater systems with distinct recharge sources, both naturally discharging towards Utah Lake and the Jordan River. These two systems are associated with water right administrative Area 54 and a portion of Area 55 (see Figure 1).

The Area 54 groundwater system is predominantly recharged from the Oquirrh Mountains. Groundwater moves generally from the west to the east, exiting Cedar Valley through the subsurface at Cedar Pass and Mosida Hills as illustrated on Figure 2. Approximately 10,000 acre-feet of groundwater leaves Cedar Valley by subsurface outflow through the Cedar Pass area and approximately 4,700 acre-feet leaves through the Mosida Hills area.[1] Groundwater in Area 54 eventually discharges to Utah Lake and the Jordan River.

The groundwater in the Area 55 system is predominantly recharged from the Wasatch Range. It moves generally from east to west, ultimately discharging to Utah Lake and the Jordan River. The estimated long-term average recharge to each flow system is tabulated in Table 1.

Table 1. Hydrologic System Recharge.

Recharge by Area	
Area 54	Quantity (ac-ft/yr)
54 West[1]	25,000
54 East[2]	1,000
Total Area 54	**26,000**
Area 55	Quantity (ac-ft/yr)
Utah Valley[3]	**145,000**

Current Conditions

Northern Utah County

The current estimate of average annual withdrawal from wells in northern Utah Valley is about 69,600 acre-feet.[4] In addition, an estimated 69,000 acre-feet[5] of water per year discharges to valley drains and springs and is fully utilized by existing rights. The total usage in northern Utah Valley from wells and discharges is projected to be 138,600 acre-feet per year. Approximately

[1] J. Lucy Jordan, Walid W. Sabbah, 2012, Utah Geological Survey (USG), "Hydrology and Simulation of Groundwater Flow in Cedar Valley, Utah County, Utah," page 2.
[2] Jay R. Cederberg, Phillip M. Gardner, Susan A. Thiros, 2009, United States Geologic Survey (USGS) "Hydrology of Northern Utah Valley, Utah County, Utah, 1975-2005," page 24, 33, and 35.
[3] Jay R. Cederberg, Phillip M. Gardner, Susan A. Thiros, 2009, United States Geologic Survey (USGS) "Hydrology of Northern Utah Valley, Utah County, Utah, 1975-2005," 145,000 acre-feet is estimated by reducing the amount of recharge from of Area 54 East from the recharge of all of northern Utah Valley, page 24 and 25.
[4] USGS, Utah Department of Natural Resources, and Utah Department of Environmental Quality. "Groundwater Conditions in Utah," 1995 – 2011, average withdrawal for Northern Utah Valley.
[5] Jay R. Cederberg, Phillip M. Gardner, Susan A. Thiros, 2009, United States Geologic Survey (USGS) "Hydrology of Northern Utah Valley, Utah County, Utah, 1975-2005," page 24, 33, and 35.

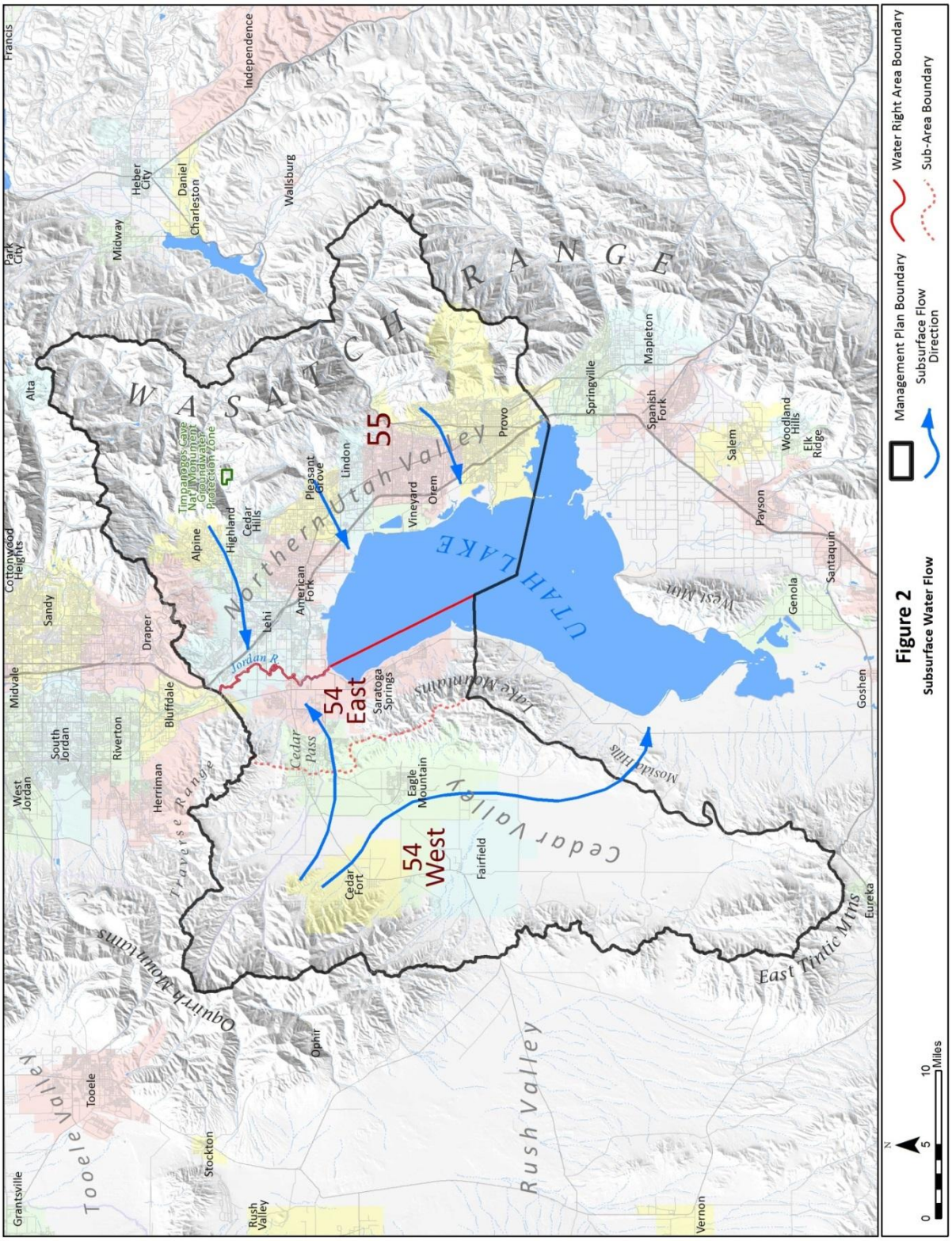

Figure 2
Subsurface Water Flow

1,000 acre-feet of well withdrawal in northern Utah Valley occurs within the area defined as Area 54 East; therefore, the calculated value of groundwater withdrawal in the Area 55 portion of northern Utah Valley is approximately 137,600 acre-feet.

Based on existing water rights, the amount of potential groundwater withdrawal from wells in northern Utah Valley was conservatively estimated by totaling quantities of water associated with perfected (developed) and approved (undeveloped or developing) groundwater rights of record with the Division of Water Rights. To provide the most accurate assessment of potential groundwater withdrawal, existing water rights were in some cases adjusted based on projections of future use. The potential groundwater withdrawal (including drains and springs) is estimated to be 265,000 acre-feet per year for northern Utah Valley; approximately 245,000 acre-feet for the Area 55 section of the valley; and approximately 20,000 acre-feet within the Area 54 East.

Table 2. Estimated Potential Groundwater Withdrawal in Northern Utah Valley.

Potential Groundwater Use	
Type	**Quantity (ac-ft/yr)**
Domestic and Stock	2,000
Irrigation	37,000
Municipal	209,000
Industrial/Other	17,000
Total (all of northern Utah Valley)	**265,000**
Total Potential in 54 East	(20,000)
Total (Potential in Area 55)	**245,000**

Cedar Valley

The current average annual withdrawal from wells in Area 54 West is about 5,700 acre-feet[6]. In addition, an estimated 3,700 acre-feet per year[7] discharges to valley drains, ditches and springs. The total estimates of usage from wells and discharges to valley drains, ditches and springs in Area 54 West are estimated to be 9,400 acre-feet per year.

Based on existing water rights, the amount of potential groundwater withdrawal from wells and springs in Area 54 West was estimated by totaling perfected (developed) and approved (undeveloped or developing) groundwater rights of record with the Division of Water Rights. To provide the most accurate assessment of potential groundwater withdrawal, existing water rights were compared and adjusted to reflect measured groundwater use data reported to the Division of Water Rights. The potential groundwater withdrawal (including drains and springs) is estimated to be 19,500 acre-feet per year as shown by use in Table 3.

[6] USGS, Utah Department of Natural Resources, and Utah Department of Environmental Quality. "Groundwater Conditions in Utah," 1995-2011, average withdrawal for Cedar Valley, Utah County.
[7] J. Lucy Jordan, Walid W. Sabbah, 2012, Utah Geological Survey (USG), "Hydrology and Simulation of Groundwater Flow in Cedar Valley, Utah County, Utah," page 100.

Table 3. Estimated Potential Groundwater Withdrawal in Area 54 West.

Potential Groundwater Withdrawal Area 54 West	
Type	**Quantity (ac-ft/yr)**
Domestic and Stock	500
Irrigation	11,700
Municipal/Domestic	7,300
Industrial/Other	negligible
Total	**19,500**

Summary

A summary of the hydrologic and water right data described in this plan is presented in Table 4. Groundwater use in Area 54 is less than half of the average annual projected long-term recharge; however, potential use in this area exceeds the long-term average recharge by 13,500 acre-feet per year. In Water Right Area 55 the estimated groundwater use is slightly under the long-term average recharge; however, potential use in this area exceeds long-term recharge by 100,000 acre-feet per year. A listing of groundwater rights within the groundwater management plan area can be found on the Division of Water Rights' webpage for this groundwater management plan.

Table 4. Summary of Hydrologic and Water Right Data.

Recharge, Potential and Actual Use by Area	
Area 54	
Recharge	**Quantity (ac-ft/yr)**
54 West	25,000
54 East	1,000
Total	26,000
Potential Use	
54 West	19,500
54 East	20,000
Total	39,500
Difference in Potential Use versus Recharge	**-13,500**
Actual Use	
54 West	9,400
54 East	1,000
Total	10,400
Difference in Actual Use versus Recharge	**15,600**
Area 55 Portion of Utah Valley	
Recharge	Quantity (ac-ft/yr)
Utah Valley	145,000
Potential Use	
Total	245,000
Difference in Potential Use versus Recharge	**-100,000**
Actual Use	
Total	137,600
Difference in Actual Use versus Recharge	**7,400**

Appropriation Policy

The following policy guidelines are hereby implemented to ensure groundwater withdrawals do not exceed a safe yield, to safeguard the physical integrity of the aquifer, and to protect water quality in northern Utah and Cedar Valleys.

1) The appropriation of groundwater in northern Utah Valley and Cedar Valley was administratively suspended by the State Engineer in 1995. These areas will remain closed to new consumptive use appropriations.

2) All change or exchange applications that represent a new groundwater withdrawal from Area 54 East or the portion of Area 55 within the groundwater management plan area that were filed after September 30, 2010 will not be approved.

3) Surface water diversions may not be changed to underground point(s) of diversion unless:

    a. The new well is to replace a spring or drain impacted by new groundwater development, where flow is insufficient to supply historical beneficial use. A water user is required to file a change application setting forth a claim of reduced flow due to new groundwater development. The claim of reduced flow must show the reduction is not related to an alteration of the conveyance works of surface rights that may affect the historical return flows or seepage losses from conveyance facilities; or

    b. The well is for the recovery of water from an approved Aquifer Storage and Recovery project; or

    c. The surface source proposed to be changed is within area 54 West (see Figure 1.) and the proposed well remains within area 54 West; or

    d. The surface source proposed to be changed is within a canyon area and the proposed well remains within the same canyon area.

4) Change applications proposing to move groundwater rights anywhere within a given water right area within the management plan boundary, including applications that propose to move water rights from area 54 East to 54 West, will be reviewed on their individual merits and may be approved.

5) Change applications proposing to move underground points of diversion from Water Right Area 54 to Area 55, or Area 55 to Area 54, will not be approved except under the following conditions:

    a. The underground point of diversion to be changed is an approved location as of June 4, 2013 within the Central Zone[8] shown on Figure 3, and;

    b. The proposed hereafter point of diversion remains within the Central Zone.

6) Applications to develop groundwater will not be approved in the Timpanogos Cave National Monument Protection Zone as defined in the Timpanogos Cave National Monument Water Right Settlement Agreement dated March 22, 2004.

Safe Yield

An objective of this plan is to set a safe yield for northern Utah and Cedar Valleys. Based on the recharge information presented, the safe yield for the portion of Area 55 discussed in this plan is estimated to be 145,000 acre-feet and the safe yield for Area 54 is estimated to be 26,000 acre-feet. It is vital for the protection of the groundwater resource to ensure the safe yield is not exceeded.

Inasmuch as potential withdrawals exceed safe yield, future water use will be monitored and further measures will be implemented as necessary to assure safe yield is maintained. All diversions of groundwater within northern Utah and Cedar Valley that are approved to divert 100 acre-feet or more per year are required to install, operate and maintain flow-measuring devices, and report withdrawals annually to the State Water Use Program. Prior to implementation of the monitoring and recording requirements, the State Engineer will notify affected water users. Measuring and reporting withdrawals of groundwater in conjunction with other data collection and monitoring will aid the State Engineer and water users in protecting the resource and implementing the objectives of the groundwater management plan.

Priority Regulation

In the future if the State Engineer determines safe yield is exceeded in all or part of the groundwater management plan area, groundwater withdrawals may be regulated by priority date. Utah statutes provide that each application filed with the State Engineer (Application to Appropriate, Change, or Exchange) has a priority date which is the date the application was received by the State Engineer's office. A regulated area may be the entire basin or may be a much smaller area. The priority date used for regulation in a given area will be the date of the application that first approves the diversion of water from the source within the regulated area. Any proposed regulation of withdrawals in all or part of the groundwater management plan area will be handled as an amendment to this groundwater management plan. At any time water users may agree to participate in a voluntary arrangement to manage withdrawals, including before a determination that groundwater withdrawals exceed safe yield.

[8] The Central Zone is a one-mile buffer on either side of the administrative boundary between Areas 54 and 55.

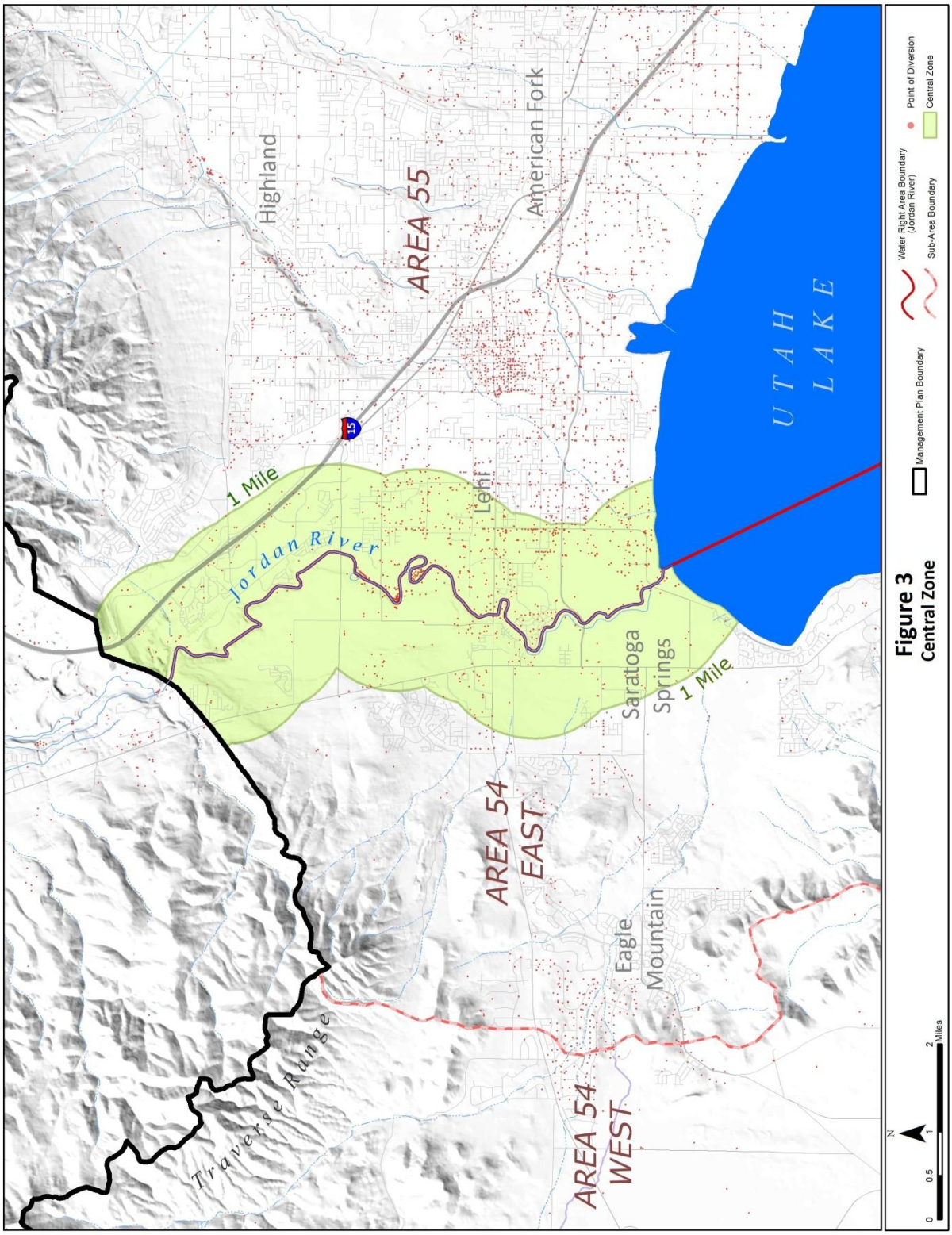

Figure 3
Central Zone