SCIENCE-BASED LAND-USE PLANNING TOOLS TO HELP PROTECT GROUND-WATER QUALITY, CEDAR VALLEY, IRON COUNTY, UTAH

by Mike Lowe, Janae Wallace, and Walid Sabbah, Utah Geological Survey
and Jason L. Kneedy, Chesapeake Energy

SPECIAL STUDY 134
UTAH GEOLOGICAL SURVEY
a division of
UTAH DEPARTMENT OF NATURAL RESOURCES
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Cover photo: *View of Cedar City from Right Hand Canyon Road above the "C" on Lone Tree Mountain looking northwest.*

ISBN 978-1-55791-836-9

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ABSTRACT

Cedar Valley, Iron County, is a semi-rural area in southwestern Utah that is experiencing an increase in residential development. Whereas much of the development is on community sewer systems, many subdivisions use septic tank soil-absorption systems for wastewater disposal. Many of these septic-tank systems are on basin-fill deposits that are the principal aquifer for the area. The purpose of our study is to provide tools for water-resource management and land-use planning. In this study we (1) map ground-water recharge and discharge areas for the basin-fill aquifer to indicate where ground-water resources are most vulnerable to surface sources of pollution, (2) classify the ground water quality in the basin-fill aquifer to formally identify and document the beneficial use of ground water resources, and (3) apply a ground-water flow model using a mass balance approach to determine the potential impact of projected increased numbers of septic tank systems on water quality in the basin-fill aquifer and thereby recommend appropriate septic-system density requirements to limit water-quality degradation.

The Cedar Valley basin-fill aquifer consists primarily of Tertiary to Quaternary alluvial sediments composed of discontinuous, lenticular, commonly elongated, poorly to well-sorted bodies of sand, clay, gravel, and boulders, interbedded with lava flows and some lacustrine, eolian, and volcaniclastic deposits. The basin fill may be as much as 3900 feet (1190 m) thick in the eastern part of Cedar Valley. Ground water in the Cedar Valley basin-fill aquifer occurs under confined, unconfined, and perched conditions.

Ground-water recharge areas include the fractured bedrock surrounding the valley, and basin fill along the valley margins, which typically consists of coarse, granular, permeable sediments deposited primarily in alluvial fans, where ground water is generally under unconfined conditions. The basin-fill aquifer is generally under leaky confined conditions in the central, lower elevation areas of the valley where water-yielding coarser grained deposits are overlain by or contain intervening beds of low-permeability silt and clay. Upward ground-water gradients in the central, lower elevation areas of Cedar Valley were once sufficient to supply flowing wells that covered an approximate area of 50 square miles (130 km^2) in central Cedar Valley in 1939, but due to ground-water pumpage, no flowing wells have existed in Cedar Valley since 1975. This central part of the valley, which contains fine-grained confining layers greater than 20 feet (6 m) thick and where ground water now generally has a downward vertical head gradient, is mapped as a secondary recharge area. Although some wells in the confined part of the basin-fill aquifer have an upward vertical head gradient, they are sporadically distributed and are not mapped as a discrete ground-water discharge area.

Utah's ground-water quality classes are based mostly on total-dissolved-solids (TDS) concentrations as follows: Class IA (Pristine), less than 500 mg/L; Class II (Drinking Water Quality), 500 to less than 3000 mg/L; Class III (Limited Use), 3000 to less than 10,000 mg/L; and Class IV (Saline), 10,000 mg/L and greater. Cedar Valley ground water is Class IA (80% of basin; primarily in central and western parts of valley), Class II (19%; primarily in eastern part of valley), and Class III (1%; an area of persistent nitrate contamination northwest of Cedar City) based on chemical analyses of water from 119 wells sampled during 1974–2000. Total-dissolved-solids concentrations range from 184 to 2190 mg/L. Nitrate-as-nitrogen concentrations in the basin-fill aquifer range from 0.06 to 57.4 mg/L, and average 7.59 mg/L.

Nitrogen in the form of nitrate is one of the principal indicators of pollution from septic tank soil absorption systems. To provide recommended septic-system densities, we used a mass-balance approach in which the nitrogen mass from projected additional septic tanks is added to the current nitrogen mass and then diluted with ground water flow available for mixing plus the water added by the septic tank systems themselves. Ground water available for mixing was calculated using a regional, three-dimensional, steady-state, ground-water flow model. Our ground-water flow indicates that two categories of recommended maximum septic-system densities are appropriate for development using septic tank soil-absorption systems for wastewater disposal: 5 and 15 acres per system (2 and 6 hm^2/system). These recommended maximum septic-system densities are based on hydrogeologic parameters incorporated in the ground-water flow simulation and the modeled area was divided into three ground-water flow domains based on flow-volume similarities; a

fourth domain was assigned to northern Cedar Valley due to insufficient data.

INTRODUCTION

Cedar Valley (figure 1), Iron County, is a semi-rural area in southwestern Utah that is experiencing an increase in residential development. Whereas much of the development is on community sewer systems, many subdivisions use septic tank soil-absorption systems for wastewater disposal. Many of these septic-tank systems are on basin-fill deposits that are the principal aquifer for the area. Preservation of ground-water quality and the potential for ground-water quality degradation are critical issues that should be considered in determining the extent and nature of future development in Cedar Valley. Local government officials in Cedar Valley have expressed concern about the potential impact that development may have on ground-water quality, particularly development that uses septic tank soil-absorption systems for wastewater disposal. Local government officials would like to formally identify ground-water recharge areas and current ground-water quality to provide a basis for defendable land-use regulations to protect ground-water quality; they would also like a scientific basis for determining recommended densities for septic-tank systems as a land-use planning tool.

Purpose and Scope

The purpose of our study is to provide land-use planners with science-based tools for approving new development in a manner that will protect ground-water quality. To accomplish this purpose we (1) delineate ground-water recharge areas for the basin-fill aquifer to determine where the aquifer is most vulnerable to surface sources of pollution, (2) classify the ground water quality of the basin-fill aquifer to formally identify and document the beneficial use of ground water resources, and (3) apply a ground-water flow model using a mass balance approach to determine the potential impact of projected increased numbers of septic tank systems on water quality in the basin-fill aquifer, and thereby recommend appropriate septic-system density requirements to limit water-quality degradation.

Ground-Water Recharge Area Delineation

The purpose of recharge-area mapping is to delineate the relative vulnerability of the basin-fill aquifer to potential surface sources of contamination based on the presence or absence of confining layers and vertical head gradient. In this study, we used the methods of Anderson and others (1994; see also Anderson and Susong, 1995) as modified by Lowe and Snyder (1996) and Snyder and Lowe (1998) for identifying confining layers, and delineating recharge and discharge areas for basin-fill aquifers; much of the text in this section is from Snyder and Lowe (1998). To delineate recharge and discharge areas, we evaluated both the principal aquifer (figure 2) and local overlying shallow unconfined aquifers. The principal aquifer is the most important source of ground water, and may be confined or unconfined. The principal aquifer begins at the mountain front along the valley margins where coarse-grained alluvial-fan sediments predominate and ground water is generally unconfined. Away from bedrock exposures, fine-grained silt and clay may form confining layers above and within the principal aquifer. Water in sediments above the upper confining layer is in a shallow unconfined aquifer. Shallow unconfined aquifers are generally not an important source of drinking water.

We used drillers' logs of water wells to delineate primary and secondary recharge areas and discharge areas, based on the presence or absence of confining layers and relative water levels in the principal and shallow unconfined aquifers. Well-log information is summarized in appendix A. The use of drillers' logs requires interpretation because of the variable quality of the logs. Correlation of geology from well logs is difficult because lithologic descriptions prepared by various drillers are generalized and commonly inconsistent. Use of water-level data from well logs is also problematic because levels in the shallow unconfined aquifer are commonly not recorded, and because water levels were measured during different seasons and years.

Confining layers are defined as any fine-grained (clay and/or silt) layer thicker than 20 feet (6 m) (Anderson and others, 1994). Some logs note both clay and sand in the same interval, with no information describing relative percentages; these are not classified as confining layers (Anderson and others, 1994). If both clay and sand are checked and the word "sandy" is written in the remarks column, then the layer is assumed to be a predominantly clay confining layer (Anderson and others, 1994). Some drillers' logs show clay together with gravel, cobbles, or boulders; these units are also not classified as confining layers, although in some areas in Utah layers of clay containing gravel, cobbles, or boulders function as confining layers.

The primary recharge areas for the principal aquifer are the bedrock uplands surrounding and within the valley, and basin fill lacking thick clay layers, generally along valley margins (figure 3). Ground-water flow in primary recharge areas has a downward component. If present, secondary recharge areas exist where clay layers are thicker than 20 feet (6 m) and the hydraulic gradient is downward. Areas of secondary recharge extend toward the valley center until the hydraulic gradient is upward (figure 3). The hydraulic gradient is upward where the potentiometric surface of the principal aquifer is higher than the water table in the shallow unconfined aquifer (Anderson and others, 1994). Water-level data for the shallow uncon-

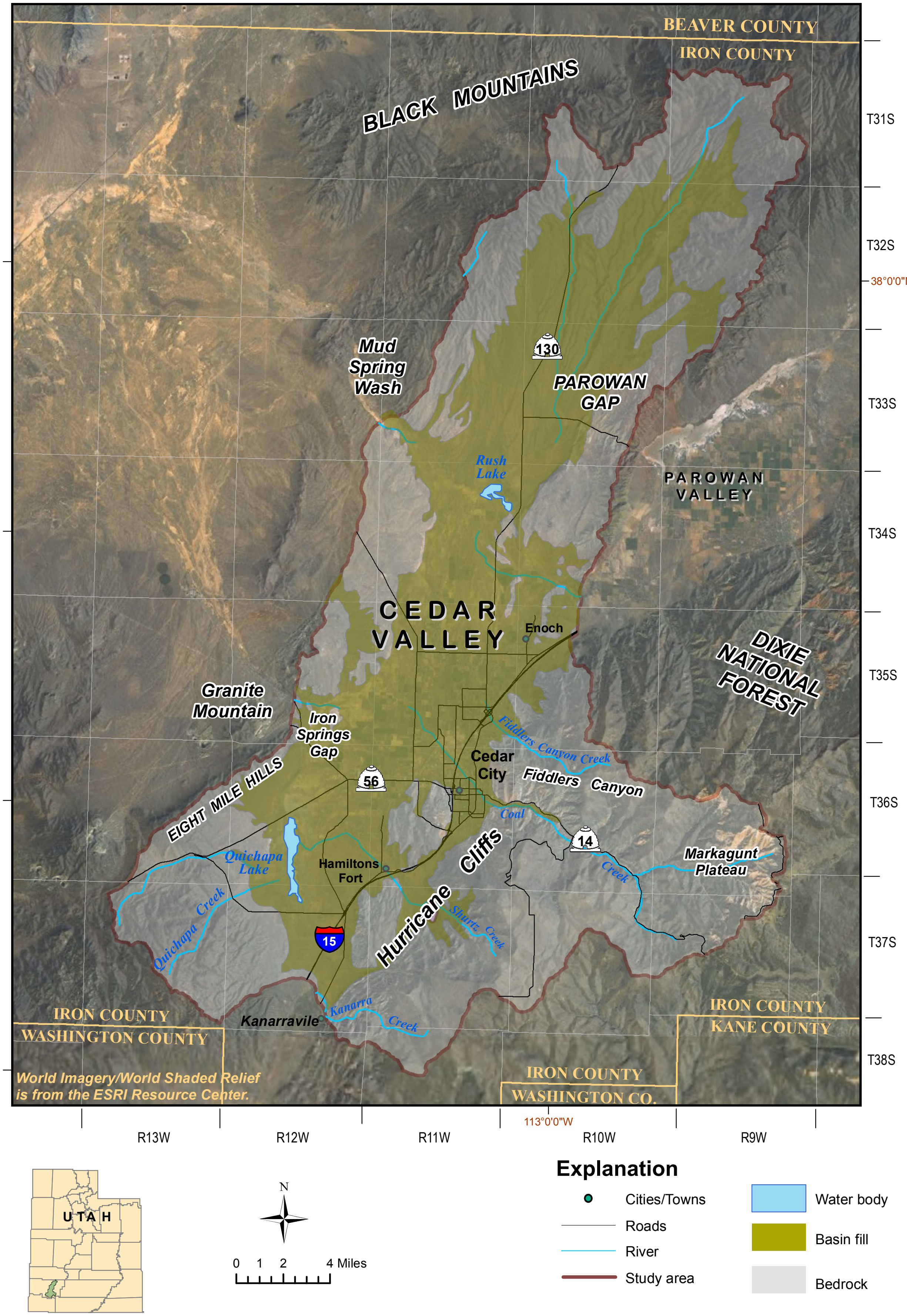

Figure 1. *Location of Cedar Valley study area.*

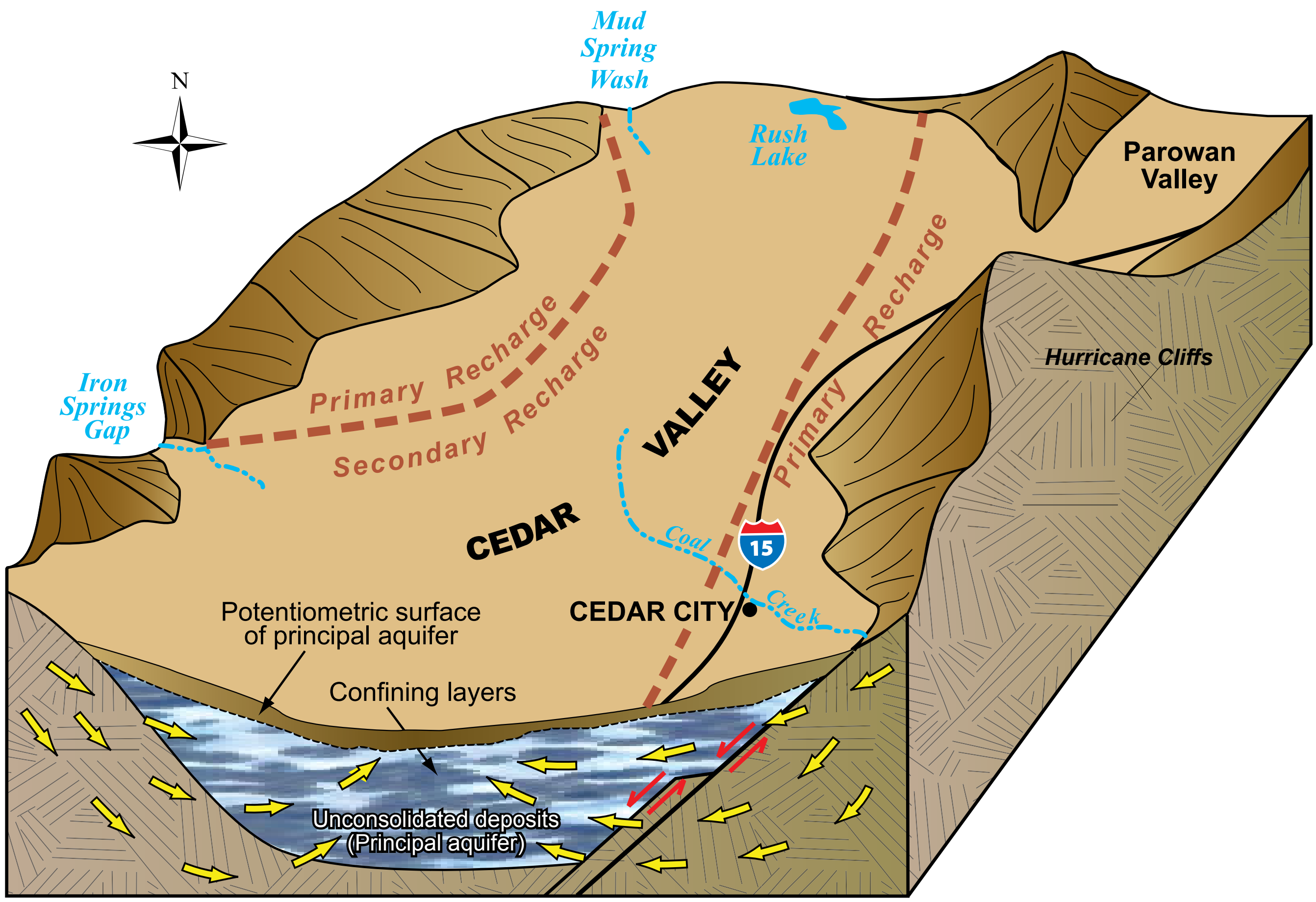

Figure 2. *Schematic block diagram showing ground-water conditions in the principal basin-fill aquifer in Cedar Valley. Yellow arrows indicate ground-water flow direction.*

fined aquifer are not common, but are recorded on some water-well logs. Where confining layers extend to the ground surface, secondary recharge is mapped where the potentiometric surface in the principal aquifer is below the ground surface.

Ground-water discharge areas are at lower elevations than recharge areas. In discharge areas, the water in confined aquifers discharges to the land surface or to a shallow unconfined aquifer (figure 3). For this to happen, the hydraulic head in the principal aquifer must be higher than the water table in the shallow unconfined aquifer. Otherwise, downward pressure from the shallow aquifer exceeds the upward pressure from the confined aquifer, creating a net downward hydraulic gradient as in secondary recharge areas. Flowing (artesian) wells, indicative of discharge areas, are marked on drillers' logs and some flowing wells are shown on U.S. Geological Survey 7.5-minute quadrangle maps. Wells having potentiometric surfaces above the top of the confining layer can be identified from water-well logs. Surface water, springs, or phreatophytic plants characteristic of wetlands can also indicate ground-water discharge, but in some instances the discharge may be from a shallow unconfined aquifer. An understanding of the topography, surficial geology, and ground-water hydrology is necessary before using wetlands to indicate discharge from the principal aquifer.

We generally did not map small discharge areas defined by single well logs where surrounded completely by secondary recharge. Contaminants entering the aquifer system above these wells may be less likely to affect the principal aquifer than in the surrounding areas of secondary recharge.

Ground-Water Quality Classification

The purpose of aquifer classification is to recognize the value (quality) of the water resource in Utah, as outlined under Section 317-6-5, Ground Water Classification for Aquifers, Utah Administrative Code (December 1, 2009). Ground-water quality classes under the Utah Water Quality Board classification scheme are based largely on total-dissolved-solids (TDS) concentrations (table 1) (for the ranges of chemical-constituent concentrations used in this report, including those for TDS, milligrams per liter [mg/L] equals parts per million). If any contaminant exceeds Utah's ground water quality (health) standards (and,

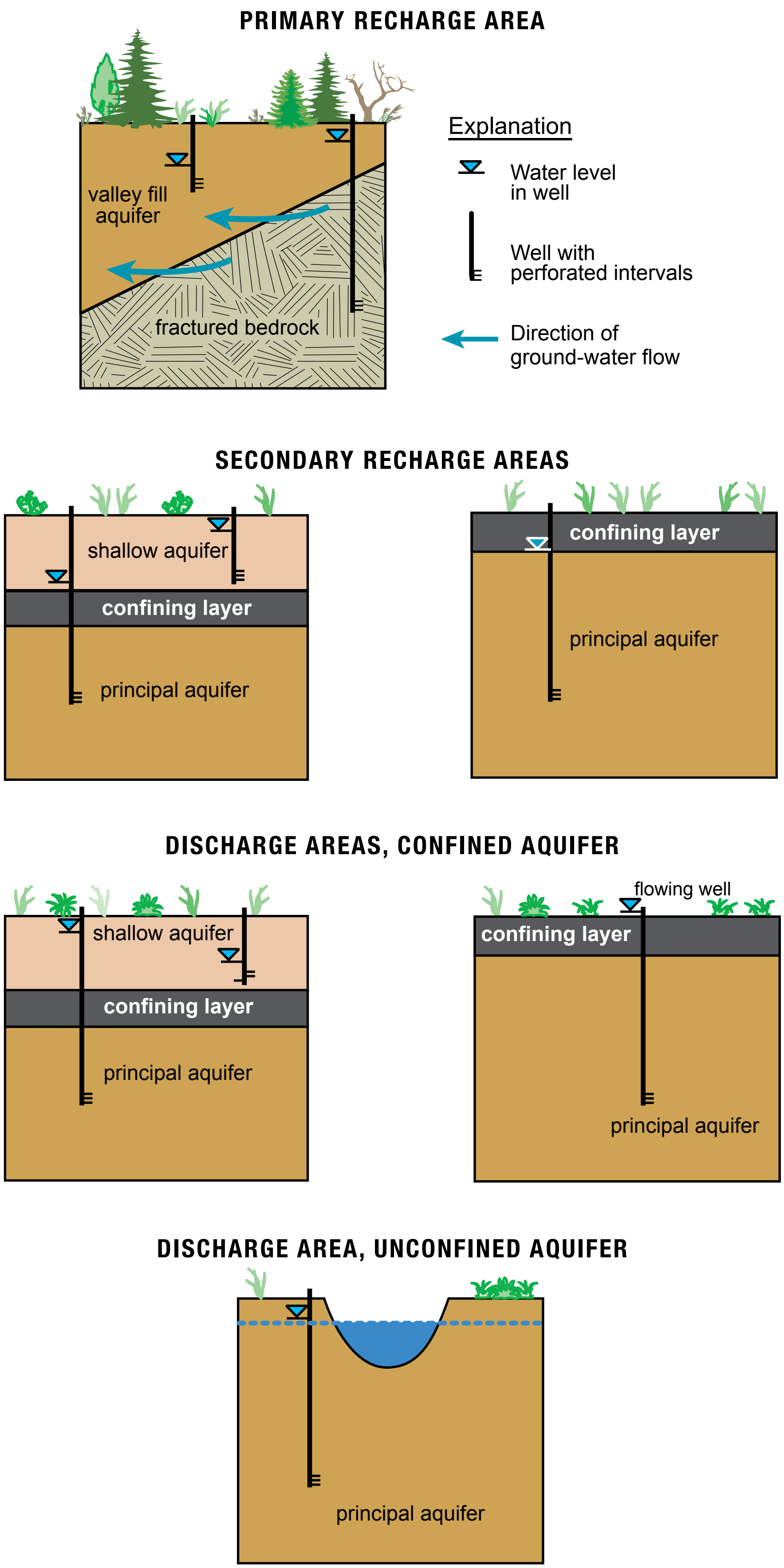

Figure 3. *Relative water levels in wells in recharge and discharge areas (modified from Snyder and Lowe, 1998).*

if human caused, cannot be cleaned up within a reasonable time period), the ground water is classified as Class III, Limited Use ground water. Note that Class IB (Irreplaceable ground water) and Class IC (Ecologically Important ground water) are not based on TDS concentrations.

To classify the quality of ground water in the Cedar Valley basin-fill aquifer, we used ground-water quality data from the U.S. Geological Survey, Utah Division of Water Quality, Utah Division of Drinking Water, Southern Utah University, and Ford Chemical. The U.S. Geological Survey data are from a previous study (Brooks and Mason, 2005) that was specifically designed to provide ground-water quality data necessary for classification. Table 2 summarizes the constituents analyzed for and, where appropriate, drinking water health standards for the constituents; water-quality data are in appendix B.

Another component of the classification process is to document existing and potential pollution sources that may threaten the public's drinking-water supply. We mapped potential pollution sources (appendix C) based on the Utah Division of Drinking Water's Drinking Water Source Protection Rules.

Septic-Tank Density Analysis

The purpose of septic-tank density analyses is to provide recommended septic-tank-system densities using the mass-balance approach to evaluate potential water-quality degradation. For our mass-balance analysis, we use nitrate as the constituent of interest because it is a common pollutant associated with septic-tank systems (but not necessarily the pollutant of greatest concern), and because it is inexpensive to analyze. The potential health risks to humans posed by nitrate in ground water is discussed below. A mass-balance analysis may be used as a gross model for evaluating the possible impact of proposed developments using septic-tank sys-

***Table 1.** Ground-water quality classes under the Utah Water Quality Board's total-dissolved-solids- (TDS) based classification system (modified from Utah Division of Water Quality, 1998).*

Ground-Water Quality Class	TDS Concentration	Beneficial Use
Class IA/IB[1]/IC[2]	less than 500 mg/L[3]	Pristine/Irreplaceable/Ecologically Important
Class II	500 to less than 3000 mg/L	Drinking Water[4]
Class III	3000 to less than 10,000 mg/L	Limited Use[5]
Class IV	10,000 mg/L and greater	Saline[6]

[1]Irreplaceable ground water (class IB) is a source of water for a community public drinking-water system for which no other reliable supply of comparable quality and quantity is available due to economic or institutional constraints; it is a ground-water quality class that is not based on TDS.
[2]Ecologically Important ground water (class IC) is a source of ground-water discharge important to the continued existence of wildlife habitat; it is a ground-water quality class that is not based on TDS.
[3]For concentrations less than 7000 mg/L, mg/L is about equal to parts per million (ppm).
[4]Water having TDS concentrations in the upper range of this class must generally undergo some treatment before being used as drinking water.
[5]Generally used for industrial purposes.
[6]May have economic value as brine.

tems for wastewater disposal on ground-water quality, allowing planners to more efficiently determine appropriate average septic-tank system densities.

In the mass-balance approach, we added the nitrogen mass from the projected additional septic tanks to the current nitrogen mass and then diluted it with the amount of ground-water flow available for mixing plus the water added by the septic-tank systems themselves. We used the following equation to determine the projected nitrate concentration resulting from additional septic tanks, and thus to determine how many septic-tank systems can be added before exceeding a designated target nitrate concentration:

$$N_P = \frac{[(ST_T - ST_C)Q_{ST}] * N_L + [N_A(Q_M + [ST_T * Q_{ST}])]}{[ST_T * Q_{ST}] + Q_M}$$

where:

N_P is the projected nitrate concentration (mg/L),

N_A is the ambient (background) nitrate concentration for the domain (mg/L),

N_L is the estimated average nitrate concentration from each septic tank (mg/L),

ST_T is the total number of septic tanks in the system (variable, unitless),

ST_C is the current number of septic tanks (constant, unitless),

Q_{ST} is the flow from each septic tank in liters per second (L/s), and

Q_M is the ground-water flow computed from the model (L/s).

To determine a recommended septic-tank system density, we divided the domain area acreage by the total number of septic tanks (ST_T) that existed at the projected nitrate concentration (N_P):

$$\text{Tank Density} = \frac{\text{Domain acreage}}{ST_T}$$

where ST_T is defined above.

To provide recommended septic-tank densities for Cedar Valley using the mass-balance approach to evaluate potential water-quality degradation, we used an existing ground-water flow model (Brooks and Mason, 2005) to estimate ground-water flow in the basin fill available for mixing (dilution). Using the model, we divided the basin fill into three ground-water flow domains based on similar characteristics of flow per unit area. For each domain, we determined area acreage, ground-water flow volumes, number of existing septic-tank systems, and present-day background nitrate concentrations. Then, using the appropriate amount of wastewater and accompanying nitrogen load introduced per septic-tank system, we projected nitrogen loadings in each domain based on increasing numbers of septic tank soil-absorption systems. By limiting allowable degradation of ground-water nitrate concentrations to varying amounts of water-quality degradation determined to be acceptable by local government officials, we were then able to derive septic-density recommendations for each domain.

Location and Geography

Cedar Valley is in eastern Iron County, southwestern Utah, between 38°07'15" and 37°32'15" north latitude and 113°23'15" and 112°49' west longitude (figure 1). It is a northeast-southwest-trending, elongate valley bordered by the Black Mountains to the north, the Markagunt Plateau to the east, low-lying mountains and hills to the west, and the Harmony Mountains to the southwest. Cedar Val-

Table 2. *Utah and EPA primary and secondary drinking water-quality standards and analytical methods for some chemical constituents sampled in Cedar Valley, Iron County, Utah.*

CHEMICAL CONSTITUENT	EPA ANALYTICAL METHOD[1]	WATER-QUALITY STANDARD (mg/L)
Nutrients:		
total nitrate/nitrite	353.2	10.0
ammonia as nitrogen	350.3	-
total phosphorous and dissolved total phosphate	365.1	-
Dissolved metals (as listed in State of Utah Public Health Laboratory online manual):		
arsenic	200.9	0.01
barium	200.7	2.0
cadmium	200.9	0.005
chromium	200.9	0.1
copper	200.7	1.3
lead	200.9	0.015
mercury	245.1	0.002
selenium	200.9	0.05
silver*	200.9	0.1
zinc*	200.7	5.0
General Chemistry: (as listed in State of Utah Public Health Laboratory online manual)		
total dissolved solids (TDS)	160.1	2000[+**] or (500*[++])
pH*	150.1	between 6.5 and 8.5
aluminum*	200.7	0.05 to 0.2
Calcium	200.7	-
sodium	200.7	-
boron	200.7	-
bicarbonate	406C	-
carbon dioxide	406C	-
carbonate	406C	-
chloride*	407A	250
total alkalinity	310.1	-
total hardness	314A	-
specific conductance	120.1	-
iron*	200.7	0.3
potassium	200.7	-
hydroxide	406C	-
sulfate *[++]	375.2	250
magnesium	200.7	-
manganese	200.7	0.5

- No drinking-water quality standard exists for the chemical constituent.
*For secondary standards (exceeding these concentrations does not pose a health threat).
[+] Maximum contaminant level is reported from the Utah Administrative Code R309-200 (Utah Division of Drinking Water).
[**]For public water-supply wells, if TDS is greater than 1000 mg/L, the supplier shall satisfactorily demonstrate to the Utah Water Quality Board that no better water is available. The Board shall not allow the use of an inferior source of water if a better source of water is available.
[++]TDS and sulfate levels are given in the Primary Drinking Water Standards, R309-200. They are listed as secondary standards, excess of recommended levels cause consumer complaint.
[1] http://www.epa.gov/safewater/methods/analyticalmethods_ogwdw.html#one

ley is approximately 32 miles (51 km) long and ranges from 8 miles (13 km) wide at its northern boundary to less than 1 mile (1.6 km) wide in the south. The floor of Cedar Valley covers 270 square miles (700 km^2); its drainage basin encompasses more than 580 square miles (1502 km^2). Elevations range from 11,307 feet (3446 m) at Brian Head in the Markagunt Plateau to about 5350 feet (1631 m) at the outlet at Mud Springs Wash in the northwest part of the valley.

Coal Creek, the principal perennial stream in Cedar Valley, flows westward from the Markagunt Plateau and has deposited a large alluvial fan in the Cedar City area (Bjorklund and others, 1978). Shirts Creek, formerly known as Shurtz Creek, a smaller perennial stream flowing westward from the Markagunt Plateau, enters Cedar Valley near Hamiltons Fort. Fiddlers Canyon Creek, one of the larger intermittent and ephemeral streams flowing westward from the Markagunt Plateau, enters Cedar Valley between Cedar City and Enoch. Quichapa Creek is a perennial stream flowing northeastward into the valley from the Harmony Mountains. Surface water flows westward out of Cedar Valley via Mud Springs Wash and Iron Springs Gap only during rare flash floods following heavy local precipitation (Bjorklund and others, 1978). Some spring runoff accumulates in Quichapa and Rush Lakes, which are shallow playa lakes.

Population and Land Use

From 2000–2007, the population of Iron County (most of the people in the county live in Cedar Valley) increased by 28.85% from 33,779 to 43,526 (Demographic and Economic Analysis Section, 2008). The population of Iron County is projected to be 103,920 by 2050 (Demographic and Economic Analysis Section, 2005).

Government, trade, and the service industry are the principal sources of employment in Iron County (Utah Division of Water Resources, 1995, table 4-4). Although agricultural land is being subdivided for residential and commercial uses, agricultural commodity production, mostly beef, dairy, and irrigated crops, will likely continue to be an important part of Cedar Valley's economy (Utah Division of Water Resources, 1995).

Climate

Cedar Valley's climate is characterized by large daily temperature variations, moderately cold winters, and warm, dry summers (Bjorklund and others, 1978). Temperatures at Cedar City airport range from a maximum of 105°F (41°C) to a minimum of about -26°F (-32°C) (Moller and Gillies, 2008); the maximum daily temperature variation is greatest in summer when fluctuations can be as much as 40°F (22°C) (Ashcroft and others, 1992). The normal mean annual temperature at the Cedar City airport was 50.9°F (10.5°C) from 1971 to 2000 (Moller and Gillies, 2008) . The growing season (the number of consecutive frost-free days) in Cedar Valley averages 133 days at the Cedar City airport (Moller and Gillies, 2008).

The Markagunt Plateau averages 35.7 inches (90.7 cm) of precipitation annually at Brian Head (Moller and Gillies, 2008), mostly as snow during winter. Annual precipitation in Cedar Valley ranges from about 8 to 14 inches (20 to 36 cm) (Bjorklund and others, 1978). At the Cedar City airport, normal mean annual precipitation was 11.41 inches (29.9 cm) and reference mean annual evapotranspiration was 49.11 inches (124.7 cm) from 1971 to 2000 (Moller and Gillies, 2008). Most precipitation is generated in winter and spring by humid air masses moving southeastward from the north Pacific (Bjorklund and others, 1978). Snow is common in Cedar Valley from December through March, and snowstorms occur occasionally during April and May (Bjorklund and others, 1978).

PREVIOUS INVESTIGATIONS

Gilbert (1875), Howell (1875), Powell (1879), and Dutton (1880) conducted early reconnaissance studies of the geology and physiography of southwestern Utah, including descriptions of the Cedar Valley area. Coal and ore deposits of the Cedar Valley region were investigated early in the 1900s by Lee (1907), Leith and Harder (1908), and Richardson (1909). Averitt (1962, 1967), Averitt and Threet (1973), Rowley (1975, 1976), Mackin and others (1976), Mackin and Rowley (1976), Rowley and Threet (1976), Maldonado and Williams (1993a, b), and Moore and Nealey (1993) produced 7.5-minute geologic quadrangle maps of the Cedar Valley area (figure 4). Rowley (1978) mapped the geology of the Thermo 15' quadrangle. Steven and others (1990) mapped the geology of the Richfield 1º x 2º quadrangle which includes the northern part of the study area. Averitt (1962), Threet (1963), Stewart and others (1972a, b), and Maldonado and others (1997) studied the structure of the Cedar Valley region. Huntington and Goldthwait (1904), Mackin (1960), Averitt (1962), Hamblin (1970, 1984), Rowley and others (1978), Anderson and Mehnert (1979), Anderson (1980), and Anderson and Christenson (1989) studied the Hurricane fault zone and discussed its significance as a possible boundary between the Basin and Range and Colorado Plateau physiographic provinces. Blank and Mackin (1967) made a geologic interpretation of an aeromagnetic survey of the southwest part of the study area. Eppinger and others (1990) assessed the mineral resources of the Cedar City 1º x 2º quadrangle. Rowley and others produced an interim geologic map for the Cedar City 30' x 60' quadrangle.

Meinzer (1911) conducted an early reconnaissance investigation of water resources in western Utah, including Cedar Valley (which he called Rush Lake Valley). Thomas and Taylor (1946) completed the first comprehensive investigation of ground-water conditions in Cedar and Parowan Valleys. Descriptions of the status of ground-water development in Cedar Valley were provided by Thomas and others (1952), and Barnell and Nelson (in Waite and others, 1954). Sandberg (1963, 1966) described the ground-water resources for selected basins in southwestern Utah, including Cedar Valley. Barnett and Mayo (1966) made recommendations regarding ground-water management and warned of a potential water-resources crisis in Cedar Valley. Bjorklund and others (1977, 1978) reevaluated ground-water conditions in Cedar and Parowan Valleys and produced water budgets for each valley. Wallace and Lowe (1998a, 1999) and Lowe and Wallace (1999a,b) recommended septic-tank system density/lot size for the entire Cedar Valley using Bjorklund and others' (1978) water budget. Lowe and others (2000) and Wallace and others (2001) provided septic-tank system density/lot-size recommendations for three subdivision areas in Cedar Valley. Wallace and Lowe (2000) and Lowe and Wallace (2001) evaluated the potential contribution of geologic nitrogen to nitrate in ground water in the Enoch area. Howells and others (2002) provided selected hydrologic data for Cedar Valley collected from 1930–2001. Hurlow (2002) evaluated the relation of ground water to geology in the Cedar Valley drainage basin. Brooks and Mason (2005) evaluated the hydrologic system and water quality in Cedar Valley, and developed a digital ground-water flow model for the basin-fill aquifer.

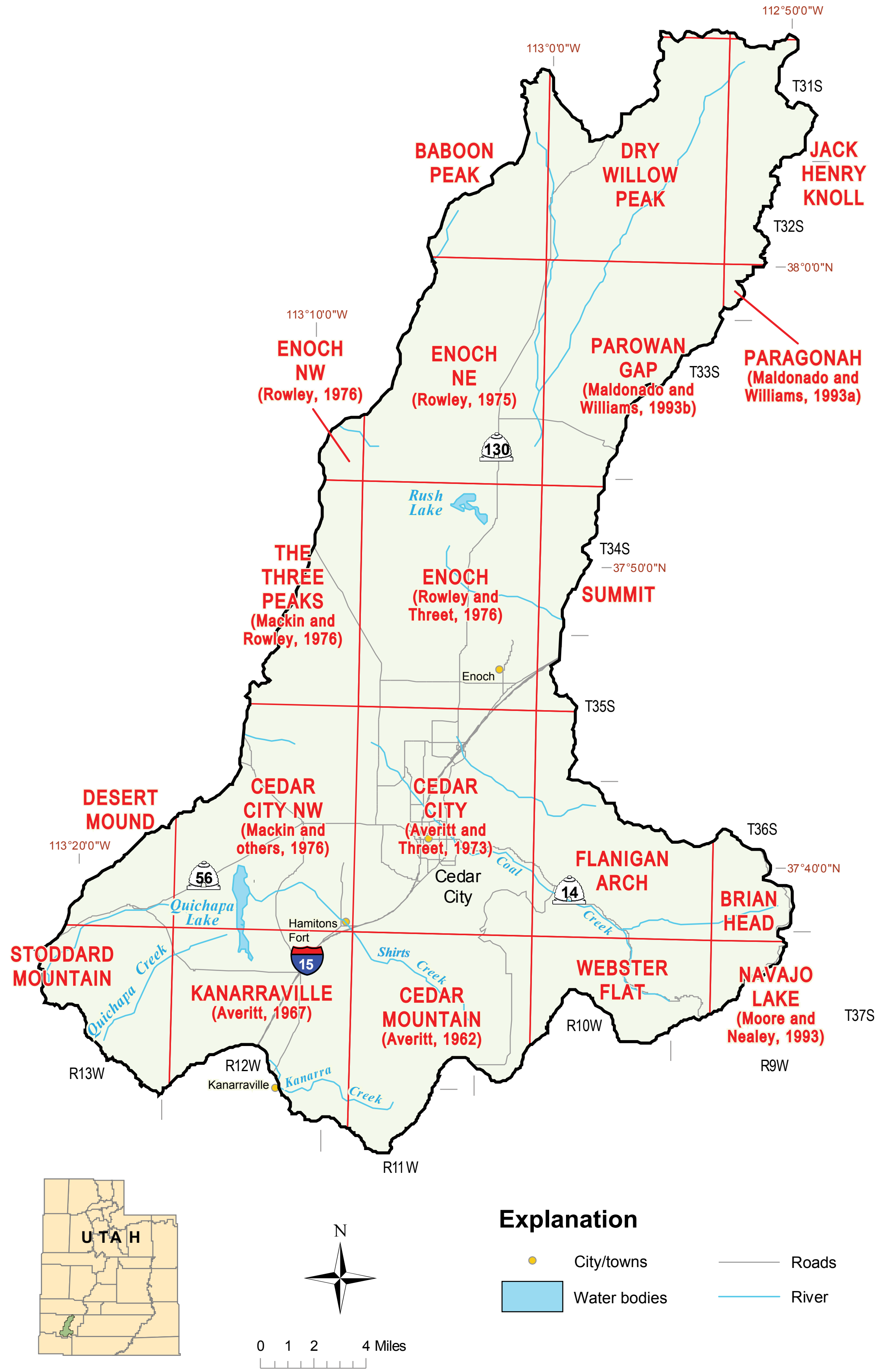

Figure 4. *Geologic mapping for 7.5-minute quadrangles in Cedar Valley, Iron County, Utah.*

GEOLOGIC SETTING

The Cedar Valley drainage basin is in the transition zone between the Basin and Range and Colorado Plateau physiographic provinces (Stokes, 1977). Many geologists consider the Hurricane fault zone, which probably first formed in the Pliocene, to be the boundary between the provinces (Anderson and Mehnert, 1979). The general location of the Hurricane fault zone is marked by the sheer Hurricane Cliffs, which are up to 2000 feet (610 m) high (Hamblin, 1970). The width of the fault zone, located at the base of the cliffs, is quite variable, but locally up to several miles wide (Averitt, 1962). Although the Hurricane fault zone is considered seismically active and potentially capable of producing future surface-faulting earthquakes, most movement occurred during the Pliocene and Pleistocene; the elapsed time since the last surface-faulting event is likely between 5000 and 10,000 years (Pearthree and others, 1998). Total vertical displacement along the Hurricane fault zone is estimated between 1500 and 4000 feet (457 and 1220 m) (Kurie, 1966; Anderson and Mehnert, 1979).

The Markagunt Plateau, east of the Hurricane Cliffs, has some features characteristic of the Colorado Plateau physiographic province, such as high elevation and relief dominated by gently dipping sedimentary rocks that are locally disrupted by folds and faults. However, aligned volcanic cones and prevalent northeast-trending block faults of the Markagunt Plateau are more typical of the Basin and Range physiographic province. Geomorphic features of the Markagunt Plateau include (1) narrow, predominantly westward sloping, V-shaped valleys, (2) steep-sided sharp-crested ridges, (3) structurally controlled drainage alignments, (4) elongated closed basins, and (5) hillside trenches or depressions (Anderson and Christenson, 1989).

Cedar Valley to the west of the Hurricane Cliffs is characterized by geomorphic features typical of other closed basins in the Basin and Range physiographic province. Cedar Valley is an asymmetrical graben formed by down dropping along valley margin normal faults from Miocene to Quaternary time; the asymmetry is due to greater displacement that occurred on the eastern basin-bounding fault system (of which the Hurricane fault zone is part) than on faults on the west side of the valley (Hurlow, 2002). The basin margins consist of broad alluvial-fan slopes that grade basinward into slightly undulating plains, the lowest depressions of which contain lakes, swamps, and dry alkali flats (Meinzer, 1911). A low divide, created by the alluvial fan deposited by Coal Creek, separates Cedar Valley into two subbasins. The south basin drains into saline ephemeral Quichapa Lake; the north basin partly drains into ephemeral Rush Lake, and water from Coal Creek may also drain to depressions farther south (Meinzer, 1911).

Stratigraphic units in the Cedar Valley area range from Triassic to Quaternary in age (figures 5 and 6). Consolidated rocks have a maximum combined thickness of more than 16,000 feet (4900 m) (Bjorklund and others, 1978). Unconsolidated to poorly consolidated basin-fill deposits are up to 3900 feet (1200 m) thick in Cedar Valley (Cook and Hardman, 1967; Hurlow, 2002); these deposits are thickest in the eastern part of the basin. Hurlow (2002) subdivided the basin fill into three seismically defined units (A, B, and C) having likely differences in water-yielding characteristics to help Brooks and Mason (2005) assign layers in their ground-water flow model.

GROUND-WATER CONDITIONS

Introduction

Ground water in Cedar Valley occurs in two types of aquifers: fractured bedrock and basin-fill deposits (figure 2). Ground water in fractured-rock aquifers is recharged primarily from infiltration of precipitation and streamflow, and flows primarily through fractures. Herein, we focus on the basin-fill aquifers.

Occurrence

The Cedar Valley basin-fill aquifer consists primarily of Quaternary alluvial sediments, composed of discontinuous, lenticular, commonly elongated, poorly to well-sorted bodies of sand, clay, gravel, and boulders (Thomas and Taylor, 1946), interbedded with lava flows and containing some lacustrine and eolian deposits (Bjorklund and others, 1978). Based on water-well data, the thickness of Quaternary basin fill is estimated to be at least 1000 feet (300 m) (Thomas and Taylor, 1946; Anderson and Mehnert, 1979). A gravity survey indicates basin fill may be as much as 3900 feet (1200 m) thick in the eastern part of the complexly faulted Cedar Valley graben (Cook and Hardman, 1967). Seismic-reflection profiles indicate the basin fill has a maximum thickness of 3800 feet (1160 m) near Rush Lake (Hurlow, 2002).

Ground water in the Cedar Valley basin-fill aquifer occurs under confined, unconfined, and perched conditions in unconsolidated basin-fill deposits (figure 2) (Bjorklund and others, 1978). The basin-fill aquifer is generally under unconfined conditions along the higher elevation margins of Cedar Valley where it typically consists of coarse, granular, permeable sediments (Bjorklund and others, 1978), deposited primarily in alluvial fans (Thomas and Taylor, 1946). The basin-fill aquifer is generally under leaky confined conditions in the central, lower elevation areas of the valley (figure 2) (Sandberg, 1966; Bjorklund and others, 1978) where water-yielding coarser grained deposits are capped by or contain intervening beds of low-

Age (Ma)	Period	Map Symbol and Unit Name		Description	Approximate Thickness in feet (m)
	QUATERNARY	Qs Sedimentary deposits		Interbedded gravel, sand, silt, and clay.	0 - 150+ (0 - 45)
	QUATERNARY	QTb Basalt		Flows and small cinder cones.	0 - 330+ (0 - 100)
2.6	QUATERNARY-TERTIARY	QTs Sedimentary deposits		Interbedded gravel, sand, silt, and clay.	0 - 1330 (0 - 405)
	QUATERNARY-TERTIARY	Seismically defined basin-fill units (subsurface only; not shown on figure 6)	A	Interbedded gravel, sand, silt, clay, and sedimentary breccia.	0 - 1330 (0 - 405)
			B		0 - 1825 (0 - 555) 0 - 980 (0 - 300)
			C		0 - 980 (0 - 300)
	TERTIARY	Ti Intrusive rocks		Quartz monzonite intrusions of the "Iron Axis." "iron axis"	
	TERTIARY	Tv Volcanic rocks		Interbedded ash-flow tuff, volcanic breccia, flows, and related sedimentary deposits. Some deposits are younger than unit Ti.	0 - 4000 (0 - 1200)
	TERTIARY	TKs Sedimentary rocks		Interbedded mudstone, siltstone, sandstone, conglomerate, and limestone.	2190 - 2320 (665 - 705)
66	CRETACEOUS	Ks Sedimentary rocks		Interbedded sandstone, mudstone, conglomerate, and coal.	2700 - 3600 (825 - 1100)
144	JURASSIC	Js Sedimentary rocks		Interbedded sandstone, siltstone, mudstone, and limestone.	3900 - 5150 (1200 - 1575)
205	TRIASSIC	TRs Sedimentary rocks		Interbedded sandstone, siltstone, mudstone, gypsiferous mudstone, and minor conglomerate.	2100 - 2400 (640 - 730)

Figure 5. *Generalized stratigraphic column for Cedar Valley drainage basin (Hurlow, 2002). Units correspond to those on figure 6.*

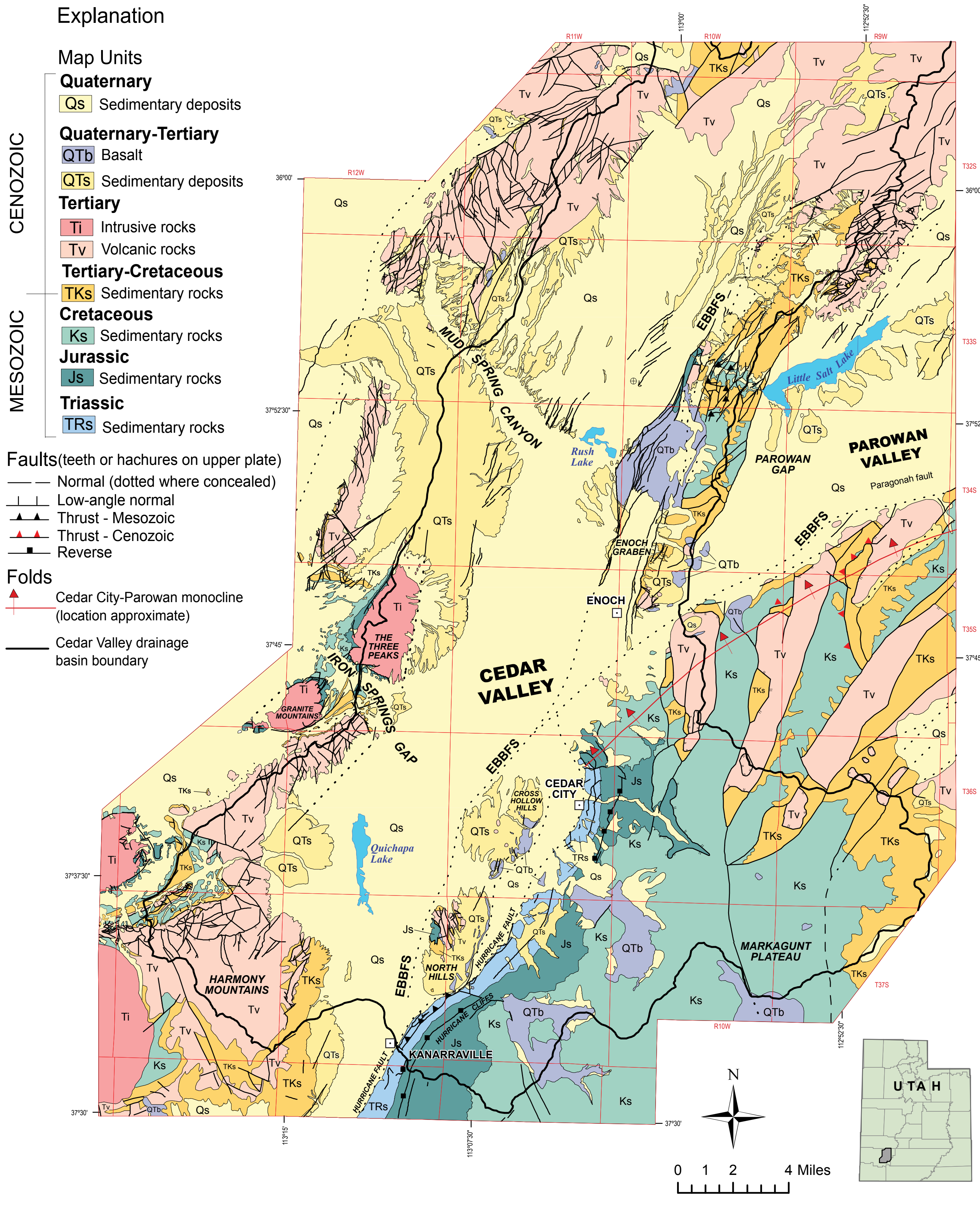

Figure 6. *Generalized geologic map of Cedar Valley drainage basin and adjacent areas. EBBFS is eastern basin-bounding fault system (from Hurlow, 2002).*

permeability silt and clay (Bjorklund and others, 1978). The low-permeability sediments are extensive enough to locally form effective confining beds or layers, but they are not continuous enough to form major layers in the basin fill where the ground-water system acts as a single, complex aquifer (Thomas and Taylor, 1946). The boundary between confined and unconfined conditions is indefinite and gradational, and shifts as the potentiometric surface of the basin-fill aquifer system rises and falls with changes in recharge and discharge (Bjorklund and others, 1978). Upward ground-water gradients in the central, lower elevation areas of Cedar Valley were once sufficient to supply flowing wells that covered an approximate area of 50 square miles (130 km^2) in 1939 (Thomas and Taylor, 1946, plate 18), but no flowing wells have existed in Cedar Valley since 1975 (Bjorklund and others, 1978).

Depth to ground water in wells ranges from near the ground surface in the central portion of the valley to about 250 feet (76 m) below the surface along the valley margins (Bjorklund and others, 1978). Most wells have static-water levels of less than 100 feet (30 m) below the land surface. Depths to ground water in wells in the Coal Creek alluvial-fan area range from about 200 feet (60 m) near Cedar City to about 10 feet (3 m) in the distal portions of the fan (Bjorklund and others, 1978). Depths to ground water range from about 150 feet (46 m) along the mountain front to about 10 feet (3 m) in the lower portions of the valley in the Hamiltons Fort/Kanarraville area, from about 10 feet (3 m) near Quichapa Lake to about 100 feet (30 m) along the mountain front to the southwest, and from about 10 feet (3 m) near Rush Lake to about 50 feet (15 m) a few miles northeast of Rush Lake (Bjorklund and others, 1978).

The withdrawal of large amounts of ground water during the irrigation season causes seasonal changes in water levels (Sandberg, 1966), as does seasonal variation in precipitation and streamflow (Thomas and Taylor, 1946). There is a general pattern of declining water levels during the irrigation season, typically from May through September, and rising water levels from October through May (Bjorklund and others, 1978). Seasonal changes in ground-water levels exceeding 30 feet (9 m) were observed in 1974 in the center of the valley northwest of Cedar City, but water levels declined less than 5 feet (1.5 m) in most areas along the western side of the valley during the same year (Bjorklund and others, 1978, figure 6).

Longer term changes in water level depend on annual precipitation and evapotranspiration, and on annual well pumpage. Between 1940 and 1974, the amount of ground-water discharge from wells, springs, and evapotranspiration exceeded recharge to the ground-water system which resulted in an overall decline in ground-water levels in the basin-fill aquifer (Bjorklund and others, 1978, p. 33). Due to concerns caused by declining water levels, the Utah State Engineer closed the entire Cedar Valley basin to new appropriations of water rights in 1966; portions of Cedar Valley had already been closed to new appropriations since the 1940s (Utah Division of Water Resources, 1995). Average annual ground-water levels had declined as much as 30 feet (9 m) in some areas of Cedar Valley between 1940 and 1974, which was attributed primarily to withdrawal from wells (Bjorklund and others, 1978, figure 11). Between 1963 and 1993, water-level declines greater than 10 feet (3 m) were limited to the area west of Quichapa Lake (Barnett and Mayo, 1966), indicating long-term recharge and discharge are relatively in balance for most of Cedar Valley's basin-fill aquifer (Utah Division of Water Resources, 1995). However, ground-water levels in much of Cedar Valley declined from March 1975 to March 2005, with the largest declines (about 36 feet [11 m]) occurring north of Enoch (Burden and others, 2005) (figure 7).

The alluvial deposits yield water at rates ranging from 1 to 4000 gallons per minute (4–15,100 L/min) (Bjorklund and others, 1978). The most productive aquifers consist of beds of coarse, clean, well-sorted gravel and sand that readily yield large quantities of water to wells (Bjorklund and others, 1978). Sandberg (1966), based on data from 10 wells in the Cedar Valley basin-fill aquifer, calculated a range for specific capacity of 10 to 50 gallons per minute per foot of drawdown (12–58 L/min per m of drawdown) with an average of 28 gallons per minute per foot of drawdown (32 L/min per m of drawdown). Bjorklund and others (1978) compiled data from six multiple-well aquifer tests completed in gravelly aquifer material in Cedar Valley and calculated a range for average hydraulic conductivity of 13 to 251 feet per day (4–77 m/d), a transmissivity range of 2540 to 52,000 square feet per day (230–4830 m^2/d), and a storage coefficient range of 0.0005 to 0.2.

Ground-water flow is generally from the higher elevation recharge areas to lower elevation discharge areas. In southern Cedar Valley, ground water flows northward from the Kanarraville area, northeastward from the Harmony Mountains, and southeastward from the Eightmile Hills (Bjorklund and others, 1978, plate 5). Ground water in the vicinity of the Coal Creek alluvial fan moves northward and northwestward from the apex of the fan and then moves either southward toward Quichapa Lake or westward toward Iron Springs Gap (Thomas and Taylor, 1946). Ground water in northern Cedar Valley generally moves northwestward toward Rush Lake and then continues toward Mud Spring Wash (Bjorklund and others, 1978). Horizontal hydraulic gradients are generally flat in the central, lower elevation areas of Cedar Valley, such as near Quichapa Lake. Hydraulic gradients are about 25 feet per mile (5 m/km) at Iron Springs Gap and 50 feet per mile (9 m/km) at Mud Spring Wash (Sandberg, 1966).

Recharge and Discharge

Ultimately, most recharge to the basin-fill aquifer comes directly or indirectly from precipitation within the Cedar

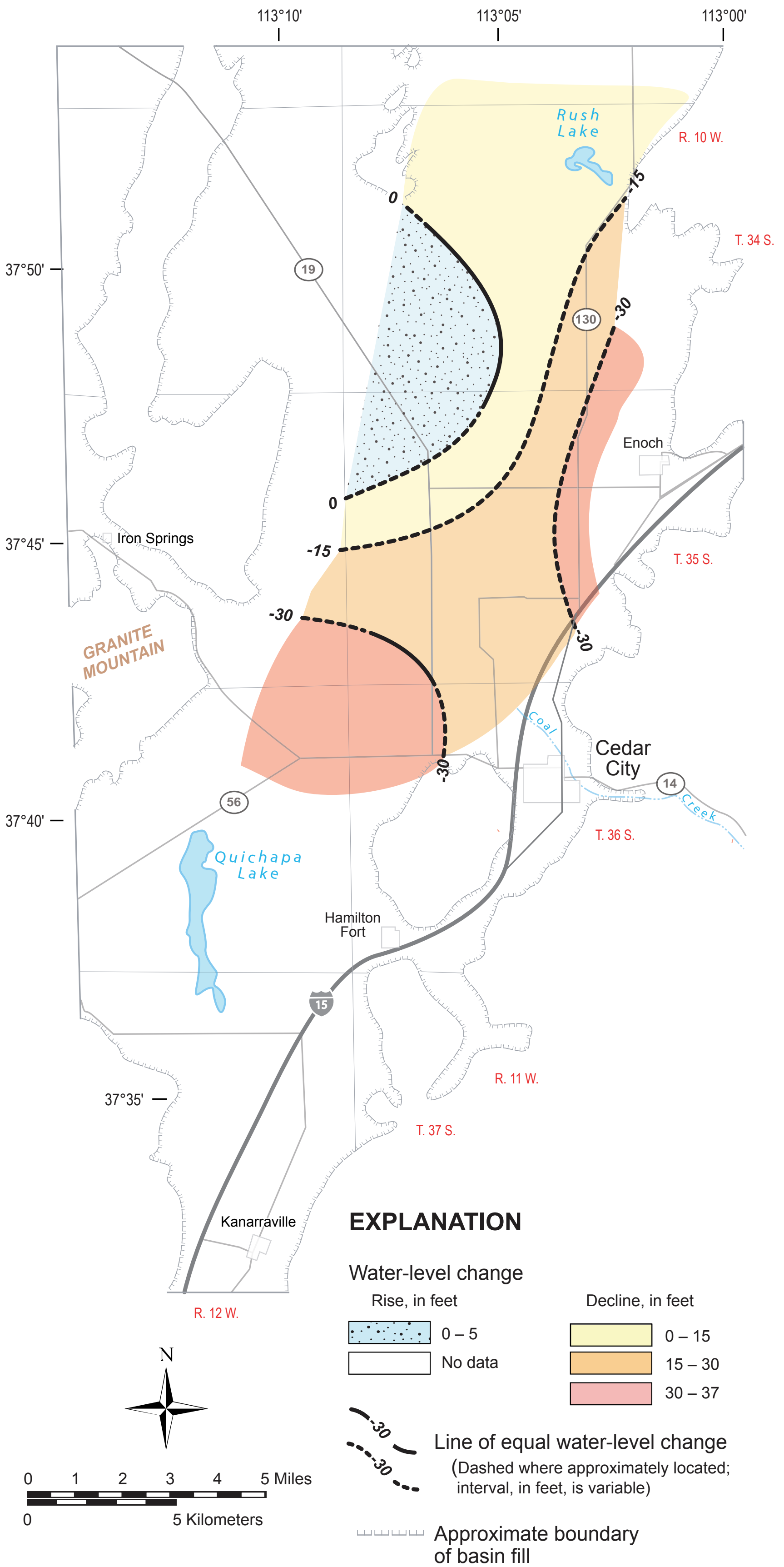

Figure 7. *Change of water level in Cedar Valley from spring 1975 to spring 2005 (modified from Burden and others, 2005).*

Valley drainage basin (Sandberg, 1966). Recharge to the Cedar Valley basin-fill aquifer is from (1) infiltration of irrigation from ground-water sources, (2) seepage from streams and major irrigation canals, (3) infiltration of irrigation from surface-water sources, (4) infiltration of land-applied wastewater effluent, (5) infiltration of irrigation applied to lawns and gardens, (6) infiltration of precipitation falling on unconsolidated basin-fill, (7) bedrock inflow from the surrounding hills and mountains, and (8) subsurface inflow from Parowan Valley (table 3) (Brooks and Mason, 2005). Precipitation falling on unconsolidated basin fill and bedrock inflow from upland areas are the greatest sources of recharge, followed by infiltration of irrigation from ground- and surface-water sources and seepage from streams and major irrigation canals (Brooks and Mason, 2005).

Discharge from the basin-fill aquifer in Cedar Valley occurs through (1)) well withdrawals, (2 evapotraspiration, and (3) subsurface outflow through Iron Springs Gap and Mud Spring Wash (table 3) (Brooks and Mason, 2005). Water-well pumpage is by far the greatest source of discharge.

Ground-Water Quality from Previous Studies

Ground-water quality in Cedar Valley is generally good and is suitable for most uses (Utah Division of Water Resources, 1995). Ground water in the basin-fill aquifer is generally classified as calcium- or magnesium-sulfate type. Sodium-chloride-type ground water is present near Rush Lake and calcium-bicarbonate-type ground water is present southwest of Quichapa Lake (Bjorklund and others, 1978). Thomas and Taylor (1946) reported TDS concentrations ranging from about 150 mg/L, just west of Quichapa Lake, to more than 1700 mg/L for certain wells on the Coal Creek alluvial fan. Bjorklund and others (1978, table 5) reported TDS concentrations in ground water ranging from 166 to 2752 mg/L. Sandberg (1966) reported TDS concentrations in ground water ranging from 281 to 3750 mg/L. For this study, based on water-quality data collected by Howells and others (2002) and from public water-supply wells within the study area (Rachael Cassady, Utah Division of Drinking Water, written communication, 2001), TDS range from 184 to 2190 mg/L with an average of 584 mg/L (plate 1).

Table 3. *Ground-water budget for 2000, Cedar Valley, Iron County, Utah (modified from Brooks and Mason, 2005).*

Recharge	**(acre-feet)**
Precipitation on unconsolidated basin fill	10,300
Bedrock inflow from surrounding hills and mountains	9900
Recharge from irrigation with ground water	7100–8600
Seepage from streams and major irrigation canals	4700–5100
Recharge from irrigation with surface water	4900
Subsurface inflow	2000
Recharge from land application of wastewater effluent	1500
Recharge from irrigation of lawns and gardens	600–1000
Total recharge (rounded)	41,000–43,000
Discharge	
Wells	36,000
Evapotranspiration	3000
Subsurface outflow	1000
Springs	Negligible
Total discharge (rounded)	40,000

The type of water and quantity of dissolved solids are largely influenced by local geology. Ground water with high TDS concentrations and high calcium and sulfate concentrations exists in the Coal Creek and Fiddlers Canyon alluvial-fan areas because Mesozoic rocks in the drainage basin contain abundant gypsum (Thomas and Taylor, 1946). Ground water with high total-dissolved-solids concentrations and high sodium and chloride concentrations near the playa areas of Rush and Quichapa Lakes (Bjorklund and others, 1978) is typical of such playa lake settings. Ground water in the area recharged by Quichapa Creek has low TDS concentrations and is the least hard water in the basin-fill aquifer because its drainage basin is underlain almost exclusively by Tertiary volcanic rocks, which contain few soluble minerals.

In addition to calcium, sulfate, and chloride, another chemical constituent, nitrate, typically associated with human activities, has been identified in Cedar Valley. Nitrate concentrations in ground water have been analyzed and reported in two ways in the literature for Cedar Valley: nitrate as nitrogen and nitrate as nitrate. The values for nitrate-as-nitrate are reported as higher values than the corresponding nitrate-as-nitrogen values. The U.S. Environmental Protection Agency drinking-water quality (health) standard for nitrate as nitrogen is 10 mg/L (U.S. Environmental Protection Agency, 2009), and 45 mg/L as for nitrate as nitrate.

Thomas and Taylor (1946, p. 107) reported nitrate-as-nitrate concentrations ranging from 0.0 to 260 mg/L for wells in Cedar Valley; they noted that the highest nitrate concentration in ground water was found in the Fiddlers Canyon alluvial-fan area, and that this high-nitrate ground water also contained high chloride and sulfate concentrations. Some of the wells in the Coal Creek alluvial-fan area were also high in nitrate and sulfate, but not high in chloride concentrations (Thomas and Taylor, 1946, p. 107). Sandberg (1966) reported nitrate-as-nitrate concentrations in Cedar Valley ranging from 1.0 to 109 mg/L. Bjorklund and others (1978) reported nitrate-as-nitrogen concentrations in Cedar Valley ranging from 0.0 to 14 mg/L. For this study, based on water-quality data collected by the U.S. Geological Survey (Howells and others, 2002), from public water-supply wells within the study area (Rachael Cassady, Utah Division of Drinking Water, written communication, 2001), and from 1974 to 2000 data reported by Lowe and Wallace (2001), nitrate-as-nitrogen concentrations range from less than 0.06 to 57.4 mg/L.

Thomas and Taylor (1946) noted that nitrate concentrations greater than a few mg/L in shallow ground water is considered an indication of water-quality degradation typically associated with human activities. However, they noted (Thomas and Taylor, 1946, p. 110) that depths for most of the wells having high nitrate concentration in Cedar Valley exceed 100 feet (30 m), suggesting a geologic source of nitrate possibly associated with soluble salts in the basin fill rather than an anthropogenic origin. Wallace and Lowe (2000) and Lowe and Wallace (2001) also suggested that historically high nitrate concentrations in the Enoch area may be due in part to a geologic source of nitrogen, and documented nitrogen-bearing strata in the Straight Cliffs Formation in Fiddlers Canyon to the southeast of Enoch.

GROUND-WATER RECHARGE AREA MAPPING

Recharge and Discharge Areas

Primary recharge areas (plate 2) include the bedrock uplands (including Cross Hollow and North Hills east of Quichapa Lake) and the upper parts of alluvial fans along the basin margins in the eastern and western parts of the study area; northern Cedar Valley north of Rush Lake is also mapped as a primary recharge area, although there are few wells in the area. Basin fill in these areas consists mostly of sand and gravel lacking thick silt and clay layers (figure 3). Secondary recharge areas (plate 2) having a thick confining layer and a downward vertical ground-water flow gradient (figure 3) cover much of the central part of the study area.

Although some wells have discharge area characteristics (figure 3) in the central part of Cedar Valley, they are isolated and surrounded by wells with secondary recharge area characteristics (plate 2). Therefore, we did not map a discharge area in Cedar Valley.

Potential for Water-Quality Degradation

Based solely on ground-water recharge- and discharge-area mapping, the potential for ground-water contamination in Cedar Valley is moderate to high. Much of the water in the principal basin-fill aquifer comes from bedrock uplands with few pollutants that could enter the system. In some areas on the Markagunt Plateau, this circumstance is changing due to increased residential development using septic-tank systems. Additionally, many potential contamination sources are on the basin-fill deposits. Some of these potential contamination sources are in primary recharge areas where the principal aquifer has no significant hydrogeologic barriers to limit contamination by pesticides or other water-borne contaminants. Care must be taken in siting potential contaminant sources, such as feed lots and septic tanks, especially in primary recharge areas. The widespread clay layers in the center of Cedar Valley may provide some protection to the principal aquifer, but their lateral continuity is unknown.

GROUND-WATER QUALITY CLASSIFICATION

Introduction

Ground-water quality classification, based primarily on TDS (table 1), is a tool for local governments in Utah to use for managing potential ground-water contamination sources and for protecting the quality of their ground-water resources. The following information, much of which is from the Utah Division of Water Quality's (1998) *Aquifer Classification Guidance Document* by Lowe and Wallace (1999c, 1999d), outlines the purposes and requirements of ground-water quality classification.

Background Information About Ground-Water Quality Classification

On October 4, 1984, Utah Governor Bangerter issued an Executive Order stating, "The quality of ground water will be protected to a degree commensurate with current and probable future uses. Preventive measures will be taken to minimize contamination of the resource so that current and future public and private beneficial uses will not be impaired." Based on public comments, the former Division of Environmental Health (now Department of Environmental Quality) implemented an anti degradation approach using "differential protection" based on the quality or value of the ground-water resource. The policy of differential protection recognizes possible impacts on ground water from human activities, but limits any adverse impacts to pre-established acceptable levels tied directly to the existing ground-water quality. Ground-water quality classification is one of the principal means for implementing the differential protection policy because it establishes the quality of the ground-water resource.

The Utah Ground Water Quality Protection Regulations, initially adopted in 1989, allow the Utah Water Quality Board to classify the ground-water quality of all or parts of aquifers as a method for maintaining quality in areas where sufficient information is available. Such information includes a comprehensive understanding of the aquifer system supported by factual data for existing water quality, potential contaminant sources, and current ground-water uses. Ground-water quality classification (or reclassification) may be initiated by either the Utah Water Quality Board or by a petition submitted by a licensed professional geologist or engineer on behalf of a company or governmental entity. At least one public hearing is required before the Utah Water Quality Board rules on the proposed classification. Once the ground-water quality of an aquifer is classified, commensurate protection levels are applied to classified areas based on the differential protection policy.

Ground-Water Quality Classification: A Planning Tool

Ground-water quality classification is a planning tool for local governments to use in making land-use management decisions. It allows local governments to use ground-water quality as a reason for permitting or not permitting a proposed activity or land use based on the differential protection policy. Many facilities and/or activities can and do have an impact on ground-water quality, but are not regulated by state or federal laws. Such facilities/activities include septic tanks, animal feed lots, land application of animal wastes, and some industrial/manufacturing activities. Many of these facilities/activities are permitted through local land use management programs. From this perspective, ground-water quality classification can be a useful tool for local governments, if they so desire, to manage their ground-water resources based on the beneficial use established by ground-water quality classification.

Ground-water quality classification has many potential applications as a land-use management tool. One example is using ground-water quality classification to establish zoning that will locate industrial facilities in areas where ground-water quality is already poor, such as in some areas around Great Salt Lake. Additionally, ground-water quality classification can be used as a basis for determining the density of development in areas that use septic tanks for wastewater disposal. Ground-water quality classification also can be used as a basis for encouraging developers to invest in the infrastructure needed to connect a proposed subdivision onto an existing sewer line, rather than dispose of domestic wastewater using septic-tank systems. However, ground-water quality classification does not result in any mandatory requirement for local governments to take specific actions, such as land-use zoning restrictions, technical assessments, or monitoring.

Results

Data Sources for the Basin-fill Aquifer

The Central Iron County Water Conservancy District petitioned the Utah Water Quality Board to classify the principal basin-fill aquifer in Cedar Valley as shown on plate 3. The Utah Water Quality Board approved this classification on October 18, 2002. The classification is based on (1) data from 72 wells sampled between 1979 and 2000 by the U.S. Geological Survey, (2) data from 28 wells from analyses supplied to the Utah Division of Drinking Water between 1974 and 2000, and (3) nitrate data from 19 wells sampled between 1979 and 1981 and analyzed by various laboratories including Southern Utah University, Ford Chemical, and the Utah Division of Epidemiology and Laboratory Services (Lowe and Wallace, 2001). Some areas, where insufficient data exist, require extrapolation of ground-water quality conditions. The basis for extrapolation was based on local geologic characteristics. The classes (plate 3) are as follows:

Class IA- Pristine ground water: For this class, TDS concentrations in Cedar Valley range from 184 to 492 mg/L. The north end of Cedar Valley is classified as Pristine ground water based on rock types in the drainage basin and land use; the geologic units are primarily volcanic rocks having low solubility, and little human activity occurs in this part of Cedar Valley. Class IA areas are the most common ground-water quality class mapped in Cedar Valley (plate 3), covering about 82 percent of the total basin-fill area.

Class II- Drinking Water Quality ground water: For this class, TDS concentrations in Cedar Valley range from 506 to 2190 mg/L. Class II areas are found along the western margin of the Markagunt Plateau in the eastern portions of the valley, and in three smaller areas: south of Rush Lake, northeast of Quichapa Lake, and at the mouth of Mud Spring Canyon (plate 3). The areas having Drinking Water Quality ground water cover about 17 percent of the total basin-fill area.

Class III- Limited Use ground water: For this class, no TDS values between 3000 mg/L to 10,000 mg/L were identified. However, we identified nitrate concentrations exceeding drinking-water-quality standards of greater than 10 mg/L, and such water is considered Limited Use ground water. The wells having nitrate concentrations exceeding 10 mg/L, the U.S. Environmental Protection Agency drinking-water quality standard, are in the Enoch area west of Fiddlers Canyon (plate 2) (Lowe and Wallace, 2001). High nitrate levels may be due to contamination from septic-tank systems, feed lots, and/or fertilizer; however, geologic nitrogen in some strata in the Straight Cliffs Formation may also be a source of nitrate in ground water in the Enoch area (Lowe and Wallace, 2001). The area where ground water has elevated nitrate concentrations (ranging from 10.42 to 57.4 mg/L) is mapped as Class III (plate 3), and covers about 1 percent of the total basin-fill area.

Land-Use Planning Considerations

Current beneficial uses of ground water: Cedar Valley has 2780 perfected water-well rights, of which 20 of which are for public-supply wells. Plate 2 shows the location of water-supply wells. Ground water from wells in Cedar Valley is used as follows: 76 percent for irrigation, 19 percent for public supply, 5 percent for domestic and stock-watering purposes, and less than 1 percent for industry (Burden and others, 2005).

Potential for ground-water quality degradation: We mapped potential ground-water contaminant sources including facilities related to mining, agricultural practices, and waste-water treatment facilities (appendix C, plate 4). A primary objective was to identify potential contaminant sources to establish a relationship between water quality and land-use practices. We mapped approximately 630 potential contaminant sources in the following categories in Cedar Valley:

1. mining sites, which include abandoned and active gravel mining operations and borrow pits, coal mines, and cinder pits,
2. agricultural areas that potentially contribute nitrate, which include (a) irrigated and non-irrigated farms, (b) active and abandoned animal feed lots, corrals, and stable/barnyards, and (c) grazing or pasture land,
3. industrial sites that potentially contribute pesticides, metals, solvents, petroleum products, and polychlorinated biphenyl (PCB), including salt production/storage facilities, transportation facilities, transformer stations, and excavating facilities,
4. small businesses, some of which may contribute pollutants such as solvents into the ground-water system, such as laundromats, beauty parlors, and dry cleaners,
5. large lawns that may contribute fertilizer and pes-

ticides, including parks, cemeteries, and nurseries,

6. service stations, including auto shops and gas stations that may contribute fuel, oil, antifreeze, and solvents; junkyard/salvage operations that may contribute pollutants such as metals and solvents,
7. waste-disposal sites that may contribute pollutants such as solvents, metals, and nitrate,
8. storage tanks that may contribute pollutants such as fuel and oil, and
9. medical facilities, including dental, health clinics, pharmaceutical, and veterinarian services, that may contribute pollutants such as metals and solvents.

In addition to the above-described potential contaminants, plate 4 shows the distribution of septic tank soil-absorption systems in Cedar Valley. Approximately 3300 septic-tank systems exist in Cedar Valley (Kelly Crane, Nolte Associates, Inc., written communication, March, 2009), and may contribute contaminants such as nitrate and solvents. All approved water wells, shown on plate 3, are also considered potential contaminant sources because pollutants can be conveyed to the water table via the well bore.

Possible land-use planning applications of this ground-water quality classification: Ground-water quality classification is a tool that can be used in Utah to manage potential ground water contamination sources and protect the quality of ground water resources. Ground-water quality classification, in concert with septic-tank density/water-quality degradation studies (Hansen, Allen, and Luce, Inc., 1994; Wallace and Lowe, 1998a, 1999), has been used in Heber Valley in Wasatch County and Ogden Valley in Weber County to require the sizes of lots using septic-tank systems for wastewater disposal to be at least 5 and 3 acres (0.02 and 0.01 km^2), respectively.

The ground-water quality classification, in conjunction with the septic-tank density/water-quality degradation analysis presented below, provides a means to set maximum densities for development using septic-tank systems for wastewater disposal in Cedar Valley. The ground-water quality classification may also be used as a basis for prohibiting the dumping of poor quality water and other liquid or solid wastes into creek beds, canals, and ditches.

SEPTIC-TANK DENSITY/WATER-QUALITY DEGRADATION ANALYSIS

Introduction

Land-use planners have long used septic-tank suitability maps to determine where wastewater from these systems will likely percolate within an acceptable range. However, they recently learned that percolation alone does not remediate many constituents found in wastewater, including nitrate. Under aerobic conditions, ammonium from septic-tank effluent can convert to nitrate, contaminating ground water and posing potential health risks to humans, primarily very young infants (Comley, 1945; Fan and others, 1987; Bouchard and others, 1992). Studies involving laboratory rats ingesting a combination of nitrite and heptamethyleneimine in drinking water reported an increase in tumor occurrence (Taylor and Lijinsky, 1975). However, epidemiological investigations involving human beings have shown conflicting evidence. An association between stomach cancer in human beings and nitrate in drinking water was reported in Colombia and Denmark (Cuello and others, 1976, Fraser and others, 1980). Conversely, investigations in the United Kingdom and other countries indicate no correlation exists between nitrate levels and cancer incidence (Forman, 1985; Al-Dabbagh and others, 1986; Croll and Hayes, 1988).

With continued population growth and installation of septic tank soil-absorption systems in new developments, the potential for nitrate contamination will increase. One way to evaluate the potential impact of septic-tank systems on ground-water quality is to perform a mass-balance calculation (Hansen, Allen, and Luce, Inc., 1994; Zhan and McKay, 1998; Lowe and Wallace, 1999a, 1999b; Wallace and Lowe, 1999; Lowe and others, 2000, 2003, 2004, 2007). This type of analysis may be used as a gross model for evaluating the possible impact of proposed developments using septic-tank systems for wastewater disposal on ground-water quality, allowing planners to more effectively determine appropriate average septic-system densities.

Ground-Water Contamination from Septic Tank Systems

Pathogens

As the effluent from a septic-tank soil absorption system leaves the drain field and percolates into the underlying soil, it can have high concentrations of pathogens, such as viruses and bacteria. Organisms such as bacteria can be mechanically filtered by fine-grained soils and are typically removed after traveling a relatively short distance in the unsaturated zone. However, in coarse-grained soils, or soils containing preferential flow paths like cracks, worm burrows, or root holes, these pathogens can reach the water table. Pathogens can travel up to 40 feet (12 m) in the unsaturated zone in some soils (Franks, 1972). Some viruses can survive up to 250 days (U.S. Environmental Protection Agency, 1987), which is the minimum ground-water time of travel for public water-supply wells or springs to be separated from potential biological contamination sources.

Household and Industrial Chemicals

Many household and industrial chemicals (table 4) are commonly disposed of through septic-tank systems and, unless they volatilize easily, are not remediated by percolation through soils in the unsaturated zone. Contamination from these chemicals can be minimized by reducing their disposal via septic-tank systems, thus maximizing the potential for dilution of those chemicals that do reach ground water (Lowe and Wallace, 1999e).

Phosphate

Phosphate, typically derived from organic material or some detergents, is discharged from septic-tank systems (Fetter, 1980). Whereas phosphate (and phosphorus) commonly contributes to eutrophication of surface waters (Fetter, 1980), it is generally not associated with water-quality degradation from septic-tank systems (Lowe and Wallace, 1999e). Phosphates are removed from septic-tank system effluent by absorption onto fine-grained soil particles and by precipitation with calcium and iron (Fetter, 1980). In most soils, complete removal of phosphate is common (Franks, 1972).

Nitrate

Ammonia and organic nitrogen, mostly from the human urinary system, are commonly present in wastewater within septic tanks (table 4). Typically, almost all ammonia is converted into nitrate before leaving the septic-tank soil-absorption system drain field. Once nitrate passes below the zone of aerobic bacteria and the roots of plants, negligible attenuation occurs as it travels through the soil (Franks, 1972). Once in ground water, nitrate becomes mobile and can persist in the environment for long periods of time. Areas having high densities of septic-tank systems risk elevated nitrate concentrations reaching unacceptable levels. In the early phases of ground-water quality degradation associated with septic-tank systems, nitrate is likely to be the only pollutant detected (Deese, 1986). Regional nitrate contamination from septic-tank discharge has been documented on Long Island, New York, where many densely populated areas without sewer systems exist (Fetter, 1980).

A typical single-family septic-tank system in Cedar Valley discharges about 221 gallons (837 L) of effluent per day containing nitrogen (or nitrate as nitrogen) concentrations of around 53.4 mg/L. Therefore, distances between septic-tank system drain fields and sources of culinary water must be sufficient to allow dilution of nitrate in the effluent to levels below the ground-water quality standard.

We consider nitrate to be the key indicator for use in determining the number or density of septic-tank systems that should be allowed in Cedar Valley. Projected nitrate concentrations in all or parts of aquifers can be estimated for increasing septic-tank system densities using a mass balance approach.

Table 4. *Typical characteristics of wastewater in septic-tank systems (from Hansen, Allen, and Luce, Inc., 1994).*

Parameter	Units	Quantity
Total Solids	mg/L	680–1000
Volatile Solids	mg/L	380–500
Suspended Solids	mg/L	200–290
Volatile Suspended Solids	mg/L	150–240
BOD	mg/L	200–290
Chemical Oxygen Demand	mg/L	680–730
Total Nitrogen	mg/L	35–170
Ammonia	mg/L	6–160
Nitrites and Nitrates	mg/L	<1
Total Phosphorus	mg/L	18–29
Phosphate	mg/L	6–24
Total Coliforms	*MPN/100 mL	1010–1012
Fecal Coliforms	*MPN/100 mL	108–1010
pH	-	7.2–8.5
Chlorides	mg/L	86–128
Sulfates	mg/L	23–48
Iron	mg/L	0.26–3.0
Sodium	mg/L	96–110
Alkalinity	mg/L	580–775
P-Dichlorobenzene**	mg/L	0.0039
Toluene**	mg/L	0.0200
1,1,1-Trichloroethane*	mg/L	0.0019
Xylene**	mg/L	0.0028
Ethylbenzene**	mg/L	0.004
Benzene**	mg/L	0.005

* Most probable number of coliform per 100 milliliters of water
** Volatile Organics are the maximum concentrations

The Mass-Balance Approach

General Methods

We use a mass-balance approach for water quality degradation assessments because it has been used elsewhere in the western United States (Hansen, Allen, and Luce, Inc., 1994; Wallace and Lowe, 1998a, 1998b, 1998c, 1999; Zhan and McKay, 1998; Lowe and Wallace, 1999a, 1999b; Lowe and others, 2000, 2003, 2004, 2007), is a practical method to apply under time, budget, and data availability/acquisition constraints; and it provides a quantitative basis for land-use planning decisions. In the mass-balance approach to compute projected nitrate concentrations, the average nitrogen mass expected from projected new septic tanks is added to the existing, ambient (background) mass of nitrogen in ground water and then diluted with the known (or estimated) ground-water flow available for mixing, plus water that is added to the system by septic tanks. We used a discharge of 221 gallons (837 L) of effluent per day for a domestic home based on a per capita indoor usage of 71.5 gallons (270.7 L) per day (Utah Division of Water Resources, 2001, p. 23) multiplied by Iron County's 2008 average 3.09 person household (Utah Governor's Office of Planning and Budget, 2010). We used an estimated nitrogen loading of 53.4 mg/L of effluent per domestic septic tank for nitrogen loadings based on: (1) an average 3.09 people per household, (2) an average nitrogen loading of 17 grams of nitrogen per capita per day (Kaplan, 1988, p. 149), (3) 270.7 liters per capita per day water use, and (4) an assumed retainment of 15 % of the nitrogen in the septic tank (to be later removed during pumping) (Andreoli and others, 1979, in Kaplan, 1988, p. 148). This estimated nitrogen loading is close to Bauman and Schafer's (1985, in Kaplan, 1988, p. 147) nitrogen (or nitrate as nitrogen) concentration in septic-tank effluent of 62 ± 21 mg/L based on the averaged means from 20 previous studies. We determined ground-water flow available for mixing, the major control on nitrate concentration in aquifers when using the mass-balance approach (Lowe and Wallace, 1997), using a numerical ground-water flow model (Brooks and Mason, 2005).

Limitations

There are many limitations to any mass-balance approach (see, for example, Zhan and McKay [1998]; Lowe and Wallace, [1999a, b]; Lowe and others, [2000]). We identify the following limitations to our application of the mass-balance approach:

1. calculations of ground-water flow available for mixing are based on a numerical model and simulation of ground-water flow, and are subject to model limitations,

2. background nitrate concentration is attributed to natural sources, agricultural practices, and use of septic-tank systems, but projected nitrate concentrations are based on septic-tank systems only and do not include nitrate from other potential sources (such as lawn and garden fertilizer),

3. calculations do not account for localized, high-concentration nitrate plumes associated with individual or clustered septic-tank systems,

4. calculations assume that the septic-tank effluent from existing homes is in a steady-state condition with the aquifer, and

5. the approach assumes negligible denitrification and instantaneous ground-water mixing for the entire aquifer or mixing zone below the site.

Additionally, calculations do not account for changes in ground-water conditions due to ground-water withdrawal from wells, are based on aquifer parameters that must be extrapolated to larger areas where they may not be entirely representative, and may be based on existing data that do not represent the entire valley.

Although many caveats exist in applying this mass-balance approach, we believe it is the best available method in land-use planning because it provides a general basis for making recommendations for septic-tank system densities. In addition, the approach is cost-effective and can be applied in areas with limited information.

Ground-Water Flow Calculations

Introduction

Ground-water flow rates and volumes are required in this study to investigate the potential role of septic-tank effluent in water-quality degradation of ground water in Cedar Valley. In order to achieve this objective, we estimated cell-by-cell flow rates and volumes for 13 flow zones/regions by modifying the transient numerical ground-water flow model developed by Brooks and Mason (2005), which simulated ground-water flow in the basin-fill aquifer of the study area for the period 1938–2000.

Original Version of Brooks and Mason (2005) Model

Brooks and Mason (2005) used the U.S. Geological Survey (USGS) modular finite-difference code MODFLOW 2000 (Harbaugh and others, 2000) to construct three-layer steady-state and transient models for simulating the basin-fill hydrologic system in Cedar Valley. Calibrated water levels from the steady-state model were used as starting water levels for the transient model simulation. The transient model simulates 63 yearly stress periods from 1938 to 2000, with the first 12 stress periods defined as steady-state stress periods to represent the steady-state conditions prevailed during 1938–1949.

Model construction began with the steady-state model. Areally, Brooks and Mason (2005) discretized the hydrologic area represented by the models into a grid of rectangular cells, with each cell having homogeneous properties. The rectangular model grid contains 91 rows and 34 columns. Cell size is variable and active cells range in size from about 55 to 250 acres (22-100 hm^2). Small cell-size areas generally represent areas having more data. The model grid was rotated clockwise about 23 degrees from north so cell faces are generally parallel to the boundary of the unconsolidated basin fill.

Vertically, the model is composed of three layers of unconsolidated basin fill with a maximum total simulated thickness of 3000 feet (900 m). The top layer (layer 1) was assigned a saturated thickness of 50 feet (15 m) to represent unconfined conditions at the top of the ground-water system throughout the valley. The bottom of layer 1 was set at about 50 feet (15 m) below the ground surface. The thicknesses of layers 2 and 3 are similar and range from 20 to 1450 feet (6–440 m).

Brooks and Mason (2005) assigned no-flow boundaries to contacts between unconsolidated basin fill and consolidated rock around the basin fill. However, at most locations around the valley, estimated inflow from consolidated rock was simulated as wells in cells near the boundary. Brooks and Mason's (2005) model simulates recharge from irrigation, precipitation, and seepage from Coal Creek as specified flow boundaries using the Recharge Package (Harbaugh and others, 2000). Brooks and Mason's (2005) model simulates inflow from consolidated rock and Parowan Valley as a specified flow boundary using the Well Package (Harbaugh and others, 2000) in the active cells of layers 2 and 3 near no-flow boundaries.

Brooks and Mason's (2005) model simulates discharge to evapotranspiration in layer 1 using the Evapotranspiration Package (Harbaugh and others, 2000). Brooks and Mason's (2005) model simulates discharge to wells in all layers using the Well Package (Harbaugh and others, 2000). Brooks and Mason's (2005) model simulates the outflow through unconsolidated basin fill in Iron Springs Gap, Mud Springs Canyon, and near Kanarra in all model layers using the General Head Boundary (GHB) Package (Harbaugh and others, 2000). Brooks and Mason's (2005) model simulates discharge to springs near Enoch in layer 1 using the Drain Package (Harbaugh and others, 2000).

Brooks and Mason (2005) calibrated the model to steady-state conditions to adequately determine the distribution of recharge and discharge rates, values and distribution of hydraulic conductivity, conductance of drains, general head boundaries, and horizontal flow boundaries. Brooks and Mason (2005) used ground-water levels measured in March 1939 and March 1950, and compared the conceptual ground-water flow budget for the steady-state period to simulated values to determine if the model adequately simulated the ground-water system for the late 1930s and 1940s. The steady-state model was then converted into a transient model, and the final calibrated steady-state simulation was used as the starting conditions for the transient simulation. The transient simulation was calibrated by adjusting the model to more accurately simulate measured water-level fluctuations and the water-budget components until measured water levels and flow components reasonably matched the simulated water levels and flow (Brooks and Mason, 2005).

For more details on the models developed by Brooks and Mason (2005), please visit the link http://pubs.usgs.gov/sir/2005/5170/.

Modified Version of Brooks and Mason (2005) Model

Brooks and Mason (2005) developed the original model using a modified version of MODFLOW-2000 with instances instead of stress periods; this is not supported by the regular public domain MODFLOW-2000 (Harbaugh and others, 2000) code embedded in the Groundwater Modeling System (GMS) (Aquaveo, 2008) Graphical User Interface (GUI) used at the Utah Geological Survey. Due to software incompatibility, we were not able to use the original Brooks and Mason (2005) simulations. After consultation with Brooks (the main simulation developer), we reconstructed the model using the same boundary conditions, recharge and discharge boundaries and flow rates, and hydraulic parameter boundaries and rates (hydraulic conductivity, anisotropy, and specific yield) as the original calibrated model using the regular public domain U.S. Geological Survey MODFLOW-2000 (Harbaugh and others, 2000) embedded in GMS GUI (Aquaveo, 2008).

To obtain the overall flow rates and volumes for each flow zone throughout the model's basin-fill area of our septic-tank density study, we made a few changes to the original version of Brooks and Mason (2005) model. First, we combined the vertical model's three-layer system into one layer (convertible layer) with a maximum total simulated thickness of 3000 feet (900 m). Second, we changed the variable grid cell size into a constant rectangular grid cell size (3094 cells with 2088 by 2264 feet [636 by 690 m] cell size and a cell's area of about 108 acres [44 hm^2]) throughout the entire model's domain. Third, we changed the coordinate system projection into North American Datum 1927 – Zone 12 in order to be consistent with other data and map overlays in our study. Fourth, we used the calibrated values of various parameters in the original model as initial values in this new modified model so that no further calibration is needed. Similar to the original model, the active area of the modified model is 234.7 square miles (608 km^2), or 150,220 acres (60,790 hm^2) (1638 cells out of 3094 total cells).

We ran the modified simulation using the regular public domain MODFLOW-2000 and embedded Layer Property Flow (LPF) package (Harbaugh and others, 2000) for both steady-state and transient conditions for the period 1938-2000. Similar to the original Brooks and Mason (2005) model, the transient model consists of 63 annual stress periods with one-year time step each. The first 13-year stress periods/time steps were assigned as steady state. Since the original simulation was calibrated, the results of the new modified model were considered acceptable with no further calibration.

Results of modified simulations and flow calculations

Our objectives of modifying the original model were to obtain reasonable ground-water flow estimates. The modified model simulations helped to identify the ground-water flow patterns and estimate the quantity of ground water flowing through the basin-fill sediments.

The simulation provided the ground-water level distribution and ground-water flow directions. The most recent stress period/time step (year 2000) of the transient simulation was used to estimate ground-water flow patterns and volumetric flow budgets in this modeling. Figure 8 shows simulated ground-water level distribution and flow directions in the last stress period/time step of the transient model. Figure 9 shows simulated cell-to-cell flow rates in the last stress period/time step of the transient model. The figure shows four cell-to-cell flow ranges in both cubic feet per day and cubic feet per second per acre. These four cell-to-cell flow ranges were used to subdivide the entire basin-fill model domain into 13 flow zones with one weighted average flow rate for each zone (figure 10). Table 5 shows the flow zone IDs, number of active model cells, areas, and total cell-to-cell flow rates for each flow zone in the entire model's domain. Flow zone areas range from 550 acres (220 hm^2) for Zone-1 to 63,829 acres (25,800 hm^2) for Zone-8. Flow rates range from 0.03 cubic feet per second (0.000058 cfs/acre; 0.0008 m^3/s) for Zone-1 to 193 cubic feet per second (0.013 cfs/acre; 5.5 m^3/s) for Zone-9.

Model Limitations

As is the case for any ground-water flow model, we made assumptions to approximate the actual ground-water flow in the study area. As mentioned above, we combined the original three-layer model into a one-layer model with equivalent hydraulic properties integrated from the calibrated values of the original model, and assumed no further calibration was necessary. In our case, however, that concern is of limited importance because the layers in the original model have similar hydraulic property boundaries and values, the calibrated values of hydraulic properties in the original model were used in this modified model, and the resulting simulated water level distribution is very similar to the original model's output.

Septic-Tank System/Water-Quality Degradation Analyses

Introduction

We calculated projected domain-specific nitrate concentrations in three ground-water flow domains (tables 6 and 7, plate 5) by applying a mass-balance approach using domain-specific parameters, such as the existing nitrogen load (present-day background nitrate concentration) and amount of ground water available for mixing (table 6), and our estimated 221 gallons per day (837 L/day) contributed by each septic-tank system, with an estimated nitrogen loading of 53.4 mg/L of septic-tank effluent. We also defined a fourth domain (domain 4) for which the mass-balance approach was not applied (plate 6), due to the sparse data (septic tanks, water-quality analyses) available. The mass-balance approach predicts the impact of nitrate from use of septic-tank systems over a defined area.

We calculated one graph of nitrate concentration versus number of septic tanks each for domains 1 through 3 based on a range of parameters that affect the amount of ground water available for dilution. We obtained the current number of septic-tank systems in each domain from Nolte Associates, Inc. (Kelly Crane, Nolte Associates, Inc., written communication, March 2009). We supplemented these data by identifying potential sites of septic systems from buildings and house dwellings plotted from aerial photographs. Tables 6, 7, and 8 list the number of septic-tank systems estimated for each domain. The exact number of septic-tank systems in-use and not in-use is unknown; we estimate that about 2200 septic-tank systems have been permitted in Cedar Valley.

For this analysis, we used a total of 2200 septic tanks for all the domains, and ranges from a low of 5 (domain 4) to a high of 835 (domain 2) (table 8). Present-day background nitrate concentrations for each domain range from 0.38 mg/L (domain 1) to 6.07 mg/L (domain 3) (table 6). For domains 1, 2, and 3, allowable degradation above current background levels of nitrate were set at 1.00 mg/L for domain 1, 0.35 mg/L for domain 2, and 0.20 mg/L for domain 3 (table 7), based on discussions with Iron County govern-

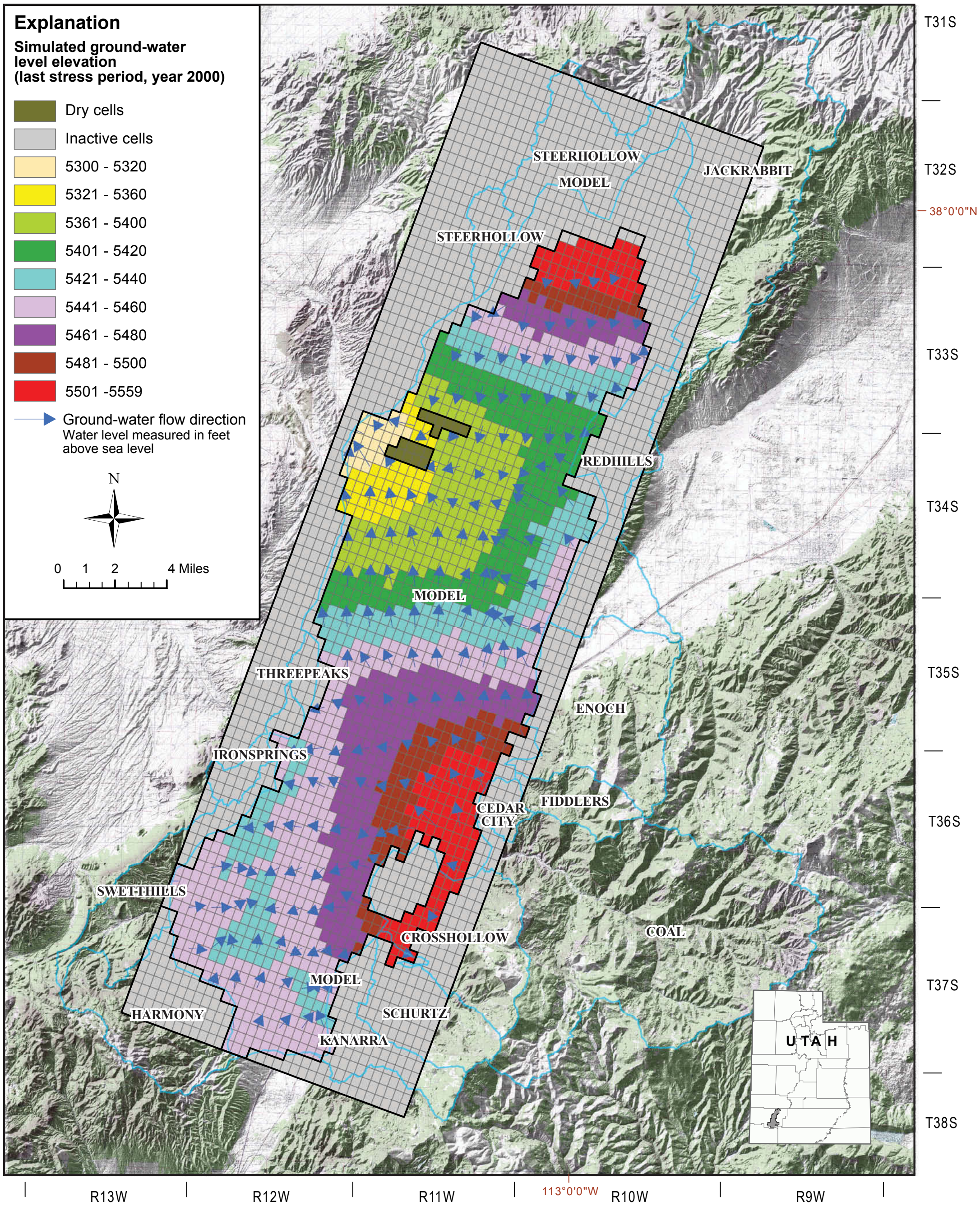

Figure 8. *Simulated water levels of the modified ground-water flow model (last stress period, 2000) for Cedar Valley, Iron County, Utah.*

ment officials on April 22, 2010. For domain 4, for which the mass-balance approach was not applied because of limited data, we assign a lot-size recommendation of 15 acres (6 hm^2) to be protective of ground-water quality.

Results

Domain 1: Figure 11 shows a plot of projected nitrate concentration versus septic-tank density and number of septic-tank systems in model domain 1 along the northern and southwestern margins of Cedar Valley (plate 5). The present-day background nitrate concentration for model domain 1 is 0.38 mg/L (table 6). There are an estimated 541 septic systems in model domain 1 (tables 6 and 7). Model domain 1 has an area of 20,726 acres (8388 hm^2) (table 6), so the existing average septic-system density is 38 acres per system (15 hm^2/system) (table 7, figure 11). Based on our analyses (table 6), estimated ground-water flow available for mixing in model domain 1 is 14 cubic feet per second (0.4 m^3/s) (table 6). For model domain 1 to maintain an overall nitrate concentration of 1.38 mg/L (which allows 1 mg/L of degradation), the total number

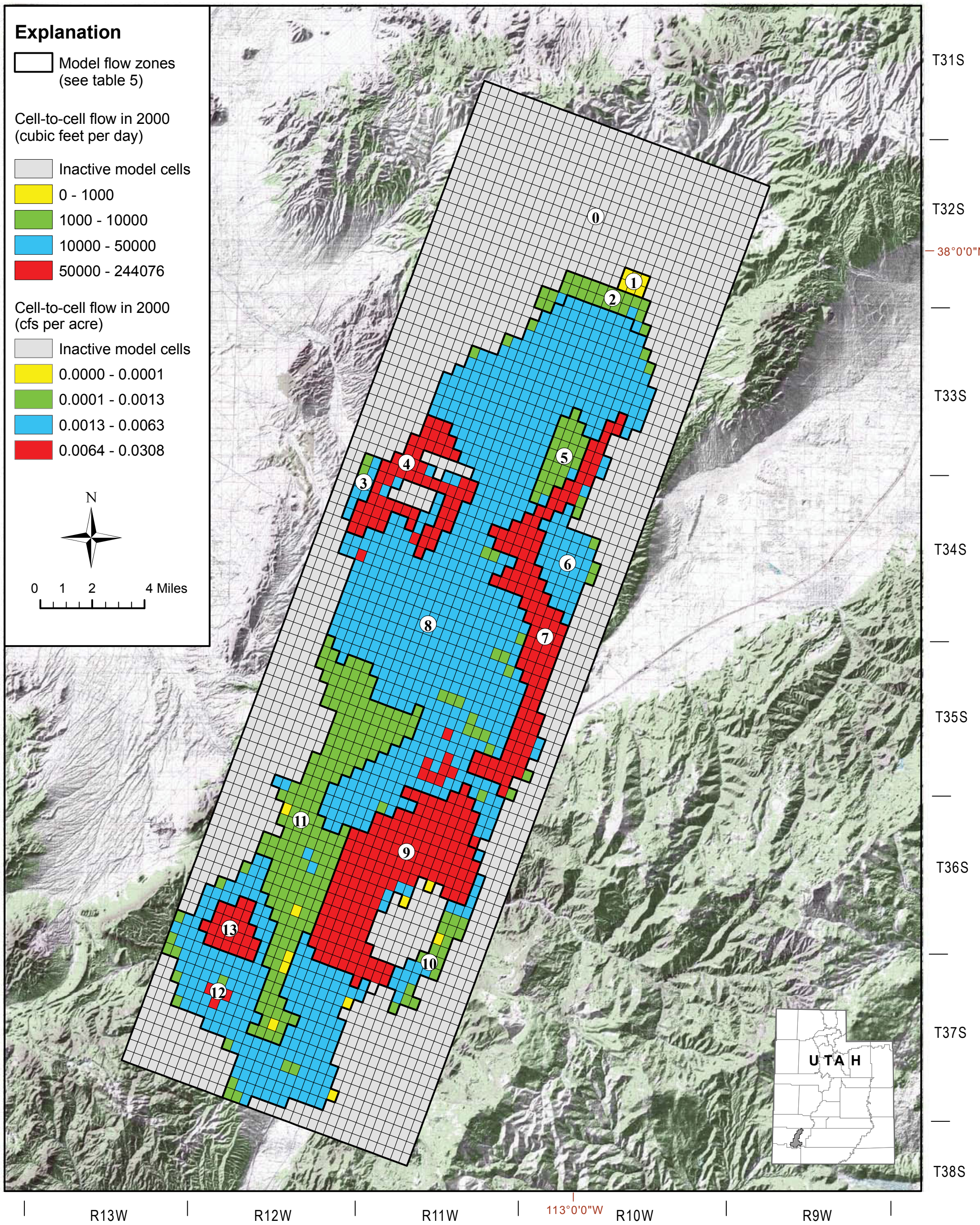

***Figure 9.** Simulated cell-to-cell flow zones and flow rates of the modified ground-water flow model (last stress period, 2000) for Cedar Valley, Iron County, Utah.*

of homes using septic tank soil-absorption systems should not exceed 1360 (figure 11, table 7) based on the estimated nitrogen load of 53.4 mg/L per septic-tank system. This corresponds to a septic-system density of about 15.5 acres per system (6.3 hm^2/system) in model domain 1 (table 7, figure 11).

Domain 2: Figure 12 shows a plot of projected nitrate concentration versus septic-tank density and number of septic-tank systems in model domain 2 in the central and southern parts of Cedar Valley (plate 5). Present-day background nitrate concentration for model domain 2 is 5.35 mg/L (table 6). We estimate 838 septic systems are located in model domain 2 (tables 6 and 7). Model domain 2 has an area of 94,550 acres (38,260 hm^2) (table 6), so the average septic-system density is 113 acres per system (46 hm^2/system) (table 7). Based on our analyses, estimated ground-water flow available for mixing in domain 2 is 279 cubic feet per second (7.9 m^3/s) (table 6). For model domain 2 to maintain an overall nitrate concentration of 5.7 mg/L (which allows 0.35 mg/L of degradation), the total number of homes using septic tank soil-absorption

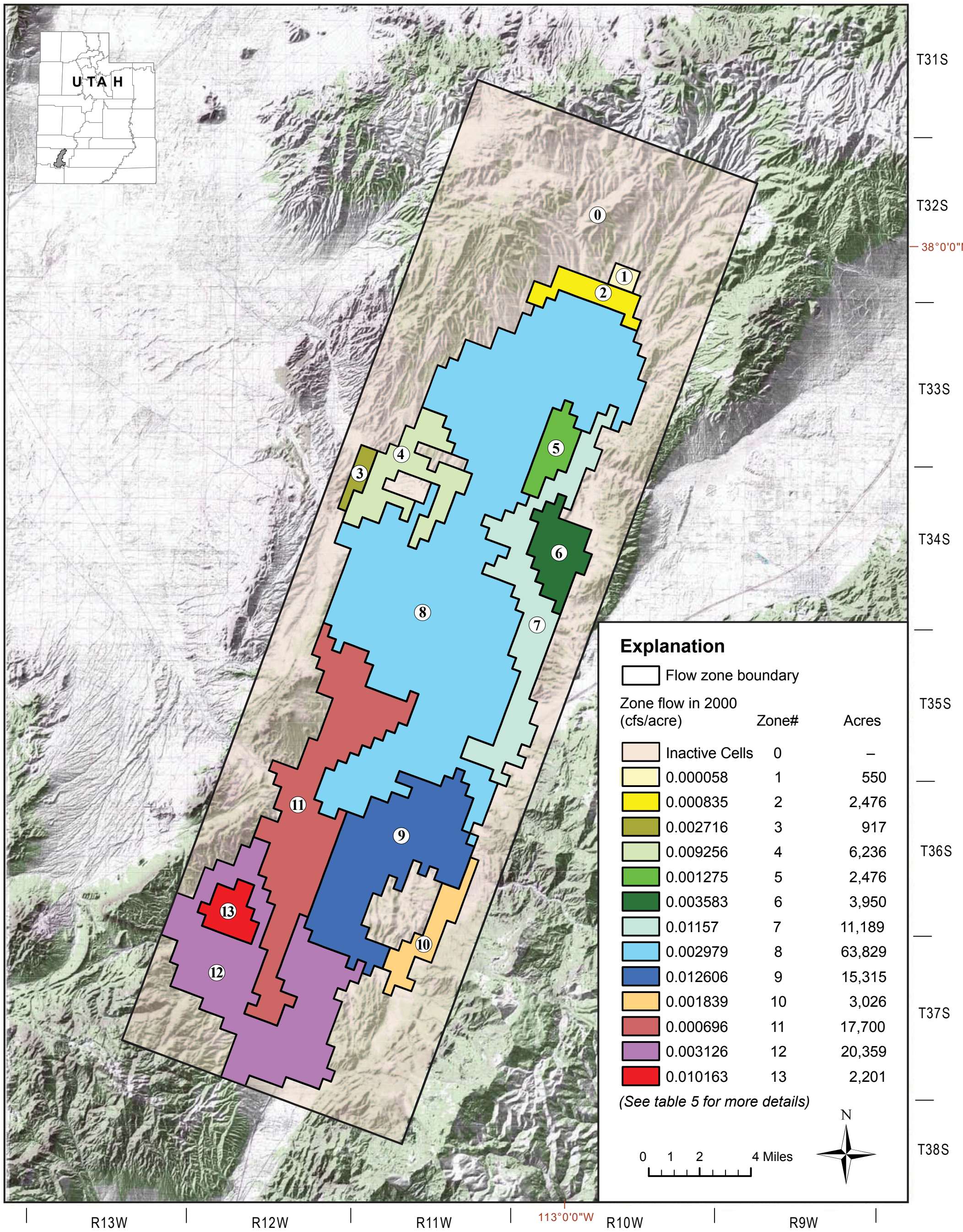

Figure 10. *Summary of simulated flow rates per acre for 13 flow zones of the modified ground-water flow model (last stress period, 2000) for Cedar Valley, Iron County, Utah.*

systems should not exceed 6900 (table 7, figure 12) based on the estimated nitrogen load of 53.4 mg/L per septic-tank system. This corresponds to a septic-system density of 13.7 acres per system (2 hm^2/system) in model domain 2 (table 7, figure 12).

Domain 3: Figure 13 shows a plot of projected nitrate concentration versus septic-tank density and number of septic-tank systems in model domain 3 in eastern and southwestern Cedar Valley (plate 5). Present-day background nitrate concentration for model domain 3 is 6.07 mg/L (table 6). An estimated 821 septic systems are presently in model domain 3 (tables 6 and 7). Model domain 3 has an area of 34,940 acres (14,140 hm^2) (table 6), so the average septic-tank system density is 28 acres per system (11 hm^2/system) (table 7). Based on our analyses (table 6), estimated ground-water flow available for mixing in model domain 3 is 402 cubic feet per second (11.4 m^3/s) (table 6). For model domain 3 to maintain an overall nitrate concentration of 6.27 mg/L (which allows 0.2 mg/L of degradation), the total number of homes using septic tank soil-absorption systems should not exceed 5700 (table 7, figure 13) based on the estimated nitrogen load of 53.4 mg/L per septic-tank system (figure 14, table 7). This

Table 5. Flow zone IDs, number of active model cells, areas, and total cell-to-cell flow rates for 13 integrated flow zones.

Zone-ID	# Model Cells	Area (acres)	Cell-to-Cell flow (cubic feet per second)	Cell-to-Cell flow (cubic feet per second/acre)
0	**1456**	**133,528**	**Inactive model grid cells**	
1	6	550	0.03	0.000058
2	27	2476	2.07	0.000835
3	10	917	2.49	0.002716
4	68	6236	57.72	0.009256
5	27	2476	3.16	0.001275
6	43	3943	14.13	0.003583
7	122	11,188	129.46	0.01157
8	696	63,829	190.17	0.002979
9	167	15,315	193.07	0.012606
10	33	3026	5.57	0.001839
11	193	17,700	12.33	0.000696
12	222	20,359	63.63	0.003126
13	24	2201	22.37	0.010163

Table 6. Parameters used to perform a mass-balance analysis for ground-water-flow model domains in Cedar Valley, Iron County, Utah.

Calculated flow domain	Area (acres)	Flow+ (cubic feet per second)	Flow per acre (cfs per acre)	Current average nitrate concentration (background) (mg/L)	Number of wells sampled	Current number of septic tanks*
1	20,726	14	0.0007	0.38	13	541
2	94,500	279	0.003	5.35	85	838
3	34,940	402	0.012	6.07	78	821

+ Data were derived using ground-water flow computer model.

* Number of septic tanks was estimated by digitizing buildings from aerial photographs and verified by Cedar City (Nolte Engineering, written communication, 2009).

Table 7. Results of the mass-balance analysis for Cedar Valley, Iron County, using the best-estimate nitrogen loading of 53.4 mg N/L+ for different ground-water-flow model domains and allowable degradation limits set by Iron County government officials.

Domain	Current density (acres/system)	Current number of septic tanks	Allowable degradation with respect to nitrate concentration* (mg/L)	Calculated nitrate concentration (mg/L)	Total # projected septic tanks	Calculated lot-size (acres per system)
1	40	541	1.00	1.38	1360	15.5
2	55	838	0.35	5.7	6900	13.7
3	28	821	0.20	6.27	5700	6.1

+ Best-estimate calculation is based on a nitrogen load of 17 g N per capita per day (from Kaplan, 1988) for a 3.09-person household and 71.5 gallons per capita as the amount of indoor use water generated per household based on the 2002 Utah State Water Plan (Utah Division of Water Resources, 2001 [revised 2002]).

*Determined in consultation with Iron County government officials in Cedar City on April 22, 2010.

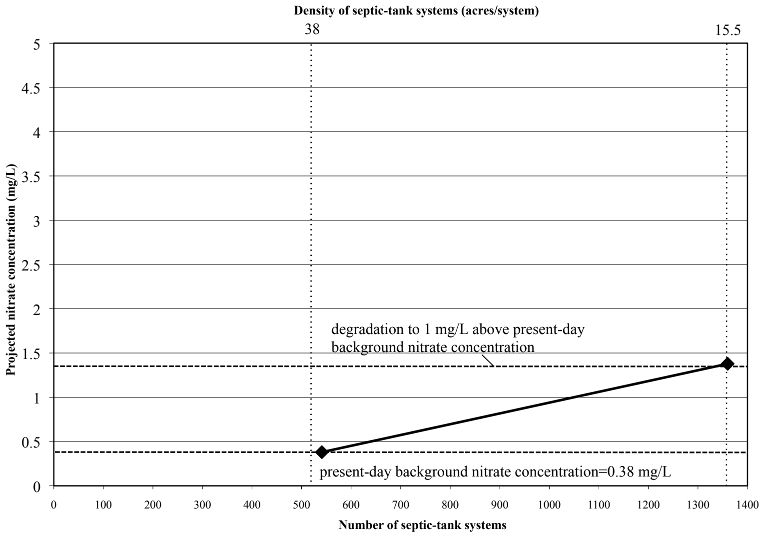

Figure 11. *Projected and current septic-tank density and number of systems versus nitrate concentration for domain 1 in Cedar Valley, Utah, based on 541 existing septic tanks (see tables 6 and 7).*

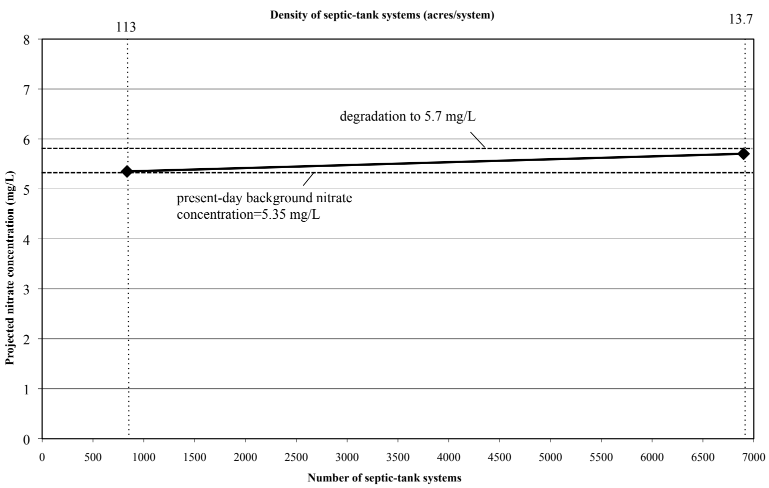

Figure 12. *Projected and current septic-tank density and number of systems versus nitrate concentration for domain 2 in Cedar Valley, Iron County, Utah, based on 838 existing septic tanks (see tables 6 and 7).*

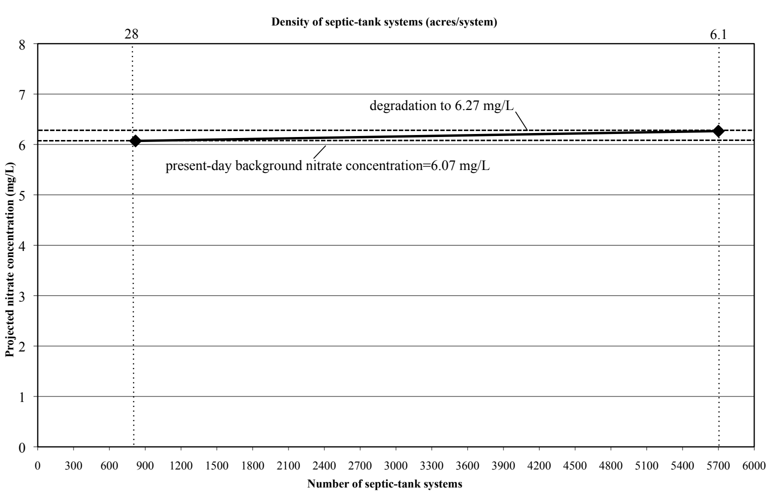

Figure 13. *Projected and current septic-tank density and number of systems versus nitrate concentration for domain 3 in Cedar Valley, Iron County, Utah, based on 821 existing septic tanks (see tables 6 and 7).*

corresponds to a septic-system density of about 6.1 acres per system (2.5 hm^2/system) in model domain 3 (table 7).

Recommendations for Land-Use Planning

These approximations of nitrate concentrations/water-quality degradation provide a conservative (worst case) first approximation of long-term ground-water pollution from septic-tank systems. The graphs of projected nitrate concentration versus number of septic-tank systems in each area show recommended septic-tank density for each domain based on the parameters described above. However, due to sparse data, (septic tanks and water quality data), we do not believe the mass-balance approach should be applied to the northern part of Cedar Valley. We therefore define a land-use planning domain, domain 4, in northern Cedar Valley (plate 6).

Present-day background nitrate concentration for land-use planning domain 4 is 2.6 mg/L. Five septic-tank systems are estimated to be in land-use planning domain 4 (table 8). Land-use planning domain 4 has an area of 61,237 acres (24,783 hm^2), so the average septic-tank system density is 12,250 acres per system (4960 hm^2/system) (table 8).

For land-use planning purposes, we round the calculated lot-sizes (table 7) to 15 acres (6 hm^2) for land-use planning domains 1 and 2, and 5 acres (2 hm^2) for land-use planning domain 3, and apply the most conservative of these recommendations (15 acres [6 hm^2]) to land-use planning domain 4 (table 8, plate 6). Land-use planning domain 1 (plate 6) has an area of 17,700 acres (7,160 hm^2), so our lot-size recommendation of 15 acres (6 hm^2) for land-use planning domain 1 would allow for a total of 1180 septic-tank systems; as there are currently 541 septic-tank systems in land-use planning domain 1, the maximum additional septic-tank systems that could be added is 639 (table 8). Land-use planning domain 2 (plate 6) has an area of 48,918 acres (19,800 hm^2), so our lot-size recommendation of 15 acres (6 hm^2) for land use planning domain 2 would allow for a total of 3261 septic-tank systems; as there are currently 836 septic-tank systems in land-use planning domain 2, the maximum additional septic-tank systems that could be added is 2426 (table 8). Land-use planning domain 3 (plate 6) has an area of 22,365 acres (9050 hm^2), so our lot-size recommendation of 5 acres (2 hm^2) for land use planning domain 3 would allow for a total of 4473 septic-tank systems; as there are currently

Table 8. *Recommended lot sizes and allowable number of septic tanks in land-use planning domains based on mass-balance analysis and allowable degradation limits set by Iron County government officials in Cedar Valley, Iron County, Utah.*

Domain	Current density (acres/system)	Current number of septic tanks	Area (acres)	Projected number of new septic tanks based on lot-size recommendation and acreage	Total number of septic tanks in land-use planning domain	Recommended lot size (acres/system)
1	33	541	17,700	639	1180	15
2	59	835	48,918	2,426	3261	15
3	27	819	22,365	3,654	4473	5
4*	12,250	5	61,237	4,077	4082	15

+ best-estimate calculation is based on a nitrogen load of 17 g N per capita per day (from Kaplan, 1988) for a 3.09-person household and 71.5 gallons per capita as the amount of indoor use water generated per household based on the 2002 Utah State Water Plan (Utah Division of Water Resources, 2002.

* Due to an insufficient amount of data in domain 4, we provide the most conservative recommendation of 15 acre lot size to be protective of ground water (see text for explanation)

819 septic-tank systems in land-use planning domain 3, the maximum additional septic-tank systems that could be added is 3654 (table 8). Land-use planning domain 4 (plate 6) has an area of 61,237 acres (24,780 hm^2), so our lot-size recommendation of 15 acres (6 hm^2) for land use planning domain 4 would allow for a total of 4082 septic-tank systems; as there are currently 5 septic-tank systems in land-use planning domain 2, the maximum additional septic-tank systems that could be added is 4077 (table 8).

Our lot-size recommendations apply to development using septic-tank systems for wastewater disposal, and are not relevant to development using well-engineered, well-constructed sewer lagoon systems. However, poorly engineered, poorly constructed sewer lagoon systems could have even greater negative impact on ground-water quality than septic-tank systems.

SUMMARY AND CONCLUSIONS

Ground water is the principal source of drinking water in Cedar Valley. Most public water supply is from the basin-fill aquifer. The basin-fill aquifer consists primarily of Quaternary alluvial sediments, composed of discontinuous, lenticular, commonly elongated, poorly to well-sorted bodies of sand, clay, gravel, and boulders, interbedded with lava flows and containing some lacustrine and eolian deposits. Based on water-well data, the thickness of Quaternary basin fill is estimated to be at least 1000 feet (300 m); a gravity survey indicates basin fill may be as much as 3900 feet (1,200 m) thick in the eastern part of Cedar Valley.

Primary recharge areas include the bedrock uplands, the upper parts of alluvial fans along the basin margins in the eastern and western parts of the study area, and northern Cedar Valley north of Rush Lake. Basin fill in these areas consists mostly of sand and gravel lacking thick silt and clay layers. Secondary recharge areas having a thick confining layer and a downward vertical ground-water flow gradient cover much of the central part of the study area. Although some wells have discharge area characteristics in the central part of Cedar Valley, they are isolated and surrounded by wells with secondary recharge area characteristics. Therefore, we did not map a discharge area in Cedar Valley.

Based solely on ground-water recharge- and discharge-area mapping, the potential for ground-water contamination in Cedar Valley is moderate to high. Much of the water in the principal basin-fill aquifer comes from bedrock uplands where few pollutants exist that could enter the system. However, there are many potential contamination sources on the basin-fill deposits. Some of these potential contamination sources are in primary recharge areas where the principal aquifer has no significant hydrogeologic barriers to contamination from pesticides or other water-borne contaminants. We recommend caution be taken in siting potential contaminant sources, such as feed lots and septic tanks, especially in primary recharge areas. The widespread clay layers in the center of Cedar Valley may provide some protection to the principal aquifer, but their lateral continuity is unknown.

Ground-water quality classification is a relatively new tool that can be used in Utah to manage potential ground water contamination sources and protect the quality of ground water resources. The results of the ground-water quality classification for Cedar Valley, approved by the Utah Water Quality Board in 2002, indicate that the basin fill aquifer contains mostly high-quality ground water resources that warrant protection. Eighty-two percent of ground-water wells representing the aquifer in the area is classified as Class IA, and 17% is classified as Class II, based on chemical analyses of water from 119 wells sampled between

1974 and 2000 (TDS range of 140 to 1818 mg/L). Additionally, 1% of the ground-water wells representing the aquifer in the Enoch area is classified as Class III due to ground water exceeding the drinking-water quality standard of 10 mg/L for nitrate-as-nitrogen.

Septic tank soil-absorption systems are used to dispose of domestic wastewater in much of Cedar Valley. Many constituents in septic-tank effluent are known to undergo little remediation in the soil environment as they travel through the unsaturated zone to ground water; once in ground water, dilution is the principal mechanism for lowering concentrations of these constituents. We used nitrate in septic-tank effluent as an indicator for evaluating the dilution of constituents in wastewater that reach aquifers; this evaluation uses a mass-balance approach based principally on ground-water flow available for mixing with effluent constituents in the aquifer of concern. The mass-balance approach for the basin-fill aquifer in Cedar Valley, the principal source of drinking water, indicates two categories of recommended maximum septic-tank system densities are appropriate for development using septic tank soil-absorption systems for wastewater disposal: 5 and 15 acres per system (2 and 6 hm^2/system). These recommended minimum lot sizes are based on hydrogeologic parameters incorporated in the ground-water flow model and geographically divided into three ground-water flow domains on the basis of flow-volume similarities; a fourth domain was assigned to northern Cedar Valley due to insufficient data. We recommended a maximum septic-tank system density of 15 acres per system (6 hm^2/system) for this domain due to an expected low amount of ground-water available for mixing in much of the area.

ACKNOWLEDGMENTS

This study was partly funded by the Iron County and the Central Iron County Water Conservancy District, the Utah Division of Water Rights. We thank Kelly Crane, Nolte Associates, Inc., for supplying estimates for the number of septic-tank systems in Cedar Valley, and Bill Nelson, Iron County, for providing sewer service district boundaries. We thank Rich Emerson and Kim Nay, Utah Geological Survey, for preparing the maps and figures for this paper. We thank Hugh Hurlow, Paul Inkenbrandt, Robert Ressetar, and Kimm Harty, Utah Geological Survey, for providing helpful reviews of this report.

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APPENDICES

APPENDIX A

RECORDS OF WATER WELLS USED TO DELINEATE RECHARGE AND DISCHARGE AREAS

WELL-NUMBERING SYSTEM

The numbering system for wells in this study is based on the Federal Government cadastral land-survey system that divides Utah into four quadrants (A–D) separated by the Salt Lake Base Line and Meridian (figure A.1). The study area includes the southwestern quadrant (C). The wells are numbered with this quadrant letter (C), followed by township and range, all enclosed in parentheses. The next set of characters indicates the section, quarter section, quarter-quarter section, and quarter-quarter-quarter section designated by letters a through d, indicating the northeastern, northwestern, southwestern, and southeastern quadrants, respectively. A number after the hyphen corresponds to an individual well within a quarter-quarter-quarter section. For example, the well (C-37-11)9adb-1 would be the first well in the northwestern quarter of the southeastern quarter of the northeastern quarter of section 9, Township 37 South, Range 11 West (NW¼SE¼NE¼ section 9, T. 37 S., R. 11 W.).

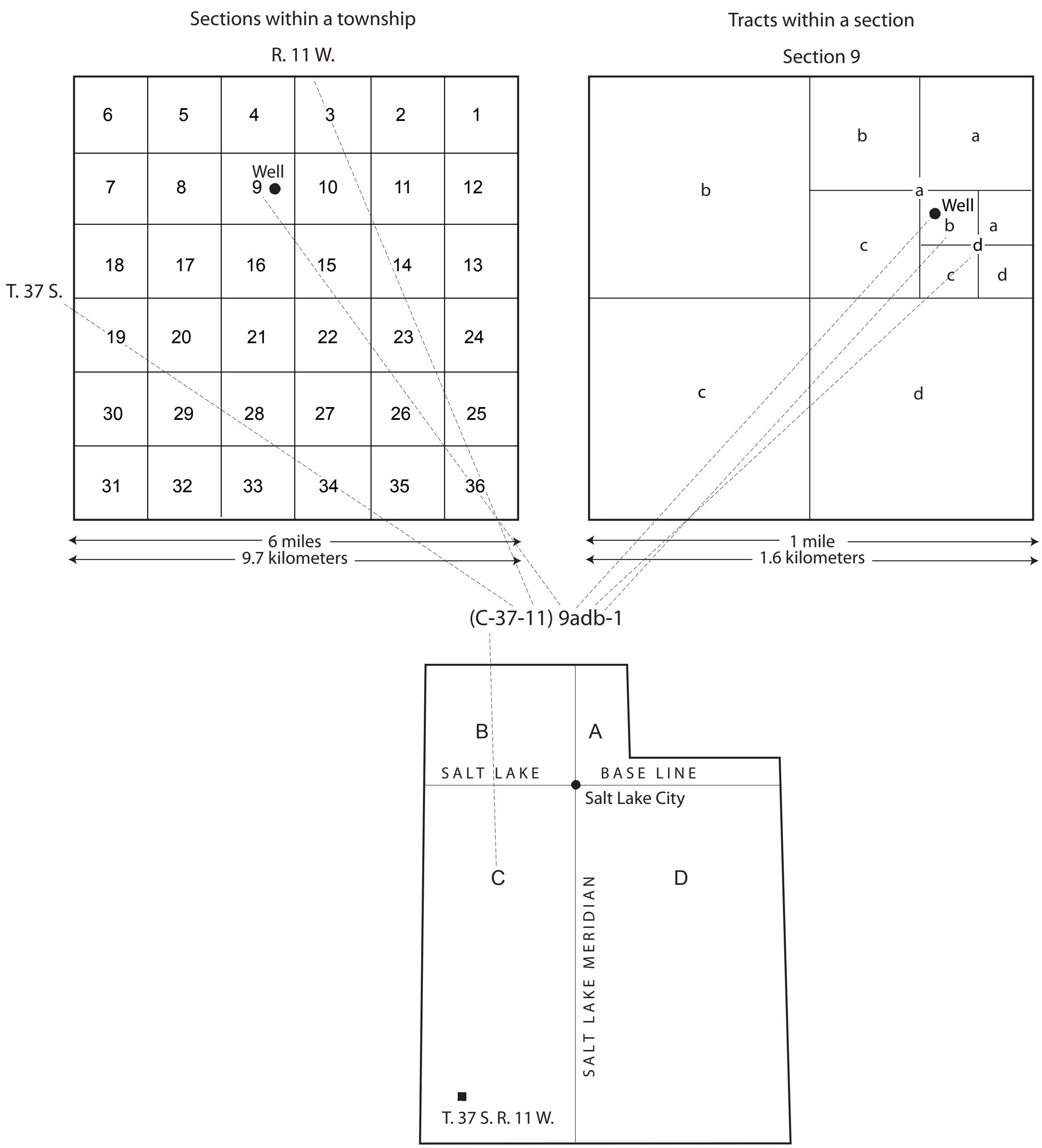

Figure A1. *Numbering system for wells in Utah (see text for additional explanation).*

__Table A1.__ Records of wells used to construct recharge area map, Cedar Valley, Iron County, Utah.

Site Number	Local Well number	Year well drilled	Elev-ation (ft)	Well depth (ft)	Re-charge area	Water level (ft)	Water level date	Top of confining layer (ft)	Bottom of confining layer (ft)	Depth to bedrock (ft)	Top of perfor-ations (ft)	Bottom of perfor-ations (ft)	Notes
2	(C-33-11) 33cca-1	1997	5378	190	1	7	05/12/97	0	25	N	40	190MI	
6	(C-34-10) 31caa-1	1951	5487	220	1	47	05/10/51	0	25	N	32	188MI	
7	(C-34-11) 33dac-1	1967	5452	289	1	28	10/16/67	0	30	N	97	276MI	
8	(C-34-11) 1abc-1	1993	5410	153	1	95	01/11/93	0	25	N	--	--	
9	(C-34-11) 1daa-1	1961	5395	120	Y	18	02/03/61	--	--	N	--	--	
10	(C-34-11) 1acb-1	1967	5398	159	Y	15	12/07/67	--	--	N	37	121MI	
11	(C-34-11) 2add-1	1978	5420	100	Y	70	??/??/78	--	--	N	80	95	
12	(C-34-11) 3cca-1	1945	5385	510	N	6	11/01/45	42	70	N	7	--	
13	(C-34-11) 3cdb-1	1947	5385	345	N	9	06/11/47	30	52	N	12	76MI	
14	(C-34-11) 9ccd-1	1970	5403	130	1	37	12/01/70	2	60	N	117	127	
15	(C-34-11) 13bbc-1	1942	5388	121	N	6	06/20/42	45	100	N	20	121MI	
16	(C-34-11) 20dba-1	1955	5430	117	1	26	10/13/55	7	27	N	46	52	
17	(C-34-11) 21dcd-1	1946	5424	168	1	20	06/15/46	23	80	N	85	--	
18	(C-34-11) 23bda-1	1972	5406	596	1	90	11/01/72	26	210	N	200	596	
19	(C-34-11) 23bdd-1	1945	5412	302	1	21	08/02/45	0	35	N	35	--	
20	(C-34-11) 23bcd-1	1946	5415	162	1	20	04/13/46	0	58	N	36	78MI	
21	(C-34-11) 23abb-1	1946	5407	338	1	16	04/18/46	0	20	N	20	264MI	
23	(C-34-11) 28cbd-1	1979	5437	160	1	23	07/06/79	0	40	N	50	90	
24	(C-34-11) 31ccc-1	1980	5595	322	1	223	09/16/80	55	110	N	190	268	
25	(C-34-11) 31ccb-1	1971	5595	253	1	223	09/08/71	33	100	N	232	242	
26	(C-34-11) 33dac-1	1993	5452	530	1	45	05/17/93	0	25	N	295	515MI	
27	(C-34-11) 33dbd-1	1984	5450	230	1	20	07/27/84	20	50	N	190	230	
28	(C-34-11) 33dad-1	1983	5452	188	1	20	06/25/83	19	55	N	148	188	
29	(C-34-11) 33ddb-1	1979	5451	255	1	23	11/16/79	0	78	N	108	126	
30	(C-34-11) 33dcd-1	1964	5453	250	N	28	06/12/64	81	112	N	79	228MI	
31	(C-34-11) 33dac-1	1967	5455	289	1	28	10/16/67	0	30	N	97	276MI	
32	(C-34-11) 33bca-1	1965	5442	161	1	38	05/22/65	15	48	N	141	161	
33	(C-34-11) 33bbc-1	1964	5452	125	Y	25	04/27/64	--	--	N	82	112	
34	(C-34-11) 34cca-1	1996	5452	360	1	30	10/08/96	0	47	N	280	360	
35	(C-34-11) 28dcd-1	1959	5437	300	1	30	11/10/59	89	111	N	60	261	
36	(C-34-11) 35abc-1	1949	5443	255	1	26	10/01/49	31	60	N	--	--	
37	(C-34-11) 36dcc-3	1952	5460	148	N	+F	04/03/52	98	102	N	16	130	flowing well
38	(C-34-11) 36bcc-1	1995	5446	320	1	72	02/06/95	89	132	N	200	320MI	
39	(C-34-11) 36aad-1	1952	5481	131	N	2	02/15/52	--	--	N	20	115	
40	(C-35-10) 7adc-1	1999	5620	450	1	110	04/01/99	0	23	N	150	450	
41	(C-35-10) 8cca-1	1968	5730	232	Y	140	12/20/68	--	--	N	150	230	
42	(C-35-10) 8ccd-1	1997	5740	276	Y	167	04/24/97	--	--	N	246	276	
43	(C-35-10) 18abc-1	1995	5640	200	Y	136	03/21/95	--	--	N	151	194	
44	(C-35-10) 30bbb-1	1995	5795	400	1	302	05/04/95	68	89	N	240	400MI	
45	(C-35-11) 1ccc-1	1996	5461	830	1	53	03/06/96	100	165	N	300	830MI	
46	(C-35-11) 1bbb-1	1998	5454	430	1	55	08/25/98	60	96	N	340	420MI	

Table A1. *continued*

Site Number	Local Well number	Year well drilled	Elev-ation (ft)	Well depth (ft)	Re-charge area	Water level (ft)	Water level date	Top of confining layer (ft)	Bottom of confining layer (ft)	Depth to bedrock (ft)	Top of perfor-ations (ft)	Bottom of perfor-ations (ft)	Notes
47	(C-35-11) 1ccc-1	1982	5468	368	1	67	05/09/82	80	138	N	--	--	
48	(C-35-11) 2acc-1	1975	5465	250	1	60	09/28/75	70	155	N	223	224	
49	(C-35-11) 3ccc-1	1983	5468	750	Y	40	10/10/83	--	--	N	390	690	
50	(C-35-11) 3ccc-1	1983	5468	165	Y	21	05/13/83	--	--	N	127	165	
51	(C-35-11) 4abd-1	1970	5460	195	Y	25	05/26/70	--	--	N	84	153MI	
52	(C-35-11) 4daa-1	1996	5467	460	1	12	07/27/96	0	75	N	120	446MI	
53	(C-34-11) 33dcd-1	1949	5453	516	1	2	10/20/49	24	45	N	53	516	
54	(C-35-11) 4abd-1	1973	5461	312	1	43	09/01/73	34	56	N	200	312	
55	(C-35-11) 4baa-1	1996	5457	300	1	24	07/09/96	1	21	N	260	300	
56	(C-35-11) 4bdb-1	1995	5464	300	1	50	08/23/95	0	23	N	180	300	
57	(C-35-11) 4add-1	1994	5465	385	1	33	12/27/94	0	87	N	268	368	
58	(C-35-11) 4dda-1	1993	5472	352	1	55	11/02/93	0	75	N	338	348	
59	(C-35-11) 5cdd-1	1998	5473	280	1	30	09/19/98	0	142	N	142	170MI	
61	(C-35-11) 6cbd-1	1996	5522	209	1	154	08/16/96	67	113	N	169	209	
62	(C-35-11) 7dbd-1	1980	5480	110	Y	75	12/22/80	--	--	N	70	110	
63	(C-35-11) 7bcb-1	1946	5489	190	1	38	11/11/46	0	60	N	--	--	
64	(C-35-11) 8ddd-1	1953	5493	260	1	20	04/30/53	0	23	N	30	--	
65	(C-35-11) 8dab-1	1994	5486	210	1	32	05/27/94	3	45	N	160	210	
66	(C-35-11) 8ddd-1	1943	5493	198	1	17	05/27/43	0	86	N	86	198MI	
67	(C-35-11) 8cdd-1	1971	5492	300	1	45	11/20/71	0	52	N	200	300	
68	(C-35-11) 8bbd-1	1992	5483	195	1	28	12/05/92	5	45	N	175	195	
69	(C-35-11) 9aaa-1	1996	5478	360	1	30	03/20/96	0	54	N	70	360MI	
70	(C-35-11) 9dad-1	1993	5487	400	1	42	06/09/93	17	78	N	280	400	
71	(C-35-11) 9dbb-1	1992	5485	205	1	30	12/23/92	42	63	N	185	205	
72	(C-35-11) 9abb-1	1998	5475	465	1	20	12/04/98	0	43	N	180	465MI	
73	(C-35-11) 9cbd-1	1989	5485	250	1	20	10/18/89	1	65	N	120	190MI	
74	(C-35-11) 9ccd-1	1945	5492	142	1	18	09/10/45	0	25	N	130	142	
75	(C-35-11) 10ddc-1	1994	5493	273	Y	36	05/24/94	--	--	N	153	273MI	
76	(C-35-11) 11ccd-1	1948	5496	163	1	14	06/23/48	0	40	N	--	--	
77	(C-35-11) 10dac-1	1998	5488	460	1	42	01/29/98	0	94	N	300	460MI	
78	(C-35-11) 10cca-1	1983	5488	145	Y	22	04/26/83	--	--	N	120	145	
79	(C-35-11) 10ccc-1	1989	5495	400	1	40	07/18/89	96	167	N	200	400	
80	(C-35-11) 10ddc-1	1968	5494	320	1	41	06/14/68	85	133	N	253	303MI	
81	(C-35-11) 10cdd-2	1955	5490	152	1	20	05/03/55	0	28	N	--	--	
82	(C-35-11) 10dbb-1	1995	5485	470	1	29	01/11/95	0	26	N	435	455	
83	(C-35-11) 10bad-1	1983	5481	295	1	22	08/23/83	0	54	N	--	--	
84	(C-35-11) 10ccc-1	1946	5496	273	1	20	04/15/46	0	54	N	57	273MI	
85	(C-35-11) 11dca-1	1960	5494	301	1	30	02/14/60	0	28	N	216	293MI	
86	(C-35-11) 11ccc-1	1970	5492	300	N	32	12/11/70	75	140	N	216	300	
87	(C-35-11) 11aaa-1	1974	5467	400	1	45	07/23/74	12	60	N	240	400	
88	(C-35-11) 11cdc-1	1944	5494	268	N	7	06/12/44	--	--	N	147	152	
89	(C-35-11) 12add-1	1994	5485	810	1	48	10/20/94	0	34	N	200	810MI	

Table A1. *continued*

Site Number	Local Well number	Year well drilled	Elev-ation (ft)	Well depth (ft)	Re-charge area	Water level (ft)	Water level date	Top of confining layer (ft)	Bottom of confining layer (ft)	Depth to bedrock (ft)	Top of perfor-ations (ft)	Bottom of perfor-ations (ft)	Notes
90	(C-35-11) 12dbb-1	1994	5480	320	1	60	12/20/94	6	120	N	240	320MI	
91	(C-35-11) 12dcb-1	1996	5487	327	1	30	11/20/96	11	105	N	284	310MI	
92	(C-35-11) 12dab-1	1996	5485	353	1	55	10/14/96	0	75	N	276	346	
93	(C-35-11) 12dbc-1	1993	5485	334	1	42	11/02/93	0	251	N	254	334	
94	(C-35-11) 12dcc-1	1982	5492	329	Y	45	06/29/82	--	--	N	245	305	
95	(C-35-11) 12ccc-1	1968	5488	700	1	20	02/17/68	0	90	N	100	700	
96	(C-35-11) 12dcd-1	1943	5496	216	Y	12	06/23/43	--	--	N	30	216	poor descriptions
97	(C-35-11) 13dca-1	1950	5535	153	1	45	11/09/50	6	50	N	122	141MI	
98	(C-35-11) 13bad-1	1945	5497	202	1	55	08/22/45	0	27	N	55	202	
99	(C-35-11) 13cac-1	1949	5514	167	1	24	08/06/49	6	35	N	95	133MI	
100	(C-35-11) 13dda-1	1945	5555	206	1	50	07/21/45	0	40	N	62	113	
101	(C-35-11) 14aac-1	1960	5495	665	Y	18	05/01/60	--	--	N	80	120	
102	(C-35-11) 14bbb-1	1976	5492	501	Y	35	09/26/76	--	--	N	200	501	
103	(C-35-11) 14bac-1	1956	5499	202	N	28	08/15/56	66	94	N	58	202	
104	(C-35-11) 15daa-1	1980	5510	402	1	52	04/28/80	0	58	N	180	404MI	
105	(C-35-11) 15acc-1	1978	5507	495	Y	40	07/19/78	--	--	N	232	495	
106	(C-35-11) 15aac-1	1960	5500	245	1	55	08/04/60	0	30	N	212	233MI	
107	(C-35-11) 15dba-2	1937	5495	267	N	4	??/??/37	--	--	N	--	--	
108	(C-35-11) 15abb-1	1955	5495	185	1	21	06/01/55	20	46	N	128	150	
109	(C-35-11) 15dab-1	1961	5507	272	N	28	01/13/61	0	30	N	75	272MI	
110	(C-35-11) 16acd-1	1975	5504	860	N	52	07/18/75	26	48	N	416	712MI	
111	(C-35-11) 16dcc-1	1995	5514	300	1	35	11/20/95	0	38	N	220	300	
112	(C-35-11) 16acc-1	1972	5504	510	1	100	10/20/72	0	31	N	180	500	
113	(C-35-11) 16aab-1	1960	5494	120	1	41	09/02/60	0	83	N	110	116	
114	(C-35-11) 17dcd-1	1993	5509	325	1	35	02/04/93	0	30	N	205	318MI	
115	(C-35-11) 17aac-1	1995	5495	185	1	40	10/21/95	0	80	N	165	171	
116	(C-35-11) 17dcd-1	1999	5509	240	1	25	??/??/99	0	23	N	220	240	
117	(C-35-11) 19bda-1	1963	5505	501	N	45	07/18/63	200	228	N	400	495	
118	(C-35-11) 19dcc-1	1995	5513	500	1	54	11/29/95	0	20	N	338	435MI	
119	(C-35-11) 19cbd-1	1993	5518	800	1	50	05/17/93	0	101	N	200	800MI	
120	(C-35-11) 19bda-2	1946	5505	163	1	52	11/02/46	0	50	N	--	--	
121	(C-35-11) 19acc-1	1940	5505	145	1	24	04/22/40	0	50	N	--	--	
122	(C-35-11) 19acd-1	1995	5508	472	1	46	05/19/95	45	99	N	--	--	
123	(C-35-11) 21bcc-1	1995	5525	470	1	88	07/28/95	0	65	N	416	461MI	
124	(C-35-11) 21abd-1	1975	5520	317	Y	45	07/19/75	--	--	N	150	317	
125	(C-35-11) 21cdd-1	1976	5538	255	1	78	07/28/76	70	90	N	217	232	
126	(C-35-11) 21cab-1	1989	5528	420	1	70	09/03/89	0	67	N	380	420	
127	(C-35-11) 21dcc-1	1982	5546	300	1	32	08/08/82	31	63	N	100	300	
128	(C-35-11) 21cda-1	1979	5535	304	1	90	06/18/79	9	42	N	224	304	
129	(C-35-11) 21abb-1	1945	5517	136	Y	28	11/15/45	--	--	N	132	136	
130	(C-35-11) 21cdb-1	1967	5532	251	1	50	06/07/67	0	45	N	60	233MI	
131	(C-35-11) 21dbd-2	1940	5541	232	1	33	05/18/40	0	68	N	--	--	

Table A1. *continued*

Site Number	Local Well number	Year well drilled	Elev-ation (ft)	Well depth (ft)	Re-charge area	Water level (ft)	Water level date	Top of confining layer (ft)	Bottom of confining layer (ft)	Depth to bedrock (ft)	Top of perfor-ations (ft)	Bottom of perfor-ations (ft)	Notes
132	(C-35-11) 21bab-1	1993	5518	450	1	120	07/28/93	84	110	N	380	450	
133	(C-35-11) 21cad-1	1994	5526	435	1	80	10/14/94	82	238	N	238	435MI	
134	(C-35-11) 21dcc-1	1973	5539	370	1	66	02/09/63	110	157	N	284	295	
135	(C-35-11) 22acb-2	1948	5525	238	1	29	07/01/48	0	71	N	202	238	
136	(C-35-11) 22bbb-1	1994	5517	400	1	70	03/14/94	31	55	N	100	400	
137	(C-35-11) 22adc-1	1948	5529	118	1	21	09/12/48	0	97	N	101	116	
138	(C-35-11) 22dbd-1	1982	5535	300	Y	42	07/27/82	--	--	N	140	280	
139	(C-35-11) 23abb-1	1987	5523	635	Y	71	07/02/87	--	--	N	120	635	
140	(C-35-11) 23bdd-1	1954	5545	161	1	55	09/14/54	0	25	N	95	143MI	
141	(C-35-11) 23bcc-2	1948	5528	176	1	24	03/24/48	0	50	N	84	176	
142	(C-35-11) 23abd-1	1952	5545	178	1	21	01/07/52	73	152	N	155	178	
143	(C-35-11) 24cca-1	1980	5712	430	Y	160	09/05/80	--	--	N	100	430MI	
144	(C-35-11) 24bdd-1	1948	5605	141	1	110	07/16/48	90	110	N	115	140MI	
145	(C-35-11) 24ddc-1	1948	5538	182	Y	142	11/24/48	--	--	N	167	182	
146	(C-35-11) 24bcc-1	1997	5591	300	Y	141	05/22/97	--	--	N	126	286MI	
147	(C-35-11) 26dcb-1	1989	5700	250	1	20	10/18/89	1	65	N	120	190MI	
148	(C-35-11) 26cba-1	1972	5612	265	Y	57	10/15/72	--	--	N	120	265	
149	(C-35-11) 26cbd-1	1993	5638	300	1	156	11/03/93	0	28	N	220	300	
150	(C-35-11) 26ddb-1	1970	5740	280	Y	201	08/05/70	--	--	N	220	280	poor descriptions
151	(C-35-11) 27bcc-1	1994	5555	335	1	60	04/04/94	0	35	N	200	335	
152	(C-35-11) 27bba-1	1994	5543	506	1	--	02/08/94	0	26	N	--	--	dry hole
153	(C-35-11) 27dbb-1	1957	5560	228	Y	62	04/13/57	--	--	N	100	190	
154	(C-35-11) 27bab-2	1997	5542	404	1	90	06/13/97	0	34	N	80	404	
155	(C-35-11) 27cad-1	1991	5563	261	1	80	09/30/91	0	23	N	120	261	
156	(C-35-11) 27bda-1	1989	5553	101	Y	42	11/25/89	--	--	N	61	101	
157	(C-35-11) 27bcb-1	1970	5548	198	1	64	11/05/70	28	66	N	66	190MI	
158	(C-35-11) 27aba-1	1975	5540	200	N	44	07/07/75	--	--	N	50	172MI	
159	(C-35-11) 27dbb-1	1960	5562	156	Y	156	08/19/60	--	--	N	82	156MI	
160	(C-35-11) 27bab-1	1995	5544	118	Y	48	03/27/95	--	--	N	78	118	
161	(C-35-11) 27bab-2	1956	5544	204	1	49	04/19/56	0	38	N	53	191MI	
162	(C-35-11) 27bcc-1	1952	5553	101	1	49	12/23/52	0	30	N	85	101	
163	(C-35-11) 28aac-1	1977	5547	354	Y	85	09/05/77	--	--	N	--	--	
164	(C-35-11) 28adb-1	1983	5554	298	1	42	05/26/83	0	30	N	161	298	
165	(C-35-11) 28adc-1	1993	5556	300	1	70	02/23/93	0	54	N	220	300	
166	(C-35-11) 28ccc-1	1948	5557	172	1	64	11/15/48	4	34	N	132	172	
167	(C-35-11) 28aba-1	1945	5544	88	Y	38	11/19/45	--	--	N	80	88	
168	(C-35-11) 28abc-1	1943	5546	94	Y	18	09/25/43	--	--	N	84	94	poor descriptions
169	(C-35-11) 28aca-1	1993	5551	276	1	69	08/27/93	0	34	N	156	276	
170	(C-35-11) 29add-1	1950	5544	423	1	44	07/31/50	0	82	N	123	423MI	
171	(C-35-11) 29add-1	1950	5544	418	1	18	08/31/50	0	74	N	--	--	
172	(C-35-11) 29dcd-1	1939	5552	204	Y	41	06/06/39	--	--	N	86	204	
173	(C-35-11) 29dcb-1	1975	5545	120	1	52	03/25/75	0	20	N	96	100	

Table A1. continued

Site Number	Local Well number	Year well drilled	Elev-ation (ft)	Well depth (ft)	Re-charge area	Water level (ft)	Water level date	Top of confining layer (ft)	Bottom of confining layer (ft)	Depth to bedrock (ft)	Top of perfor-ations (ft)	Bottom of perfor-ations (ft)	Notes
174	(C-35-11) 29abd-1	1978	5536	300	1	80	09/28/78	0	40	N	200	300	
175	(C-35-11) 29abd-1	1978	5536	290	1	40	09/18/78	0	30	N	230	290	
176	(C-35-11) 29adc-1	1962	5544	432	N	59	01/07/62	130	166	N	80	371MI	
177	(C-35-11) 29cca-1	1996	5536	609	1	71	11/20/96	0	63	N	50	609	
178	(C-35-11) 30acc-1	1995	5522	426	1	42	03/08/95	0	43	N	361	424MI	
179	(C-35-11) 30abb-1	1992	5515	440	1	52	11/25/92	0	113	N	361	425	
180	(C-35-11) 30abb-1	1996	5515	56	1	56	11/28/96	0	49	N	337	377	
181	(C-35-11) 30aaa-1	1990	5521	335	1	13	08/17/90	0	64	N	295	330	
182	(C-35-11) 30bad-1	1980	5516	325	1	32	06/05/80	90	143	N	306	307	
183	(C-35-11) 30dcc-1	1956	5526	200	1	41	03/10/56	2	28	N	--	--	
184	(C-35-11) 30adb-1	1995	5525	281	1	55	11/27/95	0	80	N	275	278	
185	(C-35-11) 30adc-1	1994	5527	321	1	60	11/21/94	0	170	N	--	--	
186	(C-35-11) 30adb-1	1993	5526	295	1	82	09/10/93	0	31	N	--	--	
187	(C-35-11) 30adb-1	1993	5526	270	1	91	07/26/93	105	145	N	--	--	
188	(C-35-11) 31bac-1	1954	5523	200	1	48	08/13/54	1	30	N	157	196MI	
189	(C-35-11) 31acd-1	1951	5536	472	N	14	05/19/51	97	168	N	80	472MI	
190	(C-35-11) 31cab-2	1956	5524	153	1	34	03/28/56	0	32	N	--	--	
191	(C-35-11) 31dab-1	1952	5536	188	Y	38	04/24/52	--	--	N	172	182	
192	(C-35-11) 31dbd-1	1977	5535	298	1	51	04/11/77	40	84	N	172	265MI	
193	(C-35-11) 31cbb-1	1992	5520	250	1	33	11/16/92	33	62	N	210	250	
194	(C-35-11) 31bdb-1	1995	5524	760	1	52	03/16/95	27	109	N	280	760MI	
195	(C-35-11) 32bda-1	1975	5546	415	Y	55	04/19/75	--	--	N	216	384MI	
196	(C-35-11) 32dac-1	1981	5563	158	Y	62	02/17/81	--	--	N	140	151	
197	(C-35-11) 32aac-1	1974	5554	195	1	69	12/10/74	2	40	N	110	147MI	
198	(C-35-11) 32ccd-1	1961	5553	253	Y	74	09/13/61	--	--	N	97	222MI	
199	(C-35-11) 32daa-1	1974	5564	201	Y	85	10/16/74	--	--	N	160	195	
200	(C-35-11) 32abd-2	1945	5555	256	1	43	07/06/45	0	60	N	75	256	
201	(C-35-11) 32daa-1	1945	5566	258	1	50	06/06/45	0	50	N	78	258	
202	(C-35-11) 32bda-1	1964	5546	252	Y	64	02/17/64	--	--	N	82	250	
203	(C-35-11) 32aad-1	1955	5556	147	1	76	09/07/55	6	42	N	--	--	
204	(C-35-11) 32aca-1	1936	5555	223	1	41	07/29/36	0	55	N	60	223	
205	(C-35-11) 32add-1	1940	5565	200	Y	52	03/20/40	--	--	N	70	200	
206	(C-35-11) 32cdd-1	1953	5556	164	1	58	09/19/53	0	42	N	63	130MI	
207	(C-35-11) 32acc-1	1994	5553	85	1	85	08/04/94	46	77	N	--	--	
208	(C-35-11) 33aac-1	1994	5575	265	1	90	08/11/94	0	40	N	198	208MI	
209	(C-35-11) 33bac-1	1980	5568	405	Y	60	06/01/80	--	--	N	185	405	
210	(C-35-11) 33aac-2	1952	5575	148	1	148	12/19/52	0	35	N	127	148MI	
211	(C-35-11) 33dbd-1	1951	5585	206	Y	78	05/12/51	--	--	N	81	200MI	
212	(C-35-11) 33ccd-1	1971	5575	217	Y	88	12/30/71	--	--	N	100	215	
213	(C-35-11) 33aba-1	1952	5572	140	Y	72	12/09/52	--	--	N	118	140MI	
214	(C-35-11) 33abd-1	1956	5578	217	Y	85	02/25/56	--	--	N	85	217	
215	(C-35-11) 33bbb-1	1954	5557	120	Y	70	12/16/54	--	--	N	100	114	

Table A1. *continued*

Site Number	Local Well number	Year well drilled	Elev-ation (ft)	Well depth (ft)	Re-charge area	Water level (ft)	Water level date	Top of confining layer (ft)	Bottom of confining layer (ft)	Depth to bedrock (ft)	Top of perfor-ations (ft)	Bottom of perfor-ations (ft)	Notes
216	(C-35-11) 34cdd-1	1994	5625	303	Y	140	09/04/94	--	--	N	223	303	
217	(C-35-11) 34baa-1	1961	5579	241	Y	103	07/29/61	--	--	N	108	241	
218	(C-35-11) 34acd-1	1943	5595	100	Y	80	09/20/43	--	--	N	80	100	
219	(C-35-11) 34aac-1	1946	5592	140	Y	68	11/13/46	--	--	N	80	140	
220	(C-35-11) 35cba-1	1973	5637	250	Y	100	06/05/73	--	--	N	100	150	
221	(C-35-11) 35cda-1	1961	5682	238	Y	200	05/23/61	--	--	N	200	238	
222	(C-35-12) 13cbb-1	1992	5625	350	1	130	08/18/92	128	155	N	130	350MI	
223	(C-35-12) 13cba-1	1993	5612	332	Y	226	07/13/93	--	--	N	232	255	
224	(C-35-12) 14dad-1	1993	5615	335	Y	237	06/19/93	--	--	N	279	334	
225	(C-35-12) 14acc-1	1993	5715	540	Y	220	06/08/93	--	--	N	300	540	
226	(C-35-12) 23ccc-1	1998	5525	235	Y	101	08/19/98	--	--	N	195	235	
227	(C-35-12) 23dad-1	1943	5505	132	1	28	07/19/43	0	54	N	--	--	
228	(C-35-12) 24aaa-1	1993	5505	195	1	58	10/02/93	5	60	N	115	194	
229	(C-35-12) 24cab-1	1998	5510	200	1	48	09/14/98	0	64	N			
230	(C-35-12) 25bca-1	1980	5498	200	Y	37	08/15/80	--	--	N	142	152	
231	(C-35-12) 26dcd-1	1994	5491	313	1	70	09/14/94	1	43	N	277	313	
232	(C-35-12) 27bcb-1	1957	5505	297	1	16	05/07/57	19	50	N	63	297	
233	(C-35-12) 27bbd-1	1958	5460	270	1	45	06/12/58	0	45	N	92	270	
235	(C-35-12) 34dcd-1	1959	5481	144	1	22	10/18/59	0	37	N	72	120MI	
236	(C-35-12) 35adc-1	1997	5495	520	1	68	02/20/97	0	98	N	140	520	
237	(C-35-12) 36aaa-1	1996	5516	698	1	30	03/22/96	6	45	N	212	540MI	
238	(C-35-12) 36dda-1	1994	5517	595	1	22	03/28/94	19	52	N	200	595MI	
239	(C-35-12) 36bdc-1	1972	5513	415	Y	53	09/12/72	--	--	N	182	392	
240	(C-35-12) 36daa-1	1937	5520	400	Y	7	08/26/37	--	--	N	180	400	poor descriptions
243	(C-36-11) 5dca-1	1955	5562	162	Y	58	03/23/55	--	--	N	65	159MI	
244	(C-36-11) 5abd-1	1939	5565	166	1	51	05/10/39	0	60	N	70	166	
245	(C-36-11) 5dcd-1	1943	5556	110	Y	49	08/08/43	--	--	N	70	110	
246	(C-36-11) 5dbd-1	1962	5557	203	Y	90	09/13/62	--	--	N	126	200	
247	(C-36-11) 5abb-1	1940	5560	105	1	57	07/10/40	0	67	N	--	--	
248	(C-36-11) 5dcc-1	1957	5553	204	1	72	05/10/57	22	42	N	100	180	
249	(C-36-11) 6ccc-1	1974	5514	324	1	28	04/30/74	83	160	N	186	291MI	
250	(C-36-11) 6cdc-1	1942	5522	295	1	10	05/02/42	0	40	N	168	178	
251	(C-36-11) 6acb-1	1948	5527	172	1	24	12/12/48	18	60	N	--	--	
252	(C-36-11) 6bac-1	1950	5522	187	Y	21	12/18/50	--	--	N	139	172MI	
253	(C-36-11) 7aba-1	1965	5534	352	1	54	04/27/65	3	42	N	102	345MI	
254	(C-36-11) 7baa-1	1962	5523	234	1	51	11/05/62	57	80	N	223	233	
255	(C-36-11) 7baa-2	1947	5525	180	1	32	03/20/47	30	60	N	--	--	
256	(C-36-11) 7baa-3	1951	5525	175	1	22	12/03/51	12	35	N	135	175	
257	(C-36-11) 8cbb-1	1984	5538	501	1	72	08/17/84	10	56	N	201	501	
258	(C-36-11) 8dda-1	1989	5615	308	Y	250	08/01/89	--	--	N	228	308	
259	(C-36-11) 8bda-1	1955	5552	190	Y	48	05/23/55	--	--	N	60	190	
260	(C-36-11) 8bba-1	1936	5544	158	1	34	05/12/36	0	107	N	50	158	poor desrciptions

Table A1. continued

Site Number	Local Well number	Year well drilled	Elev-ation (ft)	Well depth (ft)	Re-charge area	Water level (ft)	Water level date	Top of confining layer (ft)	Bottom of confining layer (ft)	Depth to bedrock (ft)	Top of perfor-ations (ft)	Bottom of perfor-ations (ft)	Notes
261	(C-36-11) 8cbb-1	1955	5533	240	1	47	11/30/55	0	52	N	52	230MI	
262	(C-36-11) 10bcd-1	1996	5678	205	Y	172	01/25/96	--	--	N	140	200	
263	(C-36-11) 10bcd-1	1996	5685	215	Y	176	01/19/96	--	--	N	147	207	
264	(C-36-11) 11bdb-1	1968	5755	670	Y	214	07/14/68	--	--	530	221	623	
266	(C-36-11) 16bbc-1	1963	5642	180	1	100	08/09/63	65	85	N	165	175	
267	(C-36-11) 17bbb-1	1985	5533	535	1	71	10/17/85	4	54	N	250	505	
268	(C-36-11) 17bdb-1	1994	5605	350	Y	160	09/20/94	--	--	N	290	330	
269	(C-36-11) 17abc-1	1983	5730	370	Y	290	09/23/83	--	--	N	170	370MI	
270	(C-36-11) 17bac-1	1965	5540	116	Y	80	10/04/65	--	--	N	103	107	
271	(C-36-11) 17baa-1	1955	5549	117	Y	75	09/07/55	--	--	N	100	108	
272	(C-36-11) 17acb-1	1990	5595	273	Y	140	01/11/90	--	--	N	233	273	
273	(C-36-11) 18bdd-1	1994	5515	390	1	67	05/28/94	15	57	N	110	390	
274	(C-36-11) 18bca-1	1960	5515	372	1	45	01/26/60	0	25	N	285	320	
275	(C-36-11) 18bca-1	1958	5513	457	1	21	02/15/58	34	74	N	--	--	
276	(C-36-11) 18ada-1	1944	5532	245	1	38	04/22/44	0	74	N	80	245	
277	(C-36-11) 22cca-1	1978	5650	200	Y	112	07/06/78	--	--	N	125	197	
278	(C-36-11) 28aaa-1	1973	6047	126	Y	47	09/24/73	--	--	N	--	--	
279	(C-36-11) 30acc-1	1996	5618	610	Y	176	??/??/96	--	--	N	220	600MI	
280	(C-36-11) 32dba-1	1998	5795	400	Y	290	04/21/98	--	--	N	240	400MI	
281	(C-36-12) 1aaa-3	1946	5518	274	1	21	06/14/46	20	48	N	212	228MI	
282	(C-36-12) 1dcc-1	1993	5505	161	1	14	10/29/93	0	125	N	141	161	
283	(C-36-12) 2dca-1	1985	5493	820	1	42	08/23/85	107	128	N	355	618MI	
284	(C-36-12) 2dda-1	1940	5495	55	1	25	04/23/40	0	25	N	0	55	
285	(C-36-12) 2dcb-1	1983	5493	457	1	33	04/04/83	18	82	N	125	450	
286	(C-36-12) 3dbb-1	1985	5476	517	1	55	11/07/85	4	62	N	357	517	
287	(C-36-12) 3cdc-1	1996	5472	538	1	32	10/04/96	0	147	N	238	538	
288	(C-36-12) 3abb-1	1975	5480	132	1	37	09/19/75	0	37	N	95	132MI	
290	(C-36-12) 9abd-1	1966	5475	250	1	15	07/26/66	0	60	N	65	230MI	
291	(C-36-12) 10aaa-1	1951	5478	245	1	1	09/11/51	0	103	N	--	--	
292	(C-36-12) 11bda-1	1968	5485	300	1	31	03/28/68	0	25	N	275	285	
293	(C-36-12) 11abd-1	1972	5487	211	Y	16	09/19/72	--	--	N	124	211	
294	(C-36-12) 11acb-1	1996	5487	304	1	30	11/28/96	0	40	N	264	304	
295	(C-36-12) 11daa-1	1993	5492	336	1	40	07/27/93	15	250	N	270	336	
296	(C-36-12) 12ccc-1	1945	5505	342	1	13	07/01/45	60	85	N	323	333	
297	(C-36-12) 12ccc-1	1994	5493	355	1	70	10/10/94	0	65	N	295	330	
298	(C-36-12) 12ccb-1	1979	5493	360	1	38	11/20/79	6	340	N	340	360	
299	(C-36-12) 12ddb-1	1951	5511	262	1	34	10/04/51	0	80	N	--	--	
300	(C-36-12) 12aaa-1	1942	5517	83	1	12	03/28/42	20	70	N	60	83	
301	(C-36-12) 14add-1	1970	5491	190	1	32	06/02/70	0	23	N	146	184MI	
302	(C-36-12) 16bba-1	1957	5460	85	N	+F	04/05/57	0	20	N	--	--	flowing well
303	(C-36-12) 16ccb-1	1941	5470	154	N	+F	02/26/41	0	28	N	--	--	flowing well
304	(C-36-12) 20adc-1	1996	5478	1020	1	45	10/08/96	3	38	N	162	802	

Table A1. continued

Site Number	Local Well number	Year well drilled	Elev-ation (ft)	Well depth (ft)	Re-charge area	Water level (ft)	Water level date	Top of confining layer (ft)	Bottom of confining layer (ft)	Depth to bedrock (ft)	Top of perfor-ations (ft)	Bottom of perfor-ations (ft)	Notes
305	(C-36-12) 20cac-1	1951	5580	477	1	35	12/05/51	12	35	N	196	477	
306	(C-36-12) 23ccb-1	1967	5473	228	1	19	03/07/67	16	37	N	55	203MI	
307	(C-36-12) 24cbb-1	1994	5491	400	1	60	12/07/94	0	70	N	360	380	
308	(C-36-12) 24aad-1	1950	5512	237	1	30	11/10/50	0	27	N	62	237MI	
309	(C-36-12) 25bdd-1	1956	5545	300	1	52	11/18/56	11	43	N	90	300	
310	(C-36-12) 25cda-1	1993	5550	220	1	72	08/10/93	0	45	N	--	--	
311	(C-36-12) 28bab-1	1945	5440	80	1	38	07/06/45	0	26	N	34	45	
312	(C-36-12) 29bbc-1	1995	5570	505	Y	145	09/29/95	--	--	N	451	502MI	
313	(C-36-12) 29abb-1	1998	5510	1006	Y	89	09/15/98	--	--	N	162	1006MI	
314	(C-36-12) 29aaa-1	1995	5462	413	1	25	08/04/95	0	40	N	--	--	
315	(C-36-12) 29aab-1	1990	5478	205	1	65	08/25/90	0	60	N	165	205	
316	(C-36-12) 29abc-1	1987	5500	340	1	46	11/30/87	10	40	N	260	314MI	
317	(C-36-12) 29abb-1	1990	5510	215	1	70	08/28/90	0	24	N	175	215	
318	(C-36-12) 29ada-1	1997	5463	300	1	30	06/13/97	50	85	N	260	300	
319	(C-36-12) 29dbb-1	1993	5495	340	1	68	06/09/93	68	285	N	--	--	
320	(C-36-12) 30bcc-1	1981	5661	323	Y	205	03/31/81	--	--	N	301	312	
321	(C-36-12) 30bcc-1	1995	5675	223	Y	223	07/14/95	--	--	N	260	275	
322	(C-36-12) 30bca-1	1980	5670	290	1	205	01/22/80	35	50	N	255	265	
323	(C-36-12) 30aca-1	1983	5595	240	Y	143	04/11/83	--	--	N	226	231	
324	(C-36-12) 30bcb-1	1986	5560	220	Y	108	09/26/86	--	--	N	188	212	
325	(C-36-12) 30add-1	1984	5570	206	1	140	12/17/84	27	75	N	183	203	
326	(C-36-12) 30dcb-1	1974	5595	300	Y	128	11/08/74	--	--	N	244	279MI	
327	(C-36-12) 30bda-1	1974	5624	294	Y	172	10/10/74	--	--	N	258	268	
328	(C-36-12) 30cdb-1	1974	5645	285	1	180	08/14/74	20	60	N	262	272	
329	(C-36-12) 30cac-1	1974	5617	195	Y	150	07/07/74	--	--	N	160	170	
330	(C-36-12) 30bcd-1	1978	5663	290	Y	202	01/20/78	--	--	N	246	280	
331	(C-36-12) 30bdb-1	1978	5642	276	Y	182	03/08/78	--	--	N	215	243	
332	(C-36-12) 30bdb-1	1977	5660	300	1	193	10/30/77	65	90	N	235	241	
333	(C-36-12) 30bcb-1	1977	5680	280	Y	199	12/22/77	--	--	N	259	276	
334	(C-36-12) 30ccb-1	1977	5644	301	Y	212	11/23/77	--	--	N	150	188	
335	(C-36-12) 31acb-1	1992	5580	430	1	154	12/21/92	3	50	N	310	430MI	
336	(C-36-12) 31cbb-1	1996	5680	255	Y	210	02/20/96	--	--	N	195	200	
337	(C-36-12) 31bac-1	1992	5630	305	1	160	03/30/92	23	83	N	265	305	
338	(C-36-12) 31cdc-1	1992	5596	360	1	180	11/24/92	65	143	N	240	360MI	
339	(C-36-12) 31bbd-1	1987	5650	250	1	186	09/11/87	126	170	N	200	227MI	
340	(C-36-12) 31ccd-1	1993	5609	370	1	131	08/13/93	8	54	N	260	370MI	
341	(C-36-12) 31bbb-1	1990	5675	309	Y	235	08/05/90	--	--	N	275	285	
342	(C-36-12) 31dcd-1	1964	5555	305	Y	27	05/15/64	--	--	N	70	286	
343	(C-36-12) 32dcd-1	1990	5498	301	Y	247	12/14/90	--	--	N	250	300	
344	(C-36-12) 32ccc-1	1956	5529	336	1	53	11/30/56	0	48	N	75	175	
345	(C-36-12) 32dcc-1	1959	5498	204	1	24	05/21/59	97	120	N	40	195MI	
346	(C-36-12) 32dcc-1	1960	5496	276	1	38	08/16/60	56	126	N	55	230MI	

Site Number	Local Well number	Year well drilled	Elev-ation (ft)	Well depth (ft)	Re-charge area	Water level (ft)	Water level date	Top of confining layer (ft)	Bottom of confining layer (ft)	Depth to bedrock (ft)	Top of perfor-ations (ft)	Bottom of perfor-ations (ft)	Notes
347	(C-36-12) 33acb-1	1990	5445	150	N	+F	09/10/90	74	118	N	110	150	flowing well
348	(C-36-12) 34dbc-1	1994	5455	550	1	20	03/28/94	0	25	N	345	550MI	
349	(C-36-12) 35ccb-1	1994	5471	545	1	130	06/22/94	36	120	N	438	545MI	
350	(C-36-12) 35dcb-1	1992	5510	560	1	45	04/01/92	0	56	N	--	--	
351	(C-36-12) 35dcb-1	1989	5510	350	1	94	09/08/89	5	57	N	330	520	
352	(C-36-12) 36add-1	1957	5535	288	1	50	12/12/57	0	43	N	222	284MI	
354	(C-36-13) 25ddd-1	1997	5705	402	Y	210	07/01/97	--	--	N	362	402	
355	(C-36-13) 25cad-1	1994	5710	310	Y	270	08/01/94	--	--	N	--	--	
356	(C-36-13) 27ccd-1	1990	6005	405	Y	80	08/23/90	--	--	N	285	405	
357	(C-37-12) 1bba-1	1993	5535	500	Y	82	01/20/93	--	--	N	300	500	
358	(C-37-12) 1baa-1	1975	5550	243	Y	81	09/17/75	--	--	N	223	243	
359	(C-37-12) 1bbc-1	1961	5522	260	1	14	06/10/61	45	111	N	--	--	
360	(C-37-12) 2cba-1	1995	5474	423	1	30	02/12/96	0	60	N	360	416MI	
361	(C-37-12) 2dda-1	1975	5500	280	Y	77	09/19/75	--	--	N	272	280	
362	(C-37-12) 2dad-1	1986	5500	280	Y	58	04/19/86	--	--	N	85	280MI	
363	(C-37-12) 3ddd-1	1970	5496	275	1	24	09/01/70	0	25	N	177	265MI	
364	(C-37-12) 3bdd-1	1991	5455	356	1	10	03/29/91	0	67	N	336	356	
365	(C-37-12) 4cdd-1	1991	5460	213	1	28	11/03/91	20	50	N	238	268MI	
366	(C-37-12) 4cac-1	1992	5468	285	1	20	09/20/92	0	82	N	--	--	
367	(C-37-12) 4adc-1	1994	5445	308	N	3	06/18/94	7	125	N	218	298	
368	(C-37-12) 4bdb-1	1993	5458	200	N	15	11/24/93	30	100	N	160	200	
369	(C-37-12) 5acb-1	1993	5505	458	Y	60	05/15/93	--	--	N	158	458	
370	(C-37-12) 5bbb-1	1965	5533	300	Y	90	07/16/65	--	--	N	90	300	
371	(C-37-12) 5bbc-1	1960	5541	252	1	70	05/15/60	0	20	N	72	187MI	
372	(C-37-12) 5aac-1	1959	5504	216	Y	36	06/24/59	--	--	N	55	205MI	
373	(C-37-12) 9acc-1	1959	5490	186	1	16	07/18/59	0	25	N	75	180	
374	(C-37-12) 9bbb-2	1943	5486	214	N	3	06/06/43	128	176	N	--	--	
375	(C-37-12) 11aa-1	1953	5510	365	1	25	09/19/53	8	45	N	25	365	
376	(C-37-12) 11aaa-1	1995	5500	480	1	30	06/12/95	0	30	N	120	480MI	
377	(C-37-12) 14cbc-1	1955	5492	236	1	42	10/06/55	15	41	N	50	216	
378	(C-37-12) 14adc-1	1961	5510	237	1	60	07/15/61	0	80	N	75	237	
379	(C-37-12) 14aaa-1	1946	5515	160	1	13	10/31/46	0	50	N	50	150MI	
380	(C-37-12) 14dad-1	1946	5529	206	1	37	6/27/46	0	48	N	--	--	
381	(C-37-12) 15cdc-1	1965	5515	355	Y	67	07/06/65	--	--	N	70	350MI	
382	(C-37-12) 21cac-1	1962	5650	285	1	225	04/17/62	70	118	N	241	272	
383	(C-37-12) 22dcb-1	1995	5505	225	1	41	11/11/95	18	65	N	141	220	
384	(C-37-12) 24bbc-1	1965	5580	177	Y	144	??/??/65	--	--	N	155	170	
385	(C-37-12) 23abd-1	1988	5533	547	1	92	12/27/88	39	79	N	--	--	
386	(C-37-12) 26bad-1	1992	5505	435	1	42	04/19/92	0	45	N	235	435	
388	(C-37-12) 26aaa-1	1993	5637	289	1	162	07/14/93	80	140	N	220	289	
390	(C-37-12) 26aaa-1	1995	5640	390	1	88	08/01/95	0	113	N	270	390MI	

APPENDIX B
WATER-QUALITY DATA

Table B1. *Water-quality data for Cedar Valley, Iron County, Utah.*

WELL LOCATION	DATE SAMPLED	Source*	pH, water, whole field (standard units)	Specific conduc-tance (µS/cm)	Water tempera-ture, (deg. C)	Hard-ness, total (mg/L as $CaCO_3$)	Nitrogen, ammonia+ organic, dissolved (mg/L as N)
(C-34-10)31caa-1	05-23-1974	USGS	-	-	-	-	-
(C-34-11)9ccd-1	09-10-1974	USGS	-	-	-	-	-
(C-34-11)14aad-2	07-26-1999	USGS	8.7	930	14.0	290	-
(C-34-11)21dcd-1	07-22-1999	USGS	7.6	800	15.5	320	-
(C-34-11)23bdd-1	06-13-1974	USGS	-	-	-	-	-
(C-34-11)36dcc-2	06-13-1977	USGS	-	-	-	-	-
(C-35-10)6bad-1	10-11-1977	USGS	-	-	-	-	-
(C-35-10)18abc-1	07-19-2000	USGS	7.7	465	15.5	200	-
(C-35-10)18bad-1	10-11-1977	USGS	-	-	-	-	-
(C-35-11)8cdc-1	10-11-1977	USGS	-	-	-	-	-
(C-35-11)8ddc-1	09-11-1974	USGS	-	-	-	-	-
(C-35-11)9dba-1	07-10-1998	USGS	7.2	630	15.5	320	-
(C-35-11)11ccc-1	07-25-2000	USGS	7.8	950	15.0	430	0.10 E
(C-35-11)11ccc-3	05-23-1974	USGS	-	-	-	-	-
(C-35-11)12add-1	07-22-1999	USGS	7.6	455	17.5	210	-
(C-35-11)12ccc-2	07-19-2000	USGS	7.6	740	15.0	300	<10
(C-35-11)13dad-1	10-11-1977	USGS	-	-	-	-	-
(C-35-11)14bca-1	07-19-2000	USGS	7.4	1,920	-	860	0.19
(C-35-11)16aab-1	09-01-1999	USGS	7.4	1,070	16.0	590	-
(C-35-11)25bcc-1	07-28-1999	USGS	7.8	990	15.0	330	-
(C-35-11)26acd-1	06-22-2000	USGS	7.3	1,020	14.0	460	0.10 E
(C-35-11)28aac-2	08-26-1999	USGS	7.1	1,270	11.5	690	-
(C-35-11)29add-1	06-12-2000	USGS	7.5	1,640	16.0	980	-
(C-35-11)29cab-1	10-11-1977	USGS	-	-	-	-	-
(C-35-11)29dbd-2	07-27-2000	USGS	6.9	2,160	10.5	1300	0.14
(C-35-11)31acd-2	08-15-1979	USGS	7.7	630	13.0	330	-
(C-35-11)31dbd-1	06-12-2000	USGS	8.2	870	14.5	440	-
(C-35-11)34dbb-1	09-01-1999	USGS	7.3	1,190	14.0	620	-
(C-35-12)26bca-1	07-21-1999	USGS	7.2	1,050	12.5	520	-
(C-35-12)27bcd-1	10-02-1974	USGS	-	-	-	-	-
(C-35-12)36ddd-1	08-26-1999	USGS	7.9	540	14.0	260	-
(C-36-11)5aca-1	08-26-1999	USGS	7.0	1,780	11.5	1,100	-
(C-36-11)5dab-1	09-01-1999	USGS	7.3	1,090	12.5	590	-
(C-36-11)7aaa-2	09-01-1999	USGS	7.2	1,410	13.5	800	-
(C-36-11)7adc-1	10-11-1977	USGS	-	-	-	-	-
(C-36-11)11bac-1	07-25-2000	USGS	7.4	2,190	16.5	1,300	-
(C-36-11)18bdd-1	07-22-1999	USGS	7.5	1,440	16.5	700	-
(C-36-11)31abc-1	07-28-2000	USGS	7.5	1,140	-	550	<0.10
(C-36-12)2dbc-1	07-21-1999	USGS	7.5	600	19.5	280	-
(C-36-12)3aad-2	07-21-1999	USGS	7.8 L	530	16.0	300	-
(C-36-12)3acc-1	10-11-1977	USGS	-	-	-	-	-
(C-36-12)9aac-1	07-21-1999	USGS	7.6	540	-	230	-
(C-36-12)11abd-1	09-11-1974	USGS	-	-	-	-	-
(C-36-12)21cbb-1	06-08-1988	USGS	8.0	340	14.0	170	-
(C-36-12)25bdd-1	05-22-1974	USGS	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	DATE SAMPLED	Source*	pH, water, whole field (standard units)	Specific conductance (µS/cm)	Water temperature, (deg. C)	Hardness, total (mg/L as $CaCO_3$)	Nitrogen, ammonia+ organic, dissolved (mg/L as N)
(C-36-12)36adb	07-25-2000	USGS	7.1	880	14.5	450	-
(C-37-12)4bbc-1	10-11-1977	USGS	-	-	-	-	-
(C-37-12)9acc-1	07-13-1999	USGS	7.9	375	16.5	150	-
(C-37-12)11aaa-1	06-14-1974	USGS	-	-	-	-	-
(C-37-12)23abd-1	07-13-1999	USGS	7.4	640	17.5	270	-
(C-37-12)23acb-1	07-19-1990	USGS	7.7	810	15.5	330	-
(C-36-12)24ada-1	09-11-1974	USGS	-	-	-	-	-
(C-35-11)3dcd	05-06-1998	UDDW	-	-	-	-	-
(C-36-12)29abb-1	10-05-1998	UDDW	-	-	-	-	-
(C-36-11)32ccb-1	10-05-1998	UDDW	-	-	-	-	-
(C-35-11)24dba-1	10-05-1998	UDDW	-	-	-	-	-
(C-35-11)24dba-2	08-26-1997	UDDW	-	-	-	-	-
(C-36-12)17ddd	10-05-1998	UDDW	-	-	-	-	-
(C-36-12)32ccb-2	11-20-1995	UDDW	-	-	-	-	-
(C-36-12)20acd	12-09-1996	UDDW	8.2	309	-	130.6	0.1
(C-36-11)30acc-1	11-03-1999	UDDW	-	-	-	-	-
(C-36-11)30acc-2	06-11-1996	UDDW	7.8	940	-	418.4	-
(C-35-11)10cdc	04-28-1998	UDDW	-	-	-	-	-
(C-35-10)18bda	07-13-2000	UDDW	-	-	-	-	-
(C-35-10)7ccc	07-13-2000	UDDW	-	-	-	-	-
(C-35-10)7caa	07-13-2000	UDDW	-	-	-	-	-
(C-36-12)15dbd	04-07-1999	UDDW	-	-	-	-	-
(C-36-12)24ada-2	03-03-1999	UDDW	-	-	-	-	-
(C-35-11)9ccc	06-11-1990	UDDW	8.0	565	-	272.1	<0.1
(C-36-11)19ddd	11-16-2000	UDDW	-	-	-	-	-
(C-36-12)3acc-1	04-25-1995	UDDW	8.3	-	-	-	-
(C-35-11)9acd	02-09-1999	UDDW	-	-	-	-	-
(C-35-11)17dbc	05-08-1998	UDDW	-	-	-	-	-
(C-37-12)1bba-1	02-15-1994	UDDW	-	-	-	-	<0.1
(C-37-12)1bba-2	02-16-1999	UDDW	-	758	-	305.0	-
(C-35-11)1cdc	03-23-1996	UDDW	-	446	-	172.0	-
(C-36-12)24cca	10-11-1999	UDDW	7.9	959	-	426.2	2.0
(C-36-12)3cdc	03-20-1997	UDDW	-	531	-	219.0	0.7
(C-36-11)7aba	11-06-2000	UDDW	-	-	-	-	-
(C-33-10)31ada-1	06-12-2000	USGS	7.8	760	16.0	230	0.23
(C-33-11)30bca-1	06-25-1974	USGS	7.5	1,860	13.5	660	-
(C-33-11)31aad-1	07-26-1999	USGS	8.1	1,200	15.5	190	-
(C-34-11)36dcc-3	08-24-1999	USGS	7.4	590	21.0	240	0.10
(C-35-11)19dbb-1	07-28-1999	USGS	8.1	770	17.5	330	0.11
(C-35-11)27dbb-1	06-31-1999	USGS	7.1	1,020	11.5	530	0.12
(C-35-11)30caa-1	08-23-1999	USGS	7.7	540	14.0	270	-
(C-35-11)33aac-1	07-14-1998	USGS	7.5	1,120	12.0	670	-
(C-35-11)33abd-1	08-25-1999	USGS	7.1	1,270	11.5	720	0.47
(C-35-11)33ccd-1	08-25-1999	USGS	7.2	1,290	12.5	710	0.32
(C-35-12)36caa-1	08-23-1999	USGS	7.5	650	16.5	290	0.17
(C-36-11)7cab-1	08-23-1999	USGS	7.8	1,060	15.5	590	0.25

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	DATE SAMPLED	Source*	pH, water, whole field (standard units)	Specific conductance (µS/cm)	Water temperature, (deg. C)	Hardness, total (mg/L as $CaCO_3$)	Nitrogen, ammonia+ organic, dissolved (mg/L as N)
(C-36-12)12dba-1	08-23-1999	USGS	7.7	550	14.5	290	0.15
(C-37-12)11dac-1	08-23-1999	USGS	7.6	640	18.5	260	0.21
(C-37-12)34abb-1	06-13-2000	USGS	7.1	810	11.0	410	-
(C-35-11)13ccb	1979-81	UGS	-	-	-	-	-
(C-35-11)13cdb	1979-81	UGS	-	-	-	-	-
(C-35-11)13ddb	1979-81	UGS	-	-	-	-	-
(C-35-11)35bdd	1979-81	UGS	-	-	-	-	-
(C-35-11)26dca	1979-81	UGS	-	-	-	-	-
(C-35-11)26acd	1979-81	UGS	-	-	-	-	-
(C-35-11)27aab	1979-81	UGS	-	-	-	-	-
(C-35-11)22dcd	1979-81	UGS	-	-	-	-	-
(C-35-11)22ddb	1979-81	UGS	-	-	-	-	-
(C-35-11)22ada	1979-81	UGS	-	-	-	-	-
(C-35-11)23cab	1979-81	UGS	-	-	-	-	-
(C-35-11)23bdd-1	1979-81	UGS	-	-	-	-	-
(C-35-11)23bdd-2	1979-81	UGS	-	-	-	-	-
(C-35-11)23acd	1979-81	UGS	-	-	-	-	-
(C-35-11)23abb	1979-81	UGS	-	-	-	-	-
(C-35-11)24ccd	1979-81	UGS	-	-	-	-	-
(C-35-11)24bdd	1979-81	UGS	-	-	-	-	-
(C-35-11)26bbb	1979-81	UGS	-	-	-	-	-
(C-35-11)22dad	1979-81	UGS	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Nitrogen, NO2+ NO3 dissolved (mg/L as N)	Calcium, dissolved (mg/L as Ca)	Magne-sium, dissolved (mg/L as Mg)	Potas-sium, dissolved (mg/L as K)	Sodium, dissolved (mg/L as Na)	Alkalinity, water, dissolved, (mg/L as $CaCO_3$)	Bicarbo-nate, water, dissolved, (mg/L as HCO_3)
(C-34-10)31caa-1	2.6	-	-	-	-	-	-
(C-34-11)9ccd-1	0.22	-	-	-	-	-	-
(C-34-11)14aad-2	0.887	44	43	6.8	80	212	259
(C-34-11)21dcd-1	0.15	56	43	4.2	49	146	178
(C-34-11)23bdd-1	1.1	-	-	-	-	-	-
(C-34-11)36dcc-2	0.68	-	-	-	-	-	-
(C-35-10)6bad-1	0.71	-	-	-	-	-	-
(C-35-10)18abc-1	0.93	40	23	4.1	17	186	227
(C-35-10)18bad-1	1.8	-	-	-	-	-	-
(C-35-11)8cdc-1	0.28	-	-	-	-	-	-
(C-35-11)8ddc-1	0.58	-	-	-	-	-	-
(C-35-11)9dba-1	0.98	62	40	2.2	14	-	-
(C-35-11)11ccc-1	10.4	83	55	4.3	29	161	197
(C-35-11)11ccc-3	0.40	-	-	-	-	-	-
(C-35-11)12add-1	0.83	44	23	5.3	17	191	233
(C-35-11)12ccc-2	10.9	58	37	5.4	18	167	206
(C-35-11)13dad-1	1.4	-	-	-	-	-	-
(C-35-11)14bca-1	19.5	180	102	5.0	66	210	256
(C-35-11)16aab-1	3.28	120	69	2.8	18	266	325
(C-35-11)25bcc-1	7.84	73	35	4.2	63	152	185
(C-35-11)26acd-1	6.59	92	56	4.2	34	313	382
(C-35-11)28aac-2	5.18	150	77	3.4	21	349	426
(C-35-11)29add-1	6.81	200	116	4.7	19	178	217
(C-35-11)29cab-1	6.5	-	-	-	-	-	-
(C-35-11)29dbd-2	2.45	300	146	5.7	31	401	500
(C-35-11)31acd-2	0.97	66	39	1.9	9.1	160	-
(C-35-11)31dbd-1	2.17	87	54	2.3	10	137	168
(C-35-11)34dbb-1	8.98	130	76	3.1	13	312	381
(C-35-12)26bca-1	0.34	99	65	2.8	41	170 L	-
(C-35-12)27bcd-1	0.26	-	-	-	-	-	-
(C-35-12)36ddd-1	0.25	50	33	2.2	15	162	197
(C-36-11)5aca-1	5.46	230	116	4.0	28	320	390
(C-36-11)5dab-1	3.52	120	69	3.5	23	310	478
(C-36-11)7aaa-2	3.95	160	97	3.6	28	312	381
(C-36-11)7adc-1	6.5	-	-	-	-	-	-
(C-36-11)11bac-1	6.51	290	147	4.2	36	236	288
(C-36-11)18bdd-1	4.05	150	83	3.6	66	182	222
(C-36-11)31abc-1	7.5	140	49	2.6	16	202	247
(C-36-12)2dbc-1	0.430	56	34	2.6	20	140	-
(C-36-12)3aad-2	0.61	62	36	2.6	23	160 L	-
(C-36-12)3acc-1	0.27	-	-	-	-	-	-
(C-36-12)9aac-1	0.39	53	25	3.0	19	130 L	-
(C-36-12)11abd-1	0.03	-	-	-	-	-	-
(C-36-12)21cbb-1	0.27	43	14	6.1	13	125 L	-
(C-36-12)25bdd-1	1.6	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Nitrogen, NO2+ NO3 dissolved (mg/L as N)	Calcium, dissolved (mg/L as Ca)	Magne-sium, dissolved (mg/L as Mg)	Potas-sium, dissolved (mg/L as K)	Sodium, dissolved (mg/L as Na)	Alkalinity, water, dissolved, (mg/L as $CaCO_3$)	Bicarbo-nate, water, dissolved, (mg/L as HCO_3)
(C-36-12)36adb	1.98	110	42	1.9	15	206 L	-
(C-37-12)4bbc-1	0.96	-	-	-	-	-	-
(C-37-12)9acc-1	1.06	51	6.4	3.4	14	130 L	-
(C-37-12)11aaa-1	0.90	-	-	-	-	-	-
(C-37-12)23abd-1	2.96	62	27	1.4	35	160 L	-
(C-37-12)23acb-1	1.8	77	34	1.9	38	149 L	-
(C-36-12)24ada-1	0.3	-	-	-	-	-	-
(C-35-11)3dcd	0.49	-	-	-	14.0	-	-
(C-36-12)29abb-1	-	-	-	-	11.0	-	-
(C-36-11)32ccb-1	-	-	-	-	9.0	-	-
(C-35-11)24dba-1	-	-	-	-	17.0	-	-
(C-35-11)24dba-2	6.15	-	-	-	-	-	-
(C-36-12)17ddd	2	-	-	-	15.0	-	-
(C-36-12)32ccb-2	0.42	-	-	-	10.0	-	-
(C-36-12)20acd	0.27	33.0	11.0	1.0	11.0	118.0	144.0
(C-36-11)30acc-1	1.04	-	-	-	23.0	-	-
(C-36-11)30acc-2	1.0	106.0	37	4.0	24.0	135.0	165.0
(C-35-11)10cdc	0.33	-	-	-	13.0	-	-
(C-35-10)18bda	1.1	-	-	-	18.0	-	-
(C-35-10)7ccc	1.1	-	-	-	17.0	-	-
(C-35-10)7caa	5	-	-	-	21.0	-	-
(C-36-12)15dbd	0.1	-	-	-		-	-
(C-36-12)24ada-2	1.04	-	-	-	15.0	-	-
(C-35-11)9ccc	0.36	53.0	34	2.0	12.0	157	192.0
(C-36-11)19ddd	3.8	-	-	-	9.0	-	-
(C-36-12)3acc-1	0.27	-	-	-	34.0	-	-
(C-35-11)9acd	0.95	-	-	-	15.0	-	-
(C-35-11)17dbc	0.18	-	-	-	-	-	-
(C-37-12)1bba-1	2.88	-	-	-	18.0	-	-
(C-37-12)1bba-2	-	68.0	-	2.0	18.0	189.0	230.0
(C-35-11)1cdc	0.7	36.0	-	5.0	18.0	185.0	225.0
(C-36-12)24cca	0.38	106.0	39	3.0	24.0	141.0	172.0
(C-36-12)3cdc	0.43	52.0	30.0	3.0	21.0	133.0	163.0
(C-36-11)7aba	3	-	-	-	264.0	-	-
(C-33-10)31ada-1	13.3	53	25	7.1	54	133	163
(C-33-11)30bca-1	.030	120	87	12	170	278	-
(C-33-11)31aad-1	0.040	25	31	7.7	180	197	241
(C-34-11)36dcc-3	0.521	46	30	4.8	31	187	228
(C-35-11)19dbb-1	0.050	63	43	3.1	30	111	135
(C-35-11)27dbb-1	3.03	120	54	2.7	17	423	516
(C-35-11)30caa-1	0.756	50	34	2.1	14	143	174
(C-35-11)33aac-1	6.50	160	66	3.0	15	254 L	-
(C-35-11)33abd-1	5.03	170	70	3.2	17	332	405
(C-35-11)33ccd-1	4.83	150	82	3.1	20	230	281
(C-35-12)36caa-1	0.277	54	39	2.9	23	133	162
(C-36-11)7cab-1	4.41	120	73	3.4	16	140	171

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Nitrogen, NO2+ NO3 dissolved (mg/L as N)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Potassium, dissolved (mg/L as K)	Sodium, dissolved (mg/L as Na)	Alkalinity, water, dissolved, (mg/L as $CaCO_3$)	Bicarbonate, water, dissolved, (mg/L as HCO_3)
(C-36-12)12dba-1	1.49	56	37	2.1	8.9	143	174
(C-37-12)11dac-1	1.06	55	.31	5.4	34	129	157
(C-37-12)34abb-1	1.10	100	35	2.0	15	311	379
(C-35-11)13ccb	12.6	-	-	-	-	-	-
(C-35-11)13cdb	17.4	-	-	-	-	-	-
(C-35-11)13ddb	13.4	-	-	-	-	-	-
(C-35-11)35bdd	32.9	-	-	-	-	-	-
(C-35-11)26dca	10.65	-	-	-	-	-	-
(C-35-11)26acd	10.42	-	-	-	-	-	-
(C-35-11)27aab	23.96	-	-	-	-	-	-
(C-35-11)22dcd	57.4	-	-	-	-	-	-
(C-35-11)22ddb	21.2	-	-	-	-	-	-
(C-35-11)22ada	11.6	-	-	-	-	-	-
(C-35-11)23cab	37.32	-	-	-	-	-	-
(C-35-11)23bdd-1	31.7	-	-	-	-	-	-
(C-35-11)23bdd-2	14.21	-	-	-	-	-	-
(C-35-11)23acd	34.6	-	-	-	-	-	-
(C-35-11)23abb	17.6	-	-	-	-	-	-
(C-35-11)24ccd	22.2	-	-	-	-	-	-
(C-35-11)24bdd	12.2	-	-	-	-	-	-
(C-35-11)26bbb	11.4	-	-	-	-	-	-
(C-35-11)22dad	13.12	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Chloride, dissoved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Hydroxide (mg/L)	Silica, dissolved (mg/L as SiO_2)	Sulfate, dissolved (mg/L as SiO_4)	Phosphorous, dissolved (mg/L as P)	Solids, sum of constituents dissolved (mg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	490
(C-34-11)9ccd-1	-	-	-	-	-	-	483
(C-34-11)14aad-2	100	0.55	-	37	120	0.034 E	567
(C-34-11)21dcd-1	16	0.38	-	23	250	<0.050	525
(C-34-11)23bdd-1	-	-	-	-	-	-	929
(C-34-11)36dcc-2	-	-	-	-	-	-	342
(C-35-10)6bad-1	-	-	-	-	-	-	276
(C-35-10)18abc-1	14	0.39	-	42	28	0.036 E	285
(C-35-10)18bad-1	-	-	-	-	-	-	284
(C-35-11)8cdc-1	-	-	-	-	-	-	454
(C-35-11)8ddc-1	-	-	-	-	-	-	380
(C-35-11)9dba-1	9.0	0.29	-	23	170	<0.010	428
(C-35-11)11ccc-1	37	0.23	-	35	260	<0.050	644
(C-35-11)11ccc-3	-	-	-	-	-	-	548
(C-35-11)12add-1	13	0.23	-	48	35	<0.050	303
(C-35-11)12ccc-2	46	0.35	-	45	74	<0.50	434
(C-35-11)13dad-1	-	-	-	-	-	-	869
(C-35-11)14bca-1	130	0.38	-	35	550	<0.050	1280
(C-35-11)16aab-1	24	0.22	-	23	330	<0.050	761
(C-35-11)25bcc-1	43	0.25	-	27	250	0.034	616
(C-35-11)26acd-1	27	0.21	-	32	180	<0.050	643
(C-35-11)28aac-2	25	0.19	-	23	320	<0.050	855
(C-35-11)29add-1	27	0.17	-	22	770	<0.050	1300
(C-35-11)29cab-1	-	-	-	-	-	-	1460
(C-35-11)29dbd-2	35	0.21	-	21	1,000	<0.050	1790
(C-35-11)31acd-2	10	0.30	-	21	170	0.010	418
(C-35-11)31dbd-1	16	0.23	-	22	290	<0.050	578
(C-35-11)34dbb-1	120	0.21	-	22	150	<0.050	735
(C-35-12)26bca-1	34	0.47	-	22	360	<0.050	730
(C-35-12)27bcd-1	-	-	-	-	-	-	492
(C-35-12)36ddd-1	6.6	0.31	-	23	120	<0.050	343
(C-36-11)5aca-1	36	0.21	-	22	700	<0.050	1,350
(C-36-11)5dab-1	23	0.25	-	21	290	<0.050	797
(C-36-11)7aaa-2	36	0.22	-	26	490	<0.050	1040
(C-36-11)7adc-1	-	-	-	-	-	-	990
(C-36-11)11bac-1	29	0.23	-	23	1,100	<0.050	1820
(C-36-11)18bdd-1	61	0.25	-	33	530	<0.050	1050
(C-36-11)31abc-1	22	0.15	-	24	350	<0.050	758
(C-36-12)2dbc-1	8.4	0.32	-	24	160	<0.050	396
(C-36-12)3aad-2	11	0.30	-	24	180	<0.050	438
(C-36-12)3acc-1	-	-	-	-	-	-	384
(C-36-12)9aac-1	10	0.15	-	33	130	<0.050	352
(C-36-12)11abd-1	-	-	-	-	-	-	398
(C-36-12)21cbb-1	11	0.30	-	45	59	0.020	268
(C-36-12)25bdd-1	-	-	-	-	-	-	492

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Chloride, dissoved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Hydrox-ide (mg/L)	Silica, dissolved (mg/L as SiO_2)	Sulfate, dissolved (mg/L as SiO_4)	Phos-phorous, dissolved (mg/L as P)	Solids, sum of consti-tuents dissolved (mg/L)
(C-36-12)36adb	7.2	0.11	-	20	180	<0.050	570
(C-37-12)4bbc-1	-	-	-	-	-	-	184
(C-37-12)9acc-1	26	0.20	-	52	11	<0.050	248
(C-37-12)11aaa-1	-	-	-	-	-	-	408
(C-37-12)23abd-1	36	0.10	-	19	110	-	400
(C-37-12)23acb-1	49	<0.10	-	19	190	0.010	506
(C-36-12)24ada-1	-	-	-	-	-	-	711
(C-35-11)3dcd	-	0.26	-	-	151.0	-	416
(C-36-12)29abb-1	-	0.20	-	-	18.0	-	236
(C-36-11)32ccb-1	-	<0.10	-	-	<5.0	-	184
(C-35-11)24dba-1	-	0.30	-	-	30	-	320
(C-35-11)24dba-2	-	0.26	-	-	67	-	388
(C-36-12)17ddd	-	0.20	-	-	62	-	296
(C-36-12)32ccb-2	-	0.11	-	-	<10	-	136
(C-36-12)20acd	11.0	0.24	0.00	37.0	23	<0.01	210
(C-36-11)30acc-1	-	0.31	-	-	339.0	-	670
(C-36-11)30acc-2	11.0	0.38	0.00	29.0	289.0	0.05	610
(C-35-11)10cdc	-	0.25	-	-	178.0	-	432
(C-35-10)18bda	-	0.30	-	-	30.0	-	256
(C-35-10)7ccc	-	0.20	-	-	29.0	-	272
(C-35-10)7caa	-	0.20	-	-	63.0	-	424
(C-36-12)15dbd	-	0.64	-	-	1420.0	-	2190
(C-36-12)24ada-2	-	0.32	-	-	295.0	-	605
(C-35-11)9ccc	9.0	0.26	0.00	25.0	130.0	<0.01	362
(C-36-11)19ddd	-	0.24	-	-	482.0	-	1030
(C-36-12)3acc-1	8.0	0.04	-	-	108.0	-	276
(C-35-11)9acd	-	0.30	-	-	165.0	-	410
(C-35-11)17dbc	-	-	-	-	-	-	406
(C-37-12)1bba-1	-	0.17	-	-	185.0	-	560
(C-37-12)1bba-2	7.0	0.24	-	27.0	155.0	<0.03	435
(C-35-11)1cdc	11.0	0.32	0.03	-	34.0	<0.05	300
(C-36-12)24cca	13.0	0.34	0.00	30.0	295.0	<0.01	435
(C-36-12)3cdc	7.0	0.30	<1.00	28.0	136.0	0.01	308
(C-36-11)7aba	-	0.29	-	-	508.0	-	925
(C-33-10)31ada-1	92	0.37	-	45	53	<0.50	468
(C-33-11)30bca-1	130	0.70	-	43	520	-	1,250
(C-33-11)31aad-1	91	1.1	-	61	280	0.051	795
(C-34-11)36dcc-3	37	0.40	-	41	67	-	369
(C-35-11)19dbb-1	15	0.29	-	21	270	-	512
(C-35-11)27dbb-1	11	0.20	-	23	130	-	614
(C-35-11)30caa-1	11	0.28	-	23	130	<0.050	346
(C-35-11)33aac-1	15	0.20	-	16	390	0.020	846
(C-35-11)33abd-1	21	0.16	-	20	360	-	860
(C-35-11)33ccd-1	13	0.23	-	20	480	-	903
(C-35-12)36caa-1	12	0.29	-	29	190	-	427
(C-36-11)7cab-1	25	0.27	-	25	410	-	754

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Table B1. *continued*

WELL LOCATION	Boron, dissolved (µg/L as B)	Bromide, dissolved (mg/L as Br)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)	Carbon Dioxide (mg/L)	Carbon-ate (mg/L)	Carbon-ate Solids (mg/L)	Turbidity (mg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-	-
(C-34-11)14aad-2	130	0.18	<10	<3.0	-	-	-	-
(C-34-11)21dcd-1	126	0.050	22	2.9 E	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-	-
(C-35-10)18abc-1	62	0.052	<10	<2.2	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-	-
(C-35-11)9dba-1	48	-	<10	<4.0	-	-	-	-
(C-35-11)11ccc-1	60	0.16	<10	<2.2	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-	-
(C-35-11)12add-1	52	0.080	<10	<3.0	-	-	-	-
(C-35-11)12ccc-2	73	0.22	<10	<2.2	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-	-
(C-35-11)14bca-1	141	0.52	<10	<2.2	-	-	-	-
(C-35-11)16aab-1	67	0.072	<10	<3.0	-	-	-	-
(C-35-11)25bcc-1	76	0.13	<10	111	-	-	-	-
(C-35-11)26acd-1	139	0.13	<10	<2.2	-	-	-	-
(C-35-11)28aac-2	71	0.061	<10	<3.0	-	-	-	-
(C-35-11)29add-1	36	0.082	<10	<2.2	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-	-
(C-35-11)29dbd-2	93	0.087	<30	<2.2	-	-	-	-
(C-35-11)31acd-2	30	-	-	-	-	-	-	-
(C-35-11)31dbd-1	31	0.075	<10	<2.2	-	-	-	-
(C-35-11)34dbb-1	99	0.11	<10	<3.0	-	-	-	-
(C-35-12)26bca-1	119	0.14	8.9 E	2.0 E	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-	-
(C-35-12)36ddd-1	52	0.022	<10	8.8	-	-	-	-
(C-36-11)5aca-1	95	0.11	<10	<3.0	-	-	-	-
(C-36-11)5dab-1	109	0.067	8.5 E	<3.0	-	-	-	-
(C-36-11)7aaa-2	100	0.095	<10	<3.0	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-	-
(C-36-11)11bac-1	270	0.10	<30	<2.2	-	-	-	-
(C-36-11)18bdd-1	176	0.23	<10	<3.0	-	-	-	-
(C-36-11)31abc-1	75	0.13	<10	1.4 E	-	-	-	-
(C-36-12)2dbc-1	81	0.039	<10	<3.0	-	-	-	-
(C-36-12)3aad-2	92	0.041	<10	<3.0	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-36-12)9aac-1	67	0.054	<10	<3.0	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-	-
(C-36-12)21cbb-1	40	-	22	7.0	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-	-

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Table B1. *continued*

WELL LOCATION	Chloride, dissoved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Hydroxide (mg/L)	Silica, dissolved (mg/L as SiO_2)	Sulfate, dissolved (mg/L as SiO_4)	Phosphorous, dissolved (mg/L as P)	Solids, sum of constituents dissolved (mg/L)
(C-36-12)12dba-1	14	.34	-	24	130	-	362
(C-37-12)11dac-1	31	0.18	-	48	150	-	433
(C-37-12)34abb-1	7.3	0.19	-	18	120	<0.050	497
(C-35-11)13ccb	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-

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Table B1. *continued*

WELL LOCATION	Boron, dissolved (µg/L as B)	Bromide, dissolved (mg/L as Br)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)	Carbon Dioxide (mg/L)	Carbon-ate (mg/L)	Carbon-ate Solids (mg/L)	Turbidity (mg/L)
(C-36-12)36adb	86	0.064	<10	<2.2	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-	-
(C-37-12)9acc-1	48	-	<10	<3.0	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-	-
(C-37-12)23abd-1	92	-	<10	<3.0	-	-	-	-
(C-37-12)23acb-1	100	-	12	1.0	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-	-
(C-35-11)3dcd	-	-	-	-	-	-	-	<0.5
(C-36-12)29abb-1	-	-	-	-	-	-	-	<0.5
(C-36-11)32ccb-1	-	-	-	-	-	-	-	0.6
(C-35-11)24dba-1	-	-	-	-	-	-	-	0.9
(C-35-11)24dba-2	-	-	-	-	-	-	-	0.6
(C-36-12)17ddd	-	-	-	-	-	-	-	1.6
(C-36-12)32ccb-2	-	-	-	-	-	-	-	0.2
(C-36-12)20acd	-	-	0.11	6.5	2.0	0	71.0	0.5
(C-36-11)30acc-1	-	-	-	-	-	-	-	<0.5
(C-36-11)30acc-2	-	-	2.50	48.0	4.0	0	81.0	19.3
(C-35-11)10cdc	-	-	-	-	-	-	-	<0.5
(C-35-10)18bda	-	-	-	-	-	-	-	<0.5
(C-35-10)7ccc	-	-	-	-	-	-	-	<0.5
(C-35-10)7caa	-	-	-	-	-	-	-	<0.5
(C-36-12)15dbd	-	-	-	-	-	-	-	<0.5
(C-36-12)24ada-2	-	-	-	-	-	-	-	<0.5
(C-35-11)9ccc	-	-	<0.02	<5.0	2.0	0	94.0	0.2
(C-36-11)19ddd	-	-	-	-	-	-	-	<0.5
(C-36-12)3acc-1	-	-	-	0.5	-	-	-	275.0
(C-35-11)9acd	-	-	-	-	-	-	-	<0.5
(C-35-11)17dbc	-	-	-	-	-	-	-	-
(C-37-12)1bba-1	-	-	-	-	-	-	-	0.3
(C-37-12)1bba-2	-	-	-	-	9.0	-	113.0	<0.5
(C-35-11)1cdc	-	-	0.54	29.0	2.0	3.0	-	22.0
(C-36-12)24cca	-	-	0.10	26.0	4.0	0	85.0	1.3
(C-36-12)3cdc	-	-	0.23	<10.0	119.0	<1.0		2.2
(C-36-11)7aba	-	-	-	-	-	-	-	<0.5
(C-33-10)31ada-1	102	0.36	<10	<2.2	-	-	-	-
(C-33-11)30bca-1	340	-	80	480	-	-	-	-
(C-33-11)31aad-1	319	0.031	130	20	-	-	-	-
(C-34-11)36dcc-3	62	0.057	<10	<3.0	-	-	-	-
(C-35-11)19dbb-1	102	0.024	5.8 E	5.5	-	-	-	-
(C-35-11)27dbb-1	123	0.036	<10	<3.0	-	-	-	-
(C-35-11)30caa-1	37	0.041	7.5 E	<3.0	-	-	-	-
(C-35-11)33aac-1	50	-	<3.0	<1.0	-	-	-	-
(C-35-11)33abd-1	60	0.044	<10	<3.0	-	-	-	-
(C-35-11)33ccd-1	118	0.055	7.5 E	<3.0	-	-	-	-
(C-35-12)36caa-1	83	0.20	<10	<3.0	-	-	-	-
(C-36-11)7cab-1	30	0.093	9.0 E	<3.0	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Boron, dissolved (µg/L as B)	Bromide, dissolved (mg/L as Br)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)	Carbon Dioxide (mg/L)	Carbon-ate (mg/L)	Carbon-ate Solids (mg/L)	Turbidity (mg/L)
(C-36-12)12dba-1	28	0.060	<10	<3.0	-	-	-	-
(C-37-12)11dac-1	114	0.17	10	1.6 E	-	-	-	-
(C-37-12)34abb-1	57	0.043	<10	<2.2	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Arsenic (µg/L)	Barium (mg/L)	Cad-mium (µg/L)	Chrom-ium (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selen-ium (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Arsenic (µg/L)	Barium (mg/L)	Cad-mium (µg/L)	Chrom-ium (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selen-ium (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-	-	-
(C-35-11)3dcd	<5.0	<0.10	<1	<7.0	<50.0	<5.0	<0.2	<10.0	<2.0
(C-36-12)29abb-1	6.0	0.06	<1	<5.0	-	<5.0	0.5	<10.0	5.0
(C-36-11)32ccb-1	<5.0	0.02	<1	<5.0	-	-	0.4	<10.0	3.0
(C-35-11)24dba-1	6.0	0.07	-	<5.0	-	-	0.4	<10.0	<2.0
(C-35-11)24dba-2	-	-	<1	-	-	-	-	-	-
(C-36-12)17ddd	5.0	0.07	<1	<5.0	-	-	0.5	<10.0	3.0
(C-36-12)32ccb-2	<5.0	<0.10	<1	<10.0	<50.0	<5.0	<0.2	<10.0	<2.0
(C-36-12)20acd	<5.0	0.05	<1	<5.0	<12.0	<3.0	<0.2	<10.0	<1.0
(C-36-11)30acc-1	<5.0	<0.10	<1	<7.0	<50.0	<5.0	<0.2	<10.0	<2.0
(C-36-11)30acc-2	<5.0	0.03	<1	<5.0	<12.0	<3.0	<0.2	<10.0	1.3
(C-35-11)10cdc	<5.0	<0.10	<1	<7.0	<50.0	<5.0	<0.2	<10.0	<2.0
(C-35-10)18bda	3.7	0.08	<1	<5.0	-	-	<0.2	<10.0	1.1
(C-35-10)7ccc	3.5	0.08	<1	<5.0	-	-	<0.2	<10.0	0.9
(C-35-10)7caa	4.7	0.16	<1	<5.0	-	-	<0.2	<10.0	3.6
(C-36-12)15dbd	7.8	<0.10	<1	<7.0	<50.0	<5.0	<0.2	<10.0	<2.0
(C-36-12)24ada-2	<5.0	<0.10	<1	<7.0	<50.0	<5.0	<0.2	<10.0	<2.0
(C-35-11)9ccc	<5.0	0.02	<1	<5.0	<20.0	<5.0	<0.2	-	<1.0
(C-36-11)19ddd	<5.0	<0.10	<1	<7.0	<50.0	<5.0	<0.2	22.0	<2.0
(C-36-12)3acc-1	-	-	0.02	1.0	1.0	-	-	-	-
(C-35-11)9acd	<5.0	<0.10	<1	<7.0	<50.0	<5.0	<0.2	<10.0	<2.0
(C-35-11)17dbc	-	-	-	-	-	-	-	-	-
(C-37-12)1bba-1	3.0	<0.10	<2	<10.0	10.0	<1.0	<1.0	<10.0	2.0
(C-37-12)1bba-2	<5.0	<0.10	<1	<7.0	<50.0	<5.0	<0.2	<10.0	<2.0
(C-35-11)1cdc	5.8	0.10	<1	4.9	14.0	2.4	<0.2	<5.0	<5.0
(C-36-12)24cca	<5.0	0.01	<1	<5.0	<12.0	<3.0	<0.2	<10.0	1.7
(C-36-12)3cdc	<5.0	0.05	<1	<5.0	<10.0	<5.0	<0.2	<10.0	<2.0
(C-36-11)7aba	<5.0	<0.10	<1	<7.0	<50.0	<5.0	<0.2	<10.0	<2.0
(C-33-10)31ada-1	-	-	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-	-	-

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Table B1. *continued*

WELL LOCATION	Arsenic (µg/L)	Barium (mg/L)	Cad-mium (µg/L)	Chrom-ium (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selen-ium (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Silver (µg/L)	Uranium (µg/L)	Zinc (µg/L)	Anti-mony (µg/L)	Berylium (µg/L)	Thallium (µg/L)	Cyanide (µg/L)	Vinyl Chloride (µg/L)	Benzene (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Silver (µg/L)	Uranium (µg/L)	Zinc (µg/L)	Anti-mony (µg/L)	Berylium (µg/L)	Thallium (µg/L)	Cyanide (µg/L)	Vinyl Chloride (µg/L)	Benzene (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-	-	-
(C-35-11)3dcd	-	-	-	<3.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-36-12)29abb-1	-	-	-	<2.0	<1.0	<1.0	<2.0	-	-
(C-36-11)32ccb-1	-	-	-	<2.0	<1.0	<1.0	<2.0	-	-
(C-35-11)24dba-1	-	-	-	<2.0	-	-	<50.0	-	-
(C-35-11)24dba-2	-	-	-	-	<1.0	<1.0	<2.0	<0.5	<0.5
(C-36-12)17ddd	-	-	-	<2.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-36-12)32ccb-2	-	-	-	<3.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-36-12)20acd	<2.0	-	32.0	<3.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-36-11)30acc-1	-	-	-	<3.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-36-11)30acc-2	<2.0	-	<30.0	<3.0	<1.0	<1.0	<50.0	-	-
(C-35-11)10cdc	-	-	-	<3.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-35-10)18bda	-	-	-	<0.5	<1.0	<0.5	<2.0	<0.5	<0.5
(C-35-10)7ccc	-	-	-	<0.5	<1.0	<0.5	<2.0	<0.5	<0.5
(C-35-10)7caa	-	-	-	<0.5	<1.0	<0.5	<2.0	<0.5	<0.5
(C-36-12)15dbd	-	-	-	<3.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-36-12)24ada-2	-	-	-	<3.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-35-11)9ccc	<2.0	-	37.0	-	-	-	-	<0.5	<0.1
(C-36-11)19ddd	-	-	-	<3.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-36-12)3acc-1	-	-	5.0	-	-	-	-	<0.5	<0.5
(C-35-11)9acd	-	-	-	<3.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-35-11)17dbc	-	-	-	-	-	-	-	<0.5	<0.5
(C-37-12)1bba-1	-	-	-	<1.0	<1.0	<1.0	<20.0	<0.5	<0.5
(C-37-12)1bba-2	-	-	210.0	<3.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-35-11)1cdc	<5.0	-	23.0	<1.0	<1.0	<1.0	<25.0	<0.5	<0.5
(C-36-12)24cca	<2.0	-	1300.0	<3.0	<1.0	<1.0	<50.0	-	-
(C-36-12)3cdc	<0.5	-	<10.0	<2.0	<1.0	<1.0	<10.0	<0.5	<0.5
(C-36-11)7aba	-	-	-	<3.0	<1.0	<1.0	<50.0	<0.5	<0.5
(C-33-10)31ada-1	-	-	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. continued

WELL LOCATION	Silver (μg/L)	Uranium (μg/L)	Zinc (μg/L)	Anti-mony (μg/L)	Berylium (μg/L)	Thallium (μg/L)	Cyanide (μg/L)	Vinyl Chloride (μg/L)	Benzene (μg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Carbon Tetra-chloride (µg/L)	1,2-Di-chloro-ethane (µg/L)	Tri-chloro-ethane (µg/L)	Para-Di-chloro-benzene (µg/L)	1,1-Di-chloro-ethylene (µg/L)	1,1,1-Tri-chloro-ethane (µg/L)	CIS-1,2-Dichloro-ethylene (µg/L)	1,2-Di-chloro-propane (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Carbon Tetra-chloride (µg/L)	1,2-Di-chloro-ethane (µg/L)	Tri-chloro-ethane (µg/L)	Para-Di-chloro-benzene (µg/L)	1,1-Di-chloro-ethylene (µg/L)	1,1,1-Tri-chloro-ethane (µg/L)	CIS-1,2-Dichloro-ethylene (µg/L)	1,2-Di-chloro-propane (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-	-
(C-35-11)3dcd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)29abb-1	-	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)17ddd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)32ccb-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)20acd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-11)30acc-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-11)30acc-2	-	-	-	-	-	-	-	-
(C-35-11)10cdc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-10)18bda	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-10)7ccc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-10)7caa	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)15dbd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)24ada-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)9ccc	<0.1	<0.1	<0.2	<0.1	<0.1	<0.5	<0.1	<0.5
(C-36-11)19ddd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)3acc-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)9acd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)17dbc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-37-12)1bba-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-37-12)1bba-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)1cdc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)24cca	-	-	-	-	-	-	-	-
(C-36-12)3cdc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-11)7aba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-33-10)31ada-1	-	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Carbon Tetra-chloride (µg/L)	1,2-Di-chloro-ethane (µg/L)	Tri-chloro-ethane (µg/L)	Para-Di-chloro-benzene (µg/L)	1,1-Di-chloro-ethylene (µg/L)	1,1,1-Tri-chloro-ethane (µg/L)	CIS-1,2-Dichloro-ethylene (µg/L)	1,2-Di-chloro-propane (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Ethylben-zene (µg/L)	Mono-chloro-benzene (µg/L)	O-dichloro-benzene (µg/L)	Styrene (µg/L)	Tetra-chloro-ethylene (µg/L)	Toluene (µg/L)	Trans-1,2-Dichloro-ethylene (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Ethylbenzene (µg/L)	Mono-chloro-benzene (µg/L)	O-dichloro-benzene (µg/L)	Styrene (µg/L)	Tetra-chloro-ethylene (µg/L)	Toluene (µg/L)	Trans-1,2-Dichloro-ethylene (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-
(C-35-11)3dcd	<0.5	<0.5	<0.5	<0.5	<0.5	4.5	<0.5
(C-36-12)29abb-1	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-
(C-35-11)24dba-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)17ddd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)32ccb-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)20acd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-11)30acc-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-11)30acc-2	-	-	-	-	-	-	-
(C-35-11)10cdc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-10)18bda	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-10)7ccc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-10)7caa	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)15dbd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)24ada-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)9ccc	<0.2	<0.1	<0.1	<0.5	<0.5	<0.1	<0.5
(C-36-11)19ddd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)3acc-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)9acd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)17dbc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-37-12)1bba-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-37-12)1bba-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)1cdc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)24cca	-	-	-	-	-	-	-
(C-36-12)3cdc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-11)7aba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-33-10)31ada-1	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Ethylbenzene (µg/L)	Mono-chloro-benzene (µg/L)	O-dichloro-benzene (µg/L)	Styrene (µg/L)	Tetra-chloro-ethylene (µg/L)	Toluene (µg/L)	Trans-1,2-Dichloro-ethylene (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

***Table B1.** continued*

WELL LOCATION	Xylene (Total) (µg/L)	Dichloro-methane (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,1,2-Tri-chloro-ethane (µg/L)	Alachlor (µg/L)	Aldicarb (µg/L)	Aldicarb Sulfoxide (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Xylene (Total) (µg/L)	Dichloro-methane (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,1,2-Tri-chloro-ethane (µg/L)	Alachlor (µg/L)	Aldicarb (µg/L)	Aldicarb Sulfoxide (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-
(C-35-11)3dcd	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-36-12)29abb-1	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-
(C-35-11)24dba-2	<0.5	<0.5	<0.5	<0.5	<0.4	<1.0	<2.0
(C-36-12)17ddd	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-36-12)32ccb-2	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-36-12)20acd	<0.5	<0.5	<0.5	<0.5	<0.4	<1.0	<2.0
(C-36-11)30acc-1	1.6	<0.5	<0.5	<0.5	-	-	-
(C-36-11)30acc-2	-	-	-	-	-	-	-
(C-35-11)10cdc	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-35-10)18bda	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-35-10)7ccc	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-35-10)7caa	<0.5	<0.5	<0.5	<0.5	<0.4	<1.0	<2.0
(C-36-12)15dbd	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-36-12)24ada-2	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-35-11)9ccc	<0.2	<0.5	<0.2	<0.1	-	-	-
(C-36-11)19ddd	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-36-12)3acc-1	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-35-11)9acd	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-35-11)17dbc	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-37-12)1bba-1	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-37-12)1bba-2	<0.5	<0.5	<0.5	<0.5	-	-	-
(C-35-11)1cdc	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
(C-36-12)24cca	-	-	-	-	<0.1	<1.0	<0.7
(C-36-12)3cdc	<0.5	<0.5	<0.5	<0.5	<0.4	<1.0	<2.0
(C-36-11)7aba	<0.5	<0.5	<0.5	<0.5	<0.4	<0.5	<2.0
(C-33-10)31ada-1	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Xylene (Total) (µg/L)	Dichloro-methane (µg/L)	1,2,4-Tri-chloro-benzene (µg/L)	1,1,2-Tri-chloro-ethane (µg/L)	Alachlor (µg/L)	Aldicarb (µg/L)	Aldicarb Sulfoxide (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Aldicarb Sulfone (μg/L)	Atrazine (μg/L)	Carbo-furan (μg/L)	Chlor-dane (μg/L)	Dibromo-chloro-propane (μg/L)	2,4-D (μg/L)	Ethylene Di-bromide (μg/L)	Hepta-chlor (μg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Aldicarb Sulfone (µg/L)	Atrazine (µg/L)	Carbo-furan (µg/L)	Chlor-dane (µg/L)	Dibromo-chloro-propane (µg/L)	2,4-D (µg/L)	Ethylene Di-bromide (µg/L)	Hepta-chlor (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-	-
(C-35-11)3dcd	-	-	-	-	-	-	-	-
(C-36-12)29abb-1	-	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-2	<2.0	<0.2	<1.5	<0.2	-	<0.2	-	<0.1
(C-36-12)17ddd	-	-	-	-	-	-	-	-
(C-36-12)32ccb-2	-	-	-	-	-	-	-	-
(C-36-12)20acd	<2.0	<0.2	<2.0	<0.4	-	<0.2	-	<0.1
(C-36-11)30acc-1	-	-	-	-	-	-	-	-
(C-36-11)30acc-2	-	-	-	-	-	-	-	-
(C-35-11)10cdc	-	-	-	-	-	-	-	-
(C-35-10)18bda	-	-	-	-	-	-	-	-
(C-35-10)7ccc	-	-	-	-	-	-	-	-
(C-35-10)7caa	<2.0	<0.2	<2.0	<0.4	-	<0.2	-	<0.1
(C-36-12)15dbd	-	-	-	-	-	-	-	-
(C-36-12)24ada-2	-	-	-	-	-	-	-	-
(C-35-11)9ccc	-	-	-	-	-	-	-	-
(C-36-11)19ddd	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-35-11)9acd	-	-	-	-	-	-	-	-
(C-35-11)17dbc	-	-	-	-	-	-	-	-
(C-37-12)1bba-1	-	-	-	-	-	-	-	-
(C-37-12)1bba-2	-	-	-	-	-	-	-	-
(C-35-11)1cdc	<0.8	<0.1	<0.9	<0.1	-	<0.1	-	<0.1
(C-36-12)24cca	<0.4	<0.1	<0.7	<0.1	-	<0.2	-	<0.1
(C-36-12)3cdc	<2.0	<0.2	<1.5	<0.2	-	<0.2	-	<0.1
(C-36-11)7aba	<2.0	<0.2	<2.0	<0.4	-	<0.2	-	<0.1
(C-33-10)31ada-1	-	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Aldicarb Sulfone (µg/L)	Atrazine (µg/L)	Carbo-furan (µg/L)	Chlor-dane (µg/L)	Dibromo-chloro-propane (µg/L)	2,4-D (µg/L)	Ethylene Di-bromide (µg/L)	Hepta-chlor (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Hepta-chlor Epoxide (µg/L)	Lindane (µg/L)	Methoxy-chlor (µg/L)	Polychlor-inated Bi-phenyls (µg/L)	Penta-chloro-phenol (µg/L)	Toxa-phene (µg/L)	2,4,5-TP (µg/L)	Benzo (A) Pyrene (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Hepta-chlor Epoxide (µg/L)	Lindane (µg/L)	Methoxy-chlor (µg/L)	Polychlor-inated Bi-phenyls (µg/L)	Penta-chloro-phenol (µg/L)	Toxa-phene (µg/L)	2,4,5-TP (µg/L)	Benzo (A) Pyrene (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-	-
(C-35-11)3dcd	-	-	-	-	-	-	-	-
(C-36-12)29abb-1	-	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-2	<0.1	<0.1	<0.2	<0.1	<0.1	<2.2	<0.4	<0.1
(C-36-12)17ddd	-	-	-	-	-	-	-	-
(C-36-12)32ccb-2	-	-	-	-	-	-	-	-
(C-36-12)20acd	<0.1	<0.1	<0.2	<0.1	<0.1	<2.2	<0.4	<0.1
(C-36-11)30acc-1	-	-	-	-	-	-	-	-
(C-36-11)30acc-2	-	-	-	-	-	-	-	-
(C-35-11)10cdc	-	-	-	-	-	-	-	-
(C-35-10)18bda	-	-	-	-	-	-	-	-
(C-35-10)7ccc	-	-	-	-	-	-	-	-
(C-35-10)7caa	<0.1	<0.1	<0.2	<0.1	<0.1	<2.2	<0.4	<0.1
(C-36-12)15dbd	-	-	-	-	-	-	-	-
(C-36-12)24ada-2	-	-	-	-	-	-	-	-
(C-35-11)9ccc	-	-	-	-	-	-	-	-
(C-36-11)19ddd	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-35-11)9acd	-	-	-	-	-	-	-	-
(C-35-11)17dbc	-	-	-	-	-	-	-	-
(C-37-12)1bba-1	-	-	-	-	-	-	-	-
(C-37-12)1bba-2	-	-	-	-	-	-	-	-
(C-35-11)1cdc	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.2	<0.1
(C-36-12)24cca	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<0.4	<0.1
(C-36-12)3cdc	<0.1	<0.1	<0.2	<0.1	<0.1	<2.2	<0.4	<0.1
(C-36-11)7aba	<0.1	<0.1	<0.2	<0.1	<0.1	<2.2	<0.4	<0.1
(C-33-10)31ada-1	-	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Hepta-chlor Epoxide (µg/L)	Lindane (µg/L)	Methoxy-chlor (µg/L)	Polychlor-inated Bi-phenyls (µg/L)	Penta-chloro-phenol (µg/L)	Toxa-phene (µg/L)	2,4,5-TP (µg/L)	Benzo (A) Pyrene (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Dalapon (µg/L)	Di (2-Ethyl-hexyl) Adipate (µg/L)	Di (2-Ethyl-hexyl) Phthal-ate (µg/L)	Dinoseb (µg/L)	Diquat (µg/L)	Endo-thall (µg/L)	Endrin (µg/L)	Glypho-sate (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

***Table B1.** continued*

WELL LOCATION	Dalapon (µg/L)	Di (2-Ethyl-hexyl) Adipate (µg/L)	Di (2-Ethyl-hexyl) Phthal-ate (µg/L)	Dinoseb (µg/L)	Diquat (µg/L)	Endo-thall (µg/L)	Endrin (µg/L)	Glypho-sate (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-	-
(C-35-11)3dcd	-	-	-	-	-	-	-	-
(C-36-12)29abb-1	-	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-2	<2.2	<1.3	<1.3	<0.4	-	-	<0.1	-
(C-36-12)17ddd	-	-	-	-	-	-	-	-
(C-36-12)32ccb-2	-	-	-	-	-	-	-	-
(C-36-12)20acd	<2.2	<1.3	<1.3	<0.4	-	-	<0.1	-
(C-36-11)30acc-1	-	-	-	-	-	-	-	-
(C-36-11)30acc-2	-	-	-	-	-	-	-	-
(C-35-11)10cdc	-	-	-	-	-	-	-	-
(C-35-10)18bda	-	-	-	-	-	-	-	-
(C-35-10)7ccc	-	-	-	-	-	-	-	-
(C-35-10)7caa	<2.2	<1.3	<1.3	<0.4	-	-	<0.1	-
(C-36-12)15dbd	-	-	-	-	-	-	-	-
(C-36-12)24ada-2	-	-	-	-	-	-	-	-
(C-35-11)9ccc	-	-	-	-	-	-	-	-
(C-36-11)19ddd	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-35-11)9acd	-	-	-	-	-	-	-	-
(C-35-11)17dbc	-	-	-	-	-	-	-	-
(C-37-12)1bba-1	-	-	-	-	-	-	-	-
(C-37-12)1bba-2	-	-	-	-	-	-	-	-
(C-35-11)1cdc	<1.0	<0.6	<0.1	<0.2	-	-	<0.1	-
(C-36-12)24cca	<2.2	<0.6	<0.3	<0.4	-	-	<0.2	-
(C-36-12)3cdc	<2.2	<1.3	<1.3	<0.4	-	-	<0.1	-
(C-36-11)7aba	<2.2	<1.3	<1.3	<0.4	-	-	<0.1	-
(C-33-10)31ada-1	-	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Dalapon (µg/L)	Di (2-Ethyl-hexyl) Adipate (µg/L)	Di (2-Ethyl-hexyl) Phthal-ate (µg/L)	Dinoseb (µg/L)	Diquat (µg/L)	Endo-thall (µg/L)	Endrin (µg/L)	Glypho-sate (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Hexa-chloro-benzene (µg/L)	Hexa-chloro-penta-diene (µg/L)	Oxamyl (Vydate) (µg/L)	Picloram (µg/L)	Simazine (µg/L)	2,3,7,8-TCDD (Dioxin) (µg/L)	Chloro-form (µg/L)	Bromo-dichloro-methane (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Hexa-chloro-benzene (µg/L)	Hexa-chloro-penta-diene (µg/L)	Oxamyl (Vydate) (µg/L)	Picloram (µg/L)	Simazine (µg/L)	2,3,7,8-TCDD (Dioxin) (µg/L)	Chloro-form (µg/L)	Bromo-dichloro-methane (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-	-
(C-35-11)3dcd	-	-	-	-	-	-	<0.5	<0.5
(C-36-12)29abb-1	-	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-2	<0.2	<0.2	<2.0	<0.2	<0.2	-	<0.5	<0.5
(C-36-12)17ddd	-	-	-	-	-	-	<0.5	<0.5
(C-36-12)32ccb-2	-	-	-	-	-	-	<0.5	<0.5
(C-36-12)20acd	<0.2	<0.2	<2.0	<0.2	<0.2	-	<0.5	<0.5
(C-36-11)30acc-1	-	-	-	-	-	-	<0.5	<0.5
(C-36-11)30acc-2	-	-	-	-	-	-	-	-
(C-35-11)10cdc	-	-	-	-	-	-	<0.5	<0.5
(C-35-10)18bda	-	-	-	-	-	-	<0.5	<0.5
(C-35-10)7ccc	-	-	-	-	-	-	<0.5	<0.5
(C-35-10)7caa	<0.2	<0.2	<2.0	<0.2	<0.2	-	<0.5	<0.5
(C-36-12)15dbd	-	-	-	-	-	-	<0.5	<0.5
(C-36-12)24ada-2	-	-	-	-	-	-	<0.5	<0.5
(C-35-11)9ccc	-	-	-	-	-	-	<0.5	<1.0
(C-36-11)19ddd	-	-	-	-	-	-	<0.5	<0.5
(C-36-12)3acc-1	-	-	-	-	-	-	<0.5	<0.5
(C-35-11)9acd	-	-	-	-	-	-	<0.5	<0.5
(C-35-11)17dbc	-	-	-	-	-	-	-	-
(C-37-12)1bba-1	-	-	-	-	-	-	<0.5	<0.5
(C-37-12)1bba-2	-	-	-	-	-	-	<0.5	<0.5
(C-35-11)1cdc	<0.1	<0.1	<2.0	<0.1	<0.1	-	<0.5	<0.5
(C-36-12)24cca	<0.1	<0.1	<0.6	<0.2	<0.1	-	-	-
(C-36-12)3cdc	<0.2	<0.2	<2.0	<0.2	<0.2	-	<0.5	<0.5
(C-36-11)7aba	<0.2	<0.2	<2.0	<0.2	<0.2	-	<0.5	<0.5
(C-33-10)31ada-1	-	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Hexa-chloro-benzene (µg/L)	Hexa-chloro-penta-diene (µg/L)	Oxamyl (Vydate) (µg/L)	Picloram (µg/L)	Simazine (µg/L)	2,3,7,8-TCDD (Dioxin) (µg/L)	Chloro-form (µg/L)	Bromo-dichloro-methane (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. continued

WELL LOCATION	Chloro-dibromo-methane (µg/L)	Bromo-form (µg/L)	M-dichloro-benzene (µg/L)	1,1-dichloro-propene (µg/L)	1,1-dichloro-ethane (µg/L)	1,1,2.2-Tetra-chloro-ethane (µg/L)	1,3-dichloro-propane (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Chloro-dibromo-methane (µg/L)	Bromo-form (µg/L)	M-dichloro-benzene (µg/L)	1,1-dichloro-propene (µg/L)	1,1-dichloro-ethane (µg/L)	1,1,2.2-Tetra-chloro-ethane (µg/L)	1,3-dichloro-propane (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-
(C-35-11)3dcd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)29abb-1	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-
(C-35-11)24dba-2	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-12)17ddd	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-12)32ccb-2	<0.1	<1.0	<0.1	<0.1	<0.1	<0.5	<0.5
(C-36-12)20acd	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-11)30acc-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-11)30acc-2	-	-	-	-	-	-	-
(C-35-11)10cdc	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0
(C-35-10)18bda	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-35-10)7ccc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-35-10)7caa	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-12)15dbd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)24ada-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)9ccc	<0.2	<1.0	<0.1	<0.1	<0.1	0.5	0.5
(C-36-11)19ddd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)3acc-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)9acd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)17dbc	-	-	-	-	-	-	-
(C-37-12)1bba-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-37-12)1bba-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)1cdc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)24cca	-	-	-	-	-	-	-
(C-36-12)3cdc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-11)7aba	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0
(C-33-10)31ada-1	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. continued

WELL LOCATION	Chloro-dibromo-methane (µg/L)	Bromo-form (µg/L)	M-dichloro-benzene (µg/L)	1,1-dichloro-propene (µg/L)	1,1-dichloro-ethane (µg/L)	1,1,2.2-Tetra-chloro-ethane (µg/L)	1,3-dichloro-propane (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Chloro-methane (µg/L)	Bromo-methane (µg/L)	1,2,3-trichloro-propane (µg/L)	1,1,1.2-Tetra-chloro-ethane (µg/L)	Chloro-ethane (µg/L)	2,2-Dichloro-propane (µg/L)	O-Chloro-toluene (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Chloro-methane (µg/L)	Bromo-methane (µg/L)	1,2,3-trichloro-propane (µg/L)	1,1,1.2-Tetra-chloro-ethane (µg/L)	Chloro-ethane (µg/L)	2,2-Dichloro-propane (µg/L)	O-Chloro-toluene (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-
(C-35-11)3dcd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)29abb-1	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-
(C-35-11)24dba-2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-12)17ddd	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-12)32ccb-2	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.1
(C-36-12)20acd	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-11)30acc-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-11)30acc-2	-	-	-	-	-	-	-
(C-35-11)10cdc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-35-10)18bda	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-35-10)7ccc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-35-10)7caa	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-12)15dbd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)24ada-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)9ccc	0.5	0.5	<0.1	0.5	0.5	0.5	<0.1
(C-36-11)19ddd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)3acc-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)9acd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)17dbc	-	-	-	-	-	-	-
(C-37-12)1bba-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-37-12)1bba-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)1cdc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)24cca	-	-	-	-	-	-	-
(C-36-12)3cdc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-11)7aba	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-33-10)31ada-1	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Chloro-methane (μg/L)	Bromo-methane (μg/L)	1,2,3-trichloro-propane (μg/L)	1,1,1.2-Tetra-chloro-ethane (μg/L)	Chloro-ethane (μg/L)	2,2-Dichloro-propane (μg/L)	O-Chloro-toluene (μg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	P- Chloro-toluene (µg/L)	Bromo-benzene (µg/L)	1,3-dichloro-propene (µg/L)	Aldrin (µg/L)	Buta-chlor (µg/L)	Carbaryl (µg/L)	Dicamba (µg/L)	Dieldrin (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	P- Chloro-toluene (µg/L)	Bromo-benzene (µg/L)	1,3-dichloro-propene (µg/L)	Aldrin (µg/L)	Buta-chlor (µg/L)	Carbaryl (µg/L)	Dicamba (µg/L)	Dieldrin (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-	-
(C-35-11)3dcd	<0.5	<0.5	<0.5	-	-	-	-	-
(C-36-12)29abb-1	-	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-2	<1.0	<1.0	<1.0	<2.0	<0.5	2.0	1.0	1.0
(C-36-12)17ddd	<1.0	<1.0	<1.0	-	-	-	-	-
(C-36-12)32ccb-2	<0.1	<0.1	<0.5	-	-	-	-	-
(C-36-12)20acd	<1.0	<1.0	<1.0	<2.0	<0.2	2.0	1.0	1.0
(C-36-11)30acc-1	<0.5	<0.5	<0.5	-	-	-	-	-
(C-36-11)30acc-2	-	-	-	-	-	-	-	-
(C-35-11)10cdc	<1.0	<1.0	<1.0	-	-	-	-	-
(C-35-10)18bda	<1.0	<1.0	<1.0	-	-	-	-	-
(C-35-10)7ccc	<1.0	<1.0	<1.0	-	-	-	-	-
(C-35-10)7caa	<1.0	<1.0	<1.0	<2.0	<0.2	<2.0	<1.0	<1.0
(C-36-12)15dbd	<0.5	<0.5	<0.5	-	-	-	-	-
(C-36-12)24ada-2	<0.5	<0.5	<0.5	-	-	-	-	-
(C-35-11)9ccc	<0.1	<0.1	0.5	-	-	-	-	-
(C-36-11)19ddd	<0.5	<0.5	<0.5	-	-	-	-	-
(C-36-12)3acc-1	<0.5	<0.5	<0.5	-	-	-	-	-
(C-35-11)9acd	<0.5	<0.5	<0.5	-	-	-	-	-
(C-35-11)17dbc	-	-	-	-	-	-	-	-
(C-37-12)1bba-1	<0.5	<0.5	<0.5	-	-	-	-	-
(C-37-12)1bba-2	<0.5	<0.5	<0.5	-	-	-	-	-
(C-35-11)1cdc	<0.5	<0.5	<0.5	<0.1	<0.1	<2.0	<0.1	<0.2
(C-36-12)24cca	-	-	-	<0.1	<0.1	<0.2	<0.4	<0.1
(C-36-12)3cdc	<0.5	<0.5	<0.5	<2.0	<0.5	<2.0	<1.0	<1.0
(C-36-11)7aba	<1.0	<1.0	<1.0	<2.0	<0.5	<2.0	<1.0	<1.0
(C-33-10)31ada-1	-	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. continued

WELL LOCATION	P- Chloro-toluene (µg/L)	Bromo-benzene (µg/L)	1,3-dichloro-propene (µg/L)	Aldrin (µg/L)	Buta-chlor (µg/L)	Carbaryl (µg/L)	Dicamba (µg/L)	Dieldrin (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	3-Hydroxy-carbo- furan (µg/L)	Meth-omyl (µg/L)	Metho-lachlor (µg/L)	Metri-busin (µg/L)	Propa-chlor (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	N-Propyl-benzene (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	3-Hydroxy-carbo- furan (µg/L)	Meth-omyl (µg/L)	Metho-lachlor (µg/L)	Metri-busin (µg/L)	Propa-chlor (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	N-Propyl-benzene (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-	-
(C-35-11)3dcd	-	-	-	-	-	<0.5	<0.5	<0.5
(C-36-12)29abb-1	-	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-2	2.0	0.5	0.5	0.5	0.5	<1.0	<1.0	<1.0
(C-36-12)17ddd	-	-	-	-	-	<1.0	<1.0	<1.0
(C-36-12)32ccb-2	-	-	-	-	-	<0.1	<0.1	<0.1
(C-36-12)20acd	2.0	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0
(C-36-11)30acc-1	-	-	-	-	-	<0.5	<0.5	<0.5
(C-36-11)30acc-2	-	-	-	-	-	-	-	-
(C-35-11)10cdc	-	-	-	-	-	<1.0	<1.0	<1.0
(C-35-10)18bda	-	-	-	-	-	<1.0	<1.0	<1.0
(C-35-10)7ccc	-	-	-	-	-	<1.0	<1.0	<1.0
(C-35-10)7caa	<2.0	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0
(C-36-12)15dbd	-	-	-	-	-	<0.5	<0.5	<0.5
(C-36-12)24ada-2	-	-	-	-	-	<0.5	<0.5	<0.5
(C-35-11)9ccc	-	-	-	-	-	<0.1	<0.1	<0.1
(C-36-11)19ddd	-	-	-	-	-	<0.5	<0.5	<0.5
(C-36-12)3acc-1	-	-	-	-	-	<0.5	<0.5	<0.5
(C-35-11)9acd	-	-	-	-	-	<0.5	<0.5	<0.5
(C-35-11)17dbc	-	-	-	-	-	-	-	-
(C-37-12)1bba-1	-	-	-	-	-	<0.5	<0.5	<0.5
(C-37-12)1bba-2	-	-	-	-	-	<0.5	<0.5	<0.5
(C-35-11)1cdc	<2.0	<1.0	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5
(C-36-12)24cca	<0.5	<0.3	<0.1	<0.1	<0.1	-	-	-
(C-36-12)3cdc	<2.0	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0
(C-36-11)7aba	<2.0	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0
(C-33-10)31ada-1	-	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	3-Hydroxy-carbo- furan (µg/L)	Meth-omyl (µg/L)	Metho-lachlor (µg/L)	Metri-busin (µg/L)	Propa-chlor (µg/L)	1,2,4-Tri-methyl-benzene (µg/L)	1,2,3-Tri-chloro-benzene (µg/L)	N-Propyl-benzene (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	N-Butyl-benzene (µg/L)	Naptha-lene (µg/L)	Hexa-chloro-buta-diene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	P-Iso-propyl-toluene (µg/L)	Iso-propyl-benzene (µg/L)	Tert-Butyl-benzene (µg/L)	Sec-Butyl-benzene (µg/L)
(C-34-10)31caa-1	-	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	N-Butyl-benzene (µg/L)	Naptha-lene (µg/L)	Hexa-chloro-buta-diene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	P-Iso-propyl-toluene (µg/L)	Iso-propyl-benzene (µg/L)	Tert-Butyl-benzene (µg/L)	Sec-Butyl-benzene (µg/L)
(C-36-12)36adb	-	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-	-
(C-35-11)3dcd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)29abb-1	-	-	-	-	-	-	-	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-	-
(C-35-11)24dba-2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-12)17ddd	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-12)32ccb-2	<0.1	<0.5	<0.2	<0.1	<0.5	<0.1	<0.5	<0.1
(C-36-12)20acd	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-11)30acc-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-11)30acc-2	-	-	-	-	-	-	-	-
(C-35-11)10cdc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-35-10)18bda	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-35-10)7ccc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-35-10)7caa	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-12)15dbd	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5
(C-36-12)24ada-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)9ccc	<0.2	<0.5	<0.2	<0.1	<0.5	<0.1	<0.5	<0.2
(C-36-11)19ddd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)3acc-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)9acd	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)17dbc	-	-	-	-	-	-	-	-
(C-37-12)1bba-1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-37-12)1bba-2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-35-11)1cdc	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
(C-36-12)24cca	-	-	-	-	-	-	-	-
(C-36-12)3cdc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-36-11)7aba	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
(C-33-10)31ada-1	-	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	N-Butyl-benzene (µg/L)	Naptha-lene (µg/L)	Hexa-chloro-buta-diene (µg/L)	1,3,5-Tri-methyl-benzene (µg/L)	P-Iso-propyl-toluene (µg/L)	Iso-propyl-benzene (µg/L)	Tert-Butyl-benzene (µg/L)	Sec-Butyl-benzene (µg/L)
(C-36-12)12dba-1	-	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Fluoro-trichloro-methane (µg/L)	Dichloro-difluoro-methane (µg/L)	Bromo-chloro-methane (µg/L)	Surfac-tant as MBAS (mg/L)	alpha, gross (PCi/ L-G)	beta, gross (PCi/ L-G)	226 radium (PCi/ L-G)
(C-34-10)31caa-1	-	-	-	-	-	-	-
(C-34-11)9ccd-1	-	-	-	-	-	-	-
(C-34-11)14aad-2	-	-	-	-	-	-	-
(C-34-11)21dcd-1	-	-	-	-	-	-	-
(C-34-11)23bdd-1	-	-	-	-	-	-	-
(C-34-11)36dcc-2	-	-	-	-	-	-	-
(C-35-10)6bad-1	-	-	-	-	-	-	-
(C-35-10)18abc-1	-	-	-	-	-	-	-
(C-35-10)18bad-1	-	-	-	-	-	-	-
(C-35-11)8cdc-1	-	-	-	-	-	-	-
(C-35-11)8ddc-1	-	-	-	-	-	-	-
(C-35-11)9dba-1	-	-	-	-	-	-	-
(C-35-11)11ccc-1	-	-	-	-	-	-	-
(C-35-11)11ccc-3	-	-	-	-	-	-	-
(C-35-11)12add-1	-	-	-	-	-	-	-
(C-35-11)12ccc-2	-	-	-	-	-	-	-
(C-35-11)13dad-1	-	-	-	-	-	-	-
(C-35-11)14bca-1	-	-	-	-	-	-	-
(C-35-11)16aab-1	-	-	-	-	-	-	-
(C-35-11)25bcc-1	-	-	-	-	-	-	-
(C-35-11)26acd-1	-	-	-	-	-	-	-
(C-35-11)28aac-2	-	-	-	-	-	-	-
(C-35-11)29add-1	-	-	-	-	-	-	-
(C-35-11)29cab-1	-	-	-	-	-	-	-
(C-35-11)29dbd-2	-	-	-	-	-	-	-
(C-35-11)31acd-2	-	-	-	-	-	-	-
(C-35-11)31dbd-1	-	-	-	-	-	-	-
(C-35-11)34dbb-1	-	-	-	-	-	-	-
(C-35-12)26bca-1	-	-	-	-	-	-	-
(C-35-12)27bcd-1	-	-	-	-	-	-	-
(C-35-12)36ddd-1	-	-	-	-	-	-	-
(C-36-11)5aca-1	-	-	-	-	-	-	-
(C-36-11)5dab-1	-	-	-	-	-	-	-
(C-36-11)7aaa-2	-	-	-	-	-	-	-
(C-36-11)7adc-1	-	-	-	-	-	-	-
(C-36-11)11bac-1	-	-	-	-	-	-	-
(C-36-11)18bdd-1	-	-	-	-	-	-	-
(C-36-11)31abc-1	-	-	-	-	-	-	-
(C-36-12)2dbc-1	-	-	-	-	-	-	-
(C-36-12)3aad-2	-	-	-	-	-	-	-
(C-36-12)3acc-1	-	-	-	-	-	-	-
(C-36-12)9aac-1	-	-	-	-	-	-	-
(C-36-12)11abd-1	-	-	-	-	-	-	-
(C-36-12)21cbb-1	-	-	-	-	-	-	-
(C-36-12)25bdd-1	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

***Table B1.** continued*

WELL LOCATION	Fluoro-trichloro-methane (µg/L)	Dichloro-difluoro-methane (µg/L)	Bromo-chloro-methane (µg/L)	Surfac-tant as MBAS (mg/L)	alpha, gross (PCi/ L-G)	beta, gross (PCi/ L-G)	226 radium (PCi/ L-G)
(C-36-12)36adb	-	-	-	-	-	-	-
(C-37-12)4bbc-1	-	-	-	-	-	-	-
(C-37-12)9acc-1	-	-	-	-	-	-	-
(C-37-12)11aaa-1	-	-	-	-	-	-	-
(C-37-12)23abd-1	-	-	-	-	-	-	-
(C-37-12)23acb-1	-	-	-	-	-	-	-
(C-36-12)24ada-1	-	-	-	-	-	-	-
(C-35-11)3dcd	<0.5	<0.5	<0.5	-	2	-	-
(C-36-12)29abb-1	-	-	-	-	<2	<4	-
(C-36-11)32ccb-1	-	-	-	-	-	-	-
(C-35-11)24dba-1	-	-	-	-	-	-	-
(C-35-11)24dba-2	<1.0	<1.0	<1.0	-	<4	8	-
(C-36-12)17ddd	<1.0	<1.0	<1.0	-	<2	<10	-
(C-36-12)32ccb-2	<0.1	<0.5	<0.5	-	4	-	-
(C-36-12)20acd	<1.0	<1.0	<1.0	<0.02	-	-	-
(C-36-11)30acc-1	<0.5	<0.5	<0.5	-	13	-	<1
(C-36-11)30acc-2	-	-	-	<0.02	4	-	-
(C-35-11)10cdc	<1.0	<1.0	<1.0	-	-	-	-
(C-35-10)18bda	<1.0	<1.0	<1.0	-	<6	7	-
(C-35-10)7ccc	<1.0	<1.0	<1.0	-	<4	<5	-
(C-35-10)7caa	<1.0	<1.0	<1.0	-	-	-	-
(C-36-12)15dbd	<0.5	<0.5	<0.5	-	<2	<3	-
(C-36-12)24ada-2	<0.5	<0.5	<0.5	-	<1	-	-
(C-35-11)9ccc	<0.1	<0.5	<0.5	-	4	-	-
(C-36-11)19ddd	<0.5	<0.5	<0.5	-	6	-	<1
(C-36-12)3acc-1	<0.5	<0.5	<0.5	0.01	4	-	-
(C-35-11)9acd	<0.5	<0.5	<0.5	-	<2	-	-
(C-35-11)17dbc	-	-	-	-	-	-	-
(C-37-12)1bba-1	<0.5	<0.5	<0.5	-	-	-	-
(C-37-12)1bba-2	<0.5	<0.5	<0.5	-	-	-	-
(C-35-11)1cdc	<0.5	<0.5	<0.5	-	1	5	-
(C-36-12)24cca	-	-	-	<0.02	<2	-	-
(C-36-12)3cdc	<1.0	<1.0	<1.0	0.19	<5	<5	-
(C-36-11)7aba	<1.0	<1.0	<1.0	-	<1	<1	-
(C-33-10)31ada-1	-	-	-	-	-	-	-
(C-33-11)30bca-1	-	-	-	-	-	-	-
(C-33-11)31aad-1	-	-	-	-	-	-	-
(C-34-11)36dcc-3	-	-	-	-	-	-	-
(C-35-11)19dbb-1	-	-	-	-	-	-	-
(C-35-11)27dbb-1	-	-	-	-	-	-	-
(C-35-11)30caa-1	-	-	-	-	-	-	-
(C-35-11)33aac-1	-	-	-	-	-	-	-
(C-35-11)33abd-1	-	-	-	-	-	-	-
(C-35-11)33ccd-1	-	-	-	-	-	-	-
(C-35-12)36caa-1	-	-	-	-	-	-	-
(C-36-11)7cab-1	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

Table B1. *continued*

WELL LOCATION	Fluoro-trichloro-methane (µg/L)	Dichloro-difluoro-methane (µg/L)	Bromo-chloro-methane (µg/L)	Surfac-tant as MBAS (mg/L)	alpha, gross (PCi/ L-G)	beta, gross (PCi/ L-G)	226 radium (PCi/ L-G)
(C-36-12)12dba-1	-	-	-	-	-	-	-
(C-37-12)11dac-1	-	-	-	-	-	-	-
(C-37-12)34abb-1	-	-	-	-	-	-	-
(C-35-11)13ccb	-	-	-	-	-	-	-
(C-35-11)13cdb	-	-	-	-	-	-	-
(C-35-11)13ddb	-	-	-	-	-	-	-
(C-35-11)35bdd	-	-	-	-	-	-	-
(C-35-11)26dca	-	-	-	-	-	-	-
(C-35-11)26acd	-	-	-	-	-	-	-
(C-35-11)27aab	-	-	-	-	-	-	-
(C-35-11)22dcd	-	-	-	-	-	-	-
(C-35-11)22ddb	-	-	-	-	-	-	-
(C-35-11)22ada	-	-	-	-	-	-	-
(C-35-11)23cab	-	-	-	-	-	-	-
(C-35-11)23bdd-1	-	-	-	-	-	-	-
(C-35-11)23bdd-2	-	-	-	-	-	-	-
(C-35-11)23acd	-	-	-	-	-	-	-
(C-35-11)23abb	-	-	-	-	-	-	-
(C-35-11)24ccd	-	-	-	-	-	-	-
(C-35-11)24bdd	-	-	-	-	-	-	-
(C-35-11)26bbb	-	-	-	-	-	-	-
(C-35-11)22dad	-	-	-	-	-	-	-

*USGS-U.S. Geological Survey; UDDW-Utah Division of Drinking Water; UGS-Utah Geological Survey; "-" indicates no data

APPENDIX C
POTENTIAL CONTAMINANT SOURCES

Table C1. *Potential contaminants, Cedar Valley, Iron County, Utah.*

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
1	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, cows, stables	fertilizer, manure
2	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
3	FORMER CONCENTRATION OF ANIMALS	abandoned barn shed	fertilizer, manure
4	INDUSTRY	power sub station	PCB, metals, solvents
5	STORAGE TANK	gravity driven gas tank	petroleum
6	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation	fertilizer, manure
7	GOVERNMENT	gravel piles, salt piles	metals, solvents, petroleum
8	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, cows, horses, sheds	fertilizer, manure
9	FORMER CONCENTRATION OF ANIMALS	abandoned animal feeding operation, barnyard	fertilizer, manure
10	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
11	STORAGE TANK	gravity driven gas tank	petroleum
12	JUNK YARD/SALVAGE	personal junk yard/salvage	metals, solvents, petroleum
13	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
14	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
15	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
16	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, sheep, cows	fertilizer, manure
17	STORAGE TANK	gravity driven gas tank	petroleum
18	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, sheep, cows,	fertilizer, manure
19	JUNK YARD/SALVAGE	junk yard/salvage	metals, solvents, petroleum
20	CONCENTRATION OF ANIMALS AND/OR FEED LOT	small corral	fertilizer, manure
21	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
22	MINING	abandoned coal mine shaft	metals, solvents
23	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
24	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, animal feeding operation, horses, cows	fertilizer, manure
25	CONCENTRATION OF ANIMALS AND/OR FEED LOT	barn shed, corral, animal feeding operation,	fertilizer, manure
26	FORMER CONCENTRATION OF ANIMALS	abandoned barn shed, corral	fertilizer, manure
27	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheds, animal feeding operation	fertilizer, manure
28	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep grazing animal feeding operation, barns,	fertilizer, manure
29	JUNK YARD/SALVAGE	junk yard/salvage	metals, solvents, petroleum
30	JUNK YARD/SALVAGE	junk yard/salvage	metals, solvents, petroleum
31	INDUSTRY	power substation	PCB, metals, solvents
32	JUNK YARD/SALVAGE	junk yard/salvage	metals, solvents, petroleum
33	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses animal feeding operation	fertilizer, manure
34	CONCENTRATION OF ANIMALS AND/OR FEED LOT	llama animal feeding operation	fertilizer, manure

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
35	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses animal feeding operation, corral	fertilizer, manure
36	CONCENTRATION OF ANIMALS AND/OR FEED LOT	small animal feeding operation horses, corral	fertilizer, manure
37	INDUSTRY	power sub station	PCB, metals, solvents
38	CONCENTRATION OF ANIMALS AND/OR FEED LOT	cow animal feeding operation, small corral,	fertilizer, manure
39	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, animal feeding operation, ranch	fertilizer, manure
40	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses animal feeding operation, corral, ranch	fertilizer, manure
41	CONCENTRATION OF ANIMALS AND/OR FEED LOT	small corral, horses, animal feeding operation	fertilizer, manure
42	FORMER CONCENTRATION OF ANIMALS	abandoned corral, sheds	fertilizer, manure
43	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral, animal feeding operation	fertilizer, manure
44	STORAGE TANK	vertical gas pump	petroleum
45	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, animal feeding operation, horses	fertilizer, manure
46	CONCENTRATION OF ANIMALS AND/OR FEED LOT	farms, barns, animal feeding operation	fertilizer, manure
47	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, corral, cows and	fertilizer, manure
48	BUSINESS	small business, horse trailers	metals, solvents, petroleum
49	STORAGE TANK	gravity driven gas tank	petroleum
50	CONCENTRATION OF ANIMALS AND/OR FEED LOT	mountain ranch, horses animal feeding	fertilizer, manure
51	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
52	INDUSTRY	industry	metals, solvents, petroleum
53	INDUSTRY	fiber manufacture company	metals, solvents
54	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, corral, horses	fertilizer, manure
55	STORAGE TANK	2 gravity driven gas tanks	petroleum
56	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, animal feeding operation, horses	fertilizer, manure
57	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation, pasture	fertilizer, manure
58	CONCENTRATION OF ANIMALS AND/OR FEED LOT	caged sheep animal feeding operation, farm	fertilizer, manure
59	CONCENTRATION OF ANIMALS AND/OR FEED LOT	fenced sheep animal feeding operation	fertilizer, manure
60	CONCENTRATION OF ANIMALS AND/OR FEED LOT	fenced sheep animal feeding operation	fertilizer, manure
296	INDUSTRY	industry manufacter sheds, lumber, aluminum	metals, solvents
61	GOVERNMENT	abandoned government agency	metals, solvents, petroleum
62	STORAGE TANK	gravity driven gas tank	petroleum
63	LARGE LAWN	sod/ turf	fertilizer, manure
64	FORMER CONCENTRATION OF ANIMALS	abandoned barn, corral	fertilizer, manure
65	JUNK YARD/SALVAGE	junk yard/salvage	metals, solvents, petroleum
66	WASTE DISPOSAL	dilapidated buildings with land fill	metals, solvents
68	WASTE DISPOSAL	county land fill	metals, solvents

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
71	WASTE DISPOSAL	facility related to land fill	metals, solvents
73	MINING	inactive mines	metals, solvents, petroleum
74	MINING	mines	metals, solvents, petroleum
75	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
76	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, cows, corral	fertilizer, manure
77	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corrals/abandoned?	fertilizer, manure
78	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
79	STORAGE TANK	gravity driven gas tank, 2 vertical gas pumps	petroleum
80	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, animal feeding operation	fertilizer, manure
81	CONCENTRATION OF ANIMALS AND/OR FEED LOT	fenced sheep animal feeding operation	fertilizer, manure
82	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, animal feeding operation, horses and	fertilizer, manure
83	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, corral, horses	fertilizer, manure
84	FORMER CONCENTRATION OF ANIMALS	abandoned animal feeding operation	fertilizer, manure
85	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, animal feeding operation, horses	fertilizer, manure
86	STORAGE TANK	gravity driven gas tank	petroleum
87	FORMER CONCENTRATION OF ANIMALS	abandoned animal feeding operation	fertilizer, manure
88	JUNK YARD/SALVAGE	junk yard/salvage, peacocks	
89	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, sheds, barns	fertilizer, manure
90	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
91	STORAGE TANK	gravity driven gas tank	petroleum
92	CONCENTRATION OF ANIMALS AND/OR FEED LOT	farm, sheds, corral, sheep animal feeding	fertilizer, manure
93	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, animal feeding operation	fertilizer, manure
94	CONCENTRATION OF ANIMALS AND/OR FEED LOT	cows, corral, animal feeding operation	fertilizer, manure
95	JUNK YARD/SALVAGE	junk yard/salvage	metals, solvents, petroleum
96	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
97	CONCENTRATION OF ANIMALS AND/OR FEED LOT	cows, horses, animal feeding operation	fertilizer, manure
98	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
99	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
100	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, cows	fertilizer, manure
101	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
102	STORAGE TANK	gravity driven gas tank	petroleum
103	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep, horse, animal feeding operation	fertilizer, manure
104	STORAGE TANK	gravity driven gas tank	petroleum
105	BUSINESS	cabin makers, lumber piles	metals, solvents, petroleum

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
106	BUSINESS	race track, motorway	metals, solvents, petroleum
107	STORAGE TANK	2 gravity driven gas tank	petroleum
108	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
109	LARGE LAWN	small park	pesticides, fertilizer
110	STORAGE TANK	gravity driven gas tank	petroleum
111	BUSINESS	lumber piles, tractors	metals, solvents, petroleum
112	INDUSTRY	trucking industry	metals, solvents, petroleum
113	INDUSTRY	storage shed, garage for freight trucks	metals, solvents, petroleum
114	BUSINESS	storage units	metals, solvents, petroleum
115	BUSINESS	24 hr truck service parts, rentals, sales, tractors	metals, solvents, petroleum
116	BUSINESS	machine and welding	metals, solvents, petroleum
117	INDUSTRY	industry stock yard	metals, solvents, petroleum
118	MEDICAL, BUSINESS	warehouse, animal hospital, cabinet & carpet	metals, solvents
119	LARGE LAWN	nursery	pesticides, fertilizer
120	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
121	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
122	CONCENTRATION OF ANIMALS AND/OR FEED LOT	dairy operation, cows and horses animal	fertilizer, manure
123	SERVICE STATION	gas station	petroleum
124	SERVICE STATION	automotive repair	metals, solvents, petroleum
125	SERVICE STATION	automotive repair	metals, solvents, petroleum
126*	BUSINESS	sheet metal	petroleum
127	BUSINESS	audio and electronic store	metals, solvents, petroleum
128	BUSINESS	motorcycle outlet	metals, solvents, petroleum
131	BUSINESS	industrial plaza, storage units, freight trucks	metals, solvents, petroleum
132	INDUSTRY	municipal airport facilities	metals, solvents, petroleum
133	MINING	gravel pit	metals, solvents, petroleum
134	MINING	inactive gravel pit	metals, solvents, petroleum
135	CONCENTRATION OF ANIMALS AND/OR FEED LOT	cows, animal feeding operation	fertilizer, manure
136	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, cows, corral	fertilizer, manure
137	STORAGE TANK	gravity driven gas tank	petroleum
138	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
139	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
140	STORAGE TANK	gravity driven gas tank	petroleum
141	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation	fertilizer, manure

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
142	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
143	STORAGE TANK	gravity driven gas tank	petroleum
144	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
145	STORAGE TANK	gravity driven gas tank	petroleum
146	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
147	STORAGE TANK	gravity driven gas tank	petroleum
148	STORAGE TANK	gravity driven gas tank	petroleum
149	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, animal feeding operation	fertilizer, manure
150	JUNK YARD/SALVAGE	junk yard/salvage	metals, solvents, petroleum
151	STORAGE TANK	gravity driven gas tank	petroleum
152	STORAGE TANK	gravity driven gas tank	petroleum
153	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
154	STORAGE TANK	gravity driven gas tank	petroleum
155	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
156	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
157	BUSINESS	small business, electronic	metals, solvents
158	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
159	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, cows, horses	fertilizer, manure
160	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, animal feeding operation horses	fertilizer, manure
161	STORAGE TANK	gravity driven gas tank	petroleum
162	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, cow, animal feeding operation	fertilizer, manure
163	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
164	MINING	gravel pit	metals, solvents, petroleum
165	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
166	MINING	gravel pit	metals, solvents, petroleum
167	MINING	related to gravel pits, storage building	metals, solvents, petroleum
168	MINING	gravel pit	metals, solvents, petroleum
169	MINING	gravel pit	metals, solvents, petroleum
170	MINING	gravel pit	metals, solvents, petroleum
171	GOVERNMENT	transportation facility, asphalt piles, garages	metals, solvents, petroleum
172	BUSINESS	hydraulic shop	metals, solvents, petroleum
173	BUSINESS	auto body shop	metals, solvents, petroleum
174*	MINING	gravel pit, inactive?	metals, solvents, petroleum
175*	GOVERNMENT	county road /transportation	metals, solvents, petroleum

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
176*	MEDICAL	animal shelter	metals, solvents
177*	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
178*	GOVERNMENT	fire department	metals, solvents, petroleum
179*	STORAGE TANK	2 gravity driven gas tank	petroleum
180*	BUSINESS	welding business	metals, solvents, petroleum
181*	JUNK YARD/SALVAGE	recycle business	metals, solvents, petroleum
182*	STORAGE TANK	gravity driven gas tank	petroleum
183	GOVERNMENT	transportation/ trucks	metals, solvents, petroleum
184	GOVERNMENT	transportation/ painting facility	metals, solvents, petroleum
185	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
186*	INDUSTRY	food processor/ major industry	metals, solvents
187*	BUSINESS	industrial plaza, storage sheds	metals, solvents, petroleum
188*	GOVERNMENT	transportation facility	metals, solvents, petroleum
189*	BUSINESS	custom meat shop	metals, solvents
190*	BUSINESS	water well pump service	metals, solvents
191*	STORAGE TANK	gravity driven gas tank	petroleum
192*	WASTE DISPOSAL	street deptartment/ solid waste	metals, solvents, petroleum,
193*	BUSINESS	rental and sales company, tractors	metals, solvents, petroleum
194*	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, horses, sheep	fertilizer, manure
195*	BUSINESS	auto rentals, u-hauls	metals, solvents, petroleum
196	CONCENTRATION OF ANIMALS AND/OR FEED LOT	arabian horses, corrals, animal feeding	fertilizer, manure
197	CONCENTRATION OF ANIMALS AND/OR FEED LOT	arabian corrals, stables	fertilizer, manure
198	JUNK YARD/SALVAGE	junk yard/salvage	metals, solvents, petroleum
199	STORAGE TANK	gravity driven gas tank	petroleum
200*	MEDICAL	veterinarian clinic	metals, solvents
201*	BUSINESS	storage units	metals, solvents, petroleum
202*	BUSINESS	haul rental business	metals, solvents, petroleum
203*	BUSINESS	log-home supplier	metals, solvents
204*	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, animal feeding operation,	fertilizer, manure
205*	INDUSTRY	power plant	PCB, metals, solvents
206*	INDUSTRY	cola distributor	metals, solvents, petroleum
332*	INDUSTRY	metal technologies	metals, solvents
207*	BUSINESS	lodge unlimited (building supply?)	metals, solvents
208*	SERVICE STATION	gas station	petroleum
298*	BUSINESS	storage sheds	metals, solvents, petroleum

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
209*	BUSINESS	storage rentals	metals, solvents, petroleum
210*	SERVICE STATION	tractor outlet, tractor repair	metals, solvents, petroleum
211*	BUSINESS	electric company, manufacturing	metals, solvents
212*	BUSINESS	storage units	metals, solvents
213*	SERVICE STATION	brakes and automotives, metal shop	metals, solvents, petroleum
214*	BUSINESS	industrial plaza, lumber warehouse, tire and	metals, solvents, petroleum
215*	BUSINESS	storage units	metals, solvents
216*	BUSINESS	appliances sales & service, warehouse	metals, solvents
130*	BUSINESS	electrical contractor, residential/ commercial	metals, solvents
217*	BUSINESS	rock masonry, bricks, wood	metals, solvents
218*	CONCENTRATION OF ANIMALS AND/OR FEED LOT	big corral, stables	fertilizer, manure
219*	LARGE LAWN	ball park	pesticides, fertilizer
220	MEDICAL	specialty clinic, orthopedic surgery	metals, solvents
221	LARGE LAWN	ball field, highschool	pesticides, fertilizer
222	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
223	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, animal feeding operation	fertilizer, manure
224	JUNK YARD/SALVAGE	junk yard/salvage	metals, solvents, petroleum
225	FORMER CONCENTRATION OF ANIMALS	abandoned corral, sheds, stables	fertilizer, manure
226	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, barns, sheds	fertilizer, manure
227	STORAGE TANK	gravity driven gas tank	petroleum
228	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
229	CONCENTRATION OF ANIMALS AND/OR FEED LOT	small scale corral	fertilizer, manure
230	CONCENTRATION OF ANIMALS AND/OR FEED LOT	farm, cows, animal feeding operation, barns	fertilizer, manure
231	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, animal feeding operation	fertilizer, manure
232	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, corral, cows	fertilizer, manure
233	LARGE LAWN	ball park	pesticides, fertilizer
234	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
235	BUSINESS	auto sales	metals, solvents, petroleum
236	CONCENTRATION OF ANIMALS AND/OR FEED LOT	barns, sheds, animal feeding operation	fertilizer, manure
237	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
238	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, animal feeding operation	fertilizer, manure
239	BUSINESS	heating and air	metals, solvents
240	GOVERNMENT	fire station	metals, solvents, petroleum
241	SERVICE STATION	gas station	petroleum
242	SERVICE STATION	gas station	petroleum

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
243	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
244	GOVERNMENT	school buses	metals, solvents, petroleum
245	SERVICE STATION	diesel inc	metals, solvents, petroleum
246	SERVICE STATION	truck stop	petroleum
247	BUSINESS, STORAGE TANK	chemical/petroleum, gas pump	metals, solvents, petroleum
248	STORAGE TANK	gravity driven gas tank	petroleum
249	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, cows	fertilizer, manure
250	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, cows	fertilizer, manure
251	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, animal feeding operation	fertilizer, manure
252	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, cow, animal feeding operation	fertilizer, manure
253	CONCENTRATION OF ANIMALS AND/OR FEED LOT	stables, corral, horses, cows, animal feeding	fertilizer, manure
254	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, cow	fertilizer, manure
255	BUSINESS	nail and ceramic shop, artistic impression,	metals, solvents, petroleum
256	SERVICE STATION	gas station, car wash	metals, solvents, petroleum
257	MEDICAL	health care center, massage therapy, vitamin	
258	BUSINESS	auto sales	metals, solvents, petroleum
259	MINING	gravel pit	metals, solvents, petroleum
260	STORAGE TANK	gas pumps	petroleum
261	SERVICE STATION	frame auto body shop, service station	metals, solvents, petroleum
262	BUSINESS	cabinet, furniture	metals, solvents
263	BUSINESS	rentals, tillers, lawn mowers	metals, solvents, petroleum
264	STORAGE TANK	2 gravity driven gas tank	petroleum
265	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
266	SERVICE STATION	automachine shop, engine rebuilding, service	metals, solvents, petroleum
267	BUSINESS	plaza, warehouse, construction, herb and food,	metals, solvents, petroleum
268*	MEDICAL	veterinarian clinic	metals, solvents
269*	BUSINESS	floor covering, carpet, vinyl, trailer sales	metals, solvents
270*	SERVICE STATION	campground, gas pumps, service station	metals, solvents, petroleum
271*	BUSINESS	laundromat	metals, solvents
272*	BUSINESS	transmission specialist, car sales	metals, solvents, petroleum
273*	BUSINESS	auto glass	metals, solvents, petroleum
274*	BUSINESS	furniture store	metals, solvents, petroleum
275*	CONCENTRATION OF ANIMALS AND/OR FEED LOT	small corral, cows	fertilizer, manure
276*	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corrals, stables, cows, horses, animal feeding	fertilizer, manure
277*	LARGE LAWN	golf course	pesticides, fertilizer

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
278	JUNK YARD/SALVAGE	cars, junk yard/salvage	metals, solvents, petroleum
279	CONCENTRATION OF ANIMALS AND/OR FEED LOT	stables, corrals	fertilizer, manure
280	BUSINESS	hanger, models of planes, trains, boats	metals, solvents
281	SERVICE STATION	car wash	metals, solvents, petroleum
282	LARGE LAWN	large lawn, school	pesticides, fertilizer
283	SERVICE STATION	gas station	petroleum
284	LARGE LAWN	large lawn, school	pesticides, fertilizer
286*	INDUSTRY	power sub station	PCB, metals, solvents
287	BUSINESS	construction steel	metals, solvents, petroleum
288	BUSINESS	farm center, tractors	metals, solvents, petroleum
289	BUSINESS	livestock market, tractors, trailers, corrals	metals, solvents, petroleum,
290	BUSINESS	barber shop	metals, solvents
291	BUSINESS	carpet, cabinets, lighting	metals, solvents
292	BUSINESS	door manufacturing, store fixtures	metals, solvents
293	BUSINESS	craft tech, carpet, vinyl, hardwood	metals, solvents
294	INDUSTRY	generator city plant	PCB, metals, solvents
295	INDUSTRY	power sub station	PCB, metals, solvents
297	BUSINESS	floor coverings	metals, solvents
299	SERVICE STATION	automotive repair	metals, solvents, petroleum
300*	BUSINESS	performance vehicles, snowmobiles, arctic	metals, solvents, petroleum
301*	LARGE LAWN	large lawn, school	pesticides, fertilizer
302*	LARGE LAWN	park	pesticides, fertilizer
303	MINING	coal mining	
304*	LARGE LAWN	ball park	pesticides, fertilizer
305*	MEDICAL	health care hospital	metals, solvents, petroleum
306*	MEDICAL	oxygen and medical suppliers	metals, solvents
307*	MEDICAL	health care center, skill nursing and rehab	metals, solvents
308*	LARGE LAWN	ball park	pesticides, fertilizer
309*	GOVERNMENT	fire station	metals, solvents, petroleum
310*	LARGE LAWN	city park	pesticides, fertilizer
311*	SERVICE STATION	car wash	metals, solvents, petroleum
312*	BUSINESS	car dealer	metals, solvents, petroleum
313*	BUSINESS	hardware store	metals, solvents
314*	BUSINESS	auto dealer	metals, solvents, petroleum
315*	BUSINESS	copy shop	metals, solvents

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
316*	LARGE LAWN	ball park	pesticides, fertilizer
317*	CONCENTRATION OF ANIMALS AND/OR FEED LOT	large corral, horses, entertainment	fertilizer, manure
318*	BUSINESS	towing company	metals, solvents, petroleum
319*	SERVICE STATION	automotive	metals, solvents, petroleum
320*	LARGE LAWN	cemetary	pesticides, fertilizer
321*	CONCENTRATION OF ANIMALS AND/OR FEED LOT	small corral, horses	fertilizer, manure
322*	BUSINESS	lumber	metals, solvents
323*	STORAGE TANK	2 gravity driven gas tanks	petroleum
324*	BUSINESS	motors, auto dealer	metals, solvents, petroleum
325*	BUSINESS	print shop	metals, solvents
326*	MEDICAL	home med care, high tech health care services	metals, solvents
327*	SERVICE STATION	gas station	petroleum
328*	SERVICE STATION	auto service station	metals, solvents, petroleum
329*	SERVICE STATION	gas station	petroleum
330*	BUSINESS	auto parts	metals, solvents
332*	INDUSTRY	metal technologies	metals, solvents
333*	SERVICE STATION	car wash	metals, solvents, petroleum
334*	SERVICE STATION	lube service station	metals, solvents, petroleum
335*	MEDICAL	health care, rehab	metals, solvents
336*	BUSINESS	paint and glass	metals, solvents
337*	BUSINESS	tire company	metals, solvents
338*	SERVICE STATION	gas station	petroleum
339*	MEDICAL	dental health care	metals, solvents
340*	SERVICE STATION	gas station	petroleum
341*	MEDICAL	chiropractic care	metals, solvents
342*	BUSINESS	carpet outlet, craft, print shop, copy center	metals, solvents
343*	BUSINESS	photography, barber shop, tan shop, dry	metals, solvents
344*	BUSINESS	carpet center, tile, ceramics	metals, solvents
345*	LARGE LAWN	ball park	pesticides, fertilizer
346*	LARGE LAWN, BUSINESS	nursery, hardware	pesticides, fertilizer
347	BUSINESS	upholstery	metals, solvents
348	BUSINESS	tire and tools	metals, solvents
349	SERVICE STATION	abandoned gas station	petroleum
350	BUSINESS	auto parts	metals, solvents
351	BUSINESS	outdoor power equipment	metals, solvents, petroleum

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
352	SERVICE STATION	auto/tire service station, brakes, alignment,	metals, solvents, petroleum
353	SERVICE STATION	auto repair	petroleum
354	LARGE LAWN	nursery, hardware	pesticides, fertilizer
355*	BUSINESS, MEDICAL	plaza: tanning, landromat, eye care center,	metals, solvents
356*	SERVICE STATION, BUSINESS	car wash, laundromat cleaners	metals, solvents, petroleum
357*	BUSINESS	plumbing supply, hardware store	metals, solvents
358*	MEDICAL	dentists offices	metals, solvents
359*	BUSINESS	window and door, awnings	metals, solvents
360*	BUSINESS	glass, windshield repair and sales	metals, solvents
361*	BUSINESS	auto dealer	metals, solvents, petroleum
362*	SERVICE STATION	gas station	petroleum
363*	BUSINESS	salon	metals, solvents
364*	BUSINESS	machine and supply shop	metals, solvents
365*	BUSINESS	beauty supply	metals, solvents
366*	BUSINESS	cobbler and saddlery, western wear	metals, solvents
367*	BUSINESS	hair and nail salon	metals, solvents
368*	BUSINESS	vacuum, sewing, water beds	metals, solvents
369*	MEDICAL	medical supply	metals, solvents
370*	SERVICE STATION	gas station	petroleum
371*	BUSINESS	upholstery	metals, solvents
372*	BUSINESS	equipment, laser alignment	metals, solvents
373*	SERVICE STATION	lube and oil filter, transmission tune up, service	metals, solvents, petroleum
374*	BUSINESS	pets supply, fence company, vinyl fencing	metals, solvents
375*	SERVICE STATION	tires	metals, solvents, petroleum
376*	GOVERNMENT	government trucks	metals, solvents, petroleum
377*	BUSINESS	auto sales	metals, solvents, petroleum
378*	BUSINESS	auto parts	metals, solvents
379*	SERVICE STATION	muffler	metals, solvents, petroleum
380*	BUSINESS	complex, mattress factory, paint suppliers	metals, solvents
381*	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses in corral, stables	fertilizer, manure
382*	BUSINESS	farm feed supplier	metals, solvents, fertilizer, manure
383*	SERVICE STATION	muffler shop	metals, solvents, petroleum
384*	BUSINESS	sheds, truck trailer wharehouse	metals, solvents
385*	BUSINESS	motor sport	metals, solvents, petroleum
386*	BUSINESS	roofing supply, timber alot	metals, solvents

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
387*	BUSINESS	electrical suppliers	metals, solvents
388*	INDUSTRY	power sub station	PCB, metals, solvents
389*	BUSINESS	cooling heating supply	metals, solvents
390*	INDUSTRY	flooring outlet, Glass supply, plumbing supply	metals, solvents
391*	BUSINESS	interiors, floor coverings, design service	metals, solvents
392*	INDUSTRY	railyard,	metals, solvents
393*	SERVICE STATION	gas pumps	petroleum
394*	BUSINESS	stoves, furniture	metals, solvents
395*	SERVICE STATION	tire center, lubrication service station	metals, solvents, petroleum
396*	BUSINESS	auto part store	metals, solvents
397*	BUSINESS	lumber	metals, solvents
398*	LARGE LAWN	nursery	pesticides, fertilizer
399*	BUSINESS	plumbing, heating, sprinkler/electrical builder	metals, solvents
400*	BUSINESS	auto body	metals, solvents, petroleum
401*	BUSINESS	supply recycling	metals, solvents
402*	BUSINESS	storage, cinder block garages	metals, solvents
403*	BUSINESS	electric	metals, solvents
404*	BUSINESS	fastening systems, power tools, repair	metals, solvents
405*	BUSINESS	wood designs	metals, solvents
406*	BUSINESS	machine shop	metals, solvents
407*	BUSINESS	automobile source, dealer vacant lot	metals, solvents, petroleum
408*	BUSINESS	cattle related items	metals, solvents
409*	JUNK YARD/SALVAGE	salvage yard, radiators, mufflers, scraps	metals, solvents, petroleum
410*	BUSINESS	farm feed	metals, solvents
411*	BUSINESS	towing	metals, solvents, petroleum
412*	BUSINESS	electrical distributors inc.	metals, solvents
413*	BUSINESS	storage units	metals, solvents
414*	BUSINESS	rubber	metals, solvents
415*	SERVICE STATION	tire service, lube and oil, radiator, breaks, tune	metals, solvents, petroleum
416*	BUSINESS	automotive, stove manufacturing	metals, solvents, petroleum
417*	BUSINESS	storage, sheds	metals, solvents
418*	STORAGE TANK	gravity driven gas tank	petroleum
419*	BUSINESS	big storage sheds, stores trucks, campers,	metals, solvents, petroleum
420*	BUSINESS	storage units	metals, solvents
421*	LARGE LAWN	large lawn, school	pesticides, fertilizer

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
422*	BUSINESS	sheet metal, air conditioning, heating	metals, solvents
423*	BUSINESS	building systems, concrete form rental and	metals, solvents, petroleum
424*	BUSINESS	prop studio, wood, building supplies	metals, solvents
425*	BUSINESS	back hoe loader, jack hammers, generators,	metals, solvents
426*	STORAGE TANK	2 gravity driven gas tanks	petroleum
427*	BUSINESS	electric company, manufacture	metals, solvents
428*	SERVICE STATION	tow car care center, mufflers	metals, solvents, petroleum
429*	BUSINESS	mill and fixture company	metals, solvents
430*	BUSINESS	beauty salon	metals, solvents
431*	GOVERNMENT	fire station	metals, solvents, petroleum
432*	SERVICE STATION	gas station	petroleum
433*	SERVICE STATION	gas station	petroleum
434*	MEDICAL	chiropractor	metals, solvents
435*	SERVICE STATION	car wash	metals, solvents, petroleum
436*	SERVICE STATION	gas station	petroleum
437*	SERVICE STATION	gas station	petroleum
438*	SERVICE STATION	gas station	petroleum
439*	SERVICE STATION	gas station	petroleum
440*	BUSINESS	appliance repair, stoves, refrigerator	metals, solvents
441*	BUSINESS	hair salon, tanning	metals, solvents
442*	BUSINESS, MEDICAL	plaza: hair salon, optometrist, mailing shop,	metals, solvents
443*	BUSINESS	professional color lab	metals, solvents
444*	BUSINESS	photography studio	metals, solvents
445*	BUSINESS	auto parts, battery	metals, solvents
446*	BUSINESS	hair salon	metals, solvents
447*	MEDICAL	dentists offices	metals, solvents
448*	BUSINESS	nail salon	metals, solvents
449*	BUSINESS	beauty salon	metals, solvents
450*	BUSINESS	mortuary	metals, solvents
451*	MEDICAL	health center, chiropractic	metals, solvents
452*	MEDICAL	dentists offices	metals, solvents
453*	LARGE LAWN	large lawn/stadium	pesticides, fertilizer
454*	STORAGE TANK	gravity driven gas tank	petroleum
455*	GOVERNMENT	government, garages, gas pumps, possible	metals, solvents, petroleum
456*	LARGE LAWN	nursery	pesticides, fertilizer

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
457*	LARGE LAWN	ball field, school	pesticides, fertilizer
458*	MEDICAL	dentist offices	metals, solvents
459*	BUSINESS	craft supply	metals, solvents
460*	BUSINESS	beauty salon	metals, solvents
461	BUSINESS	hair salon	metals, solvents
462*	BUSINESS	all season sports, snowmobiles, 3 wheeler	metals, solvents, petroleum
463*	SERVICE STATION	motorcycle atv sales and service	metals, solvents, petroleum
464	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
465	MINING	mining, possible gravel/sand	
466	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
467	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, cows	fertilizer, manure
468	STORAGE TANK	gravity driven gas tank	petroleum
469	BUSINESS	feed and pet store, dog and cat boarding and	metals, solvents
470	BUSINESS	hair salon	metals, solvents
471	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
472	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
473	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep, goats, horse, corral	fertilizer, manure
474	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, cows	fertilizer, manure
475	MINING	excavation pit, not active	metals, solvents, petroleum
476	LARGE LAWN	large lawn, elementary school	pesticides, fertilizer
477	INDUSTRY	power sub station	PCB, metals, solvents
478	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral	fertilizer, manure
479	LARGE LAWN	large lawn, elementary school, soccer field	pesticides, fertilizer
480	LARGE LAWN	cemetary	pesticides, fertilizer
481	STORAGE TANK	gravity driven gas tank	petroleum
482	CONCENTRATION OF ANIMALS AND/OR FEED LOT	stables, corral possibly abandoned	fertilizer, manure
483	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, pony	fertilizer, manure
484	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, sheep	fertilizer, manure
485	BUSINESS	machine shop, engine rebuilding	metals, solvents
486	LARGE LAWN	large lawn	pesticides, fertilizer
487	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
488	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
489	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep, horses, corral	fertilizer, manure
490	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral	fertilizer, manure
491	BUSINESS	stainless steel pumps, water wells	metals, solvents

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
492	GOVERNMENT	corp, trucks, road, transportation	metals, solvents, petroleum
493	GOVERNMENT	rubbish bins, pvc pipes	metals, solvents
494	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, cows, feed lot	fertilizer, manure
495	STORAGE TANK	gravity driven gas tank	petroleum
496	CONCENTRATION OF ANIMALS AND/OR FEED LOT,	corral, horse, gravity driven gas tank	fertilizer, manure, petroleum
497	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, 2 cows	fertilizer, manure
498	STORAGE TANK	gravity driven gas tank	petroleum
499	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
500	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, cows	fertilizer, manure
501	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
502	STORAGE TANK	gravity driven gas tank	petroleum
503	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
504	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, animal feeding operation horses	fertilizer, manure
505	MEDICAL	animal clinic	metals, solvents
506	CONCENTRATION OF ANIMALS AND/OR FEED LOT	small corral, sheep	fertilizer, manure
507	CONCENTRATION OF ANIMALS AND/OR FEED LOT	barn sheds, animal feeding operation sheep	fertilizer, manure
129	JUNK YARD/SALVAGE	junk yard/salvage	metals, solvents, petroleum
508	FORMER CONCENTRATION OF ANIMALS	abandoned poultry coops	fertilizer, manure
509	FORMER CONCENTRATION OF ANIMALS	abandoned corral /abandoned feed lot	fertilizer, manure
510	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
511	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
512	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure
513	STORAGE TANK	gravity driven gas tank	petroleum
514	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, cows, sheep	fertilizer, manure
515	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
516	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, cows	fertilizer, manure
517	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, goats, horses	fertilizer, manure
518	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, stables, cows	fertilizer, manure
519	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
520	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
521	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
522	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
523	STORAGE TANK	gravity driven gas tank	petroleum
524	LARGE LAWN	large nursery	pesticides, fertilizer
525	CONCENTRATION OF ANIMALS AND/OR FEED LOT	sheep animal feeding operation	fertilizer, manure

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
526	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, stables	fertilizer, manure
527	CONCENTRATION OF ANIMALS AND/OR FEED LOT	stables, sheep	fertilizer, manure
528	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
529	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
530	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, cows, few	fertilizer, manure
531	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
532	CONCENTRATION OF ANIMALS AND/OR FEED LOT	animal feeding operation, cows	fertilizer, manure
533	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horse	fertilizer, manure
534	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral	fertilizer, manure
535	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, pony	fertilizer, manure
536	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral	fertilizer, manure
537	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral	fertilizer, manure
538	GOVERNMENT	garage, storing device	metals, solvents
539	STORAGE TANK	gas pump	petroleum
540	JUNK YARD/SALVAGE	personal junk yard/salvage, trucks, trailers,	metals, solvents, petroleum
541	JUNK YARD/SALVAGE	personal junk yard/salvage, trucks, tires, cars,	metals, solvents, petroleum
542	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
543	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral	fertilizer, manure
544	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
545	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
546	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
547	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
548	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
549	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, goats	fertilizer, manure
550	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
551	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
552	FORMER CONCENTRATION OF ANIMALS	abandoned corral, sheep	fertilizer, manure
553	WASTE DISPOSAL	waste water facility	sewage
554	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, cows, animal feeding operation	fertilizer, manure
555	JUNK YARD/SALVAGE	dumping ground, trucks, buses, cars,	metals, solvents, petroleum
556	JUNK YARD/SALVAGE, STORAGE TANK	dumping ground, trucks, buses, cars, scraps,	metals, solvents, petroleum
557	STORAGE TANK	gravity driven gas tank	petroleum
558	WASTE DISPOSAL	no tresspassing,non potable water,	metals, solvents, nitrate
559	STORAGE TANK	gravity driven gas tank	petroleum
560	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, animals	fertilizer, manure

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
561	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, cows, horses	fertilizer, manure
562	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horse	fertilizer, manure
563	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, ostriches	fertilizer, manure
564	CONCENTRATION OF ANIMALS AND/OR FEED LOT	personal stadium, horses, corrals, stables	fertilizer, manure
565	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
566	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, stables, horses	fertilizer, manure
567	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, stables, horses	fertilizer, manure
568	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
569	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, cow	fertilizer, manure
570	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
571	STORAGE TANK	gravity driven gas tank	petroleum
572	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
573	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
574	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
575	JUNK YARD/SALVAGE	personal junk yard/salvage, trucks, cars,	metals, solvents, petroleum
576	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral for rent	fertilizer, manure
577	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral	fertilizer, manure
578	CONCENTRATION OF ANIMALS AND/OR FEED LOT	formal corral, stables, stable and tack	fertilizer, manure
579	BUSINESS	store/storage	metals, solvents
580	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
581	JUNK YARD/SALVAGE	junk yard/salvage, trailers, tractors, trucks,	metals, solvents, petroleum
582	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral, ranch	fertilizer, manure
583	MINING	excavation pit, gravel, sand	metals, solvents, petroleum
584	MINING	excavation pit, gravel, sand	metals, solvents, petroleum
585	MINING	small excavation pit	metals, solvents, petroleum
586	MINING	excavation pit, gravel, sand	metals, solvents, petroleum
587	MINING	excavation pit, not active	metals, solvents, petroleum
588	FORMER CONCENTRATION OF ANIMALS	abandoned corral, no tresspassing	fertilizer, manure
589	MINING	small excavation pit	metals, solvents, petroleum
590	CONCENTRATION OF ANIMALS AND/OR FEED LOT,	farm related business, barns, stables	metals, solvents
591	MINING	cinder pit	metals, solvents, petroleum
592	FORMER CONCENTRATION OF ANIMALS	abandoned barnyard, stable, corral	fertilizer, manure
593	MINING	collapsed mine, capped oil well	metals, solvents, petroleum
594	CONCENTRATION OF ANIMALS AND/OR FEED LOT	no tresspassing, sheds, stables, cows, barns,	metals, solvents
595	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure

Table C1. countinued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
596	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
597	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
598	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, stables	fertilizer, manure
599	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral, stables	fertilizer, manure
600	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral	fertilizer, manure
601	CONCENTRATION OF ANIMALS AND/OR FEED LOT	low lying sheds, stables, poultry animal feeding	fertilizer, manure
602	STORAGE TANK	gravity driven gas tank	petroleum
603	JUNK YARD/SALVAGE	personal junk yard, cars, trucks, tractors, wood	metals, solvents, petroleum
331	STORAGE TANK	2 gravity driven gas tanks	petroleum
604	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
605	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, stables	fertilizer, manure
606	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral	fertilizer, manure
607	LARGE LAWN	ballpark	pesticides, fertilizer
608	STORAGE TANK	gravity driven gas tank	petroleum
609	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral	fertilizer, manure
610	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
611	CONCENTRATION OF ANIMALS AND/OR FEED LOT	private property, stables, barnyard	fertilizer, manure
612	STORAGE TANK	gravity driven gas tank	petroleum
613	CONCENTRATION OF ANIMALS AND/OR FEED LOT	stables, corral, silos, mapped from distance	fertilizer, manure
614	CONCENTRATION OF ANIMALS AND/OR FEED LOT	horses, corral	fertilizer, manure
615	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
616	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
617	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
618	STORAGE TANK	gravity driven gas tank	petroleum
619	MINING	inactive gravel pit	metals, solvents, petroleum
620	JUNK YARD/SALVAGE	personal junk yard/salvage, trucks, outhouse,	metals, solvents, petroleum
621	MINING	excavation pit, gravel, sand	metals, solvents, petroleum
622	MINING	excavation pit, gravel, sand	metals, solvents, petroleum
623	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses, ponies	fertilizer, manure
624	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
625	STORAGE TANK	gravity driven gas tank	petroleum
626	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure
627	JUNK YARD/SALVAGE	hundreds of tires in yard	metals, solvents
628	STORAGE TANK	gravity driven gas tank	petroleum
629	CONCENTRATION OF ANIMALS AND/OR FEED LOT	corral, horses	fertilizer, manure

Table C1. continued

SITE #	POTENTIAL CONTAMINANT	LOCATION/SOURCE DESCRIPTION	POLLUTANT
630	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
631	CONCENTRATION OF ANIMALS AND/OR FEED LOT	ranch, farm related, corral, horses	fertilizer, manure
632	CONCENTRATION OF ANIMALS AND/OR FEED LOT	cows, animal feeding operation, corral, stables	fertilizer, manure
633	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
634	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure
636	FORMER CONCENTRATION OF ANIMALS	abandoned corral	fertilizer, manure

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PLATE 1.
TOTAL-DISSOLVED-SOLIDS CONCENTRATIONS FOR THE PRINCIPAL BASIN-FILL AQUIFER, CEDAR VALLEY, IRON COUNTY, UTAH

By
Mike Lowe, Janae Wallace,
and Walid Sabbah, Utah Geological Survey,
and Jason L. Kneedy, Chesapeake Energy

2010

This map was created from Geographic Information System (GIS) files.
Basemap constructed from features obtained from the Utah Automated Geographic Reference Center (http://agrc.utah.gov/).
Projection: Universal Transverse Mercator
Datum: North American 1983 Zone 12 N
Spheroid: Clarke 1866
Cartography by Richard Emerson

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PLATE 2. RECHARGE AREAS FOR PRINCIPAL BASIN-FILL AQUIFER, CEDAR VALLEY, IRON COUNTY, UTAH

By
Mike Lowe, Janae Wallace,
and Walid Sabbah, Utah Geological Survey,
and Jason L. Kneedy, Chesapeake Energy

2010

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PLATE 3.
GROUND-WATER QUALITY CLASSIFICATION FOR THE BASIN-FILL AQUIFER, CEDAR VALLEY, IRON COUNTY, UTAH

By
Mike Lowe, Janae Wallace,
and Walid Sabbah, Utah Geological Survey,
and Jason L. Kneedy, Chesapeake Energy

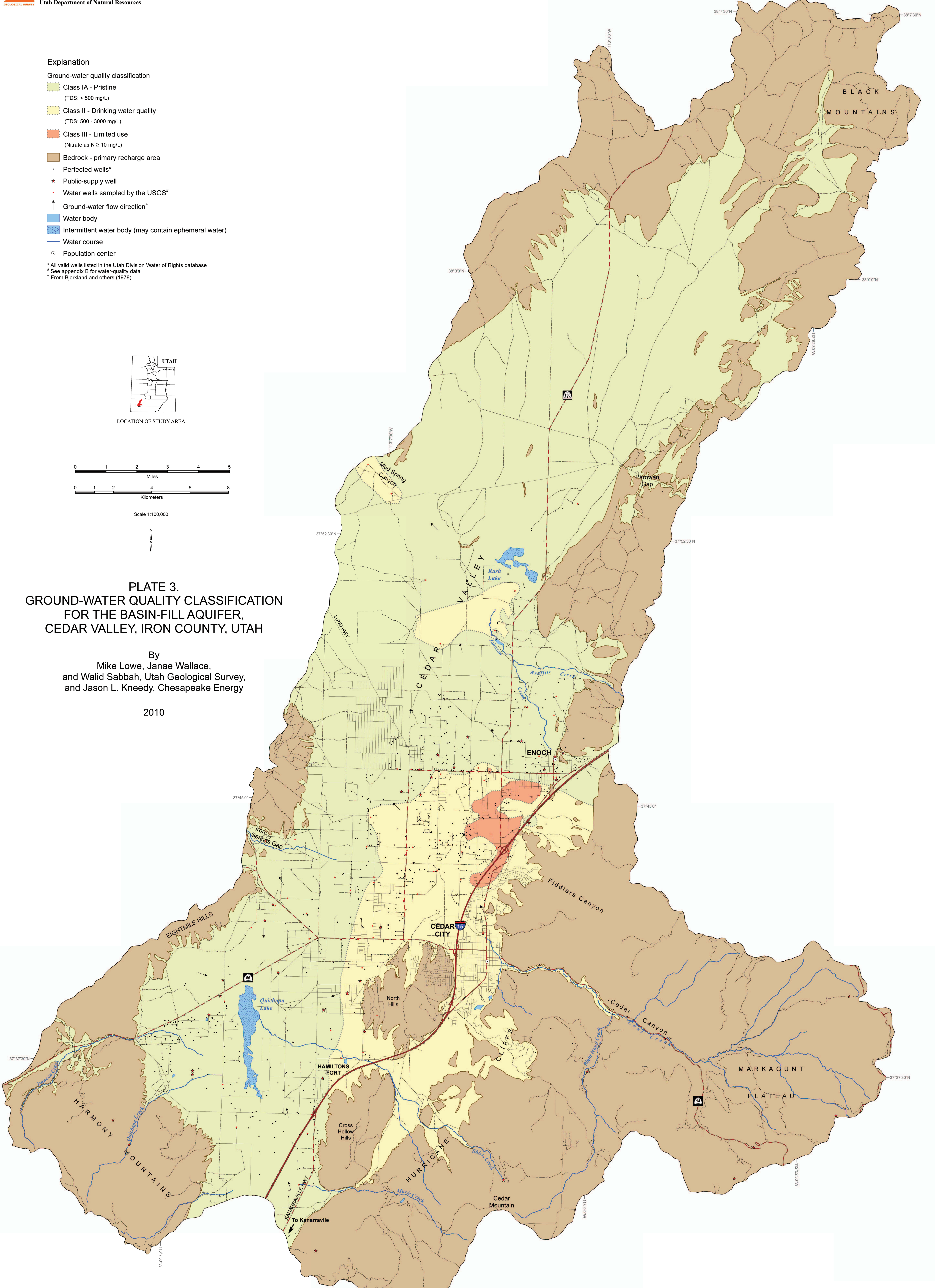
2010

Explanation

Ground-water quality classification

- Class IA - Pristine (TDS: < 500 mg/L)
- Class II - Drinking water quality (TDS: 500 - 3000 mg/L)
- Class III - Limited use (Nitrate as N ≥ 10 mg/L)
- Bedrock - primary recharge area
- Perfected wells*
- Public-supply well
- Water wells sampled by the USGS#
- Ground-water flow direction+
- Water body
- Intermittent water body (may contain ephemeral water)
- Water course
- Population center

* All valid wells listed in the Utah Division Water of Rights database
\# See appendix B for water-quality data
\+ From Bjorkland and others (1978)



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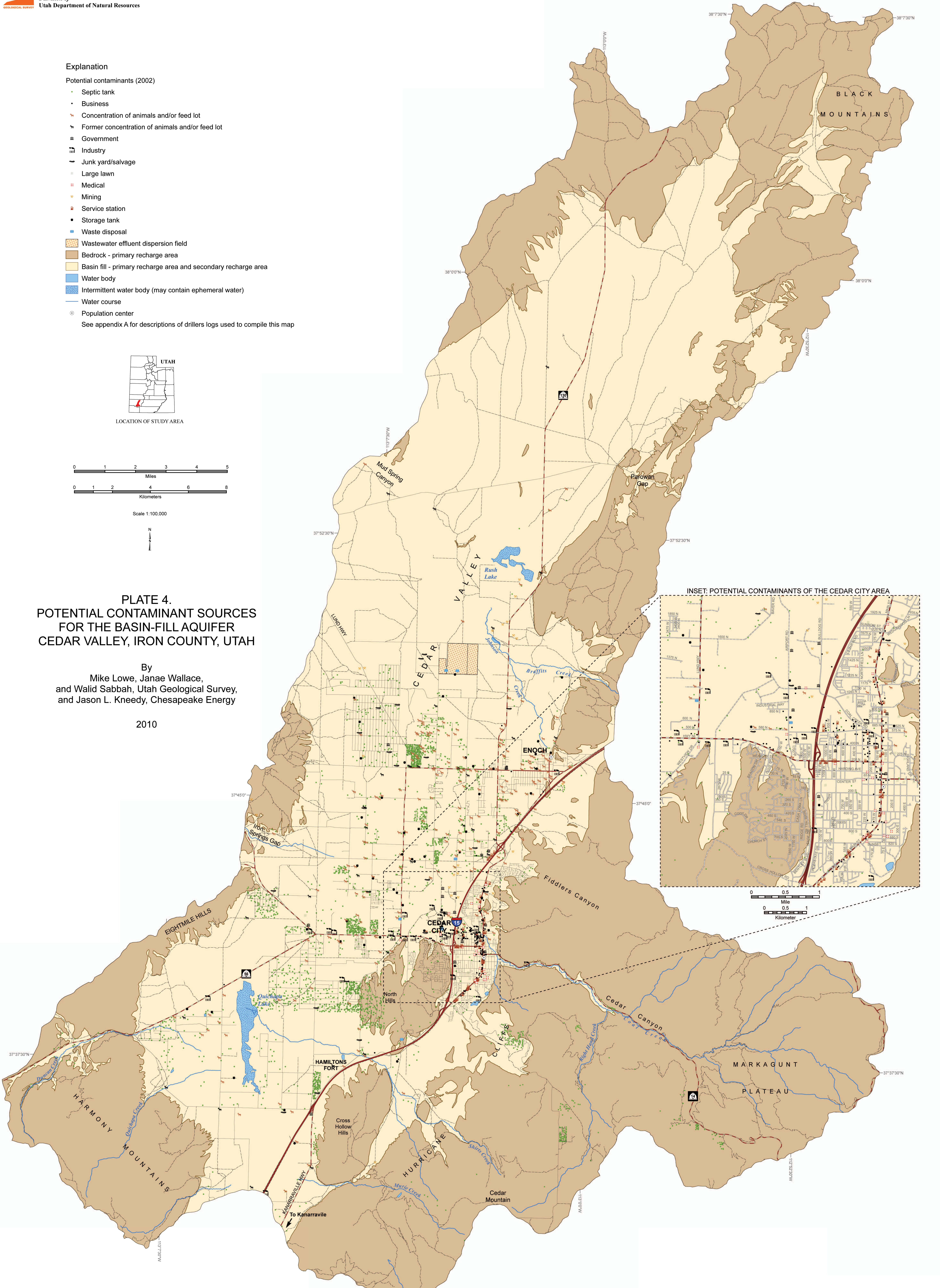

Explanation

Potential contaminants (2002)

- Septic tank
- Business
- Concentration of animals and/or feed lot
- Former concentration of animals and/or feed lot
- Government
- Industry
- Junk yard/salvage
- Large lawn
- Medical
- Mining
- Service station
- Storage tank
- Waste disposal
- Wastewater effluent dispersion field
- Bedrock - primary recharge area
- Basin fill - primary recharge area and secondary recharge area
- Water body
- Intermittent water body (may contain ephemeral water)
- Water course
- Population center

See appendix A for descriptions of drillers logs used to compile this map

PLATE 4.
POTENTIAL CONTAMINANT SOURCES FOR THE BASIN-FILL AQUIFER CEDAR VALLEY, IRON COUNTY, UTAH

By
Mike Lowe, Janae Wallace,
and Walid Sabbah, Utah Geological Survey,
and Jason L. Kneedy, Chesapeake Energy

2010

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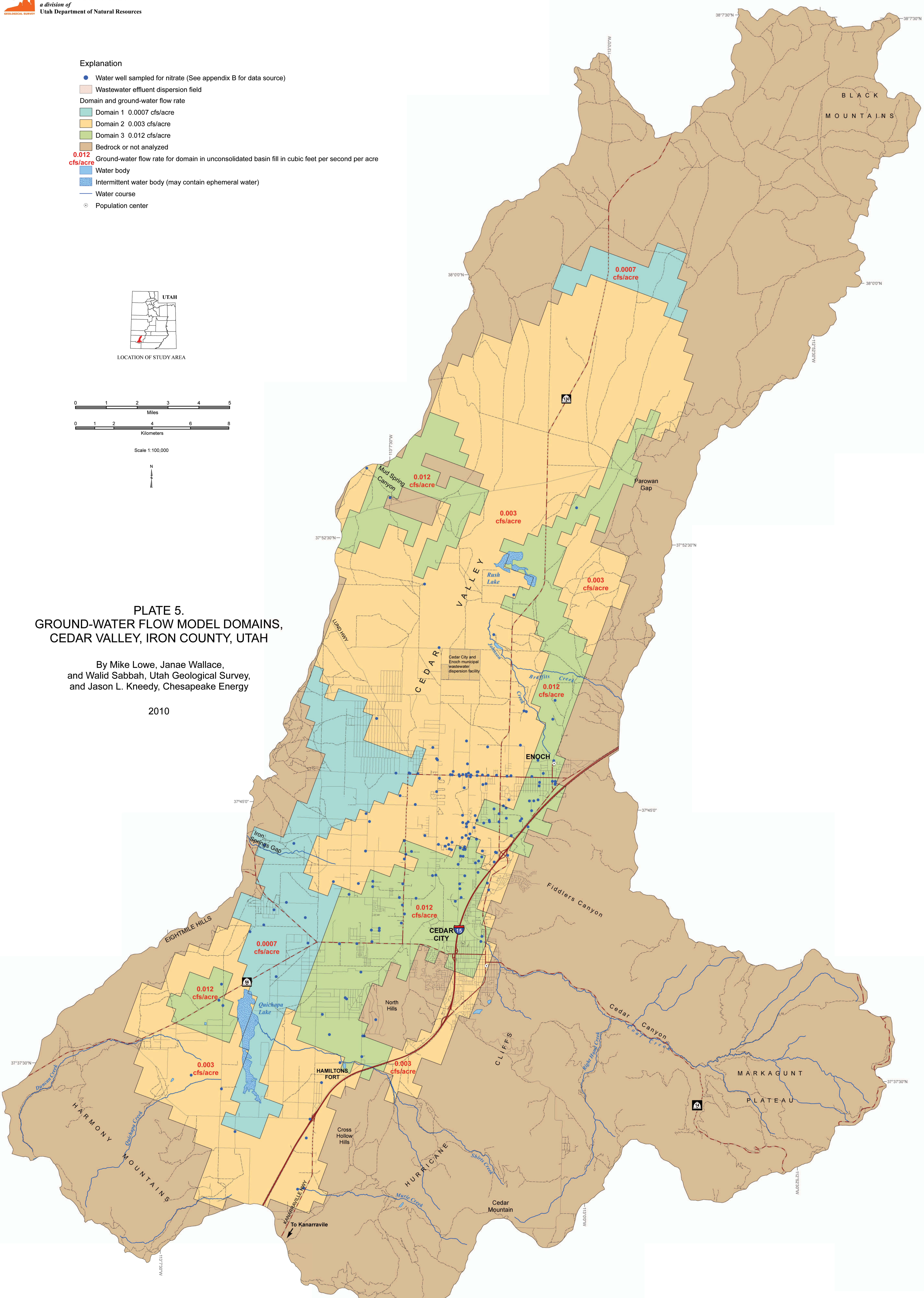

Explanation

- Water well sampled for nitrate (See appendix B for data source)
- Wastewater effluent dispersion field
- Domain and ground-water flow rate
- Domain 1 0.0007 cfs/acre
- Domain 2 0.003 cfs/acre
- Domain 3 0.012 cfs/acre
- Bedrock or not analyzed
- 0.012 cfs/acre — Ground-water flow rate for domain in unconsolidated basin fill in cubic feet per second per acre
- Water body
- Intermittent water body (may contain ephemeral water)
- Water course
- Population center

UTAH

LOCATION OF STUDY AREA

0 1 2 3 4 5
Miles

0 1 2 4 6 8
Kilometers

Scale 1:100,000

N

PLATE 5.
GROUND-WATER FLOW MODEL DOMAINS, CEDAR VALLEY, IRON COUNTY, UTAH

By Mike Lowe, Janae Wallace,
and Walid Sabbah, Utah Geological Survey,
and Jason L. Kneedy, Chesapeake Energy

2010

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PLATE 6.
LOT-SIZE RECOMMENDATIONS FOR LAND-USE PLANNING DOMAINS, CEDAR VALLEY, IRON COUNTY, UTAH

By Mike Lowe, Janae Wallace,
and Walid Sabbah, Utah Geological Survey,
and Jason L. Kneedy, Chesapeake Energy

2010

Explanation

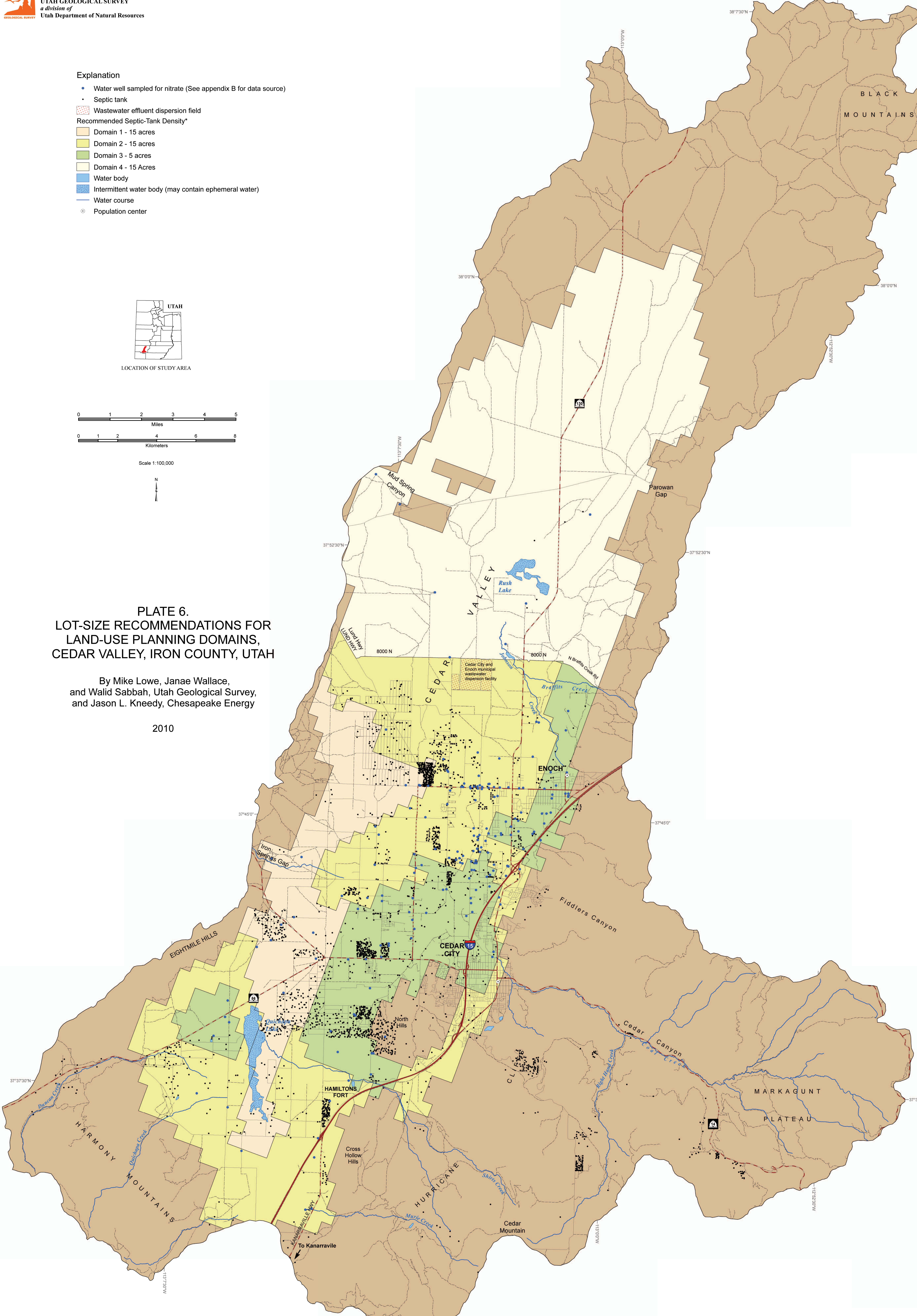
- Water well sampled for nitrate (See appendix B for data source)
- Septic tank
- Wastewater effluent dispersion field

Recommended Septic-Tank Density*

- Domain 1 - 15 acres
- Domain 2 - 15 acres
- Domain 3 - 5 acres
- Domain 4 - 15 Acres
- Water body
- Intermittent water body (may contain ephemeral water)
- Water course
- Population center

UTAH
LOCATION OF STUDY AREA

Miles: 0 1 2 3 4 5
Kilometers: 0 1 2 4 6 8
Scale 1:100,000



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