# Volume 5

# Certificated Groundwater Irrigation Rights and Municipal Water Use in the Model Area

Presentation to the Office of the Nevada State Engineer

Prepared by

SOUTHERN NEVADA WATER AUTHORITY

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# TABLE OF CONTENTS


List of Figures . . . iii

List of Tables . . . v

List of Acronyms and Abbreviations . . . vii

1.0 Introduction . . . 1-1

1.1 Purpose and Objective . . . 1-1
1.2 General Approach . . . 1-1

2.0 Data Compilation and Evaluation . . . 2-1

2.1 Data Types . . . 2-1
2.2 Data Sources . . . 2-2
2.2.1 Water Rights Data . . . 2-2
2.2.2 Groundwater and Surface Water Data . . . 2-2
2.2.3 Population Data . . . 2-2
2.2.4 Per Capita Use Data . . . 2-4
2.3 Data Set Creation . . . 2-4

3.0 Data Reduction and Analysis . . . 3-1

3.1 Data Reduction . . . 3-1
3.1.1 Water Rights Database . . . 3-1
3.2 Data Analysis . . . 3-1
3.2.1 Municipal Water Use Estimates . . . 3-2
3.2.1.1 Population Estimates . . . 3-2
3.2.1.1.1 Ely . . . 3-2
3.2.1.1.2 McGill . . . 3-3
3.2.2 Per Capita Water Use Rate . . . 3-3
3.2.3 Consumptive Water Use Estimates . . . 3-3
3.3 Summary . . . 3-3

4.0 Water Rights and Consumptive Water Use Data Set . . . 4-1

4.1 Nevada Certificated Groundwater Rights Used for Irrigation . . . 4-1
4.2 Utah Certificated Groundwater Rights Used for Irrigation . . . 4-1
4.3 Total Consumptive Water Use for Each Five Year Period Between 1945 and 2005 . . . 4-2

5.0 References . . . 5-1

**Attachment A - Water Rights Data Sets**

A.1.0 Introduction . . . A-1

**Attachment B - Consumptive Water Use Estimates**

B.1.0 Introduction . . . B-1

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## *LIST OF FIGURES*

***NUMBER*** ***TITLE*** ***PAGE***

2-1 Location of Hydrographic Areas and Major Cities in the Model Area . . . . . 2-3

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## *LIST OF TABLES*


| *NUMBER* | *TITLE* | *PAGE* |
|---|---|---|
| A.1-1 | Nevada Certificated Groundwater Rights Used for Irrigation in the Model Area | A-2 |
| A.1-2 | Utah Certificated Groundwater Rights Used for Irrigation in the Model Area | A-7 |
| B.1-1 | Consumptive Water Use Estimates for the Time Period 1945-2005 for Ely and McGill, NV | B-1 |

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# LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| afy | acre-feet per year |
| gpcd | Gallons per capita (per person) per day |
| HA | Hydrographic Area |
| NAD83 | North American Datum of 1983 |
| NDWR | Nevada Division of Water Resources |
| pdf | Portable document file |
| UDWR | Utah Division of Water Rights |
| USGS | U.S. Geological Survey |
| UTM | Universal Transverse Mercator |

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# 1.0 INTRODUCTION

## 1.1 Purpose and Objective

The purpose of this task was to compile a data set of the locations of certificated water rights from underground sources used for irrigation in the model area, and to estimate the total consumptive use of water for the communities of Ely and McGill, NV in five year increments for the time period 1945-2005. The data set of certificated water rights from underground sources used for irrigation was used to facilitate the discrimination of areas irrigated with groundwater from areas irrigated with surface water, and to help determine when groundwater irrigation began in the model area.

## 1.2 General Approach

The general approach for deriving the certificated water rights data set and consumptive water use estimates for Ely and McGill, NV included the following steps:

1. Compile water right data from the Nevada Division of Water Resources (NDWR) and the Utah Division of Water Rights (UDWR) for hydrographic areas (HA) in the model area;

2. Obtain or estimate population data, per capita use rates, and water use data for the communities of Ely and McGill, NV back to 1945;

3. Reduce the compiled water rights data into a subset of data representative of certificated water rights from underground sources used for irrigation;

4. Derive consumptive water use estimates for the communities of Ely and McGill, NV based on water use estimates;

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# 2.0 DATA COMPILATION AND EVALUATION

This section discusses the types of data needed for this assessment, the sources of the water rights and water use data, and the creation of the water rights data sets.

## 2.1 Data Types

The types of data needed for this assessment included water rights data for HAs in the model area. In addition, groundwater production data, surface water diversion data, population estimates, and per capita water use rates for the cities of Ely and McGill, NV were necessary to estimate the use of water for those communities. The specific types of data compiled for this study included:

- **Water Rights**
  - Application or Certificate Number (for Nevada)
  - Water Right Number (for Utah)
  - Point of Diversion Location (Universal Transverse Mercator [UTM] Coordinates)
  - Irrigated Acreage
  - Water Right Owner
- **Groundwater Production Data**
  - Site name or number
  - Volume of water pumped
  - Permit Number
- **Surface Water Diversion Data**
  - Site name or number
  - Volume of water diverted
  - Permit Number
- **Population Data**
  - Name of city
  - Year
  - Population

- **Per Capita Water Use Rates**

  - Geographic location (i.e., county)
  - Total population served by public water supply
  - Volume of publicly supplied water

## 2.2 Data Sources

The sources of data used for this assessment included electronic data (e.g., databases, spreadsheets, or portable document files [pdf]) obtained from various sources. The types of data collected and their sources are discussed in greater detail in the following sections.

### 2.2.1 Water Rights Data

Water rights data are available from both the NDWR and UDWR websites. Water rights data for the State of Nevada can be accessed at the following URL http://water.nv.gov/water%20rights/permitdb/permitdb_disclaimer.htm. The water rights information for Nevada was obtained from the on-line water rights database by performing a "Hydrographic Abstract" search. This type of query is accomplished by entering, at a minimum, the HA number for the basin that you are interested in. For this assessment, all water rights data were obtained for the following HAs in the model area including HA 184 (Spring Valley), HA 195 (Snake Valley), HA 179 (Steptoe Valley), HA 180 (Cave Valley), HA 183 (Lake Valley), HA 196 (Hamlin Valley), and HA 181 (Dry Lake Valley) (see Figure 2-1). Water rights data for the State of Utah can be accessed at the following URL http://nrwrt1.nr.state.ut.us/wrinfo/default.asp. Queries can be performed from this website based on a water right number, name/source, point of diversion, or places of use. The State of Utah, however, makes available a water rights point of diversion database for the entire State of Utah as a shapefile that can be viewed in ArcGIS® 9 from Environmental Systems Research Institute (ESRI). The water rights point of diversion database can be found at the following URL http://nrwrt1.nr.state.ut.us/gisinfo/wrcover.asp.

### 2.2.2 Groundwater and Surface Water Data

Municipal groundwater pumpage data and surface water diversion data were obtained from the NDWR. NDWR provided groundwater pumpage and surface water diversion data for both Ely and McGill, NV in Microsoft Excel® workbooks. These workbooks contain the permit number, duty allowed for each permit, and the volume of water pumped or diverted depending on the source of water. The data were available for the years 2002, 2003, and 2004 for the city of Ely. It was available for the year 2003 for the city of McGill. This water use data was incorporated into the estimates of water use for the appropriate year and community.

### 2.2.3 Population Data

Population data for the two largest communities in the Spring Valley model area were obtained from two main sources. The first source was a Nevada State Demographer report titled, "Nevada County

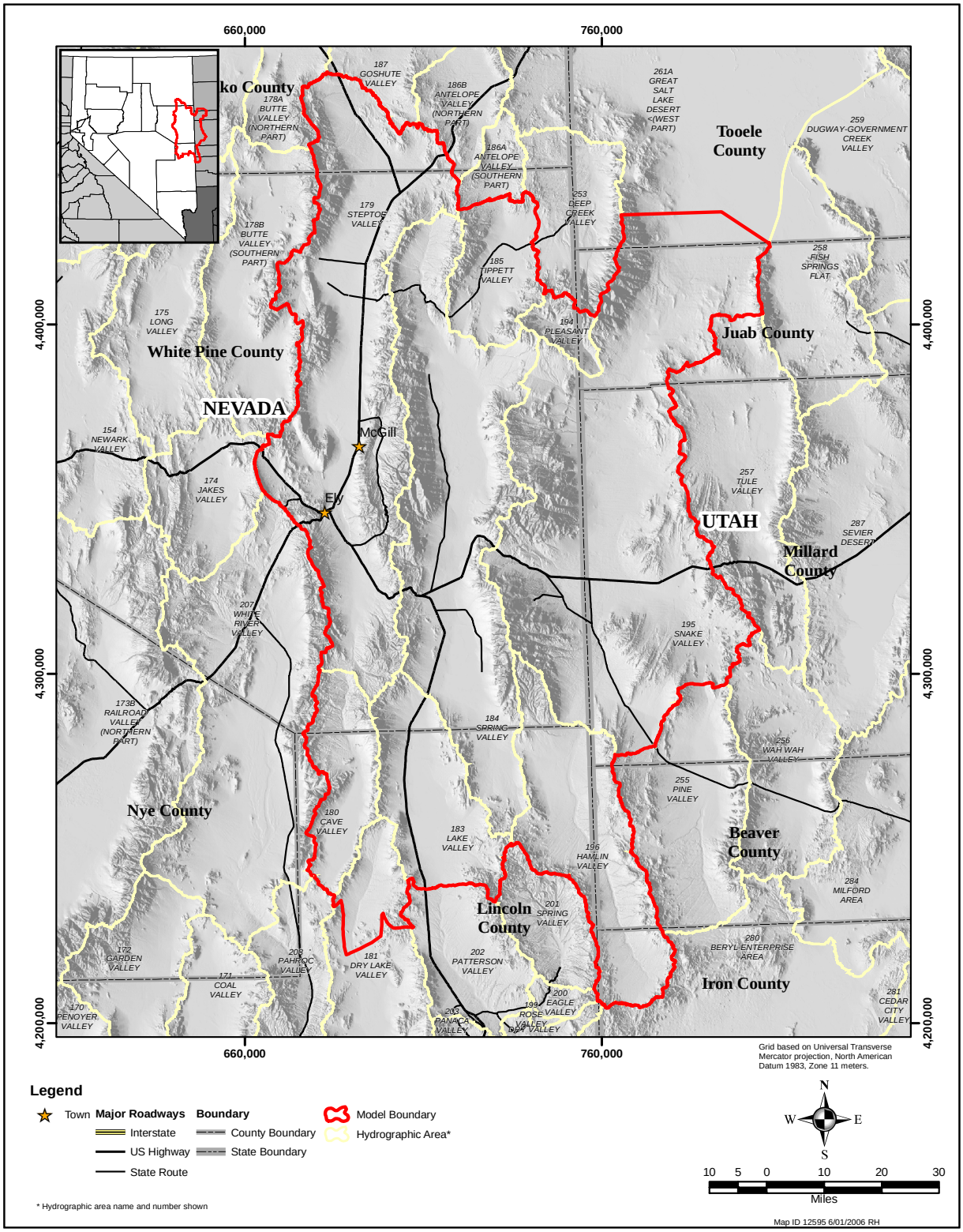


**Figure 2-1**
**Location of Hydrographic Areas and Major Cities in the Model Area**

Population Estimates July 1, 1986 to July 1, 2004 Includes Cities and Towns" (Nevada State Demographer, 2004). The second source of population data was the Nevada State Library and Archives. Nevada place names populations from 1860-2000 can be accessed from the Nevada State Library and Archives at the following URL http://dmla.clan.lib.nv.us/docs/nsla/sdc/placenames/. Population data from the Nevada State Library and Archives are available by decade for cities, towns, or townships.

### 2.2.4 Per Capita Use Data

Per capita water use rates were determined based on data obtained from the U.S. Geological Survey (USGS). Specifically, the per capita water use rates were determined from data files that can be downloaded from the following URL at http://water.usgs.gov/watuse/data/2000/nvco2000.xls. These data files provide water-use estimates by county for the United States, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands. These data files support the State-Level water-use estimates published in USGS Circular 1268 (Hutson et al., 2004). The per capita water use rate determination is discussed further in Section 3.2.2.

## 2.3 Data Set Creation

The process used to compile the water rights data sets is summarized in this section. In general, this process consisted of querying data from the online NDWR water rights database and from the UDWR water rights point of diversion database. All water right data regardless of the status or manner of use were obtained for each HA in the model area. The water right data were queried based on the HA number (see Figure 2-1). The queried data for the State of Nevada were then saved into individual Microsoft Excel® worksheets. One worksheet for each HA. Once the water right data were obtained for each HA, the State of Nevada data were combined into one Microsoft Excel® workbook and then imported into a Microsoft Access® database. In addition, UTM coordinates were determined for each water right point of diversion. The coordinates were determined by assuming that a given point of diversion was in the center of the smallest part of the legal description location. For example, if a given water right listed the point of diversion information down to the nearest quarter-quarter section, then it was assumed that the point of diversion was in the center of that quarter-quarter section. If a given water right listed the point of diversion information to the nearest section, it was then assumed that the point of diversion was in the center of that section. The data are organized by HA and then by application number.

The water right data for HAs in Utah (i.e., HA 195 and 196) were handled in a slightly different manner. Since the data were already in the form of a shapefile that could be imported into ArcGIS® 9, a spatial query was performed in ArcGIS® 9 to extract the water right data for HAs 195 (Snake Valley) and 196 (Hamlin Valley). The extracted data were then exported to another Microsoft Excel® workbook.

The water rights data for the State and Nevada and the State of Utah could not be combined into a single data set because the two are incompatible. For example, the two water rights data sets have different codes to indicate status, manner of use, and source of water.

# 3.0 DATA REDUCTION AND ANALYSIS

This section describes the reduction of the compiled water rights data sets into usable data sets for incorporation into the groundwater flow model, and the processes taken to derive consumptive water use estimates for the time period 1945-2005 in 5 year increments for the communities of Ely and McGill, Nevada.

## 3.1 Data Reduction

Prior to use in the groundwater flow model, the compiled water rights data sets needed to be reduced to data sets that represented only certificated water rights from underground sources used for irrigation. In addition, supplemental water rights were also excluded. The identification of supplemental water rights for this report was based on the State Engineer's identification of those rights in the NDWR database. This data reduction is discussed in the following section.

### 3.1.1 Water Rights Database

The process of reducing the compiled water rights database to a data set suitable for incorporation into the groundwater flow model consisted of querying each compiled water rights data set (i.e., Nevada water rights and Utah water rights) for the appropriate water rights. The data sets were queried for certificated water rights from underground sources that were used for irrigation and not supplemental for the HAs in the model area (see Figure 2-1). The queried data were then exported back to Microsoft Excel® and combined into one table for water rights in Nevada and one table for water rights in Utah. Unfortunately, the point of diversion shapefile for the state of Utah does not include the irrigated acreage associated with a given water right. The acreages for these water rights were added to the water rights data for Utah based on information obtained from the following URL http://nrwrt1.nr.state.ut.us/wrinfo/default.asp. The reduced data sets for Nevada and Utah can be seen in Attachment A, Tables A.1-1 and A.1-2, respectively.

## 3.2 Data Analysis

The total consumptive use of water for each five year period between 1945 and 2005 was estimated for the communities of Ely and McGill, NV. The consumptive water use estimates consisted of first estimating the municipal water use for each community. The municipal water use for the two communities was estimated based on population data, per capita water use rates, and groundwater production or surface water diversion data, when available. The municipal water use estimates were then used to derive the consumptive water use estimates for the two communities in the model area. These processes are described in further detail in the following sections.

### 3.2.1 Municipal Water Use Estimates

The water use attributed to a community was based either on the population and per capita water use rate for a community or groundwater production or surface water diversion data, when available. Water use estimates for a community based on the population and a per capita water-use rate were calculated by the following equation:

$$WU = P \times GPCD \times C \qquad (3\text{-}1)$$

where

WU = The community water use estimate (acre-feet per year [afy]),
P = The population of a community in a given year,
GPCD = The per capita water use rate in gallons per capita per day (gpcd),
C = A conversion factor of 0.0011201 to convert gpcd and population into afy.

The municipal water use in acre-feet per year was estimated for each year from 1945-2005. When groundwater production data and surface water diversion data were available, the sum of the two was used as the municipal water use for the community for that year.

#### 3.2.1.1 Population Estimates

For the years in which actual population data were not available, population estimates were made by bracketing the unknown years with known years and evenly distributing the difference to the unknown years. For example, most cities have population data for every ten years, but not for the individual years within a decade. In these instances, the difference in population between two decades was then evenly distributed to the missing years. It should also be noted that population data from the Nevada State Library and Archives are sometimes reported in terms of a “township” or a “census designated place”. For example, the 1930 census reports population data for the “McGill census designated place” that includes the actual town of McGill. Due to the fact that each community had slightly different circumstances in estimating population data, each community is discussed in the following sections explicitly.

##### 3.2.1.1.1 Ely

Population data for the city of Ely are available for the years 1940, 1950, 1960, 1970, and 1980 from the Nevada State Library and Archives. Population data for the years 1986 through 2004 are available from the Nevada State Demographer. Population data for the missing years were estimated by evenly distributing the difference in population between two known years to the intervening years between the known values.

#### *3.2.1.1.2 McGill*

Population data for the "McGill unincorporated" or the "McGill census designated place" are available for the years 1930, 1950, 1960, 1970, 1980, and 1990 from the Nevada State Library and Archives. It was assumed that these populations represent the actual population for the city of McGill. Population data for the city of McGill are available for the years 1996-2004 from the Nevada State Demographer. Population data for the missing years were estimated by evenly distributing the difference in population between two known years to the intervening years between the known values.

### *3.2.2 Per Capita Water Use Rate*

From the data files compiled by Hutson et al. (2004), a per capita water use rate for White Pine County was calculated. This per capita water use rate was based on the following two fields that can be found in the Nevada data files for White Pine County for the year 2000: "Public supply, total population served, in thousands" and "Public supply, total withdrawals, fresh, in Mgal/d." According to the state level data files, White Pine county had a population of 8,340 people and total fresh water withdrawal of 2.75 million gallons per day for the "public supply" category. From these two numbers, a water use rate of 330 gallons per capita per day was determined for communities located in White Pine County.

### *3.2.3 Consumptive Water Use Estimates*

Consumptive water use for each year from 1945-2005 was estimated for both Ely and McGill based on the municipal water use discussed in the previous section. It was assumed for the purposes of this study that the consumptive water use for both communities was equal to 50 percent of the municipal water use. Harrill (1986) and Brothers et al. (1993) also assumed that 50 percent of community water use was consumptively used. After the consumptive use was determined for each year from 1945-2005, the total consumptive use for each five year increment was determined by summing the consumptive use for the individual years in that five year period. Model inputs were developed for the 60-year period 1945-2005 in five year increments. The consumptive water use estimates for the two communities can be seen in Attachment B.

## *3.3 Summary*

In summary, consumptive water-use estimates for communities in the model area were obtained from a combination of actual groundwater production data, surface-water diversion data, and estimates of water use based on a community's population and a per capita water-use rate. Estimates of water-use were obtained by multiplying the per capita water-use rate by the population of a community. Actual data were used when available.

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# 4.0 WATER RIGHTS AND CONSUMPTIVE WATER USE DATA SET

This section summarizes the underground water rights data sets and documents the structure of the data sets compiled for use in the groundwater flow model. The underground water rights data sets can be seen in Attachment A, Tables A.1-1 and A.1-2. The consumptive water use estimates for Ely and McGill, NV can be seen in Attachment B.

## 4.1 Nevada Certificated Groundwater Rights Used for Irrigation

The data set of Nevada certificated water rights from underground sources used for irrigation contains the following columns along with their respective definitions (see Table A.1-1):

1. HA – Hydrographic Area;
2. App – Water right application number;
3. Change of App – Number that indicates what water right the current water right changed or modified;
4. Cert – The assigned certificate number for a perfected water right;
5. File Date – The date the original water right application was filed;
6. Status – The status of the water right;
7. Source – The source of water for the water right (e.g., underground, spring, stream);
8. UTM Northing – The UTM northing coordinates for the water right in North American Datum of 1983 (NAD83) UTM zone 11 (meters);
9. UTM Easting - The UTM easting coordinates for the water right in NAD83 UTM zone 11 (meters);
10. Div Rate (CFS) – The diversion rate from the point of diversion in cubic feet per second;
11. Type of Use – The type of use of the water right (e.g., irrigation, stockwatering, or municipal);
12. Sup – A column that indicates whether the water right is supplemental to another water right;
13. Irrigated Acres – The number of acres irrigated by the water right;
14. Annual Duty – The total volume of water assigned to the water right;
15. Units – The units for the annual duty;
16. Owner of Record – The owner of record for the water right.

## 4.2 Utah Certificated Groundwater Rights Used for Irrigation

The data set of Utah certificated water rights from underground sources used for irrigation contains the following columns along with their respective definitions (see Table A.1-2):

1. HA – The hydrographic area number;
2. WRNUM – The Utah water right number;
3. Type – The type of water right (e.g., underground, surface, or return);
4. Summary Status – The summary status of the original water right application (e.g., approved, perfected, or terminated);
5. Status – The status of the water right;
6. Priority – The file date of the water right;
7. Uses – The uses of the water right;
8. CFS – The diversion rate for the water right point of diversion;
9. ACFT – The volume of water associated with the water right;
10. Irr. Acres – The acreage of land irrigated with the water right;
11. Owner – The owner of record for the water right;
12. UTM Northing – The UTM northing coordinates for the water right in NAD83 UTM zone 11 (meters);
13. UTM Easting - The UTM easting coordinates for the water right in NAD83 UTM zone 11 (meters);

### *4.3 Total Consumptive Water Use for Each Five Year Period Between 1945 and 2005*

The total consumptive water use dataset for each five year period between 1945 and 2005 for the cities of Ely and McGill, NV can be seen in Attachment B. The table contains the following columns along with their respective definitions:

1. HA - The hydrographic area number;
2. Town – The town name;
3. Total Consumptive Use in the Time Period – The total consumptive water use for the indicated time period (acre-ft).

# 5.0 REFERENCES

Brothers, K., Buqo, T. S., and Tracy, J.V., 1993, Hydrology and Steady State Groundwater Model of Snake Valley, East-Central Nevada, and West-Central Utah, Las Vegas Valley Water District, Cooperative Water Project, Report No. 9, 66 p.

Harrill, J.R., 1986, Ground-Water Storage Depletion in Pahrump Valley, Nevada-California, 1962-75, U.S. Geological Survey Water-Supply Paper 2279, 53 p.

Hutson, S.S., Barber, N.L., Kenny, J.F., Linsey, K.S., Lumia, D.S., and Maupin, M.A., 2004, Estimated use of water in the United States in 2000: Reston Virginia, U.S. Geological Survey, Circular 1268, 46 p.

Nevada State Demographer, 2004, Nevada county population estimates July 1, 1986 to July 1, 2004, Includes Cities and Towns: Accessed May 05, 2005, at URL http://www.nsbdc.org/demographer/pubs/images/popul03.pdf.

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# Attachment A

# Water Rights Data Sets

# A.1.0 INTRODUCTION

This attachment contains the data set of Nevada certificated water rights from underground sources used for irrigation in the model area (Table A.1-1). It also contains the data set of Utah certificated water rights from underground sources used for irrigation in the model area (Table A.1-2).

# Table A.1-1
## Nevada Certificated Groundwater Rights Used for Irrigation in the Model Area
(Page 1 of 5)

| HA | App | Change of App | Cert | File Date | Status[a] | Source[b] | UTM Northing (m) | UTM Easting (m) | Div Rate (CFS) | Type of Use[c] | Sup | Irrigated Acres | Annual Duty | Units[d] | Owner Of Record |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 179 | 13953 | | 4014 | 12/21/1951 | CER | UG | 4,361,448.41 | 688,344.95 | 3 | IRR | | 141.19 | 564.8 | AFS | Kennecott Nevada Copper Company |
| 179 | 18474 | | 6123 | 12/14/1959 | CER | UG | 4,360,188.63 | 685,988.62 | 4 | IRR | | 121.89 | 487.58 | AFS | Pescio, Joe A. |
| 179 | 18475 | | 6539 | 12/14/1959 | CER | UG | 4,360,202.46 | 686,773.65 | 3 | IRR | | 145.3 | 581.2 | AFS | Pescio, Joe A. |
| 179 | 20756 | | 7127 | 9/28/1962 | CER | UG | 4,359,455.19 | 688,412.62 | 2.7 | IRR | | 140.15 | 560.6 | AFS | Ely Nevada Stake LDS |
| 179 | 21179 | | 6556 | 4/5/1963 | CER | UG | 4,354,124.87 | 688,177.42 | 0.1 | IRR | | 6.36 | 25.46 | AFS | Manning, Leroy |
| 179 | 22023 | | 7536 | 5/25/1964 | CER | UG | 4,385,186.70 | 690,566.79 | 2.7 | IRR | | 160 | 640 | AFS | Jensen, Gordon P. |
| 179 | 22208 | | 7356 | 8/27/1964 | CER | UG | 4,438,209.35 | 702,474.14 | 2.34 | IRR | | 155.15 | 620.6 | AFA | Parker, Johnny |
| 179 | 22221 | | 7065 | 9/2/1964 | CER | UG | 4,353,304.70 | 687,385.81 | 0.035 | IRR | | 0.17 | 0.7 | AFA | Atkin, Lula M. |
| 179 | 22373 | | 7714 | 12/28/1964 | CER | UG | 4,388,906.62 | 686,017.84 | 2.5 | IRR | | 139.6 | 558.4 | AFS | Soeder, Gordon And Linda |
| 179 | 22749 | 21817 | 7768 | 9/2/1965 | CER | UG | 4,358,683.10 | 689,239.33 | 2.3 | IRR | | 89.678 | 358.7 | AFS | Carpenter, John C. Jr. |
| 179 | 23358 | | 8117 | 8/25/1966 | CER | UG | 4,438,194.72 | 701,659.51 | 2.1 | IRR | | 158.73 | 634.92 | AFA | Melville Lamar F. and Dixie T. |
| 179 | 23725 | | 8610 | 2/28/1967 | CER | UG | 4,357,341.66 | 687,278.61 | 3.37 | IRR | | 157.1 | 628.4 | AFA | Grant, Lenore A. |
| 179 | 23756 | 21816 | 7485 | 3/17/1967 | CER | UG | 4,359,494.50 | 689,222.57 | 2.12 | IRR | | 78.6029999 | 314.41 | AFS | Carpenter, John C. Jr. |
| 179 | 23895 | | 8022 | 5/25/1967 | CER | UG | 4,441,968.72 | 700,329.83 | 5.4 | IRR | | 318 | 1272 | AFA | Mary Hudson Trust |
| 179 | 23898 | | 8025 | 5/25/1967 | CER | UG | 4,441,964.27 | 699,518.61 | 5.4 | IRR | | 316 | 1264 | AFA | Mary Hudson Trust |
| 179 | 23975 | | 8550 | 7/6/1967 | CER | UG | 4,392,828.63 | 690,370.09 | 3.5 | IRR | | 196 | 784 | AFA | S & H Rances, Inc. |
| 179 | 24486 | | 8302 | 5/13/1968 | CER | UG | 4,358,437.84 | 688,310.95 | 2.7 | IRR | | 157 | 628 | AFA | Christiansen, Leonard |
| 179 | 24556 | | 8303 | 7/1/1968 | CER | UG | 4,348,034.68 | 686,299.14 | 0.85 | IRR | | 51.63 | 206.52 | AFA | Jordan, Ronald W. |
| 179 | 24742 | | 7979 | 11/1/1968 | CER | UG | 4,392,440.14 | 691,572.90 | 0.8 | IRR | | 40 | 160 | AFA | Bick, Raymond P |
| 179 | 24745 | | 7823 | 11/4/1968 | CER | UG | 4,348,806.51 | 685,476.47 | 0.44 | IRR | | 5.3 | 21.2 | AFA | Bellander, Betty J. |
| 179 | 24831 | | 8006 | 1/3/1969 | CER | UG | 4,348,806.51 | 685,476.47 | 0.34 | IRR | | 4.94 | 19.76 | AFA | Bransford, Robert M. |
| 179 | 25063 | | 7997 | 5/13/1969 | CER | UG | 4,353,715.84 | 687,778.39 | 0.23 | IRR | | 3.5 | 14 | AFA | Hayward, William E. |
| 179 | 25072 | | 7980 | 5/20/1969 | CER | UG | 4,359,835.30 | 687,988.33 | 1 | IRR | | 38.8 | 155.2 | AFA | Barton, Betty Gwen |
| 179 | 25385 | | 9152 | 12/10/1969 | CER | UG | 4,394,063.37 | 691,546.26 | 2.33 | IRR | | 117 | 468 | AFS | Wood, Arnold C. |
| 179 | 25518 | 21743 | 7575 | 3/30/1970 | CER | UG | 4,358,581.45 | 679,047.28 | 5.1 | IRR | | 202.62 | 810.49 | AFA | Mellos, A. J. |

# Table A.1-1
## Nevada Certificated Groundwater Rights Used for Irrigation in the Model Area
(Page 2 of 5)

| HA | App | Change of App | Cert | File Date | Status[a] | Source[b] | UTM Northing (m) | UTM Easting (m) | Div Rate (CFS) | Type of Use[c] | Sup | Irrigated Acres | Annual Duty | Units[d] | Owner Of Record |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 179 | 25814 | 22025 | 7772 | 10/2/1970 | CER | UG | 4,385,175.11 | 689,759.31 | 2.7 | IRR | | 160 | 640 | AFS | Jensen, Gordon |
| 179 | 25928 | 21814 | 7780 | 1/29/1971 | CER | UG | 4,360,221.22 | 687,565.09 | 2.6 | IRR | | 58.3 | 233.2 | AFA | Pescio, Joe A. |
| 179 | 26153 | | 9172 | 6/2/1971 | CER | UG | 4,348,818.78 | 685,879.93 | 1 | IRR | | 30 | 120 | AFA | Bellander, Devon |
| 179 | 26212 | | 8863 | 7/14/1971 | CER | UG | 4,358,641.12 | 688,433.84 | 2.7 | IRR | | 100 | 400 | AFA | Kemp, Kemp & Parrott |
| 179 | 26288 | | 8353 | 9/1/1971 | CER | UG | 4,441,973.40 | 701,142.20 | 5.4 | IRR | | 320 | 1280 | AFA | Mary Hudson Trust |
| 179 | 26337 | | 9155 | 9/28/1971 | CER | UG | 4,349,204.05 | 685,469.19 | 0.84 | IRR | | 13.95 | 55.8 | AFA | Martin, Alphonso |
| 179 | 26489 | | 9424 | 1/18/1972 | CER | UG | 4,391,612.27 | 690,391.57 | 2.1 | IRR | | 139 | 556 | AFS | Moser, Ray E. & Catherine |
| 179 | 26600 | | 9190 | 3/8/1972 | CER | UG | 4,348,444.78 | 686,701.33 | 0.22 | IRR | | 9.24 | 36.96 | AFA | Birch, Lee |
| 179 | 26601 | | 9158 | 3/8/1972 | CER | UG | 4,348,444.78 | 686,701.33 | 0.205 | IRR | | 9.52999999 | 28.9 | AFA | De Forest, Jerry L. |
| 179 | 26631 | 22382 | 8124 | 3/24/1972 | CER | UG | 4,391,612.27 | 690,391.57 | 2.5 | IRR | | 71.3 | 285.2 | AFA | Moser, Ray E. & Catherine |
| 179 | 26674 | | 8867 | 4/20/1972 | CER | UG | 4,350,445.73 | 686,256.66 | 0.423 | IRR | | 14.23 | 56.92 | AFA | Butts, William R. |
| 179 | 26739 | | 8310 | 5/23/1972 | CER | UG | 4,357,241.31 | 684,018.63 | 0.5 | IRR | | 18.44 | 73.76 | AFA | Goforth, Bill G. |
| 179 | 26751 | | 8868 | 5/26/1972 | CER | UG | 4,356,802.73 | 682,803.71 | 0.47 | IRR | | 9.18 | 36.72 | AFA | Boundy, John Jr. |
| 179 | 26763 | | 10478 | 6/9/1972 | CER | UG | 4,352,086.98 | 687,025.94 | 0.075 | IRR | | 3.67 | 14.68 | AFA | Locke, Madison D. |
| 179 | 26834 | | 9163 | 7/17/1972 | CER | UG | 4,346,363.65 | 685,095.86 | 1.58 | IRR | | 58.8 | 235.2 | AFA | Christensen, Joyce |
| 179 | 26858 | | 8869 | 8/2/1972 | CER | UG | 4,348,420.95 | 685,886.37 | 0.33 | IRR | | 7.28 | 29.12 | AFA | Paris, Pierre V. & Mary J. Fam Trst |
| 179 | 26954 | | 8660 | 9/7/1972 | CER | UG | 4,348,420.95 | 685,886.37 | 0.374 | IRR | | 5.5 | 22 | AFA | Godon, Brian & Susan |
| 179 | 27084 | 22381 | 8253 | 10/24/1972 | CER | UG | 4,389,995.19 | 690,451.29 | 3.5 | IRR | | 124 | 496 | AFA | Moser, Ray E. & Catherine |
| 179 | 27222 | | 9485 | 1/8/1973 | CER | UG | 4,394,043.11 | 689,955.31 | 4 | IRR | | 225.2 | 900.8 | AFS | Wood, Arnold C. |
| 179 | 27649 | | 9397 | 7/23/1973 | CER | UG | 4,352,503.27 | 687,409.62 | 0.14 | IRR | | 3.3 | 13.2 | AFA | Sanders, Thomas Ross |
| 179 | 28307 | | 10619 | 5/6/1974 | CER | UG | 4,348,023.12 | 685,892.82 | 0.5 | IRR | | 11.41 | 45.64 | AFA | Gipson, Billie R. |
| 179 | 28357 | | 9403 | 5/31/1974 | CER | UG | 4,440,369.10 | 703,619.97 | 2.56 | IRR | | 297.7 | 1190.8 | AFA | Hooper, Bobby W. |
| 179 | 28628 | | 8475 | 8/21/1974 | CER | UG | 4,351,268.95 | 686,642.12 | 0.111 | IRR | | 2 | 8 | AFS | Transportation Department-Nevada |
| 179 | 28713 | | 9342 | 9/18/1974 | CER | UG | 4,357,241.31 | 684,018.63 | 0.17 | IRR | | 8.76 | 35.04 | AFA | Carson, Jay F. |
| 179 | 29240 | | 8852 | 2/24/1975 | CER | UG | 4,350,445.73 | 686,256.66 | 0.27 | IRR | | 4.74 | 18.96 | AFA | Dobrescu, June M. |
| 179 | 29388 | | 9476 | 5/15/1975 | CER | UG | 4,358,665.96 | 688,836.48 | 0.5 | IRR | | 17 | 68 | AFA | Oxborrow, Ronald H. |

# Table A.1-1
## Nevada Certificated Groundwater Rights Used for Irrigation in the Model Area
(Page 3 of 5)

| HA | App | Change of App | Cert | File Date | Status[a] | Source[b] | UTM Northing (m) | UTM Easting (m) | Div Rate (CFS) | Type of Use[c] | Sup | Irrigated Acres | Annual Duty | Units[d] | Owner Of Record |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 179 | 30257 | | 12218 | 5/18/1976 | CER | UG | 4,384,358.66 | 690,168.30 | 1.67 | IRR | | 142.2 | 426.6 | AFS | Robison, Alice Beth |
| 179 | 30354 | | 10115 | 6/28/1976 | CER | UG | 4,393,581.41 | 687,967.96 | 1.78 | IRR | | 150.61 | 602.44 | AFA | Assuras, Jim Gust |
| 179 | 30386 | | 10116 | 7/12/1976 | CER | UG | 4,372,203.54 | 684,134.40 | 1 | IRR | | 39 | 156 | AFA | Deming, Christine |
| 179 | 30582 | | 9860 | 8/25/1976 | CER | UG | 4,346,363.65 | 685,095.86 | 0.25 | IRR | | 8.44 | 33.76 | AFA | Christensen, G. Norman |
| 179 | 31120 | | 10397 | 2/18/1977 | CER | UG | 4,393,851.00 | 690,228.80 | 3.21 | IRR | | 192.7 | 770.8 | AFA | Moriah Ranches, Inc. |
| 179 | 31121 | | 10398 | 2/18/1977 | CER | UG | 4,393,851.00 | 690,228.80 | 0.1 | IRR | | 1.8 | 7.2 | AFA | Moriah Ranches, Inc. |
| 179 | 32832 | | 12874 | 7/19/1977 | CER | UG | 4,355,329.42 | 688,147.60 | 2.1 | IRR | | 110 | 330 | AFA | Allen, George J. |
| 179 | 32833 | | 12875 | 7/19/1977 | CER | UG | 4,356,411.85 | 684,452.92 | 0.39 | IRR | | 8.64 | 25.92 | AFA | Jensen, Rodney |
| 179 | 33176 | | 12190 | 8/17/1977 | CER | UG | 4,345,944.80 | 684,697.21 | 0.2 | IRR | | 5 | 15 | AFA | Krch, Julie |
| 179 | 33198 | | 12191 | 8/18/1977 | CER | UG | 4,345,944.80 | 684,697.21 | 0.263 | IRR | | 8 | 24 | AFA | Levie, Allen & Julie |
| 179 | 33203 | | 15882 | 8/18/1977 | CER | UG | 4,345,958.62 | 685,106.66 | 0.057 | IRR | | 5 | 12.93 | AFA | Murdock, Jesse Ross |
| 179 | 33237 | | 13830 | 8/22/1977 | CER | UG | 4,352,905.42 | 687,398.56 | 0.112 | IRR | | 3.75 | 11.25 | AFA | Hendrickson, Elizabeth Ann |
| 179 | 33247 | | 12208 | 8/22/1977 | CER | UG | 4,372,203.54 | 684,134.40 | 1 | IRD | | 40 | 160 | AFA | Deming, Christine |
| 179 | 35233 | | 12654 | 3/30/1978 | CER | UG | 4,350,445.73 | 686,256.66 | 0.446 | IRR | | 8.01 | 24.03 | AFA | Heckethorn, Annemarie |
| 179 | 35691 | | 12762 | 8/3/1978 | CER | UG | 4,345,583.54 | 685,943.07 | 0.71 | IRR | | 40 | 105 | AFA | Collis, Christopher R. |
| 179 | 36159 | | 12216 | 11/13/1978 | CER | UG | 4,388,715.93 | 686,548.43 | 2 | IRR | | 160 | 477.45 | AFA | Soeder, Gordon and Linda |
| 179 | 38319 | | 12217 | 6/13/1979 | CER | UG | 4,345,570.99 | 685,535.26 | 0.165 | IRR | | 10.685 | 16.02 | AFA | Miller, Robert P. & Nancy J. |
| 179 | 38327 | | 11991 | 6/14/1979 | CER | UG | 4,348,420.95 | 685,886.37 | 0.1 | IRR | | 3 | 9 | AFA | Bianchi, Elizabeth F. |
| 179 | 42111 | 9265 | 11337 | 8/18/1980 | CER | UG | 4,365,499.40 | 691,028.12 | 3.3 | IRR | | 330 | 203 | AFS | Kennecott Nevada Copper Company |
| 179 | 43128 | | 15192 | 1/22/1981 | CER | UG | 4,370,099.29 | 698,015.02 | 0.41 | IRR | | 9.10999999 | 27.33 | AFA | Dickenson, Eleanor G. |
| 179 | 44629 | 29505 | 12010 | 10/15/1981 | CER | UG | 4,349,204.05 | 685,469.19 | 0.16 | IRR | | 4.5 | 18 | AFA | Forman, Marcia |
| 179 | 44630 | 29505 | 11994 | 10/15/1981 | CER | UG | 4,355,579.79 | 683,273.59 | 0.35 | IRR | | 14.1 | 56.4 | AFA | Bradshaw, Barry K. |
| 179 | 47419 | 32859 | 13111 | 11/15/1983 | CER | UG | 4,360,202.46 | 686,773.65 | 1 | IRR | | 20 | 60 | AFA | Pescio, Joe A. |
| 179 | 47420 | 32858 | 13112 | 11/15/1983 | CER | UG | 4,360,188.63 | 685,988.62 | 1 | IRR | | 20 | 60 | AFA | Pescio, Joe A. |
| 179 | 47448 | 40546 | 12549 | 11/22/1983 | CER | UG | 4,349,204.05 | 685,469.19 | 0.5 | IRR | | 5 | 15 | AFA | Forman, Marcia |
| 179 | 48509 | | 13199 | 10/23/1984 | CER | UG | 4,372,603.90 | 684,120.17 | 1.34 | IRD | | 80 | 240 | AFA | Deming, Loran W. |
| 179 | 53915 | 41639 | 14913 | 10/5/1989 | CER | UG | 4,346,334.18 | 684,282.45 | 0.026 | IRR | | 2.5 | 10 | AFS | Doutre, Diane |

# Table A.1-1
## Nevada Certificated Groundwater Rights Used for Irrigation in the Model Area
(Page 4 of 5)

| HA | App | Change of App | Cert | File Date | Status[a] | Source[b] | UTM Northing (m) | UTM Easting (m) | Div Rate (CFS) | Type of Use[c] | Sup | Irrigated Acres | Annual Duty | Units[d] | Owner Of Record |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 179 | 53916 | 41639 | 14914 | 10/5/1989 | CER | UG | 4,346,334.18 | 684,282.45 | 0.026 | IRR | | 1.99 | 7.96 | AFS | Dale, John |
| 179 | 53917 | 41639 | 15300 | 10/5/1989 | CER | UG | 4,345,944.80 | 684,697.21 | 0.04 | IRR | | 3.935 | 15.74 | AFS | Basso, Janet |
| 179 | 55203 | 52324 | 14666 | 8/17/1990 | CER | UG | 4,352,503.27 | 687,409.62 | 0.06 | IRR | | 4.75 | 14.25 | AFA | Sanders, Thomas Ross |
| 179 | 55273 | 52505 | 14919 | 9/14/1990 | CER | UG | 4,345,545.95 | 684,719.63 | 0.12 | IRR | | 2 | 6 | AFA | Anderson, Keith M. |
| 179 | 55542 | 26601 | 14920 | 12/17/1990 | CER | UG | 4,348,444.78 | 686,701.33 | 0.065 | IRR | | 1.8 | 7.2 | AFA | Deforest, Jerry L. |
| 179 | 56548 | 33237 | 14670 | 7/18/1991 | CER | UG | 4,348,420.95 | 685,886.37 | 0.125 | IRR | | 1.25 | 3.75 | AFA | Johnson, Anita E. |
| 179 | 56887 | 51290 | 14082 | 10/30/1991 | CER | UG | 4,345,972.46 | 685,516.11 | 0.11 | IRR | | 5 | 15 | AFA | Collis, Christopher R. |
| 179 | 58458 | 43128 | 15440 | 1/8/1993 | CER | UG | 4,372,524.66 | 697,971.71 | 0.13 | IRR | | 3.39 | 10.17 | AFA | Terry, Glenn H. |
| 179 | 59236 | 33122 | 15002 | 9/14/1993 | CER | UG | 4,345,570.99 | 685,535.26 | 0.11 | IRR | | 4.24 | 8.94 | AFA | Wall Family Trust |
| 179 | 61925 | 41639 | 15449 | 2/27/1996 | CER | UG | 4,347,607.44 | 685,496.08 | 0.05 | IRR | | 5 | 20 | AFS | Sampson, Patricia |
| 179 | 62676 | 57251 | 16387 | 12/17/1996 | CER | UG | 4,345,583.54 | 685,943.07 | 0.041 | IRR | | 4 | 15.57 | AFS | Rogers, Russell & Susan |
| 183 | 15771 | | 4806 | 8/16/1954 | CER | UG | 4,282,233.81 | 706,469.82 | 2 | IRR | | 314.675 | 1258.7 | AFA | Geyser Ranch Limited Partnership |
| 183 | 15772 | | 4831 | 8/16/1954 | CER | UG | 4,284,682.20 | 706,402.69 | 1.003 | IRR | | 116.125 | 397.8 | AFA | Geyser Ranch Limited Partnership |
| 183 | 15773 | | 4807 | 8/16/1954 | CER | UG | 4,284,269.50 | 706,414.01 | 0.281 | IRR | | 200 | 203.249999 | AFA | Geyser Ranch Limited Partnership |
| 183 | 19473 | | 6125 | 1/23/1961 | CER | UG | 4,249,461.93 | 713,487.67 | 3.31300004 | IRR | | 320 | 1115.600006 | AFA | Tuffy Ranch Properties, LLC |
| 183 | 19545 | | 6126 | 2/9/1961 | CER | UG | 4,249,866.86 | 713,480.07 | 1.930000029 | IRR | | 320 | 623.2000122 | AFA | Tuffy Ranch Properties, LLC |
| 183 | 21611 | | 7377 | 11/4/1963 | CER | UG | 4,248,144.77 | 709,038.30 | 3.1 | IRR | | 160 | 640 | AFA | Geyser Ranch Limited Partnership |
| 183 | 21616 | | 7809 | 11/4/1963 | CER | UG | 4,247,070.13 | 714,353.20 | 5.4 | IRR | | 320 | 1280 | AFA | Geyser Ranch Limited Partnership |
| 183 | 21987 | | 7704 | 5/11/1964 | CER | UG | 4,273,223.06 | 705,059.42 | 0.112 | IRR | | 60 | 80.8 | AFA | Holt, Robert Jay |
| 183 | 22557 | 21614 | 7555 | 4/28/1965 | CER | UG | 4,247,772.80 | 710,322.87 | 3.66399999 | IRR | | 320 | 869.119999 | AFA | Geyser Ranch Limited Partnership |
| 183 | 23103 | | 7705 | 4/21/1966 | CER | UG | 4,248,166.96 | 709,910.62 | 4 | IRR | | 240 | 960 | AFA | Geyser Ranch Limited Partnership |
| 183 | 23528 | 21715 | 7976 | 12/5/1966 | CER | UG | 4,285,116.86 | 707,974.07 | 0.465 | IRR | | 283.973 | 336.93 | AFA | Holt, Kerry Lynn |
| 183 | 23531 | 21719 | 7245 | 12/5/1966 | CER | UG | 4,284,278.18 | 706,816.05 | 2.435 | IRR | | 232.632 | 625.75 | AFA | Holt, Clinton Reed |
| 183 | 23532 | 21720 | 7250 | 12/5/1966 | CER | UG | 4,285,106.27 | 707,191.42 | 0.647 | IRR | | 224.781 | 468.73 | AFA | Holt, Kerry Lynn |
| 183 | 23957 | 23529 | 7379 | 6/26/1967 | CER | UG | 4,274,863.38 | 705,425.03 | 0.21299999 | IRR | | 240 | 154.21 | AFA | Holt, Randall Jay |
| 183 | 59114 | 23530 | 15797 | 8/10/1993 | CER | UG | 4,242,655.27 | 712,926.35 | 1.15 | IRR | | 125.84 | 503.09 | AFA | Holt, Deeann |

# Table A.1-1
## Nevada Certificated Groundwater Rights Used for Irrigation in the Model Area
(Page 5 of 5)

| HA | App | Change of App | Cert | File Date | Status[a] | Source[b] | UTM Northing (m) | UTM Easting (m) | Div Rate (CFS) | Type of Use[c] | Sup | Irrigated Acres | Annual Duty | Units[d] | Owner Of Record |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 183 | 63111 | 59117 | 16179 | 5/15/1997 | CER | UG | 4,246,681.73 | 714,767.38 | 2.15 | IRD | | 120 | 339.68 | AFA | Kerry Holt Farms, LTD |
| 184 | 18524 | | 6138 | 1/18/1960 | CER | UG | 4,306,658.70 | 724,403.57 | 1.002 | IRD | | 5.28 | 21.15 | AFS | Phillips, Anita D. |
| 184 | 18525 | | 6992 | 1/18/1960 | CER | UG | 4,307,082.00 | 725,198.88 | 2.12 | IRD | | 14.46 | 57.84 | AFS | Phillips, Anita D. |
| 184 | 19654 | | 6449 | 3/9/1961 | CER | UG | 4,313,343.26 | 717,726.65 | 2.45 | IRD | | 143.96 | 575.83 | AFA | Rhodes, Ursel C. |
| 184 | 25439 | 22017 | 9213 | 1/19/1970 | CER | UG | 4,314,686.68 | 722,554.76 | 1.3 | IRD | | 60 | 240 | AFA | Rhodes, Ursel C. |
| 184 | 26502 | | 9300 | 1/25/1972 | CER | UG | 4,317,529.93 | 722,466.44 | 0.27 | IRR | | 18.37 | 73.48 | AFA | Rasmussen, James B. |
| 184 | 27378 | | 8357 | 3/28/1973 | CER | UG | 4,377,115.15 | 713,316.07 | 1.75 | IRR | | 332.29 | 1266.64 | AFA | Nevada Land & Resource Co LLC |
| 184 | 28653 | | 10020 | 9/9/1974 | CER | UG | 4,314,282.15 | 722,569.06 | 0.027 | IRR | | 0.3 | 1.2 | AFA | Swallow, Richard M. |
| 184 | 38972 | | 11632 | 9/7/1979 | CER | UG | 4,314,728.78 | 723,781.56 | 1.75 | IRR | | 192.12 | 768.48 | AFA | El Tejon Cattle Company |
| 185 | 27315 | | 9640 | 3/2/1973 | CER | UG | 4,416,552.68 | 727,179.89 | 2.5 | IRR | | 116.5 | 466 | AFA | Henriod Land & Livestock Co. |
| 195 | 12932 | | 4221 | 5/27/1949 | CER | UG | 4,320,115.12 | 751,746.70 | 0.045 | IRR | | 16.6 | 66.4 | AFS | Smith, Hilman D. |
| 195 | 13640 | | 4504 | 2/19/1951 | CER | UG | 4,322,055.19 | 749,272.44 | 0.71 | IRR | | 68.989 | 241.5 | AFA | Baker, George T. |
| 195 | 15213 | | 4635 | 6/20/1953 | CER | UG | 4,323,242.40 | 748,849.87 | 1 | IRR | | 170.444 | 681.78 | AFA | Bellander, Glen A. |
| 195 | 19740 | | 6473 | 4/10/1961 | CER | UG | 4,322,912.52 | 750,862.45 | 5.4 | IRR | | 454.054 | 1816.22 | AFS | Baker Ranches, Inc. |
| 195 | 23580 | | 7955 | 1/3/1967 | CER | UG | 4,320,849.31 | 749,302.46 | 1 | IRR | | 7.61 | 30.44 | AFS | Mccuen, L.V. |
| 195 | 26735 | | 9480 | 5/22/1972 | CER | UG | 4,288,404.65 | 753,753.97 | 1 | IRR | | 65.76 | 263.04 | AFA | Graff, E.J. |
| 195 | 27079 | | 8614 | 10/17/1972 | CER | UG | 4,320,445.11 | 749,315.25 | 0.5 | IRR | | 13.8 | 55.2 | AFA | Baker, John Dean |

[a] Cer = Certificated
[b] UG = Underground
[c] IRR = Irrigation; IRD = Irrigation - Desert Land Entry
[d] AFS = Acre-feet per season; AFA = Acre-feet per annum

# Table A.1-2
## Utah Certificated Groundwater Rights Used for Irrigation in the Model Area
(Page 1 of 5)

| HA | WRNUM | Type | Summary Status[a] | Status[b] | Priority | Uses[c] | CFS | ACFT | Irrigated Acres | Owner | UTM Northing (m) | UTM Easting (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 195 | 18-269 | Underground | P | UGWC | 1890 | IS | 0.111 | 0 | 1 | Cyrene N. Bagley | 4,422,167 | 774,027 |
| 195 | 18-273 | Underground | P | UGWC | 18960000 | DIS | 0.013 | 0 | 1 | H. L. Bates | 4,421,236 | 782,292 |
| 195 | 18-274 | Underground | P | UGWC | 18960000 | DIS | 0.011 | 0 | 1 | H. L. Bates | 4,421,224 | 782,280 |
| 195 | 18-266 | Underground | P | UGWC | 190106 | DIS | 0.031 | 0 | 1.5 | Charles T. Stewart | 4,421,170 | 782,129 |
| 195 | 18-267 | Underground | P | UGWC | 19010700 | DIS | 0.031 | 0 | 2 | Charles T. Stewart | 4,420,709 | 782,426 |
| 195 | 18-319 | Underground | P | UGWC | 19090000 | DIS | 0.015 | 0 | 0.1 | Cecil C. & Annette Garland | 4,422,016 | 780,609 |
| 195 | 18-301 | Underground | P | UGWC | 19150000 | DIS | 0.75 | 0 | 35 | Amy Sabey | 4,419,109 | 781,746 |
| 195 | 18-4 | Underground | P | UGWC | 19170000 | DIS | 0.1 | 0 | 0.3 | J. H. Singleton | 4,371,024 | 759,655 |
| 195 | 18-424 | Underground | P | UGWC | 1920 | DI | 0.067 | 0 | 0.25 | Eugene W. Timm | 4,421,996 | 780,249 |
| 195 | 18-280 | Underground | P | UGWC | 19200401 | DIS | 0.007 | 0 | 0.25 | Roy L. & Barbara Rowley | 4,313,758 | 757,115 |
| 195 | 18-272 | Underground | P | UGWC | 19230500 | IS | 0.045 | 0 | 0.16 | Amy Sabey | 4,421,108 | 782,361 |
| 195 | 18-265 | Underground | P | UGWC | 1925 | DIS | 0.011 | 0 | 0.5 | Louise Robison | 4,345,745 | 758,897 |
| 195 | 18-383 | Underground | P | UGWC | 19250000 | DI | 0.03 | 0 | 0.5 | Wheeler Land and Livestock Company | 4,314,420 | 757,852 |
| 195 | 18-592 | Underground | P | UGWC | 19280000 | DIS | 0.045 | 0 | 0.25 | Leah L. Layland | 4,421,294 | 781,828 |
| 195 | 18-592 | Underground | P | UGWC | 19280000 | DIS | 0.045 | 0 | 0.25 | Leah L. Layland | 4,421,312 | 781,758 |
| 195 | 18-6 | Underground | P | UGWC | 19280000 | DIS | 0.013 | 0 | 2 | Louise Robison | 4,345,824 | 758,754 |
| 195 | 18-259 | Underground | P | UGWC | 19280600 | DIS | 1.003 | 0 | 80 | Corporation of the President Aaronic Order | 4,328,560 | 761,649 |
| 195 | 18-262 | Underground | P | UGWC | 19300317 | DIS | 0.011 | 0 | 2 | Davies Ranch Inc. | 4,299,366 | 759,786 |
| 195 | 18-260 | Underground | P | UGWC | 19340718 | DI | 0.033 | 0 | 2 | BNP Family Limited Partnership | 4,421,212 | 782,237 |
| 195 | 18-261 | Underground | P | UGWC | 19340723 | I | 0.04 | 0 | 3 | BNP Family Limited Partnership | 4,421,238 | 782,189 |
| 195 | 18-291 | Underground | P | UGWC | 19350000 | I | 0.123 | 0 | 41.95 | Amy Sabey | 4,421,342 | 782,689 |
| 195 | 18-292 | Underground | P | UGWC | 19350000 | I | 0.223 | 0 | 41.95 | Amy Sabey | 4,421,695 | 783,393 |
| 195 | 18-293 | Underground | P | UGWC | 19350000 | I | 0.111 | 0 | 41.95 | Amy Sabey | 4,421,159 | 782,702 |
| 195 | 18-294 | Underground | P | UGWC | 19350000 | I | 0.067 | 0 | 41.95 | Amy Sabey | 4,421,056 | 783,436 |
| 195 | 18-70 | Underground | P | APPLCERT | 19400725 | IS | 0.195 | 0 | 22.9 | C. N. Bagley | 4,422,164 | 781,483 |
| 195 | 18-85 | Underground | P | APPLCERT | 19460309 | IS | 1.01 | 0 | 76 | Baker Ranches Inc. | 4,314,427 | 757,946 |
| 195 | 18-86 | Underground | P | APPLCERT | 19460309 | I | 1.45 | 0 | 139.1 | Dean & Donna Carter | 4,330,282 | 756,370 |
| 195 | 18-87 | Underground | P | APPLCERT | 19460309 | I | 1.29 | 0 | 72.8 | Dean & Donna Carter | 4,330,943 | 757,110 |

# Table A.1-2
## Utah Certificated Groundwater Rights Used for Irrigation in the Model Area
(Page 2 of 5)

| HA | WRNUM | Type | Summary Status[a] | Status[b] | Priority | Uses[c] | CFS | ACFT | Irrigated Acres | Owner | UTM Northing (m) | UTM Easting (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 195 | 18-88 | Underground | P | APPLCERT | 19460501 | DIS | 1.28 | 0 | 118.94 | Baker Ranches Inc. | 4,331,343 | 756,273 |
| 195 | 18-91 | Underground | P | APPLCERT | 19460715 | I | 0.74 | 0 | 76.5 | Baker Ranches Inc. | 4,313,867 | 755,938 |
| 195 | 18-92 | Underground | P | APPLCERT | 19460814 | I | 3.22 | 0 | 100.53 | Dennis & Cindy Timm | 4,420,745 | 780,322 |
| 195 | 18-96 | Underground | P | APPLCERT | 19471110 | I | 0.904 | 0 | 64.85 | Miles W. Clark | 4,361,032 | 759,999 |
| 195 | 18-130 | Underground | P | APPLCERT | 19490514 | DIS | 0.134 | 0 | 2.6 | Alan D. and Shelley C. Johnson | 4,421,234 | 780,854 |
| 195 | 18-133 | Underground | P | APPLCERT | 19490912 | I | 2.847 | 0 | 293.4 | Corporation of the President Aaronic Order | 4,328,582 | 761,669 |
| 195 | 18-137 | Underground | P | APPLCERT | 19500922 | I | 3 | 0 | 293.4 | Corporation of the President Aaronic Order | 4,327,755 | 761,287 |
| 195 | 18-140 | Underground | P | APPLCERT | 19530529 | IS | 2 | 0 | 88.4 | Corporation of the Presiding Bishop LDS Church | 4,314,156 | 758,348 |
| 195 | 18-156 | Underground | P | APPLCERT | 19550111 | IS | 1.78 | 0 | 43.6 | Corporation of the President Aaronic Order | 4,332,763 | 763,274 |
| 195 | 18-156 | Underground | P | APPLCERT | 19550111 | IS | 1.78 | 0 | 43.6 | Corporation of the President Aaronic Order | 4,332,778 | 763,692 |
| 195 | 18-161 | Underground | P | APPLCERT | 19550111 | I | 2.565 | 507.24 | 63.405 | Corporation of the President Aaronic Order | 4,338,427 | 763,314 |
| 195 | 18-161 | Underground | P | APPLCERT | 19550111 | I | 2.565 | 507.24 | 63.405 | Corporation of the President Aaronic Order | 4,338,485 | 763,825 |
| 195 | 18-163 | Underground | P | APPLCERT | 19550111 | I | 4.72 | 947 | 78.916 | Corporation of the President Aaronic Order | 4,335,571 | 762,328 |
| 195 | 18-163 | Underground | P | APPLCERT | 19550111 | I | 4.72 | 947 | 78.916 | Corporation of the President Aaronic Order | 4,335,214 | 763,679 |
| 195 | 18-163 | Underground | P | APPLCERT | 19550111 | I | 4.72 | 947 | 78.916 | Corporation of the President Aaronic Order | 4,335,612 | 763,010 |
| 195 | 18-210 | Underground | P | APPLCERT | 19561119 | DIS | 3 | 0 | 216.57 | Joseph Kinsmen Trust | 4,345,805 | 758,800 |
| 195 | 18-185 | Underground | P | APPLCERT | 19570606 | DIS | 2.96 | 0 | 103.88 | Baker Ranches Inc. | 4,314,128 | 757,545 |
| 195 | 18-142 | Underground | P | APPLCERT | 19570819 | IS | 3.02 | 0 | 300.4 | Marvin Isaac Wyler Jr. and Alicia | 4,329,062 | 762,895 |
| 195 | 18-302 | Underground | P | APPLCERT | 19571016 | I | 3.713 | 0 | 36.866 | Terry L. & Sharlene Hale | 4,390,144 | 768,922 |
| 195 | 18-302 | Underground | P | APPLCERT | 19571016 | I | 3.713 | 0 | 36.866 | Terry L. & Sharlene Hale | 4,390,002 | 768,974 |
| 195 | 18-302 | Underground | P | APPLCERT | 19571016 | I | 3.713 | 0 | 36.866 | Terry L. & Sharlene Hale | 4,389,938 | 769,002 |
| 195 | 18-145 | Underground | P | APPLCERT | 19571112 | IS | 3 | 0 | 306.2 | Marvin Isaac Wyler Jr. and Alicia | 4,329,045 | 763,626 |
| 195 | 18-159 | Underground | P | APPLCERT | 19591109 | IS | 2.24 | 0 | 59.75 | Corporation of the President Aaronic Order | 4,336,850 | 763,701 |
| 195 | 18-159 | Underground | P | APPLCERT | 19591109 | IS | 2.24 | 0 | 59.75 | Corporation of the President Aaronic Order | 4,337,210 | 763,523 |
| 195 | 18-211 | Underground | P | APPLCERT | 19600104 | IS | 4.67 | 0 | 24.0557 | David C. Bagley | 4,422,479 | 781,403 |
| 195 | 18-211 | Underground | P | APPLCERT | 19600104 | IS | 4.67 | 0 | 24.0557 | David C. Bagley | 4,421,894 | 781,779 |
| 195 | 18-211 | Underground | P | APPLCERT | 19600104 | IS | 4.67 | 0 | 24.0557 | David C. Bagley | 4,421,848 | 781,819 |
| 195 | 18-211 | Underground | P | APPLCERT | 19600104 | IS | 4.67 | 0 | 24.0557 | David C. Bagley | 4,422,129 | 781,580 |

# Table A.1-2
## Utah Certificated Groundwater Rights Used for Irrigation in the Model Area
(Page 3 of 5)

| HA | WRNUM | Type | Summary Status[a] | Status[b] | Priority | Uses[c] | CFS | ACFT | Irrigated Acres | Owner | UTM Northing (m) | UTM Easting (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 195 | 18-211 | Underground | P | APPLCERT | 19600104 | IS | 4.67 | 0 | 24.0557 | David C. Bagley | 4,422,238 | 781,303 |
| 195 | 18-211 | Underground | P | APPLCERT | 19600104 | IS | 4.67 | 0 | 24.0557 | David C. Bagley | 4,422,119 | 781,523 |
| 195 | 18-211 | Underground | P | APPLCERT | 19600104 | IS | 4.67 | 0 | 24.0557 | David C. Bagley | 4,421,941 | 781,740 |
| 195 | 18-212 | Underground | P | APPLWUCS | 19600226 | IS | 8 | 0 | 80 | O`Dean & Vera W. Anderson | 4,334,299 | 762,173 |
| 195 | 18-212 | Underground | P | APPLWUCS | 19600226 | IS | 8 | 0 | 80 | O`Dean & Vera W. Anderson | 4,333,136 | 762,216 |
| 195 | 18-212 | Underground | P | APPLWUCS | 19600226 | IS | 8 | 0 | 80 | O`Dean & Vera W. Anderson | 4,333,952 | 762,077 |
| 195 | 18-212 | Underground | P | APPLWUCS | 19600226 | IS | 8 | 0 | 80 | O`Dean & Vera W. Anderson | 4,334,299 | 762,166 |
| 195 | 18-230 | Underground | P | APPLWUCS | 19630227 | DIS | 1 | 0 | 62 | Cecil C. & Annette Garland | 4,421,984 | 780,446 |
| 195 | 18-232 | Underground | P | APPLCERT | 19630830 | IS | 5 | 0 | 10.4875 | Amy Sabey | 4,421,003 | 782,657 |
| 195 | 18-232 | Underground | P | APPLCERT | 19630830 | IS | 5 | 0 | 10.4875 | Amy Sabey | 4,421,600 | 783,296 |
| 195 | 18-232 | Underground | P | APPLCERT | 19630830 | IS | 5 | 0 | 10.4875 | Amy Sabey | 4,421,185 | 782,748 |
| 195 | 18-232 | Underground | P | APPLCERT | 19630830 | IS | 5 | 0 | 10.4875 | Amy Sabey | 4,420,662 | 782,954 |
| 195 | 18-213 | Underground | P | APPLWUC | 19650203 | DIS | 0 | 0 | 0.75 | Kevin C. Peterson | 4,396,266 | 769,167 |
| 195 | 18-296 | Underground | P | APPLCERT | 19660218 | DIS | 3 | 0 | 113.8 | Amy Sabey | 4,419,500 | 781,412 |
| 195 | 18-184 | Underground | P | APPLCERT | 19670606 | IS | 1.6 | 0 | 90 | Baker Ranches Inc. | 4,315,228 | 758,286 |
| 195 | 18-303 | Underground | P | APPLWUCS | 19671031 | I | 0.015 | 0 | 0.5 | State of Utah Department of Transportation | 4,314,170 | 757,080 |
| 195 | 18-218 | Underground | P | APPLCERT | 19690217 | I | 3 | 0 | 142.2 | Dean & Donna Carter | 4,314,884 | 757,927 |
| 195 | 18-316 | Underground | P | APPLCERT | 19690905 | IS | 5 | 0 | 244 | A. D. Ranching Company LLC | 4,420,537 | 780,411 |
| 195 | 18-327 | Underground | P | APPLWUCS | 19700427 | DI | 0.015 | 0 | 0.18 | Corporation of the Presiding Bishop LDS Church | 4,421,690 | 781,307 |
| 195 | 18-332 | Underground | P | APPLWUCS | 19710308 | DIS | 3 | 0 | 80 | Gene D. & Annemarie Heckethorn | 4,329,843 | 755,441 |
| 195 | 18-332 | Underground | P | APPLWUCS | 19710308 | DIS | 3 | 0 | 80 | Gene D. & Annemarie Heckethorn | 4,330,682 | 756,176 |
| 195 | 18-335 | Underground | P | APPLWUCS | 19710730 | DIS | 0.1 | 0 | 0.54 | George Thomas Rawlings | 4,393,708 | 767,586 |
| 195 | 18-223 | Underground | P | APPLWUCS | 19711031 | I | 5 | 0 | 329.1 | Amy Sabey | 4,419,917 | 781,417 |
| 195 | 18-339 | Underground | P | APPLWUCS | 19720223 | DIS | 0.045 | 0 | 0.4 | Clark W. Miles | 4,360,923 | 759,674 |
| 195 | 18-344 | Underground | P | APPLWUCS | 19730220 | I | 2.5 | 0 | 100.5 | Inc. Thousand Peaks Ranches | 4,403,545 | 778,853 |
| 195 | 18-344 | Underground | P | APPLWUCS | 19730220 | I | 2.5 | 0 | 100.5 | Inc. Thousand Peaks Ranches | 4,403,919 | 779,264 |
| 195 | 18-346 | Underground | P | APPLWUCS | 19730220 | I | 2.5 | 0 | 100.5 | Inc. Thousand Peaks Ranches | 4,403,919 | 779,264 |
| 195 | 18-346 | Underground | P | APPLWUCS | 19730220 | I | 2.5 | 0 | 100.5 | Inc. Thousand Peaks Ranches | 4,403,545 | 778,853 |

# Table A.1-2
## Utah Certificated Groundwater Rights Used for Irrigation in the Model Area
(Page 4 of 5)

| HA | WRNUM | Type | Summary Status[a] | Status[b] | Priority | Uses[c] | CFS | ACFT | Irrigated Acres | Owner | UTM Northing (m) | UTM Easting (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 195 | 18-359 | Underground | P | APPLWUCS | 19740418 | IS | 0 | 0 | 168.9 | Owen L. Gonder | 4,314,131 | 756,623 |
| 195 | 18-362 | Underground | P | APPLWUCS | 19740806 | DIS | 0.015 | 0 | 0.25 | Ray E. Lewis | 4,388,111 | 766,917 |
| 195 | 18-365 | Underground | P | APPLWUCS | 19740822 | DI | 0 | 0 | 0.55 | LDS Church | 4,314,115 | 757,167 |
| 195 | 18-368 | Underground | P | APPLWUCS | 19741205 | DIS | 0.03 | 0 | 0.23 | Ray E. Lewis | 4,391,452 | 767,260 |
| 195 | 18-371 | Underground | P | APPLWUCS | 19741220 | DI | 0.2 | 0 | 5 | Corporation of the President Aaronic Order | 4,333,130 | 763,534 |
| 195 | 18-376 | Underground | P | APPLCERT | 19750501 | DIS | 0.1 | 0 | 4.75 | William H. and Edith A. Dearden | 4,313,918 | 756,857 |
| 195 | 18-462 | Underground | P | APPLWUC | 19750501 | DIS | 2.5 | 0 | 120 | Carl J. Dearden | 4,313,535 | 756,372 |
| 195 | 18-216 | Underground | P | APPLCERT | 19760228 | IS | 4.24 | 0 | 58.65 | Rex C. and Susan Y. Claridge Family Living Trust | 4,420,020 | 781,006 |
| 195 | 18-216 | Underground | P | APPLCERT | 19760228 | IS | 4.24 | 0 | 58.65 | Rex C. and Susan Y. Claridge Family Living Trust | 4,420,579 | 782,036 |
| 195 | 18-381 | Underground | P | APPLWUCS | 19760716 | IS | 0 | 0 | 93.825 | Dean & Donna Carter | 4,330,844 | 757,537 |
| 195 | 18-381 | Underground | P | APPLWUCS | 19760716 | IS | 0 | 0 | 93.825 | Dean & Donna Carter | 4,331,238 | 757,486 |
| 195 | 18-381 | Underground | P | APPLWUCS | 19760716 | IS | 0 | 0 | 93.825 | Dean & Donna Carter | 4,330,819 | 757,114 |
| 195 | 18-381 | Underground | P | APPLWUCS | 19760716 | IS | 0 | 0 | 93.825 | Dean & Donna Carter | 4,330,282 | 756,370 |
| 195 | 18-401 | Underground | P | APPLCERT | 19780621 | I | 3.06 | 0 | 149.55 | Corporation of the President Aaronic Order | 4,329,578 | 762,482 |
| 195 | 18-404 | Underground | P | APPLCERT | 19781219 | I | 1.783 | 300 | 75 | Corporation of the President Aaronic Order | 4,334,807 | 763,372 |
| 195 | 18-413 | Underground | P | APPLWUCS | 19790516 | I | 1 | 0 | 62 | Cecil C. & Annette Garland | 4,421,984 | 780,446 |
| 195 | 18-415 | Underground | P | APPLWUCS | 19790524 | DIS | 0.03 | 0 | 0.5 | Mike Anderson | 4,390,470 | 768,167 |
| 195 | 18-420 | Underground | P | APPLCERT | 19791109 | I | 1.82 | 0 | 98.22 | Corporation of the President Aaronic Order | 4,330,601 | 762,390 |
| 195 | 18-421 | Underground | P | APPLCERT | 19791109 | I | 2.56 | 0 | 76.12 | Corporation of the President Aaronic Order | 4,329,770 | 761,883 |
| 195 | 18-423 | Underground | P | APPLWUCS | 19800214 | DIS | 0.78 | 0 | 1.3 | LaVon Rowley | 4,313,889 | 757,031 |
| 195 | 18-427 | Underground | P | APPLWUCS | 19800721 | DIS | 0.015 | 0 | 0.25 | Kenneth F. Hill | 4,390,159 | 768,031 |
| 195 | 18-460 | Underground | P | APPLWUC | 19811117 | DIS | 0.15 | 0 | 0.25 | Carl J. Dearden | 4,312,853 | 757,590 |
| 195 | 18-461 | Underground | P | APPLWUC | 19811117 | IS | 3 | 0 | 160 | Carl J. Dearden | 4,297,777 | 758,906 |
| 195 | 18-158 | Underground | P | APPLCERT | 19820416 | I | 2.791 | 514.92 | 64.365 | Corporation of the President Aaronic Order | 4,333,620 | 763,405 |
| 195 | 18-158 | Underground | P | APPLCERT | 19820416 | I | 2.791 | 514.92 | 64.365 | Corporation of the President Aaronic Order | 4,333,988 | 763,379 |
| 195 | 18-472 | Underground | P | APPLWUCS | 19820611 | DIS | 0.03 | 0 | 0.25 | Ray E. Lewis | 4,388,048 | 766,887 |
| 195 | 18-360 | Underground | P | APPLCERT | 19820617 | I | 0 | 76.4 | 144.1 | Corporation of the President of the Aaronic Order | 4,327,119 | 761,285 |
| 195 | 18-509 | Underground | P | APPLWUCS | 19840106 | DIOS | 0.089 | 0 | 0.73 | Owen L. Gonder | 4,313,589 | 757,181 |

# Table A.1-2
## Utah Certificated Groundwater Rights Used for Irrigation in the Model Area
(Page 5 of 5)

| HA | WRNUM | Type | Summary Status[a] | Status[b] | Priority | Uses[c] | CFS | ACFT | Irrigated Acres | Owner | UTM Northing (m) | UTM Easting (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 195 | 18-614 | Underground | P | APPLCERT | 19910311 | DIOS | 0.5 | 41.08 | 10 | Millard County | 4,314,302 | 756,935 |
| 195 | 18-634 | Underground | P | APPLCERT | 19920806 | IO | 0 | 1.42 | 0.33 | Corporation of the Presiding Bishop LDS Church | 4,397,530 | 771,413 |
| 196 | 19-17 | Underground | P | APPLCERT | 19530120 | DIS | 0.340 | 0.000 | 17.600 | Orin R. Speirs Special Trust Agreement #1 | 4,230,097 | 765,474 |
| 196 | 19-323 | Underground | P | UGWCCERT | 19300000 | DIS | 0.000 | 4.000 | 0.600 | Ronald Lee Garrison | 4,213,131 | 766,464 |
| 196 | 19-341 | Underground | P | APPLCERT | 19300000 | DIS | 0.000 | 6.000 | 1.380 | David W. And Mary G. Main | 4,211,451 | 764,611 |
| 196 | 19-342 | Underground | P | APPLCERT | 19881208 | DIS | 0.036 | 21.610 | 4.940 | Wagg Family Trust | 4,211,937 | 766,194 |
| 196 | 19-344 | Underground | P | APPLCERT | 19891016 | DI | 0.000 | 4.450 | 1.000 | Dana M. Schmutz | 4,225,047 | 772,027 |
| 196 | 19-350 | Underground | P | APPLCERT | 19750815 | DIS | 0.000 | 1.800 | 0.433 | Patrick J. Horner | 4,213,801 | 764,834 |
| 196 | 19-351 | Underground | P | APPLCERT | 19870202 | I | 0.000 | 1.000 | 0.433 | Patrick J. Horner | 4,213,801 | 764,834 |
| 196 | 19-356 | Underground | P | APPLCERT | 19980304 | DIS | 0.000 | 2.000 | 0.219 | Michael J. & Joseph F. Monahan | 4,213,225 | 764,449 |
| 196 | 19-358 | Underground | P | APPLCERT | 19980303 | DIS | 0.000 | 1.000 | 0.110 | Wendell W. And Anita E. Hoel | 4,213,225 | 764,449 |
| 196 | 19-364 | Underground | P | APPLCERT | 19980708 | DIS | 0.000 | 1.730 | 0.250 | Michael J. Huddle Trust | 4,211,457 | 765,409 |
| 196 | 19-368 | Underground | P | APPLCERT | 19981002 | DIS | 0.015 | 1.730 | 0.250 | Douglas And Carol Ann Schmutz | 4,224,651 | 772,739 |
| 196 | 19-91 | Underground | P | APPLWUCS | 19690205 | I | 0.000 | 637.400 | 159.400 | Richard And Colleen Flinspach | 4,210,093 | 769,737 |

[a] P = Perfected
[b] APPLCERT = Application to appropriate, certificated; APPLWUCS = Application to appropriate, water user's claim; UGWC = Underground water claim; UGWCCERT = Underground water claim, certificated;
[c] IS = Irrigation and stock watering; DIS = Domestic, irrigation, and stock watering; DI = Domestic and irrigation; I = Irrigation; IO = Irrigation and other;

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# Attachment B

# Consumptive Water Use Estimates

# B.1.0 INTRODUCTION

This attachment contains the total consumptive water use estimates for the time period 1945-2005 in five year increments for the cities of Ely and McGill, Nevada. These estimates can be seen in Table B.1-1.

**Table B.1-1**
**Consumptive Water Use Estimates for the Time Period 1945-2005 for Ely and McGill, NV**

| Town | Total Consumptive Use for the Time Period (acre-ft) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-99 | 2000-2004 |
| Ely | 3,449 | 3,373 | 3,586 | 3,742 | 3,815 | 3,990 | 4,316 | 4,323 | 4,004 | 4,234 | 4,332 | 8788 |
| McGill | 2,223 | 2,104 | 2,057 | 2,023 | 2,008 | 1,862 | 1,518 | 1,282 | 1,207 | 1,175 | 1,191 | 959 |

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