7.0 WATER RIGHTS AND WATER USE

7.1 Introduction

This water rights summary describes the compilation of water rights for each hydrographic area in the hydrologic study area, and tabulates the reported underground active water rights for each of the Project Basins based on information from the NDWR and the Utah Division of Water Rights (UDWR). This data compilation can be used to understand the locations of existing water rights and the quantities of committed water rights. The compiled data can also be used to assess the current and historic groundwater withdrawals for a given basin.

7.2 Background

Nevada has a prior appropriations water rights system, administered by the office of the State Engineer. Nevada water law was established in 1905, to regulate uses of surface waters. In 1913, law regarding underground waters was enacted, but the complete groundwater law was not established until 1939. Claims of "vested" water rights can be made for appropriations of water prior to the establishment of Nevada water laws in 1905 for surface water and 1939 for underground water (claims of pre-statutory rights). Some vested rights in Nevada have been adjudicated and therefore the quantity and extent have been confirmed by the court, but many have not been through this process.

In Nevada, all water ultimately belongs to the public, although water rights permits are treated like real property. The process of obtaining a water right begins with filing an application with the State Engineer to appropriate water. If the applicant is granted a permit, then the process of perfecting the water right begins. "Proof of Completion of Work" must be filed and accepted by the State Engineer, followed by "Proof of Beneficial Use." Once "Proof of Beneficial Use" is accepted by the State Engineer, then a Certificate of Appropriation of Water is issued.

Most water rights have a surveyed point of diversion, designated place of use, manner of use, rate and duty of diversion, period of use, and often contain specific conditions of water use as dictated by the State Engineer. Applications to change the point of diversion, place of use and/or manner of use of existing water right permits is a common practice as operations and demands for water change over time. Water rights are considered real property and can be sold. Water rights remain appurtenant to the place of use but may be severed by deed (sold separate from the appurtenant land).

Rulings, orders and adjudications may be issued by the State Engineer or judicial courts to resolve disputes regarding water rights. Most of the major streams and rivers in Nevada have been subject to adjudication.

The Nevada State Engineer manages groundwater by individual hydrographic basin, of which there are 232 defined (NDWR, 2005). The perennial yield of a hydrographic basin establishes the total duty of groundwater rights which are issued on a permanent basis as per the policy of the State Engineer (NDWR, 1977). While this sounds simple, it becomes complex, as defining perennial yield always involves estimation and uncertainty, and there are often other complicating issues, including interactions between basins, quantity of consumptive water use versus pumped quantity, ability to develop groundwater at the location of interest without detrimental impacts, and many other issues. The State Engineer reviews each application on a case-by-case basis, and where the State Engineer interprets a basin to be fully appropriated, the basin often becomes designated for preferred uses.

At times, water rights are issued which are supplemental to other water rights. For example, an underground water right might be issued to provide water to irrigate a pasture that is normally irrigated with surface water. Groundwater will only be used if the flow in the stream is inadequate. In some cases, water rights have been issued on the basis of a combined duty, whereby the total annual duty of several permits cannot exceed a combined total amount. These stipulations are not addressed in the State of Nevada abstracts. Each water right must be read to determine if a limitation has been placed on it. A complicating issue which is also encountered is the result of multiple water rights having been granted covering the same place of use. In some cases, a determination of the amount of water rights that are supplemental has not been made, to date. This tends to occur more frequently in cases where claims of vested rights have been filed that incorporate places of use which already have permitted water rights.

This brief overview touches only on the highlights of Nevada water law. Water rights overviews and regulations can be reviewed from the NDWR on the World Wide Web at the uniform resource locator (URL) http://water.nv.gov. In addition, copies of “Nevada Water Laws” are available through the Division of Water Resources (Ricci, 2001). More detailed summaries of Nevada water law and policies are presented by Davenport (2003) and in publications from the Division of Water Resources (Ricci, 2004; Ricci, 2003; NDWR, 1974). Nevada water law is also discussed in several short course manuals, prepared by groups such as the Nevada Water Resources Association (Buschelman and Ricci, 2004), The Cambridge Institute (de Lipkau et al., 1995), and CLE International (1994).

In addition to rulings on water right applications from the Nevada State Engineer, under the Lincoln County Conservation, Recreation, and Development Act of 2004, an agreement between the States of Nevada and Utah is required prior to any transbasin diversion from groundwater basins located within both states. Thus, for Snake Valley, a portion of which is located in both states, Nevada and Utah need to reach an agreement prior to the diversion of groundwater out of out of the basin by the project. The two states have been in discussions on an agreement since 2006.

7.3 Data Compilation

7.3.1 Nevada Water Rights

Nevada water rights data were obtained from the NDWR on the World Wide Web at URL http://water.nv.gov/water%20Rights/permitdb/permitdb_index.cfm. Preliminary basin abstracts, digital copies of application permits and certificates, maps, and underground active abstracts can all

be obtained from this web site. Both water right abstracts and underground active abstracts were downloaded for each hydrographic area within the hydrologic study area for this task on March 7, 2007 (NDWR, 2007b; NDWR, 2007c). In addition, updated water rights abstracts and underground active abstracts were obtained for Spring Valley on December 4 and December 18, 2007, respectively, to reflect Nevada State Engineers Ruling 5726 (NDWR, 2007d; NDWR, 2007e). The water rights abstracts contain basic information about a water right including the file date for the application, status, source, point of diversion, diversion rate, type of use, duty, and owner of record. The water rights abstracts were downloaded and saved into a Microsoft Excel® workbook for future reference. The downloaded water right abstracts can be found on the enclosed CD-ROM disc in the file named "NV_Water_Rights_20070307_20071218.xls." The underground active abstracts contain a summary by manner of use of the committed groundwater rights for a given basin. The underground abstracts were printed out from the NDWR website and saved as portable document files (pdf) for future reference. The underground abstracts can be can be found on the enclosed CD-ROM disc in the file named "Underground_Committed_ Water_Rights.pdf".

7.3.2 Utah Water Rights

Utah water rights data were obtained from the UDWR on the World Wide Web at URL http://nrwrt1.nr.state.ut.us/. The UDWR makes available a shapefile of the points of diversion from their water rights database. According to the UDWR website, this shapefile is generated daily from basic information contained in their water rights database. The shapefile contains basic information about a water right including the status, type (i.e., surface water vs. groundwater), the status of the application, the priority date, the uses of the water, and the owner of the water right. The Utah water rights data were downloaded on March 13, 2007 (UDWR, 2007). The downloaded shapefile was then spatially queried for water rights in Pleasant, Snake, and Hamlin valleys. The water rights for the portions of Pleasant, Snake, and Hamlin valleys that are in Utah can be found on the enclosed CD-ROM disc in the file named "Utah_Water_Rights_20070313.xls". In addition to the downloaded point of diversion data, UDWR provided a preliminary estimate of the total committed underground water rights for the Utah portion of Snake Valley (Clayton, 2007). This data can be found on the enclosed CD-ROM disc in the file named "undergrounddiversion_20071204.xls".

7.4 Summary of Underground Water Rights for Project Basins

7.4.1 Spring Valley

Spring Valley is situated mostly in White Pine County, with only the southern end of Spring Valley located in Lincoln County (see Figure 7-1). Spring Valley Creek, Cleve Creek, and numerous other perennial creeks discharge to the valley floor from the eastern slope of the Schell Creek Range. The Snake Range is also a source of numerous additional streams on the eastern side of the valley. Stream and spring water sources in Spring Valley are primarily used for irrigation and stockwatering, with some mining and milling, domestic, or other uses. Some of the larger stream and spring sources with water rights appropriations are Kalamazoo, Piermont, Garden, Bassett, Negro, Odger, McCoy, Taft, Stephens, and Cleve (Cleveland) Creeks on the eastern slope of the Schell Creek range; Spring Valley Creek and Millick Spring on the valley floor; and Dry Gulch, Shingle, Willard, Williams, Lincoln, and Murphy Creeks from the western slope of the Snake Range.

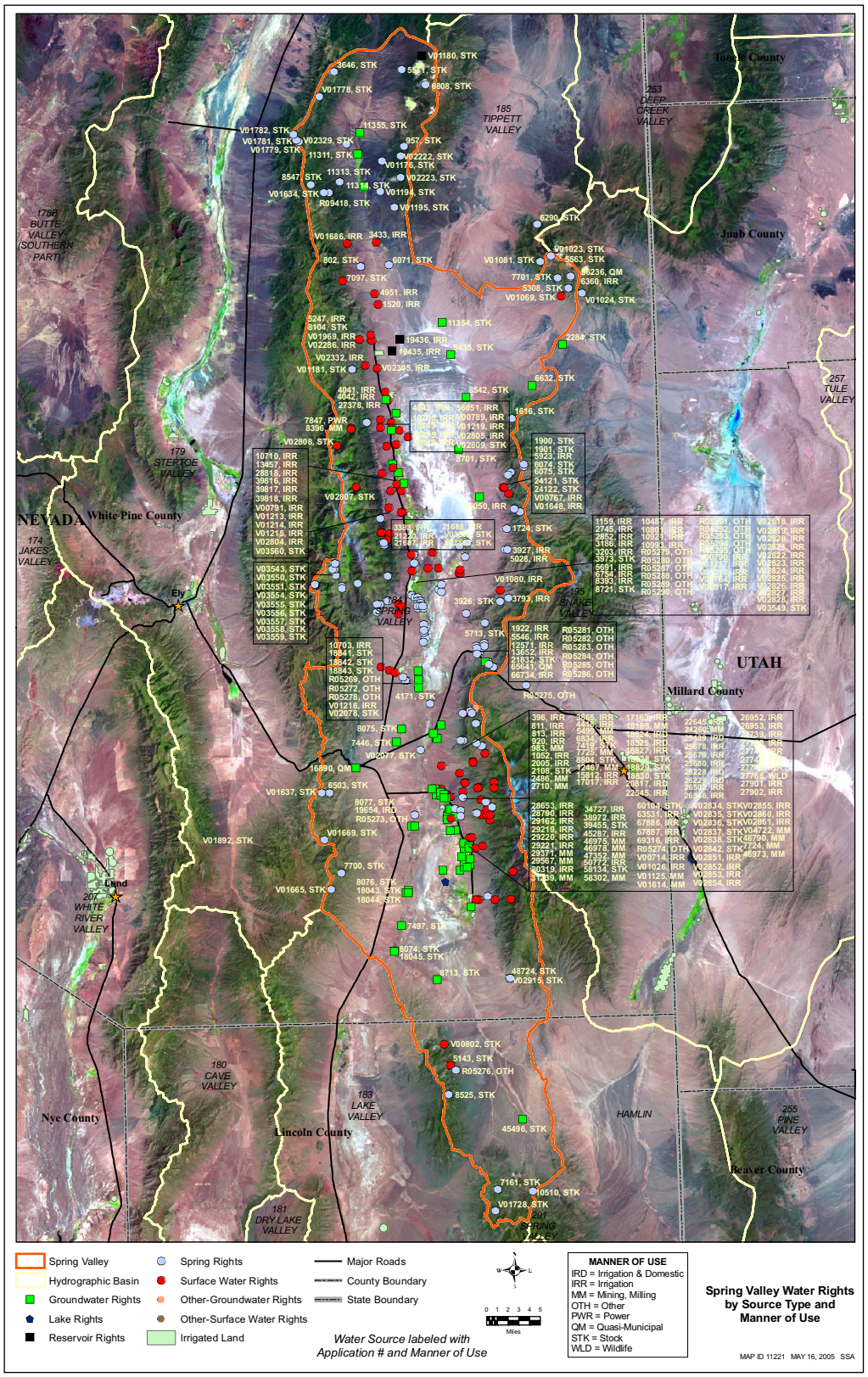

Figure 7-1
Spring Valley Water Rights

A number of streams in Spring Valley have undergone adjudication including Bassett Creek (1938), Kalamazoo Creek (1983), Negro Creek (1949), Odgers Creek (1976), and Piermont Creek (1976). Pending adjudications exists on Cleve Creek, Long Springs, Muncy Creek, Siegel Creek, and Swallow Creek.

Approximately 136 spring water rights have been filed in Spring Valley, including 24 reserved rights filed by the BLM and 16 claims of vested rights by the U.S. Forest Service (USFS). Many of the spring rights owned by BLM and the USFS are located off of the valley floor within the surrounding mountain ranges.

Table 7-1 lists the active underground water rights in Spring Valley which total 82,778 afy. Approximately 64,344 afy, or 78 percent, have a manner of use listed as municipal. The remaining uses are for irrigation, mining and milling, quasi-municipal, stockwatering, and wildlife purposes.

According to records on file with NDWR, major holders of certificated and/or permitted water rights within Spring Valley are Southern Nevada Water Authority, George Eldridge and Son, Inc., Huntsman Ranch, LLC, El Tejon Cattle Company, Nevada Land and Resource Company, LLC, and Robert L. and Fern A. Harbecke.

Table 7-1
Preliminary Estimates of Active Groundwater Rights in Spring Valley

Manner of Use	Preliminary Total (afy)
Irrigation-Desert Land Entry	836.98
Irrigation	15,744.37
Mining and Milling	1,360.7
Municipal	64,343.82
Quasi-Municipal	78.64
Stockwatering	385.61
Wildlife	27.58
Total Underground	**82,777.71**

Source: Hydrographic Basin Summary by Manner of Use (Included on the CD-ROM) (NDWR, 2007d)

7.4.2 Snake Valley

Snake Valley is split between Nevada and Utah (see Figure 7-2). In Nevada, Snake Valley is within White Pine and Lincoln Counties and includes the Snake Range, Great Basin National Park, and the community of Baker. In Utah, a majority of the valley floor is in Millard County, Utah, where Snake Valley supports significant agriculture and the communities of Garrison, Callao, Eskdale, Gandy, and Trout Creek. Portions of the southern basin also reside in Beaver and Iron Counties, Utah, while the northernmost portion of the basin is in Juab County.

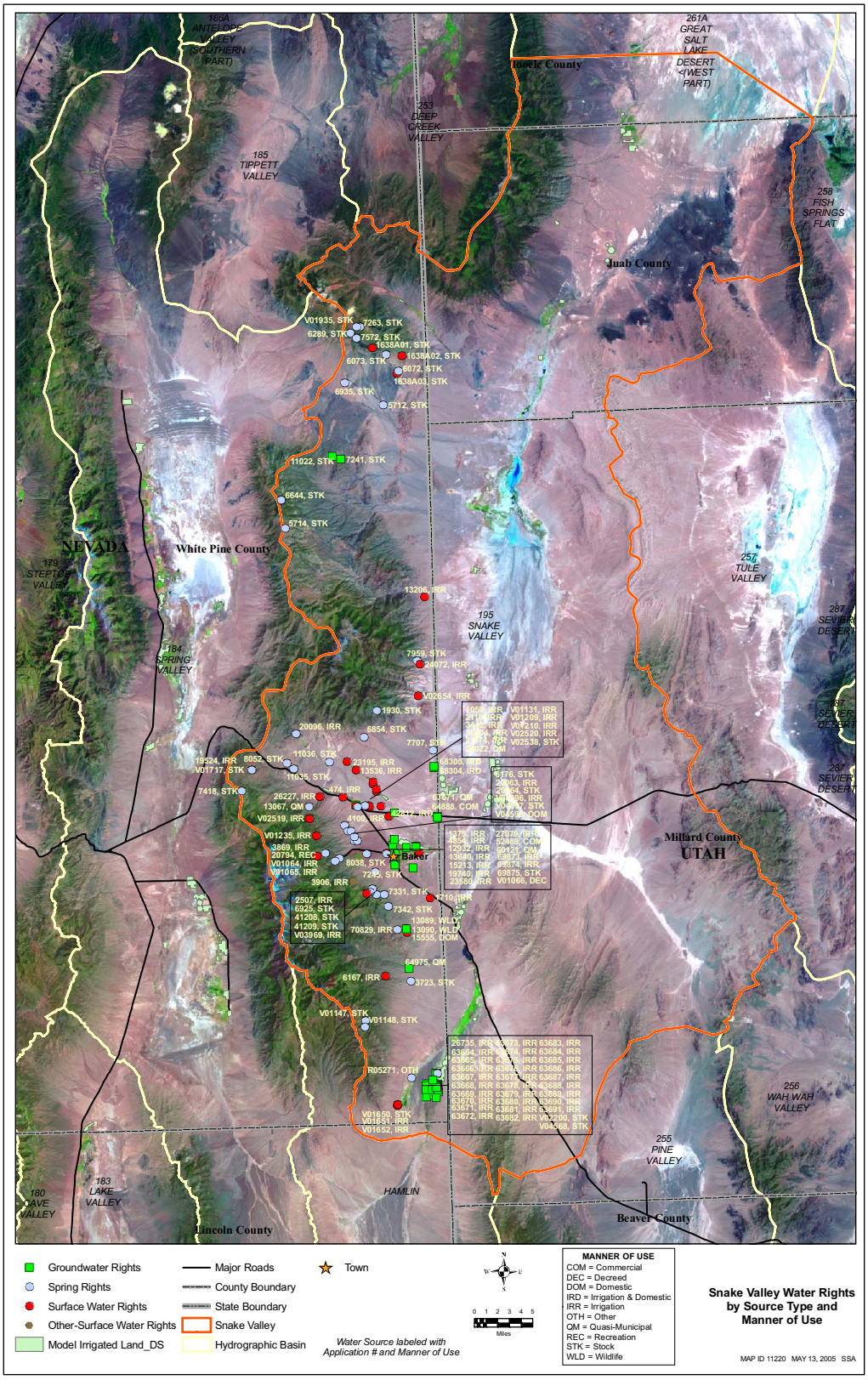

Figure 7-2
Snake Valley Water Rights (Nevada Portion)

Surface water rights have been appropriated on the major perennial streams including Smith, Hendrys, Silver, Weaver, Strawberry, Lehman, Baker, Young Canyon, Snake, and Big Springs. These streams all originate from the eastern slope of the Snake Range. Water rights have also appropriated most of the springs in the Nevada portion of Snake Valley including Lehman, Cave, Robison, Rowland, Big Wash, Eldridge, and Young's Canyon springs. Baker and Lehman Creeks have been adjudicated by the State of Nevada in the Baker-Lehman Creek Decree dated 1934. Civil decrees have also been issued by the State of Nevada for Silver Creek (1911), Six Springs (1890), and Weaver Creek (1984).

Trout Creek is a significant stream in Utah, discharging from the Deep Creek Range, a northern extension of the Snake Range. Warm Creek (Swan Creek in Nevada), discharges from the eastern flank of the Snake Range and has been adjudicated in Utah (Pringle vs. Shingleton, 1917).

A majority of the water resources in Snake Valley are derived from the Snake Range, with roughly 75 percent of surface water resources and 62 percent of groundwater resources of the basin derived in Nevada based on work by Hood and Rush (1965).

7.4.2.1 Nevada Portion

Based on records from NDWR, there are nearly 10,418 afy of active underground water rights in the Nevada portion of Snake Valley. As listed in Table 7-2, irrigation accounts for 99 percent, or 10,325.29 afy, of the total active underground water rights in the Nevada portion of Snake Valley. The next largest manner of use is for quasi-municipal with approximately 56 afy.

Major holders of certificated and/or permitted water rights within the hydrographic basin are Baker Ranches, Inc., and Granite Peak Properties, LLC.

Table 7-2
Preliminary Estimates of Active Groundwater Rights in Snake Valley (Nevada Portion)

Manner of Use	Preliminary Total (afy)
Commercial	0.06
Domestic	1.63
Irrigation-Desert Land Entry	720
Irrigation	9,605.29
Quasi-municipal	55.58
Stockwatering	34.92
Total Underground	**10,417.49**

Source: Hydrographic Basin Summary by Manner of Use (Included on the CD-ROM) (NDWR, 2007c)

7.4.2.2 Utah Portion

A large portion of central and northern Snake Valley resides in Utah (see Figure 7-2). Snake Valley is presently defined by UDWR as a basin open to new appropriations. It is listed, however, as a "focused study area." It should be noted that UDWR has water rights management areas that include multiple hydrographic basins. As such, Snake Valley is one of several hydrographic basins in Management Area No. 18. Approximately 495 water right permits have been issued by the UDWR in the Utah portion of Snake Valley, 286 of which are from an underground source (UDWR, 2007).

While there are some terminology differences between Nevada and Utah, Utah's core water-rights law and processes are very similar to that used in Nevada. However, some subtle differences exist. For example, multiple points of diversion can be specified for one application or claim number. To some degree, this avoids complications in interpreting combined duties of water rights, a difficulty encountered in assessing total committed duties in Nevada. Another difference is that single family domestic wells require water-right permit in Utah, unlike in Nevada.

Based on preliminary water right totals obtained from UDWR, there are 40,440 afy of active underground water rights in the Utah portion of Snake Valley (Clayton, 2007). As listed in Table 7-3, irrigation accounts for approximately 94 percent, or 37,942 afy, of the total active underground water rights in the Utah portion of Snake Valley. The next largest manner of use is for 'Other' uses with approximately 1,563 afy.

Major holders of approved and perfected water rights within the Utah portion of Snake Valley are the Corporation of the President Aaronic Order, and Baker Ranches Inc.

Table 7-3
Preliminary Estimates of Active Groundwater Rights in Snake Valley (Utah Portion)

Manner of Use	Preliminary Total (afy)
Irrigation	37,941.69
Stock	824.22
Domestic	111.03
Municipal	0
Mining	0
Power	0
Other	1,563.24
Total Underground	**40,440.18**

Source: Clayton, 2007; (Included on the CD-ROM)

7.4.3 Cave Valley

Cave Valley is split between White Pine County in the north and Lincoln County in the south (see Figure 7-3). The majority of the water rights in the basin are associated with spring sources. There are, however, water rights associated with the ephemeral Haggerty Wash and the ephemeral Silver Creek emanating from the Egan Range, and the ephemeral North and Sheep Creeks flowing from the western slope of the Schell Creek Range (not to be confused with North and Sheep Creeks on the *eastern* slope of Schell Creek Range, which are in Lake Valley). These creeks flow towards the valley floor on the north end of the valley and enter Cave Valley Wash and proceed to a terminal depression located at the southern end of the valley.

Records from NDWR indicate that there is approximately 47 afy of active underground water rights in the valley in the form of certificates, permits, or vested/reserved rights. All of the active underground water rights for Cave Valley are for stockwatering purposes. The underground active data for Cave Valley is listed in Table 7-4.

Table 7-4
Preliminary Estimates of Active Groundwater Rights in Cave Valley

Manner of Use	Preliminary Total (afy)
Stockwatering	46.58
Total Underground	**46.58**

Source: Hydrographic Basin Summary by Manner of Use (Included on the CD-ROM) (NDWR, 2007c)

7.4.4 Dry Lake Valley

Dry Lake Valley is also located entirely within Lincoln County (see Figure 7-4). Development of water resources in Dry Lake Valley has been minimal, primarily for stock watering. The majority of the water rights in the basin are from springs, however, there are rights associated with the ephemeral washes of Black Canyon and Fairview which originate in the Chief and Fairview ranges, respectively, on the eastern edge of the basin. These washes extend towards the valley floor and proceed to a terminal depression located at the southern end of the valley.

Records from NDWR indicate that there are approximately 57 afy of active underground water rights in the valley in the form of certificates, permits, or vested/reserved rights. Of this total, approximately 18 afy are for mining and milling purposes, while 38 afy are for stockwater purposes. The approximate committed totals by source type are listed in Table 7-5.

The principle water-right holders in Dry Lake Valley include Geyser Ranch Limited Partnership, Church of Jesus Christ-LDS, and Adams McGill Company.

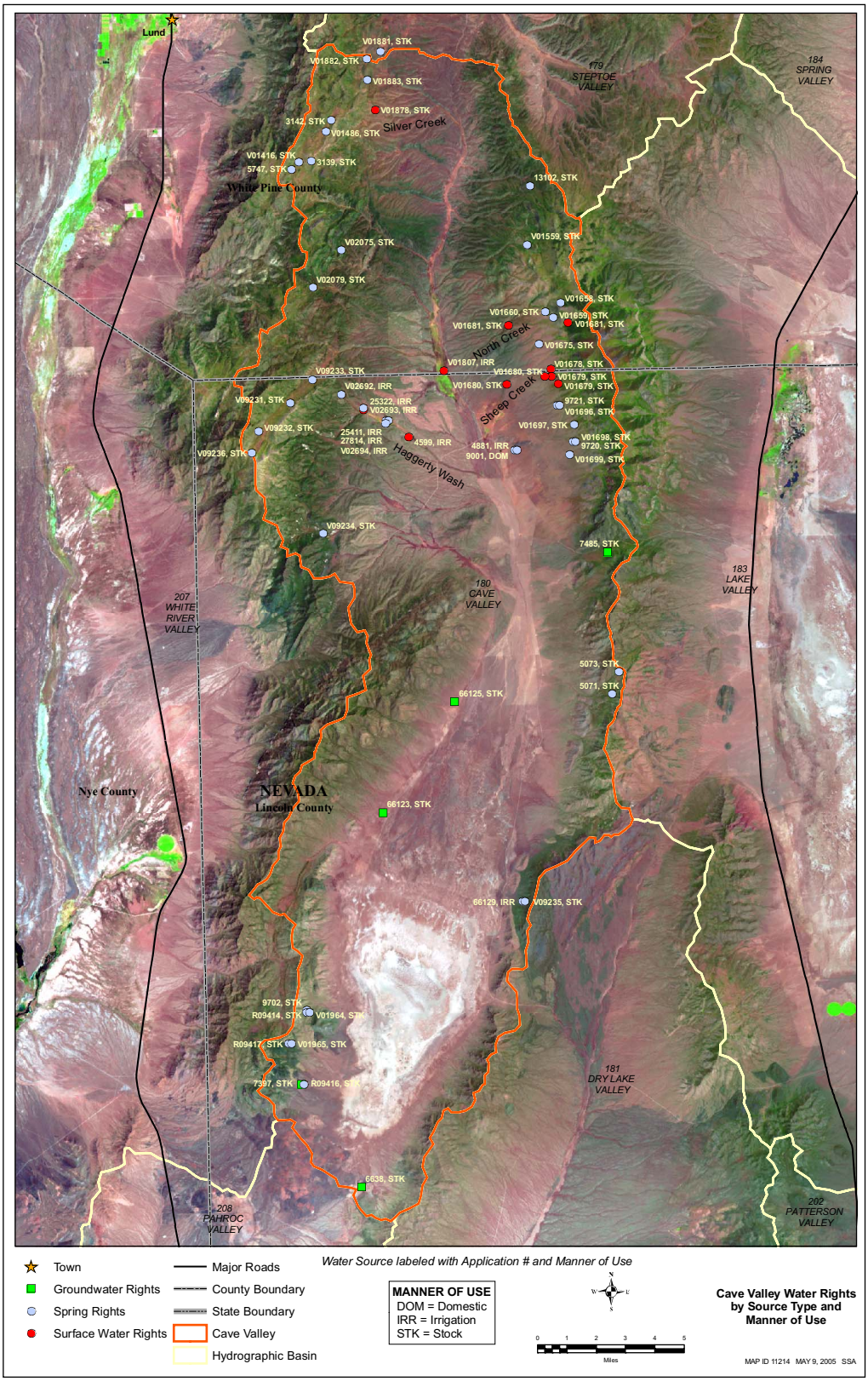

Figure 7-3
Cave Valley Water Rights

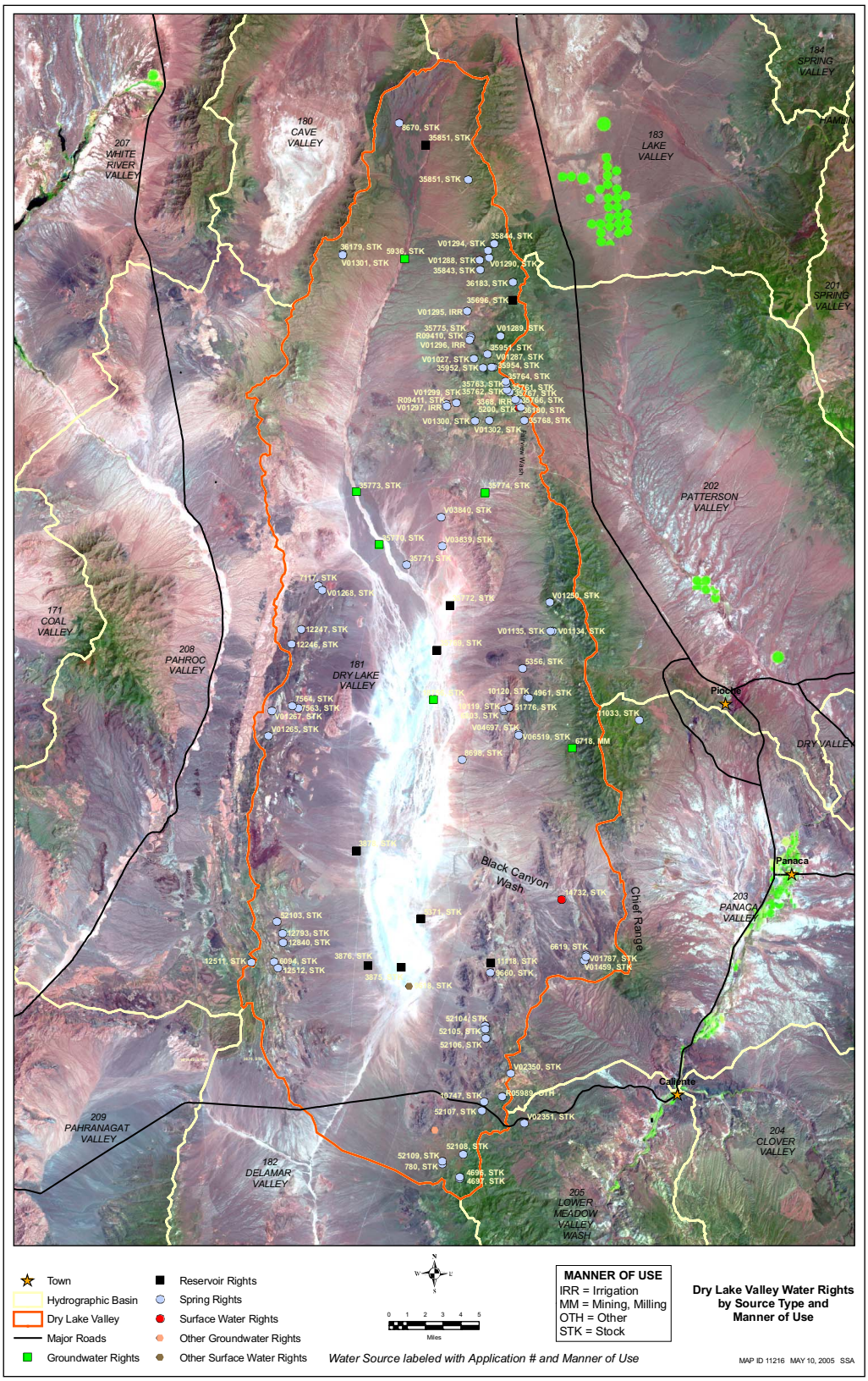

Figure 7-4
Dry Lake Valley Water Rights

Table 7-5
Preliminary Estimates of Active Groundwater Rights in Dry Lake Valley

Manner of Use	Preliminary Total (afy)
Mining and Milling	18.08
Stockwatering	38.48
Total Underground	**56.56**

Source: Hydrographic Basin Summary by Manner of Use (Included on the CD-ROM) (NDWR, 2007c)

7.4.5 Delamar Valley

Delamar Valley is located entirely within Lincoln County (Figure 7-5). Minor water resources have been developed in the basin, primarily the development of small mountain-block springs for stock water uses. The majority of the water rights in the basin are from springs. There are, however, water rights associated with ephemeral washes, including Delamar and Cedar, flowing from the ranges on the eastern edge of the basin. These creeks extend to the valley floor at the north end of the valley and proceed to a terminal depression (i.e., Delamar Lake) located at the southern end of the valley. Only one underground permit has been issued in the basin for stockwater uses.

Records from NDWR indicate that there are approximately 7 afy of active underground water rights in the valley. Table 7-6 shows that the active underground water rights in Delamar Valley are for stockwatering purposes.

Table 7-6
Preliminary Estimates of Active Groundwater Rights in Delamar Valley

Manner of Use	Preliminary Total (afy)
Stockwatering	7.24
Total Underground	**7.24**

Source: Hydrographic Basin Summary by Manner of Use (Included on the CD-ROM) (NDWR, 2007c)

The major water right owners in the valley are the Church of Jesus Christ-LDS and the Duffin family.

7.4.6 Coyote Spring Valley

Coyote Spring Valley is located within both Clark and Lincoln counties (see Figure 7-6). Until recently, only minor water resources have been developed in the basin. These water resources consist primarily of the development of small mountain-block springs for stockwater or wildlife uses. A major residential development relying on underground sources, a portion of which has been permitted, was initiated in 2006. It can be seen from Table 7-7 that according to NDWR there are

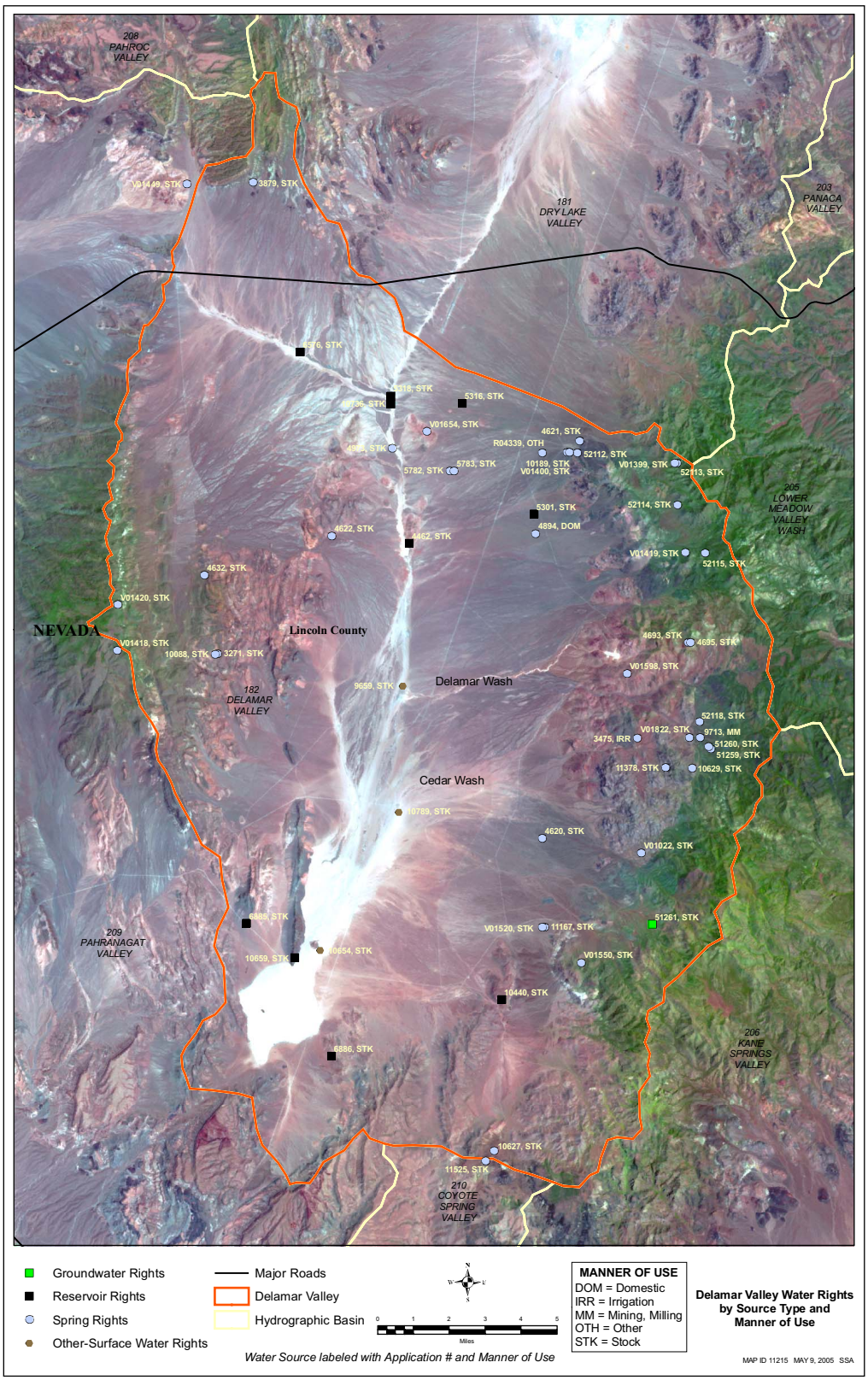

Figure 7-5
Delamar Valley Water Rights

Table 7-7
Preliminary Estimates of Active Groundwater Rights in Coyote Spring Valley

Manner of Use	Preliminary Total (afy)
Industrial	11,500
Irrigation	4.0
Mining and Milling	200
Municipal	4,600
Total Underground	**16,304**

Source: Hydrographic Basin Summary by Manner of Use (Included on the CD-ROM) (NDWR, 2007c)

approximately 16,304 afy of active underground water rights in Coyote Spring Valley. The table also shows that a majority of the water rights are associated with industrial and municipal manners of use. The major water right holders in Coyote Spring Valley are Coyote Springs Investment, LLC and SNWA.

7.5 Water Use in the Hydrologic Study Area

The breakdown of active underground water rights in the hydrologic study area by manner of use is provided on the enclosed CD-ROM in the file named "Underground_Committed_Water_Rights.pdf", and is summarized by Figure 7-7. Agricultural areas were delineated in the hydrologic study area using satellite imagery, and are also plotted on the figure. The agricultural areas were delineated based upon Normalized Difference Vegetation Index (NDVI) values calculated on June 2002 imagery. The imagery was atmospherically corrected and converted to reflectance prior to NDVI calculation. For the study area, the agricultural areas were empirically determined to have NDVI values greater than 0.72 (NDVI values range from -1.0 to +1.0). Figure 7-7 illustrates that not all hydrographic areas in the study area contain irrigated areas. The hydrographic areas with the greatest amount of agriculture include Snake Valley (12,594 acres), White River Valley (6,939 acres), Lake Valley (4,986 acres), Spring Valley (4,101 acres), and Panaca Valley (3,083 acres). As a consequence, these basins tend to have a significantly higher total water right duties than the other hydrographic areas.

Based on the active underground water rights summaries (NDWR, 2007c) (see Figure 7-7), it can also be seen that several hydrographic areas have significant duties as a result of other manners of use including municipal and industrial. For example, Steptoe Valley, Spring Valley, Lower Meadow Valley Wash, Coyote Spring Valley, Muddy River Springs Area, Lower Moapa, and Black Mountains Area all have significant duties associated with municipal and industrial manners of use.

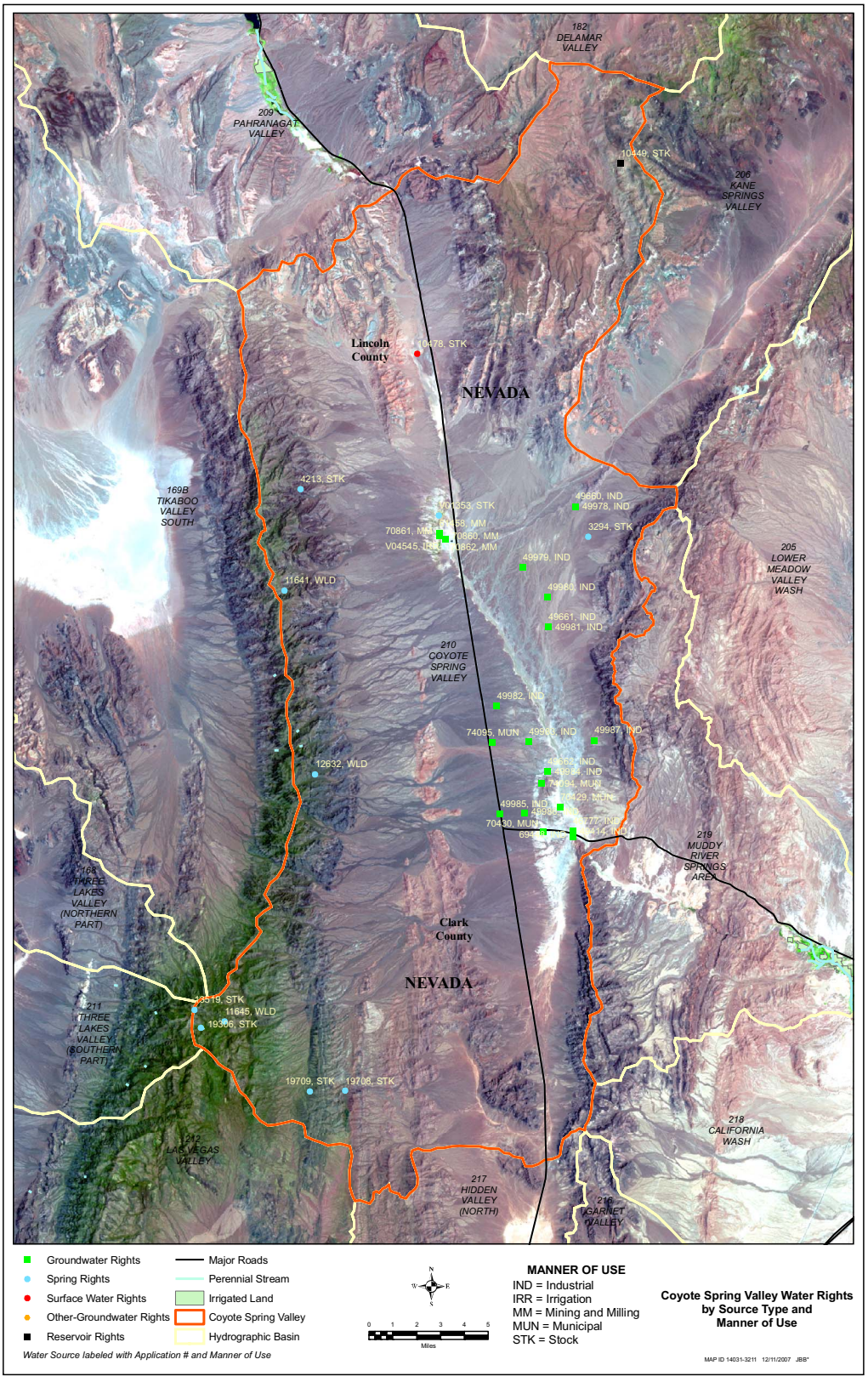

Figure 7-6
Coyote Spring Valley Water Rights

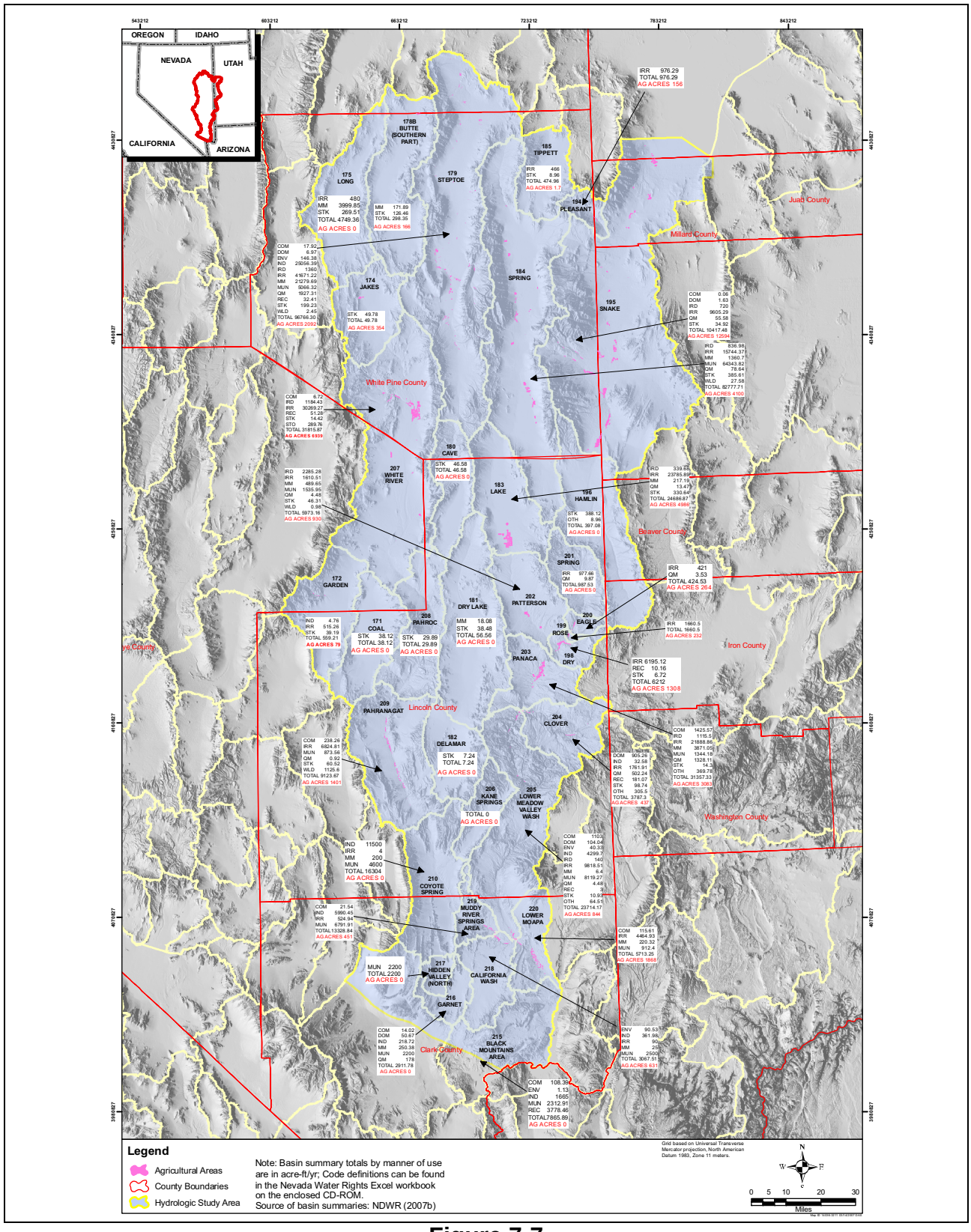

Figure 7-7
Total Active Underground Duties by Manner of Use and Agricultural Areas