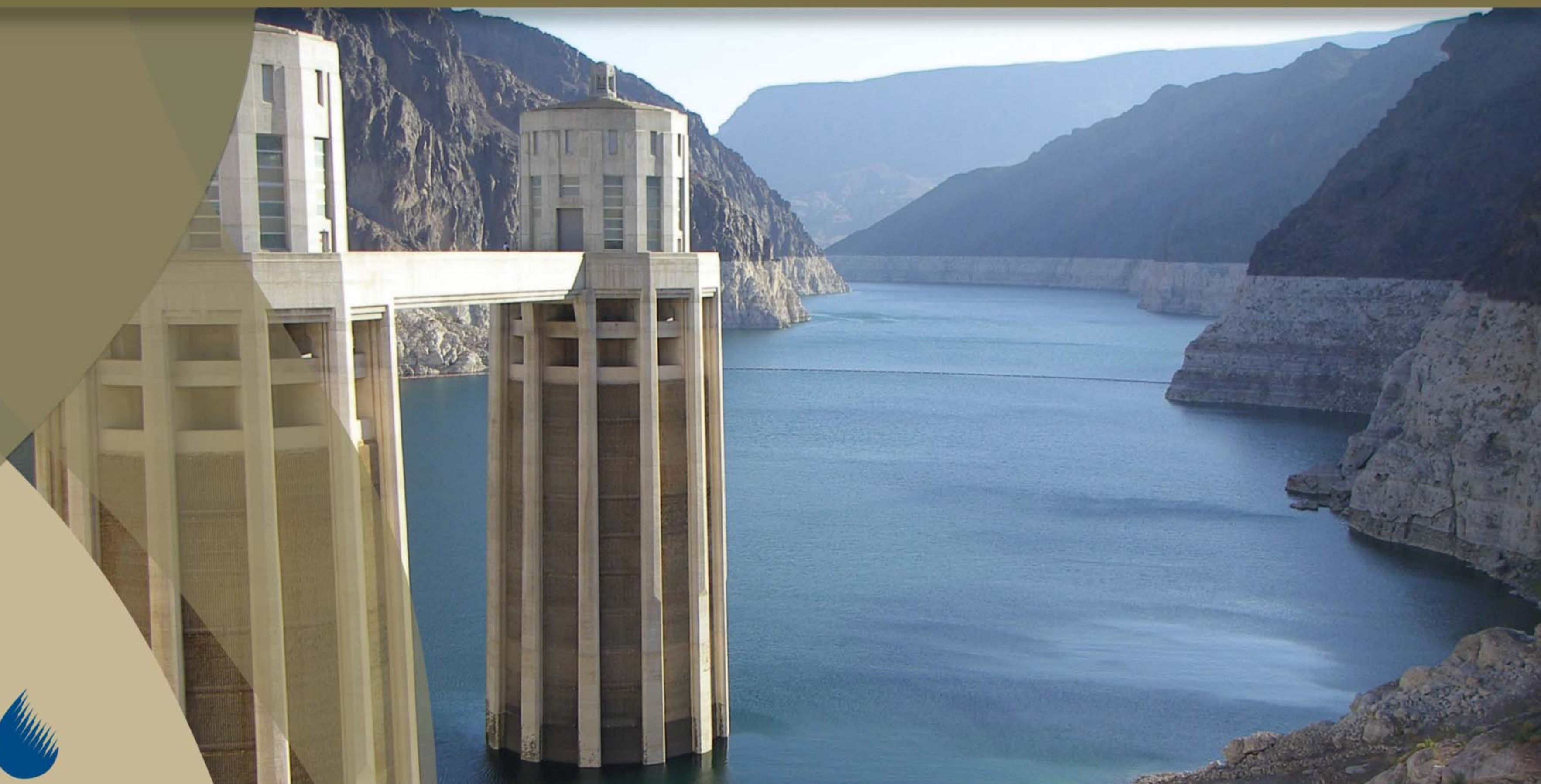
Spring, Cave, Dry Lake and Delamar Valleys



SOUTHERN NEVADA
WATER AUTHORITY

Presentation for
Watrus and Drici Testimony

James M. Watrus

Southern Nevada Water Authority
100 City Parkway, Suite 700
Las Vegas, NV 89106
862-3400

Education
M.S. Geochemistry, New Mexico Institute of Mining and Technology, 1998
B.S. Geology, University of Idaho, 1994

Professional Experience

2007 to present — **Southern Nevada Water Authority** — Las Vegas, Nevada
SENIOR HYDROLOGIST
Employed as a Senior Hydrologist with SNWA supervising the Hydrologic Analysis and Modeling Section of the Groundwater Resources Department. Responsibilities include directing a multi-disciplinary team on issues regarding water-resource acquisition and management as well as environmental compliance. This includes conducting water-resource investigations, water-related effects analyses, technical report preparation, expert witness testimony, and interacting with stakeholders.

2006 to 2007 — **Southern Nevada Water Authority** — Las Vegas, Nevada
HYDROLOGIST II
Employed as a Hydrologist II with SNWA within the Hydrologic Analysis Section for the Groundwater Resources Depatment. Experience includes data analysis, data integration, GIS analysis, surface water sampling, water-level measurement, water quality sampling, database development, site characterization, and report preparation.

2004 to 2006 — **Parsons** — Las Vegas, Nevada
SR GEOLOGIST

Employed as a Sr. Geologist with Parsons on a groundwater resource contract for the Southern Nevada Water Authority. Experience is the same as that listed for the Hydrologist II position with SNWA.

2003 to 2004 — **INTERA, Inc.** — Las Vegas, Nevada
GEOLOGIST/GEOCHEMIST

Employed as a geologist/geochemist with INTERA, Inc. on a multi-contractor environmental team to assist the National Nuclear Security Administration in investigating the contamination resulting from the Underground Nuclear Tests conducted at the Nevada Test Site. Experience includes data analysis, data integration, web development, GIS analysis, groundwater sampling, well drilling activities, and report preparation.

1998-2003 — **Science Applications International Corporation,** — Las Vegas, Nevada
GEOLOGIST/GEOCHEMIST

Same contract as described above with INTERA, Inc.

Conflicts Analysis Related to Southern Nevada Water Authority Groundwater Applications in Spring, Cave, Dry Lake, and Delamar Valleys, Nevada and Vicinity

PRESENTATION TO THE OFFICE OF THE NEVADA STATE ENGINEER

Prepared by

SOUTHERN NEVADA
WATER AUTHORITY

June 2011

SNWA Exhibit 337

Spring, Cave, Dry Lake, and Delamar Valleys Effects Rebuttal Report in Response to Myers (2011b, c, and d) and Bredehoeft (2011)

PRESENTATION TO THE OFFICE OF THE NEVADA STATE ENGINEER

Prepared by

SOUTHERN NEVADA WATER AUTHORITY

August 2011

SNWA Exhibit 407

Conceptual Model of Groundwater Flow for the Central Carbonate-Rock Province: Clark, Lincoln, and White Pine Counties Groundwater Development Project

November 2009

Transient Numerical Model of Groundwater Flow for the Central Carbonate-Rock Province: Clark, Lincoln, and White Pine Counties Groundwater Development Project

November 2009

Simulation of Groundwater Development Scenarios Using the Transient Numerical Model of Groundwater Flow for the Central Carbonate-Rock Province: Clark, Lincoln, and White Pine Counties Groundwater Development Project

DRAFT

September 2010

Addendum to the Groundwater Flow Model for the Central Carbonate-Rock Province: Clark, Lincoln, and White Pine Counties Groundwater Development Project

DRAFT

August 2010

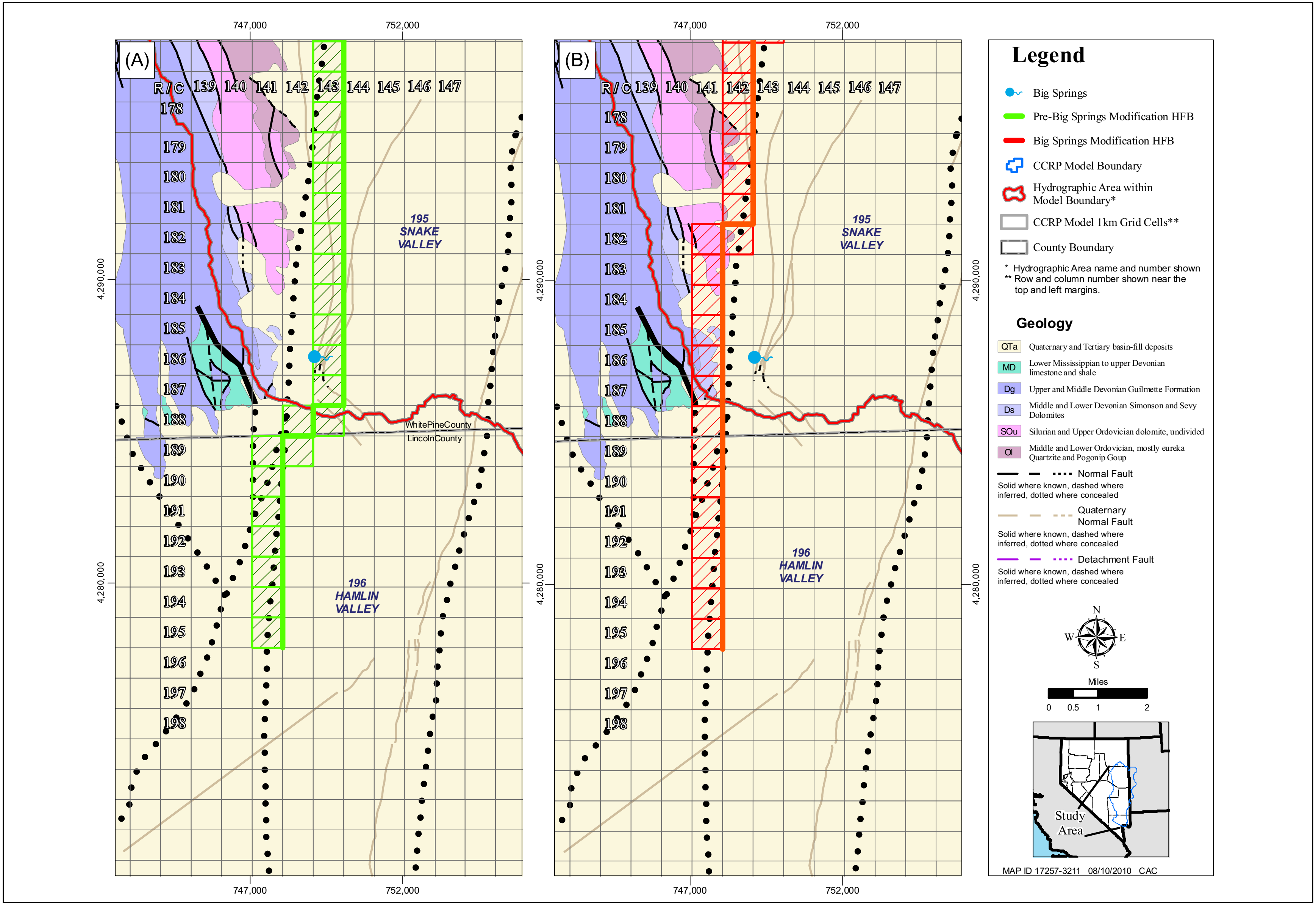


Figure 3-1
Location of Southern Snake Range HFB Relative to Big Springs in Original (A) and Modified (B) Models

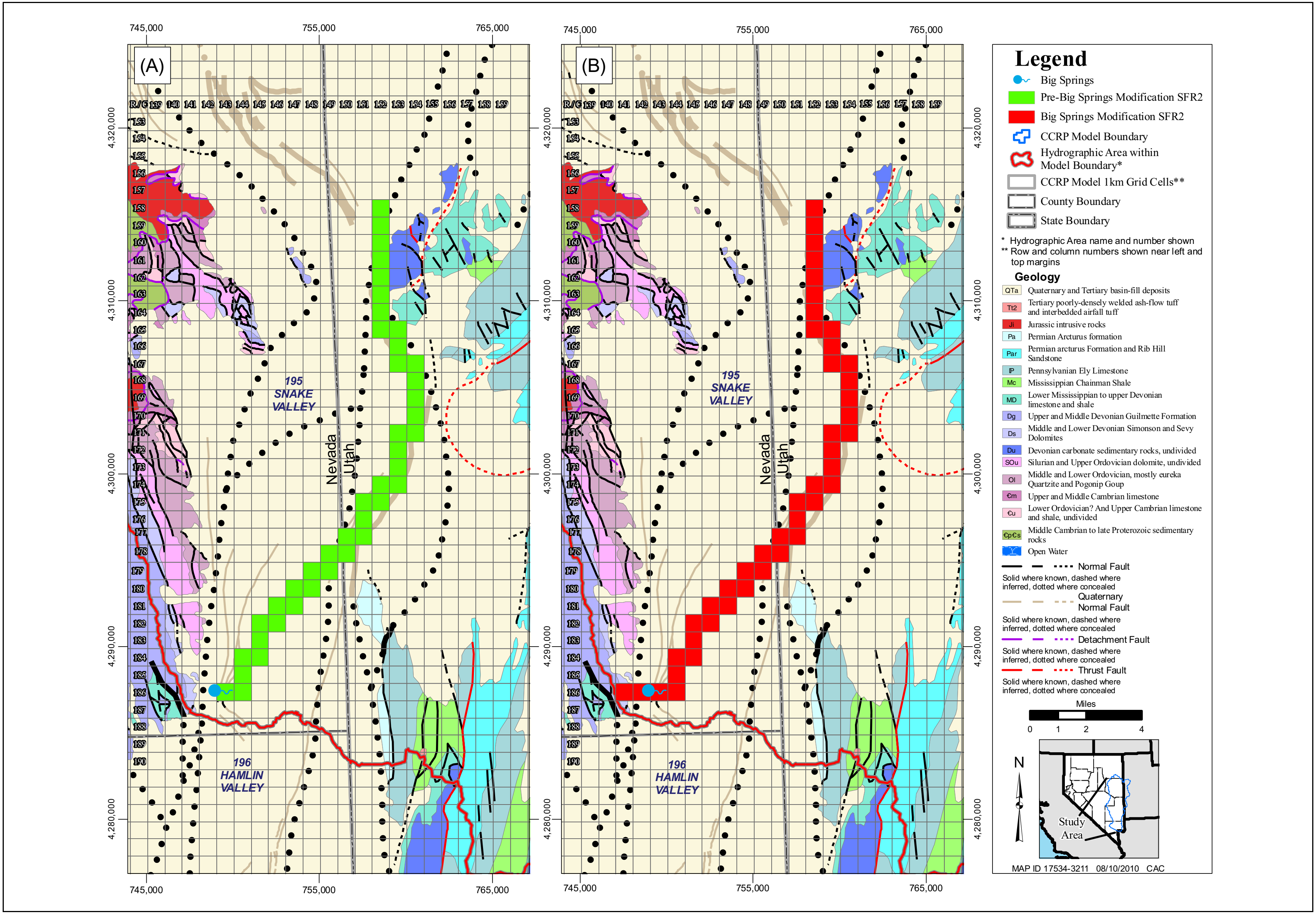


Figure 3-2

Representation of Big Springs in Original (A) and Modified (B) Models (Plan View)

SNWA Exhibit 90

Table A-1
Spring Valley Water-Right Information as Downloaded from NDWR

App.	Cert.	Status	Source	Use Code	Owner	Priority Date	POD Q	POD QQ	POD Sec	POD Twn	POD Rng	Annual Duty	Duty Balance	Unit	Diversion Rate	Diversion Balance
45	---	CAN	STR	PWR	MORTON, E.D.	2/14/1906	---	---	29	16N	66E	0	0	---	0	0
74	---	DEN	STR	PWR	CLEVELAND, A.C.	4/3/1906	---	---	29	16N	66E	0	0	---	0	0
84	---	DEN	STR	PWR	MORTON, E.D.	4/17/1906	---	---	30	20N	66E	0	0	---	0	0
99	---	CAN	STR	PWR	CLEVELAND A.C.	5/20/1906	---	---	7	16N	66E	0	0	---	0	0
100	---	CAN	STR	PWR	CLEVELAND, A.C.	5/20/1906	---	---	6	16N	66E	0	0	---	0	0
186	---	CAN	STR	PWR	NORTON, E.D.	8/20/1906	---	---	29	16N	66E	0	0	---	10	10
204	---	CAN	STR	PWR	LACKNER, E.C.	9/11/1906	---	---	29	16N	66E	0	0	---	50	50
208	---	CAN	OSW	PWR	OSCEOLA PLACER MINING CO.	9/17/1906	SW	---	4	14N	68E	0	0	---	0	0
209	---	CAN	OSW	PWR	OSCEOLA PLACER MINING CO.	9/17/1906	---	---	7	14N	68E	0	0	---	0	0
211	---	CAN	STR	PWR	YELLAND, JOHN	9/19/1906	---	---	---	14N	68E	0	0	---	0	0
225	---	CAN	SPR	MM	CAROTHERS, W.J. (ET AL)	10/11/1906	SE	---	1	14N	65E	0	0	---	10	10
311	---	CAN	SPR	MM	CAMPBELL, E.J.	12/12/1906	---	---	---	---	---	0	0	---	10	0
312	---	CAN	STR	MM	CAMPBELL, E.J.	12/12/1906	---	---	---	---	---	0	0	---	10	0
344	---	CAN	SPR	MM	SAINT LAWRENCE MINING CO.	1/24/1907	---	---	---	---	---	0	0	---	1	0
345	---	DEN	SPR	MM	ADIRONDACK MINING CO.	1/24/1907	---	---	---	---	---	0	0	---	0.2	0
346	---	DEN	SPR	MM	SAINT LAWRENCE MINING CO.	1/24/1907	---	---	---	---	---	0	0	---	0.2	0
396	563X	SUP	STR	IRR	SWALLOW, RICHARD T.	3/13/1907	SE	SW	6	11N	68E	480	480	AFA	25	0
414	---	DEN	STR	PWR	LACKNER, E.C.	3/26/1907	---	---	29	16N	66E	0	0	---	20	0
455	---	CAN	STR	MM	BUTSON, WM. P.	5/6/1907	---	---	5	16N	69E	0	0	---	10	0
481	---	CAN	STR	MM	DEVER, GEO. M.|HANCOCK, SOLOMON|HOLBROOK, E.H.|TOWNSEND, B.H.|TOWNSEND, J.L.	5/17/1907	---	---	15	20N	66E	0	0	---	10	0
502	---	WDR	STR	PWR	MCCRACKEN, PETER B.	6/1/1907	---	---	4	11N	68E	0	0	---	20	20
530	---	DEN	SPR	MM	JACKSON, PERCY|JOHNSON, CHARLEY	6/15/1907	---	---	---	17N	65E	0	0	---	1	1
560	---	CAN	STR	PWR	SNYDER, GRANT	7/12/1907	---	---	12	12N	67E	0	0	AFA	45	45
589	---	CAN	STR	PWR	HAWKINS, IRVING	7/29/1907	---	---	33	16N	66E	0	0	---	0	0
595	---	CAN	STR	PWR	PORCH, H.F.	8/1/1907	---	---	21	15N	66E	0	0	---	15	15
600	---	CAN	STR	PWR	PORCH, H.F.	8/6/1907	NE	NW	29	16N	66E	0	0	---	12	12
622	---	CAN	SPR	PWR	CLEVELAND, MRS A. C.	8/19/1907	---	---	---	16N	66E	0	0	---	15	15
655	---	CAN	SPR	PWR	KEEN, EDWIN R.	8/29/1907	---	---	---	17N	68E	0	0	---	0	0
685	---	CAN	STR	PWR	CLEVELAND, MRS A C.	9/13/1907	---	---	---	18N	66E	0	0	---	0	0
693	---	CAN	SPR	IRR	NEVADA- UTAH IRR. & DEVELOP. CO.	9/19/1907	---	---	---	12N	65E	0	0	---	0	0
697	---	CAN	STR	MM	BLACKWELL, HARRY H.	9/26/1907	---	---	---	15N	66E	0	0	---	0	0
706	---	CAN	STR	PWR	FLETCHER, E.L.	10/12/1907	SE	SE	9	20N	66E	0	0	---	0	0
707	---	CAN	STR	PWR	FLETCHER, E.L.	10/12/1907	SW	---	12	19N	65E	0	0	---	0	0
729	---	CAN	STR	IRR	GABY, C.W.|RICHARDSON, R.H.|WEEKS, F.B.	11/15/1907	---	---	---	12N	67E	0	0	---	10	10
730	---	CAN	STR	PWR	GABY, C.W. ET.AL.	11/15/1907	---	---	---	12N	67E	0	0	---	20	20
732	---	CAN	STR	MM	GABY, C.W.|RICHARDSON, R.H.|WEEKS, F.B.	11/15/1907	---	---	---	13N	68E	0	0	---	5	5

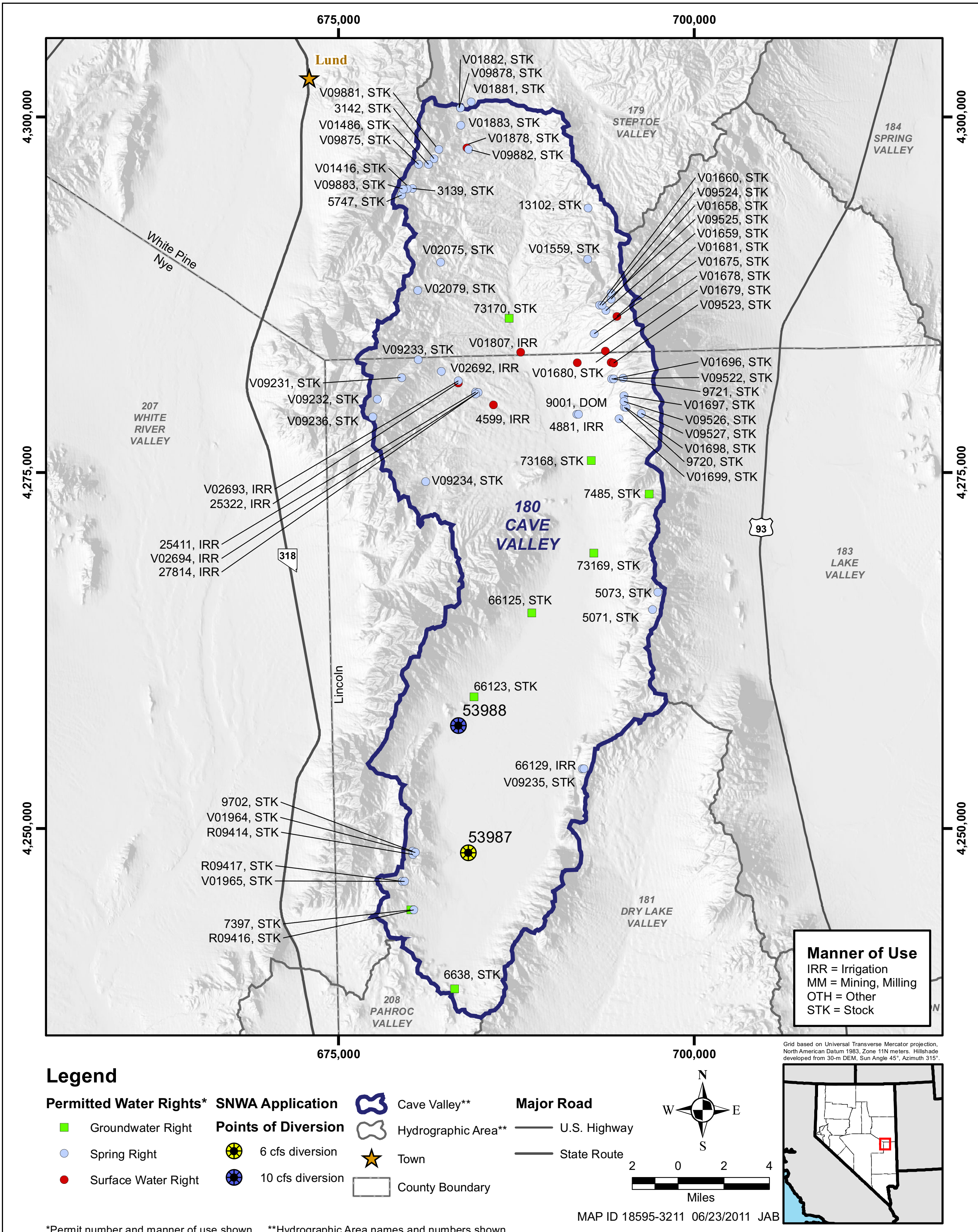


Figure 3-1
Points of Diversion for Permitted Water Rights in Cave Valley

SNWA Exhibit 337

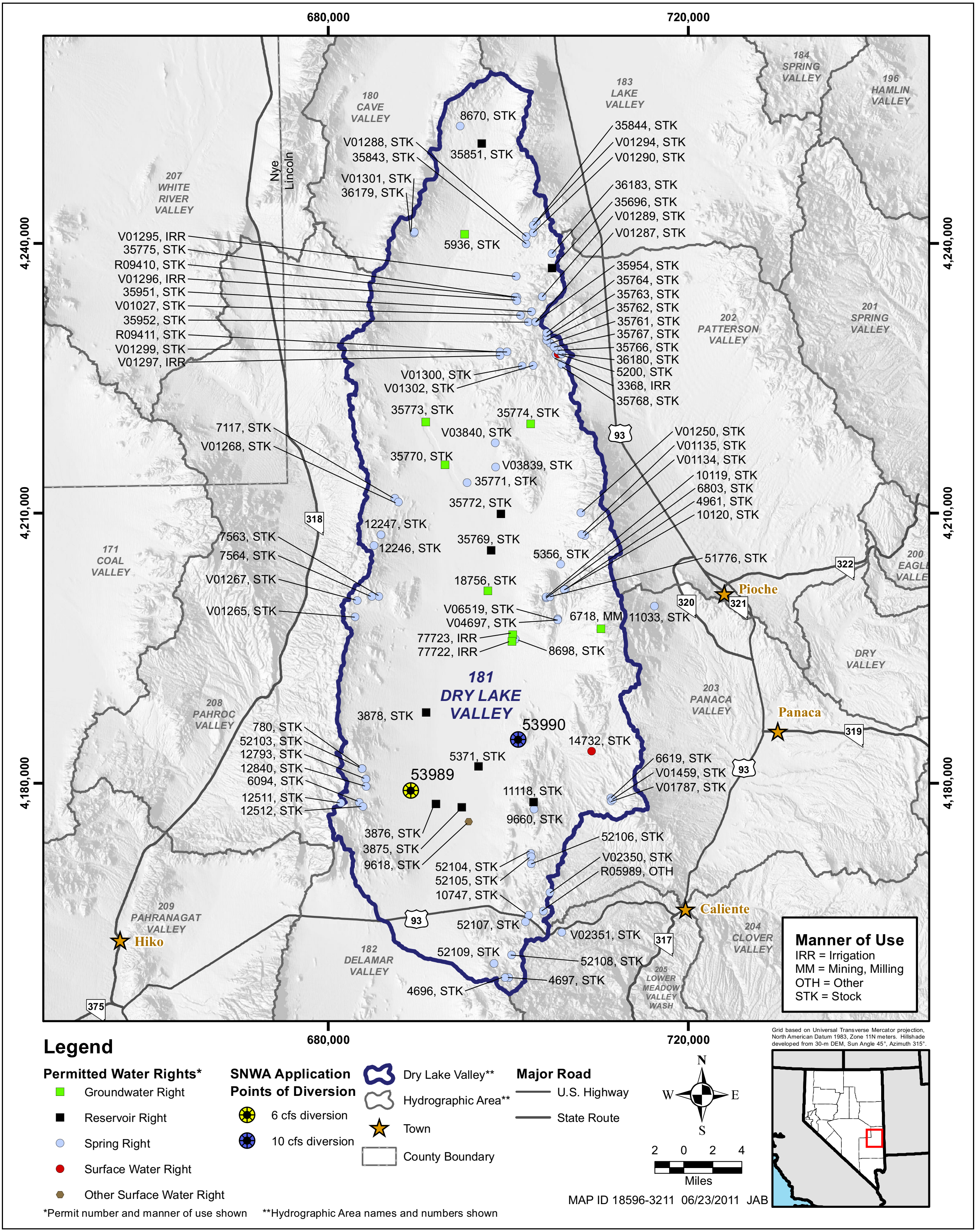


Figure 3-2
Points of Diversion for Permitted Water Rights in Dry Lake Valley

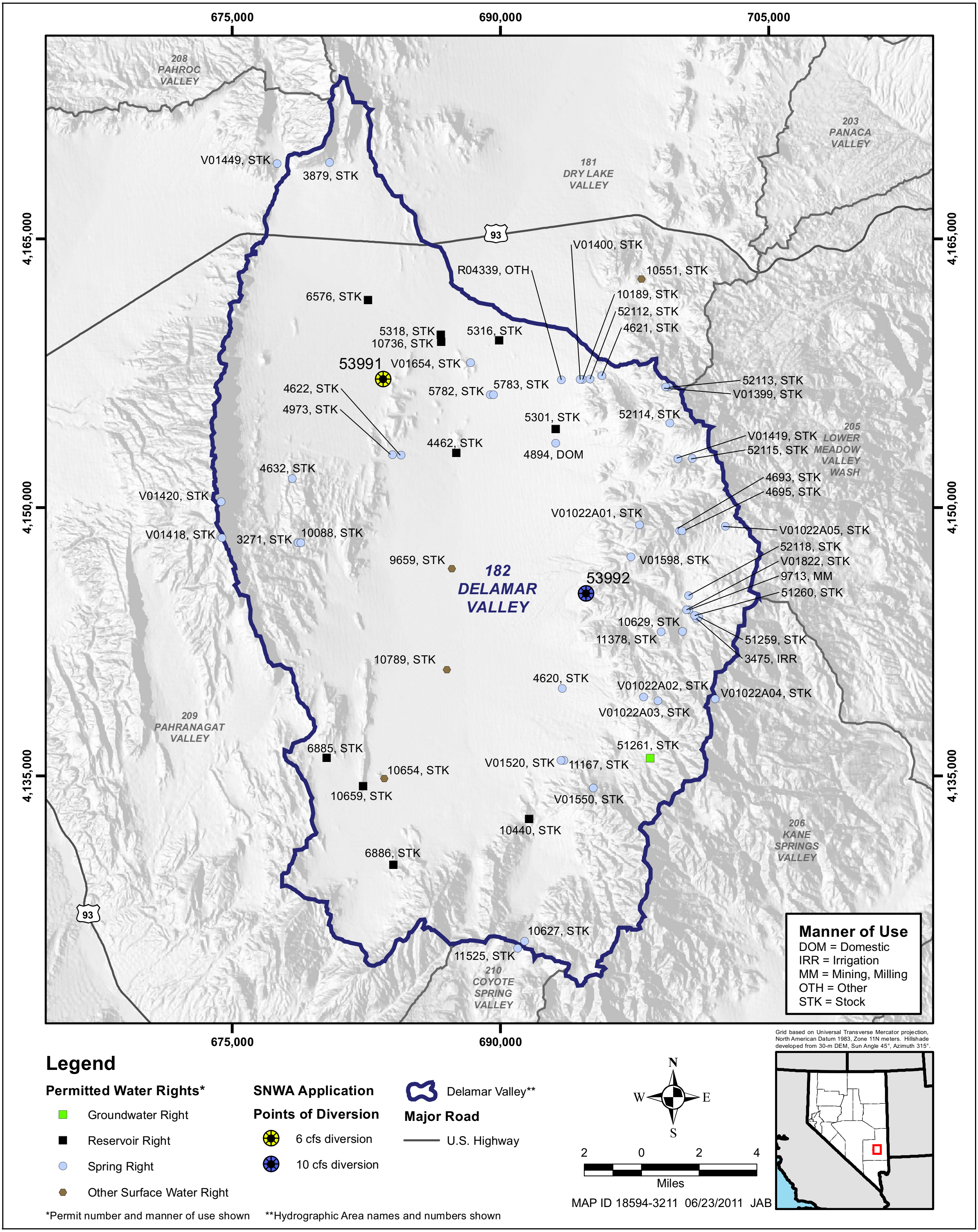


Figure 3-3
Points of Diversion for Permitted Water Rights in Delamar Valley

SNWA Exhibit 337

PLATE 1: SPRING VALLEY POINTS OF DIVERSION AND PERMITTED WATER RIGHTS

SNWA Exhibit 337

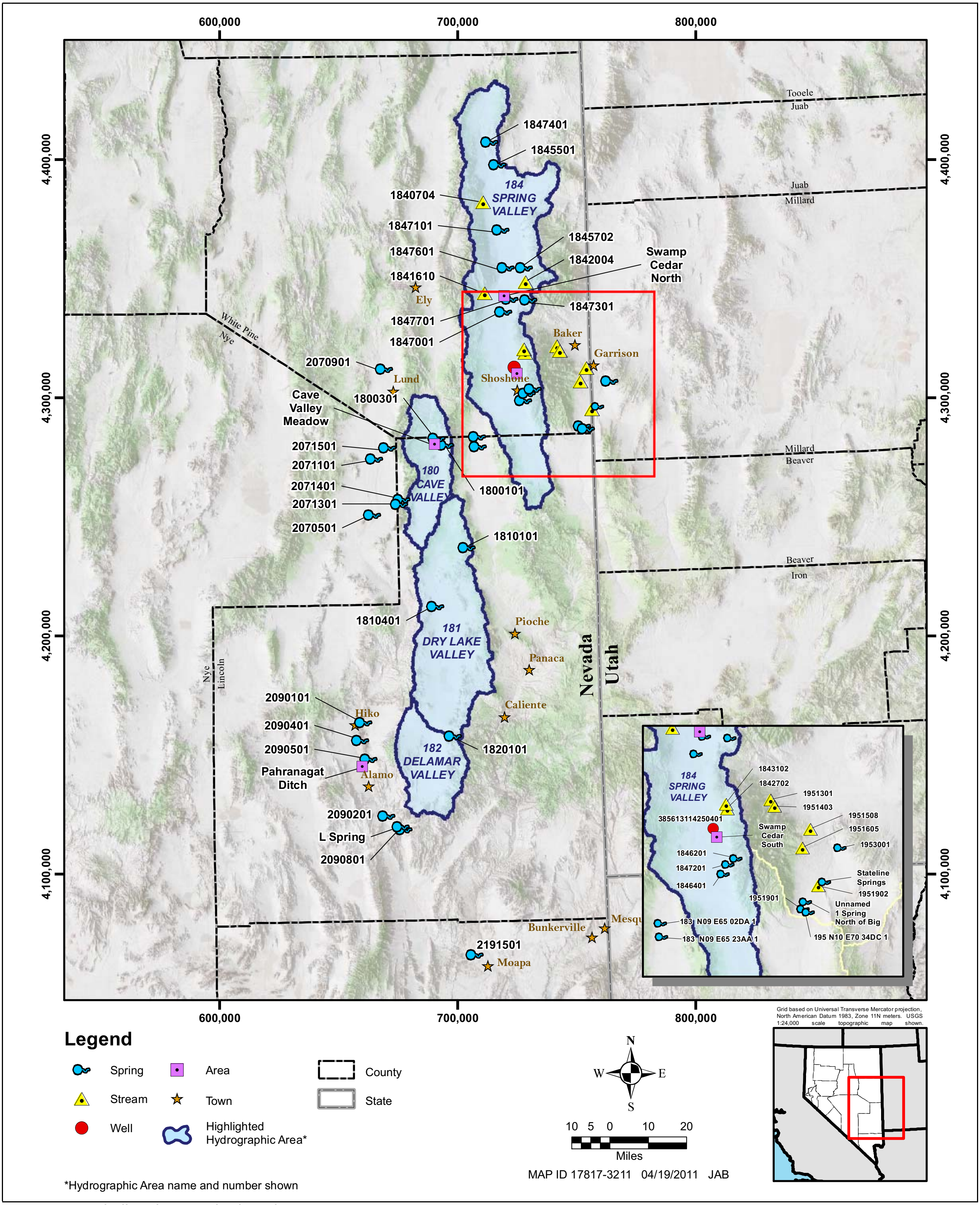
Table 3-2
Environmental Areas of Interest
(Page 1 of 2)

Site ID	Name	Hydrographic Area	Site Type	Location[a] UTM Northing (m)	UTM Easting (m)	Elevation (ft)
Spring Valley and Vicinity						
1847401	Stonehouse Spring	Spring Valley	Spring	4,406,507	710,511	6,256
1845501	Willow Spring	Spring Valley	Spring	4,397,069	713,756	5,987
1847101	Keegan Spring near Piermont, NV	Spring Valley	Spring	4,369,664	715,050	5,617
1847601	West Spring Valley Complex 1	Spring Valley	Spring	4,353,812	717,309	5,603
1845702	South Millick Spring	Spring Valley	Spring	4,353,754	725,031	5,593
---	Swamp Cedar North	Spring Valley	Area	4,342,717	719,507	5,621
1847701	Unnamed 5 Spring	Spring Valley	Spring	4,340,641	718,911	5,645
1847301	Rock Spring	Spring Valley	Spring	4,340,204	726,798	6,364
1847001	Four Wheel Drive Spring	Spring Valley	Spring	4,335,256	716,255	5,754
385613114250401	184 N12 E67 02ACBA1 USBLM (Shoshone Pond Well)	Spring Valley	Flowing Well/ Ponds	4,312,898	723,711	5,781
---	Swamp Cedar South	Spring Valley	Area	4,310,128	724,802	5,813
1846201	Swallow Springs	Spring Valley	Spring	4,302,920	728,597	6,080
1847201	Minerva Spring	Spring Valley	Spring	4,301,025	726,101	5,825
1846401	Blind Spring	Spring Valley	Spring	4,298,025	724,717	5,773
1841610	Cleve Creek	Spring Valley	Stream	4,343,870	710,765	5,964
1840704	Kalamazoo Creek	Spring Valley	Stream	4,382,169	710,123	6,233
1842004	Negro Creek	Spring Valley	Stream	4,348,593	727,948	6,032
1842702	Pine and Ridge Creeks	Spring Valley	Stream	4,318,879	727,728	7,345
1843102	Shingle Creek	Spring Valley	Stream	4,320,388	727,332	7,309
183 N09 E65 23AA 1	Wambolt Springs	Lake Valley	Spring	4,278,675	705,543	5,950
183 N09 E65 02DA 1	Geyser Creek Spring	Lake Valley	Spring	4,282,764	705,194	6,101
1953001	Clay Spring	Snake Valley	Spring	4,306,147	760,875	5,446
---	Stateline Springs	Snake Valley	Spring	4,295,881	756,735	5,423
---	Unnamed 1 Spring North of Big Springs	Snake Valley	Spring	4,289,483	750,194	5,572
1951901	Big Spring	Snake Valley	Spring	4,287,293	749,422	5,578
195 N10 E70 34DC	North Little Springs	Snake Valley	Spring	4,286,207	751,006	5,562
1951301	Lehman Creek	Snake Valley	Stream	4,321,757	741,187	6,734
1951403	Baker Creek	Snake Valley	Stream	4,319,788	742,379	6,588
1951508	Snake Creek	Snake Valley	Stream	4,312,614	753,449	5,576
1951902	Big Springs Creek	Snake Valley	Stream	4,295,165	755,908	5,450
1951605	Big Wash	Snake Valley	Stream	4,306,797	750,951	6,187

Table 3-2
Environmental Areas of Interest
(Page 2 of 2)

Site ID	Name	Hydrographic Area	Site Type	Location[a] UTM Northing (m)	UTM Easting (m)	Elevation (ft)
Cave, Dry Lake, Delamar Valleys and Vicinity						
1800301	Parker Station Spring	Cave Valley	Spring	4,282,096	688,179	6,490
---	Cave Valley Meadow	Cave Valley	Area	4,280,420	690,235	6,467
1800101	Cave Spring	Cave Valley	Spring	4,279,249	691,760	6,486
1810101	Meloy Spring	Dry Lake Valley	Spring	4,236,201	700,888	6,178
1810401	Coyote Spring	Dry Lake Valley	Spring	4,211,513	687,693	5,224
1820101	Grassy Spring	Delamar Valley	Spring	4,157,193	695,124	5,786
2070901	Preston Big Spring	White River Valley	Spring	4,311,153	666,296	5,732
2071301	Flag Spring 3	White River Valley	Spring	4,254,416	672,579	5,294
2071501	Hardy Springs	White River Valley	Spring	4,278,196	667,553	5,354
2071101	Moorman Spring	White River Valley	Spring	4,273,440	662,053	5,299
2071401	Butterfield Spring	White River Valley	Spring	4,256,472	673,530	5,324
2070501	Hot Creek Spring near Sunnyside, NV	White River Valley	Spring	4,249,926	661,290	5,229
2090101	Hiko Spring	Pahranagat Valley	Spring	4,162,744	657,549	3,878
2090401	Crystal Springs	Pahranagat Valley	Spring	4,155,348	656,165	3,803
2090501	Ash Springs	Pahranagat Valley	Spring	4,147,460	659,684	3,603
---	Pahranagat Ditch	Pahranagat Valley	Area	4,145,350	659,798	3,559
2090201	Cottonwood Spring	Pahranagat Valley	Spring	4,123,643	667,261	3,238
---	L Spring	Pahranagat Valley	Spring	4,119,155	673,202	3,159
2090801	Maynard Spring	Pahranagat Valley	Spring	4,117,909	674,444	3,107
2191501	Moapa National Wildlife Refuge Warm Springs West	Muddy River Springs Area	Spring	4,065,272	704,211	1,772

Source: Environmental Areas of Interest Identified in Marshall and Luptowitz (2011).
[a]UTM, NAD83, Zone 11N



Source: Marshall and Luptowitz (2011)

Figure 3-4
Environmental Areas of Interest

SNWA Exhibit 337

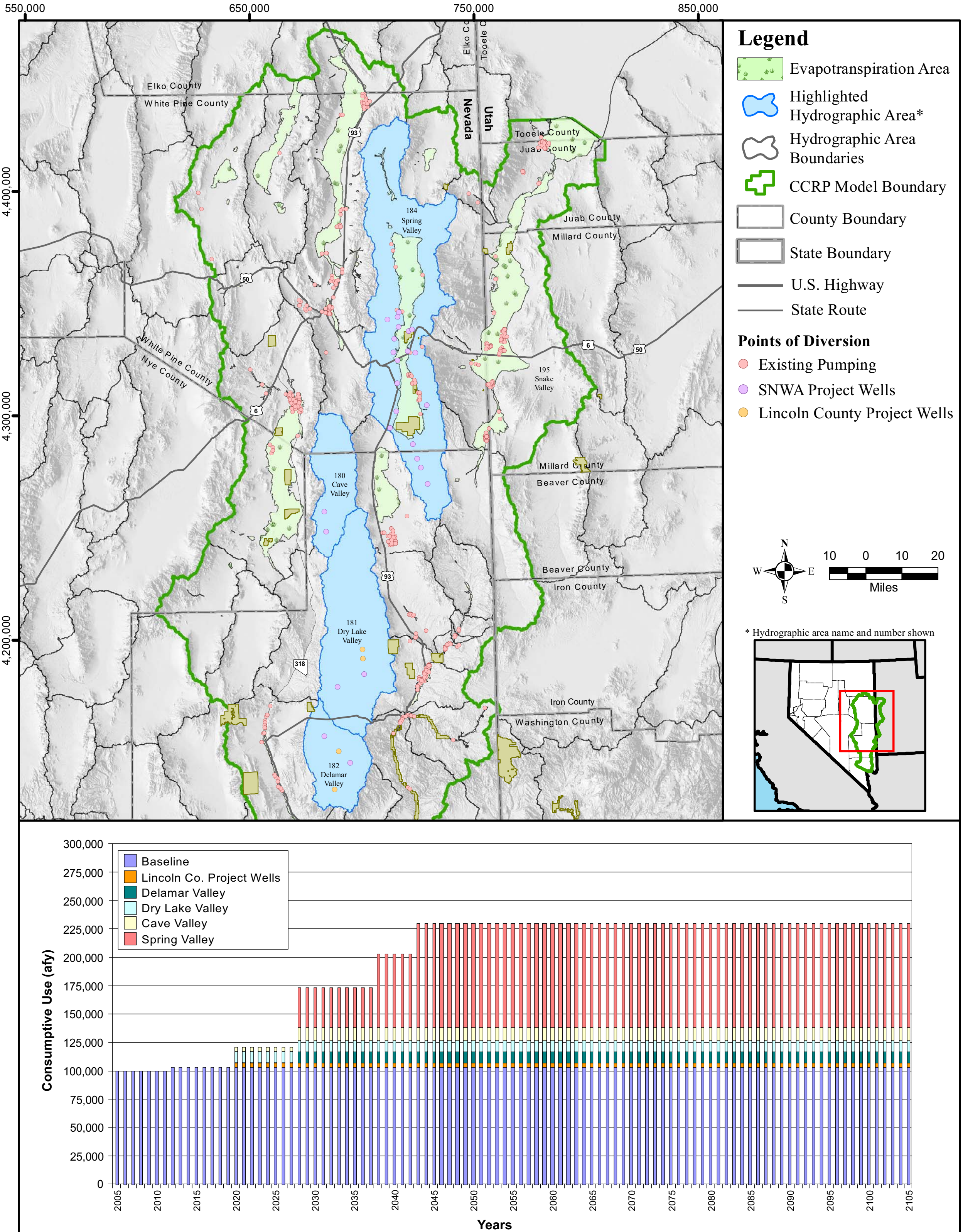


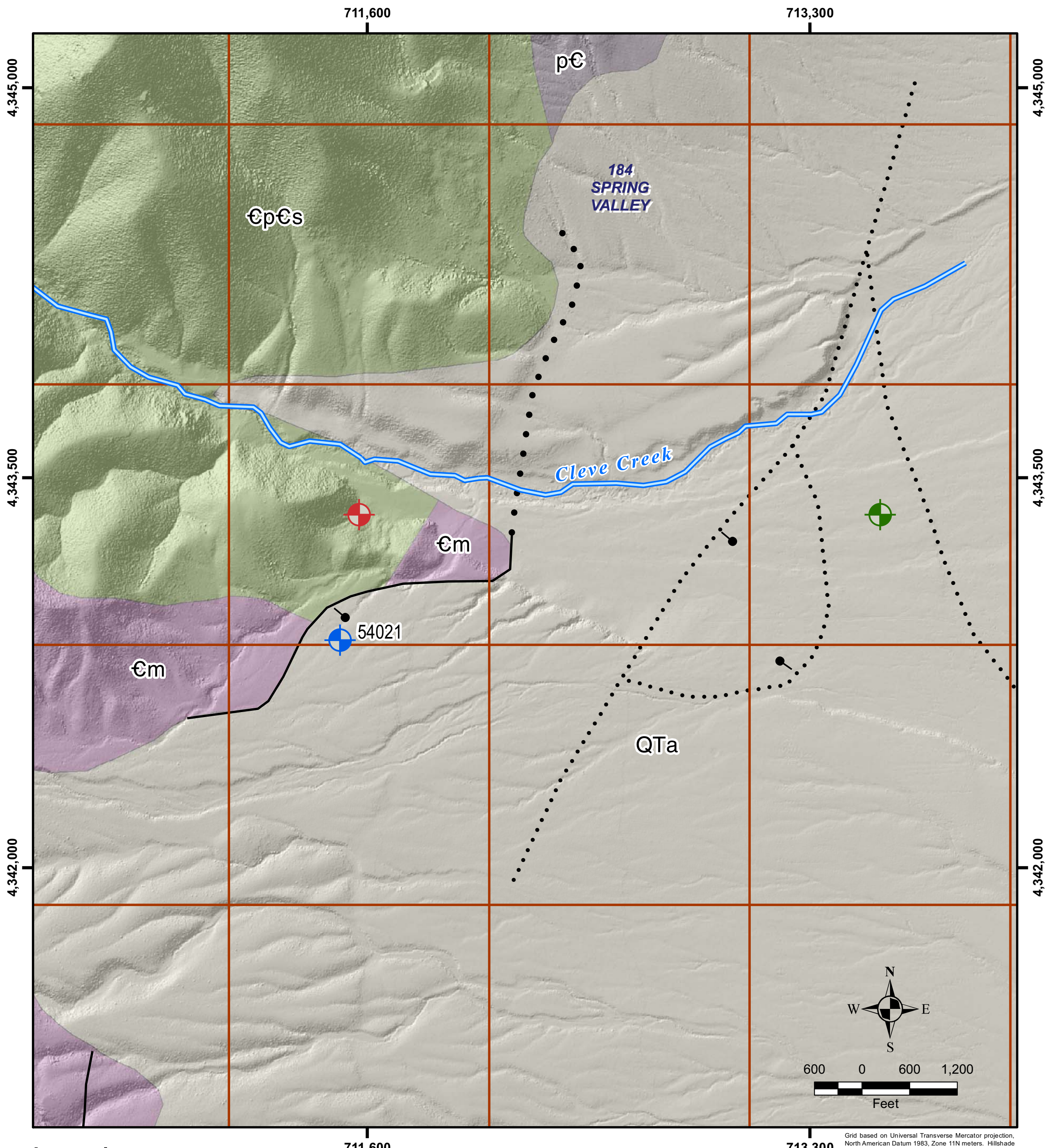
Figure 4-1
Pumping Distribution and Schedule for SNWA Pumping Simulation

SNWA Exhibit 337

Table 4-1
Project Water-Use Schedule

Year[a]	Production Volume (afy)	
	Cave, Dry Lake, and Delamar Valleys	Spring Valley
2019 to 2028	14,077	0
2028 to 2038	34,751	35,000
2038 to 2042	34,751	64,544
2042	34,751	91,222

[a]Pumping begins on December 31 for the specified year.



Grid based on Universal Transverse Mercator projection, North American Datum 1983, Zone 11N meters. Hillshade developed from 30-m DEM, Sun Angle 45°, Azimuth 315°.

Legend

- Application Point of Diversion
- Inital Model Location
- Final Model Location
- CCRP Hydrogeologic Framework Model Grid

Cleve Creek

Regional Faults

Normal fault

Dotted where concealed. Bar and ball on downthrown side of fault.

Subsidiary Faults

Normal fault

Solid where known; dotted where concealed; dotted and queried where uncertain. Bar and ball on downthrown side of fault.

Hydrographic Area name and number shown

Geologic Unit and Description

QTa	Quaternary and Tertiary alluvium
€m	Upper and Middle Cambrian limestone
€p€s	Lower Cambrian to Neoproterozoic sedimentary rocks
p€	Late to Early Proterozoic metamorphosed and crystalline precambrian basement rocks

MAP ID 18477-32111 06/08/2011 BP/JAB

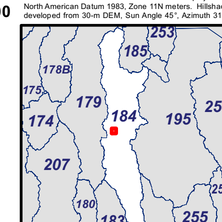


Figure 4-2
Application Point of Diversion 54021

SNWA Exhibit 337

Table ES-4 Summary of the Seven Alternatives for EIS Analysis

Seven Alternatives for Analysis	Conveyance System Alignment	SNWA Groundwater Production	Basins in Which SNWA Production Would Occur	Well Placement[3]	Full Build out
Proposed Action	Full ROW request [1]	Up to 176,655 afy	Spring, Snake, Cave, Delamar, Dry Lake	Distributed	2050
A	Full ROW request [1]	Up to 114,755 afy	Spring, Snake, Cave, Delamar, Dry Lake	Distributed	2050
B	Full ROW request [1]	Up to 176,655 afy	Spring, Snake, Cave, Delamar, Dry Lake	Points of Diversion	2050
C	Full ROW request [1]	12,000 to 114,755 afy (varies in response to drought)[2]	Spring, Snake, Cave, Delamar, Dry Lake	Distributed	2050
D	LCCRDA	Up to 78,755 afy	South Spring, Cave, Delamar, Dry Lake	Distributed	2043
E	Spring / DDC	Up to 78,755 afy	Spring, Cave, Dry Lake, Delamar (No Snake)	Distributed	2049
No Action	None	None	None	None	NA

[1] Full ROW request includes the ROW for the main pipeline, two main lateral pipelines, transmission line, and other ancillary facilities

[2] Includes 3,000 afy of water rights transferred by the SNWA to the Lincoln County Water District.

[3] "Points of diversion" refers to siting wells at specific locations identified and approved by the NSE. "Distributed" refers to siting wells based on the results of monitoring, productivity, and hydrologic modeling to reduce long-term adverse environmental effects.

GBWN Exhibit 110

the reliability of the model." The term "validation" has been used to describe the successful simulation of a post-calibration stress to the groundwater system. However, one such success does not assure that the model will reliably predict a different future stress. Konikow and Bredehoeft note that realistic expectations of models "will help to shift emphasis towards understanding complex hydrogeological systems and away from building false confidence into model predictions." Although false confidence cannot be placed in numerical models, it is more realistic that hydrologists build a reasonable model that uses field information to estimate future conditions than to ignore such capability in lieu of less rigorous estimates. The goal is for the numerical model to reasonably represent the system.

Additional uncertainties are associated with the observation data sets (such as hydraulic head measurements, ET discharge estimates, and historic groundwater pumping estimates) used for calibration. These and other model uncertainties are discussed in detail in the transient model report and model simulation reports (SNWA 2009b,c; 2010a,b).

Climate Change. Section 3.1.3.2, Climate Change Effects to All Other Resources, discusses the current research into climate change and predicted future trends for the Great Basin and provides a discussion of the range of potential effects on water resources. Current climate change models suggest that within the study area, mean temperatures are expected to rise and annual precipitation is likely to remain similar to present conditions as the century progresses (Redmond 2009). However, there is insufficient information available to predict how changes in climate would affect the rate of groundwater recharge in the region. Because of the uncertainties regarding potential effects of climate change on the groundwater flow system, it was not possible to provide a reasonable or meaningful simulation of the combined effects of pumping and climate change on water resources.

Model Limitations

All models have limitations and the CCRP model is no exception. A detailed discussion of the model limitations and accuracy of the model to reproduce measured groundwater levels and estimated groundwater budget components is provided in the numerical model report (SNWA 2009b). Although the model results provide valuable insight as to the general, long-term drawdown patterns and relative trends likely to occur from the various pumping scenarios, the model does not have the level of accuracy required to predict absolute values at specific points in time (especially decades or centuries into the future). Two major limitations of the model for predictive studies include: 1) a lack of reliable information regarding the hydraulic properties of faults included in the model; and 2) representation of future climate as discussed below.

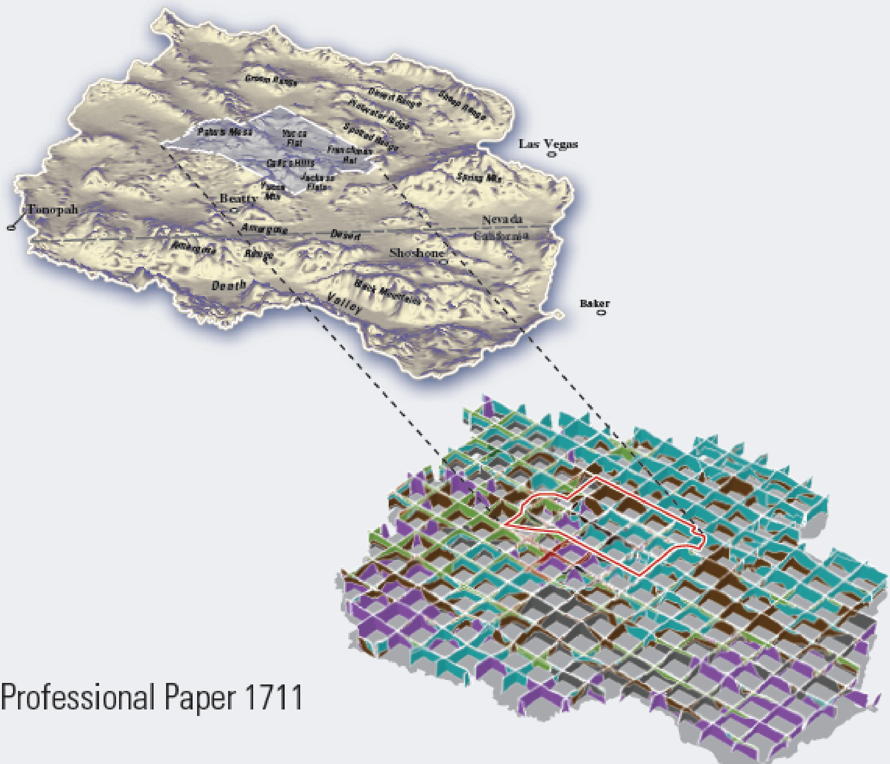
Regional information suggests that the presence of faults throughout the region strongly influences the movement of groundwater. However, reliable estimates of hydraulic properties of faults included in the model are not available. Considering the size of the study area, number of faults, and the fact that these properties would likely vary both horizontally and vertically along these structures, it is not practical (and likely would be impossible) to collect reliable estimates of hydraulic parameters for all of the major faults in the region of study. It also is probable that other faults exist in the model area that affect groundwater flow have not been identified or incorporated into the model. This pervasive lack of information regarding fault hydraulic parameters is considered a major limitation of the model. As described previously, 50 faults (or fault zones) have been represented in the numerical model (Figure 4-11, p. 4-20, SNWA 2009b). The hydraulic conductivities for these faults were treated as model parameters and were estimated during the model calibration process. Most of the major regional faults included in the calibrated model are represented as low permeability structures that inhibit flow across the fault zones. The presence of these structures in the model tends to influence the pattern and magnitude of drawdown simulated by the model.

Another limitation is that the recharge estimates used as model input assumes that the same average precipitation rate and pattern observed over approximately the past 30 year period is representative of the average conditions that will occur over the 245 year future simulation period (i.e., assumption that the annual recharge rates do not vary over the 245 year future simulation period [2005 – 2250]). For this reason, the calibrated model should not be considered an accurate or precise predictor of future conditions because it does not account for variations in future climate conditions that cannot be accurately forecasted at this time.

Conclusion. Although there are inherent uncertainties and limitations associated with results of a regional groundwater flow model over a broad region with complex hydrogeologic conditions, the calibrated CCRP model is a reasonable tool for estimating probable regional-scale drawdown patterns and trends over time, resulting from the various

Prepared in cooperation with U.S. Department of Energy
Office of Environmental Management, National Nuclear Security Administration, Nevada Site Office,
under Interagency Agreement DE–AI52–01NV13944,
Office of Civilian Radioactive Waste Management,
under Interagency Agreement DE–AI28–02RW12167, and
Department of the Interior, National Park Service

Death Valley Regional Groundwater Flow System, Nevada and California—Hydrogeologic Framework and Transient Groundwater Flow Model



Professional Paper 1711

U.S. Department of the Interior
U.S. Geological Survey

SNWA Exhibit 340

Table B-1
Spring Valley Water-Rights Attributes and Applicability for Model Analysis
(Page 1 of 9)

App.	Status	Source	Owner of Record	SNWA Owned	Junior Priority Date	Geographic Location	Included in Quantitative Analysis
802	CER	SPR	Olsen, Gasten	No	No	Alluvial Fan	Yes
811	CER	LAK	SNWA	Yes	---	---	No
813	CER	STR	SNWA	Yes	---	---	No
920	CER	STR	SNWA	Yes	---	---	No
957	CER	SPR	B Enterprises, Limited Partnership (82.5% Undivided Interest) & George L. Gardner & Laree Gardner (17.5% Undivided Interest)	No	No	Alluvial Fan	Yes
983	CER	STR	Pilot Knob Gold Mining & Milling Co.	No	No	Alluvial Fan	Yes
1052	CER	STR	Baal, John Michael Jr.	No	No	Alluvial Fan	Yes
1159	CER	STR	George Eldridge & Son, Inc.	No	No	Valley Floor	Yes
1520	CER	STR	Olsen, Casten	No	No	Alluvial Fan	Yes
1616	CER	SPR	Keegan, C J|Olsen, Casten	No	No	Mountain Block	No
1724	CER	SPR	Corp. of Church of LDS	No	No	Mountain Block	No
1900	CER	SPR	George Eldridge & Son, Inc.	No	No	Mountain Block	No
1901	CER	SPR	George Eldridge & Son, Inc.	No	No	Mountain Block	No
1922	CER	SPR	Farrel, Franklin Jr.	No	No	Mountain Block	No
2005	CER	STR	SNWA	Yes	---	---	No
2108	CER	SPR	Production Credit Corporation	No	No	Mountain Block	No
2261	CER	SPR	Kolchek, Alex	No	No	Mountain Block	No
2486	CER	SPR	Pony Express Mining and Milling|McMillin Trust	No	No	Mountain Block	No
2710	CER	SPR	Pony Express Mining and Milling|McMillin Trust	No	No	Mountain Block	No
2745	CER	SPR	Adams Mcgill Company	No	No	Valley Floor	Yes
2852	CER	STR	LDS	No	No	Alluvial Fan	Yes
3186	CER	STR	Corp. of Church of LDS	No	No	Valley Floor	Yes
3203	CER	SPR	George Eldridge & Son, Inc.	No	No	Valley Floor	Yes
3383	CER	STR	Andrae, Arthur & Audrae	No	No	Alluvial Fan	Yes
3433	CER	STR	Bundy, Clarence A.|Bundy, M. Josephine	No	No	Alluvial Fan/ Valley Floor	Yes
3646	CER	SPR	Doutre, James	No	No	Mountain Block	No
3793	CER	SPR	Rogers, G.W.|Rogers, H.T.	No	No	Mountain Block	No
3865	CER	STR	SNWA	Yes	---	---	No
3926	CER	SPR	Rogers, G.W.|Rogers, H.T.	No	No	Mountain Block	No
3927	CER	SPR	Corp. of Church of LDS	No	No	Mountain Block	No
3973	CER	SPR	Rogers, G. W.|Rogers,H.T.	No	No	Valley Floor	Yes
4041	CER	STR	SNWA	Yes	---	---	No
4042	CER	STR	SNWA	Yes	---	---	No
4043	CER	STR	SNWA	Yes	---	---	No
4171	CER	SPR	Robison Brothers	No	No	Valley Floor	Yes
4418	CER	STR	SNWA	Yes	---	---	No
4951	CER	STR	Bundy, Clarence A. & Josephine	No	No	Alluvial Fan	Yes
5028	CER	SPR	Corp. of Church of LDS	No	No	Mountain Block	No

DIVISION OF WATER RESOURCES

STATE OF NEVADA

DIVISION OF WATER RESOURCES

31239

WELL DRILLERS REPORT

Please complete this form in its entirety

OFFICE USE ONLY
Log No. 17124
Permit No 31239
Basin

1. OWNER CLARK MINING CORP. ADDRESS PO Box 418
ELY, NV 89301

2. LOCATION NW ¼ ~~NE~~ ¼ Sec 15 T. 14 N R. 67 E. WHITE PINE County
PERMIT NO SE

3. TYPE OF WORK	4. PROPOSED USE	5. TYPE WELL
New Well ☐ Reconditon ☐	Domestic ☒ Irrigation ☐ Test ☐	Cable ☒ Rotary ☐
Deepen ☒ Other ☐	Municipal ☐ Industrial ☒ Stock ☐	Other ☐

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thick-ness
SILT & GRAVEL		294	361	67
SAND	✓	361	363	2
SILT & GRAVEL		363	385	22
LARGE GRAVEL & SILT		385	397	12
SILT & SAND		397	505	108
SAND	✓	505	506	1
SILT & GRAVEL		506	527	21
GRAVEL	✓	527	528	1
SILT & SAND		528	535	7

Date started AUG 21, 1977
Date completed SEPT 6, 1977

8. WELL CONSTRUCTION

Diameter hole 8" inches Total depth 535 feet
Casing record CASED TO 397'
Weight per foot .... Thickness .250

Diameter	From	To
8 inches	0 feet	397 feet
inches	feet	feet
inches	feet	feet
inches	feet	feet
inches	feet	feet
inches	feet	feet

Unverified 11-4-77

Surface seal: Yes ☒ No ☐ Type CEMENT
Depth of seal 6" IN BASEMENT feet
Gravel packed: Yes ☐ No ☒
Gravel packed from .... feet to .... feet

Perforations: UNKNOWN - NO
Type perforation
Size perforation PERFORATIONS IN
From LAST feet to feet
From 103' ADDED feet to feet
From TO TOP feet to feet
From feet to feet
From feet to feet

9. WATER LEVEL

Static water level 231' Feet below land surface
Flow .... G.P.M.
Water temperature .... ° F. Quality

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump

BAILER TEST

G.P.M. .... Draw down .... feet .... hours
G.P.M. .... Draw down .... feet .... hours
G.P.M. .... Draw down .... feet .... hours

10. DRILLERS CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name BRENT ELDRIDGE
Address SR 1 BOX 42 ELY, NV
Nevada contractor's license number 7514A
Nevada driller's license number 844
Signed Brent Eldridge
Date SEPT 8, 1977

USE ADDITIONAL SHEETS IF NECESSARY

5471

SNWA Exhibit 341

Table 6-1
Spring Valley Underground Water Rights

App.	Cert.	Use	Duty Balance (afy)	Geographic Location	Drillers Log Number	Well Depth (ft bgs)	Depth To Water (ft bgs)	First Simulation Period where Drawdown is Greater than 50 ft (Year)	Comments
29371	10328	Mining and Milling	803.41	Alluvial Fan/ Valley Floor	10816	458	46	2062	Same POD as application number 29567. Drillers log indicates well is completed predominantly in clays, with additional minor salt and pumice layers.
29567	10329	Mining and Milling	699.92	Alluvial Fan/ Valley Floor	10816	458	46	2062	Same POD as application number 29371. Drillers log indicates well is completed predominantly in clays, with additional minor salt and pumice layers.
31239	10334	Mining and Milling	177.43	Alluvial Fan	17124	535	231	2062	Drillers log indicates well is completed in gravels, sands, and silts.
7446	1515	Stockwatering	13.44	Valley Floor	NA	30	19[a]	2062	Well depth is taken from the Application.
8075	1366	Stockwatering	27.27	Valley Floor	NA	36	25[b]	2062	Well depth is taken from the Certificate for Appropriation.
8077	1368	Stockwatering	27.01	Valley Floor	NA	35	21	2117	Well depth is taken from the Certificate for Appropriation. DTW from Burns and Drici (2011) for site 385627114292101.
45496	11965	Stockwatering	86.24	Alluvial Fan/ Valley Floor	NA	495	407	2082	Spring Valley Existing-Well Monitoring Location 383351114180201. Well depth and DTW from SNWA (2011).
18841	5673	Stockwatering	8.96	Valley Floor	NA	200	Flowing	2082	Well depth is taken from the Application. DTW information is from the Certificate of Appropriation.
18842	5674	Stockwatering	8.96	Valley Floor	NA	200	Flowing	2082	Well depth is taken from the Application. DTW information is from the Certificate of Appropriation.
18843	5675	Stockwatering	8.96	Valley Floor	NA	200	Flowing	2082	Well depth is taken from the Application. DTW information is from the Certificate of Appropriation.

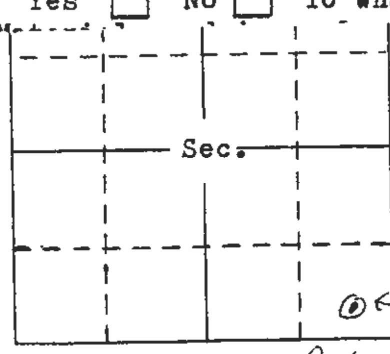
NA = Not Available
[a]DTW from nearby well 390315114304701 (Burns and Drici, 2011).
[b]DTW from nearby well 390417114302701 (Burns and Drici, 2011).

10816

REPORT OF WELL DRILLER
State of [redacted] Nevada

State law requires that this report shall be filed with the State Reclamation Engineer within 30 days after completion or abandonment of the well.

WELL OWNER:
Name Ace Turner + Rex L Frandsen
Address R#4 Box 142
Blackfoot Idaho 83221
Owner's Permit No. 23556
NATURE OF WORK (check): Replacement well ☐
New well ☒ Deepened ☐ Abandoned ☐
Water is to be used for: Mining
METHOD OF CONSTRUCTION: Rotary ☐ Cable ☒
Dug ☐ Other ____
(explain)
CASING SCHEDULE: Threaded — Welded ✓
16 "Diam. from 0 ft. to 150 ft.
14 "Diam. from 140 ft. to 235 ft.
"Diam. from ____ ft. to ____ ft.
"Diam. from ____ ft. to ____ ft.
Thickness of casing: 1/4" Material:
Steel ☒ concrete ☐ wood ☐ other ☐
(explain)
PERFORATED? Yes ☒ No ☐ Type of perforator used: Torch
Size of perforations: 1/4 " by 12 "
720 perforations from 60 ft. to 235 ft.
— perforations from ____ ft. to ____ ft.
— perforations from ____ ft. to ____ ft.
— perforations from ____ ft. to ____ ft.
WAS SCREEN INSTALLED? Yes ☐ No ☒
Manufacturer's name ____
Type ____ Model No. ____
Diam. ____ Slot size ____ Set from ____ ft. to ____ ft.
Diam. ____ Slot size ____ Set from ____ ft. to ____ ft.
CONSTRUCTION: Well gravel packed? Yes ☐
No. ☒ size of gravel ____ Gravel placed from ____ ft. to ____ ft. Surface seal provided? Yes ☐ No ☐ To what depth?



LOCATION OF WELL: County White Pine, Nev.
SW ¼ SW ¼ Sec. 22 T. 14 N/S R. 67 E/W

Size of drilled hole: 16" + 14" Total depth of well: 238 Standing water level below ground: 64 Temp. Fahr. ____ ° Test delivery: app 1000 gpm or ____ cfs Pump? ☒ Bail ☐
Size of pump and motor used to make test: 6" pump & 65 H.P. motor
Length of time of test: 6 Hrs. ____ Min. ____
Drawdown: ____ ft. Artesian pressure: ft. above land surface ____ Give flow ____ cfs or ____ gpm. Shutoff pressure: ____
Controlled by: Valve ☐ Cap ☐ Plug ☐
No control ☐ Does well leak around casing?
Yes ☐ No ☒

DEPTH FROM FEET	DEPTH TO FEET	MATERIAL	WATER YES OR NO
		0 to 105 drilled in 1966	
0	20	Clay + large Rock	no
20	40	Clay + small Rock	no
40	50	Clay + gravel	no
50	64	Clay + mostly gravel	yes
	64	first water	yes
64	70	Clay + rock	"
70	80	" "	no
80	90	" "	little
90	105	Clay + mostly small gravel	yes
		105 to 238 drilled in Aug 1969	
105	140	Clay + gravel very little water	yes
140	155	drilled threw a big lime stone rock. I couldn't drive my 16" Casing threw it so I reduced to 14"	
155	209	Clay + gravel very little water	yes
209	220	Clay + mostly gravel more water	"
220	225	Clay	no
225	235	fine gravel alot of water	yes
235	238	bed rock	no

Work started: Aug 15, 1969
Work finished: Aug 30, 1969
Well Driller's Statement: This well was drilled under my supervision and this report is true to the best of my knowledge.
Name: Rex L. Frandsen
Address: R#4 Box 142 Blackfoot, Idaho
Signed by: Rex L Frandsen
License No. — Date: Nov 27, 1969

DIVISION OF WATER RESOURCES

STATE OF NEVADA

DIVISION OF WATER RESOURCES

31239

WELL DRILLERS REPORT

Please complete this form in its entirety

OFFICE USE ONLY
Log No. 17124
Permit No. 31239
Basin

1. OWNER CLARK Mining Corp. ADDRESS PO Box 418
ELY, NV 89301

2. LOCATION NW ¼ ~~NW~~ ¼ Sec 15 T. 14 N R. 67 E. White Pine County
PERMIT NO. SE

3. TYPE OF WORK
New Well ☐ Reconditon ☐
Deepen ☒ Other ☐

4. PROPOSED USE
Domestic ☒ Irrigation ☐ Test ☐
Municipal ☐ Industrial ☒ Stock ☐

5. TYPE WELL
Cable ☒ Rotary ☐
Other ☐

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Silt & Gravel		294	361	67
Sand	✓	361	363	2
Silt & Gravel		363	385	22
Large Gravel & Silt		385	397	12
Silt & Sand		397	505	108
Sand	✓	505	506	1
Silt & Gravel		506	527	21
Gravel	✓	527	528	1
Silt & Sand		528	535	7

Date started Aug 21, 1977
Date completed Sept 6, 1977

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump

BAILER TEST

G.P.M. .... Draw down .... feet .... hours
G.P.M. .... Draw down .... feet .... hours
G.P.M. .... Draw down .... feet .... hours

8. WELL CONSTRUCTION

Diameter hole 8" inches Total depth 535 feet
Casing record CASED TO 397'
Weight per foot .... Thickness .250

Diameter	From	To
8 inches	0 feet	397 feet
inches	feet	feet
inches	feet	feet
inches	feet	feet
inches	feet	feet
inches	feet	feet

Unknown Data † 11477

Surface seal: Yes ☒ No ☐ Type CEMENT
Depth of seal 6" IN BASEMENT feet
Gravel packed: Yes ☐ No ☒
Gravel packed from .... feet to .... feet

Perforations: UNKNOWN – NO
Type perforation
Size perforation PERFORATIONS IN
From LAST feet to .... feet
From 103' ADDED feet to .... feet
From TO TOP feet to .... feet
From .... feet to .... feet
From .... feet to .... feet

9. WATER LEVEL

Static water level 231' Feet below land surface
Flow .... G.P.M.
Water temperature .... ° F. Quality

10. DRILLERS CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Brent Eldridge
Address SR 1 Box 42 Ely, NV
Nevada contractor's license number 7514A
Nevada driller's license number 844
Signed Brent Eldridge
Date Sept 8, 1977

USE ADDITIONAL SHEETS IF NECESSARY

5471

SNWA Exhibit 341

Table 6-2
Spring Valley Spring Water Rights

App.	Cert.	Use	Duty Balance (afy)	Spring Name	Geographic Location	First Simulation Period where Drawdown is Greater than 50 ft (Year)	Comments
4171	1981	Stockwatering	14.33	Layton Spring	Valley Floor	2082	Spring Valley Discharge Monitoring Location 1845901 and Piezometer SPR7019Z. Three miscellaneous discharge measurements reported the spring dry in the summer and fall of 2010. The DTW for SPR7019Z was 11.17 ft bgs (SNWA, 2011).
V02077	NA	Stockwatering	11.20	Willard Springs	Valley Floor	2082	Willard Springs is an area of biological monitoring associated with the stipulated agreements (Marshall and Luptowitz, 2011).
R05274	NA	Other	1.84	Unnamed Spring	Alluvial Fan	2117	Nearby well SPR7023I has a DTW of 301.47 ft bgs (Burns and Drici, 2011).
R05273	NA	Other	2.15	Spring Creek Springs	Alluvial Fan/ Valley Floor	2082	---
R05269	NA	Other	3.59	4WD Spring	Alluvial Fan/ Valley Floor	2062	Spring Valley Piezometer Monitoring Location SPR7012Z has a DTW of 2.36 ft bgs (SNWA, 2011).
R05272	NA	Other	67.24	Unnamed Spring	Alluvial Fan/ Valley Floor	2062	Unnamed spring located within the same quarter quarter section as 4WD Spring.
R05278	NA	Other	67.24	Unnamed Spring	Alluvial Fan/ Valley Floor	2062	Unnamed spring located within the same quarter section as 4WD Spring.
R05279	NA	Other	7.95	Unnamed Spring	Valley Floor	2117	Located very near Spring Valley Piezometer Monitoring Location SPR7016Z with a DTW of 1.65 ft bgs (SNWA, 2011).
R05280	NA	Other	7.95	Unnamed Spring	Alluvial Fan/ Valley Floor	2082	Located very near Spring Valley Piezometer Monitoring Location SPR7016Z with a DTW of 1.65 ft bgs (SNWA, 2011).
R05292	NA	Other	7.95	Unnamed Spring	Alluvial Fan/ Valley Floor	2082	Located approximately 1.25 mi north of SPR7016Z (SNWA, 2011).
R05294	NA	Other	7.95	Unnamed Spring	Alluvial Fan/ Valley Floor	2082	Located approximately 1.25 mi north of SPR7016Z (SNWA, 2011).
R05293	NA	Other	7.95	Unnamed Spring	Alluvial Fan/ Valley Floor	2117	Located approximately 0.46 mi southwest of Spring Valley Discharge Monitoring Location 1848501 Cleveland Ranch Spring South (SNWA, 2011).
V02821	NA	Irrigation	9600	Big Reservoir Spring No. 4	Valley Floor	2117	Cleveland Ranch Spring Location. Spring Valley Monitoring Program spring location South Cleveland Ranch Spring and monitoring well locations SPR7029M, SPR7029M2, SPR7030M, and SPR7030M2.
V02824	NA	Irrigation	9600	Big Reservoir Spring No. 7	Alluvial Fan/ Valley Floor	2117	Cleveland Ranch Spring Location. Spring Valley Monitoring Program spring location South Cleveland Ranch Spring and monitoring well locations SPR7029M, SPR7029M2, SPR7030M, and SPR7030M2.
V02825	NA	Irrigation	9600	Big Reservoir Spring No. 8	Valley Floor	2117	Cleveland Ranch Spring Location. Spring Valley Monitoring Program spring location South Cleveland Ranch Spring and monitoring well locations SPR7029M, SPR7029M2, SPR7030M, and SPR7030M2.
8721[a]	2509	Stockwatering	14.48	South Millick Spring	Valley Floor	---	Spring Valley Discharge Monitoring Location 1845702 and Piezometer SPR7018Z.
10921[a]	3375	Irrigation	570.73	South Millick Spring	Valley Floor	---	Spring Valley Discharge Monitoring Location 1845702 and Piezometer SPR7018Z.
10993[b]	3376	Irrigation	433.62	North Millick Spring	Valley Floor	---	North Millick Spring is located near the monitoring for South Millick Spring.

NA = Not Applicable

[a]Application Numbers 8721 and 10921 correspond to South Millick Spring. While the drawdowns at this spring never exceed 50 ft, the model simulates a change in flow of greater than 15 percent.

[b]Application Number 10993 corresponds to North Millick Spring. While the drawdowns at this spring never exceed 50 ft, the model simulates a change in flow of greater than 15 percent.

Table C-4
Environmental Areas of Interest Model Simulated Drawdowns
(Page 1 of 2)

Site ID	Name	Hydrographic Area	Site Type	Geographic Location	Model Simulated Drawdown Greater than 50 ft for Specified Year				
					2029	2042	2062	2082	2117
Spring Valley and Vicinity									
1847401	Stonehouse Spring	Spring Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
1845501	Willow Spring	Spring Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
1847101	Keegan Spring near Piermont, NV	Spring Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
1847601	West Spring Valley Complex 1	Spring Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
1845702	South Millick Spring	Spring Valley	Spring	Valley Floor	No	No	No	No	No
---	Swamp Cedar North	Spring Valley	Area	Valley Floor	No	No	No	No	Yes
1847701	Unnamed 5 Spring	Spring Valley	Spring	Valley Floor	No	No	No	Yes	Yes
1847301	Rock Spring	Spring Valley	Spring	Mountain Block	---	---	---	---	---
1847001	Four Wheel Drive Spring	Spring Valley	Spring	Alluvial Fan/Valley Floor	No	No	Yes	Yes	Yes
385613114250401	184 N12 E67 02ACBA1 USBLM (Shoshone Pond Well)	Spring Valley	Flowing Well/ Ponds	Alluvial Fan/Valley Floor	No	No	No	No	No
---	Swamp Cedar South	Spring Valley	Area	Alluvial Fan/Valley Floor	No	No	No	No	No
1846201	Swallow Springs	Spring Valley	Spring	Alluvial Fan	No	No	No	No	No
1847201	Minerva Spring	Spring Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
1846401	Blind Spring	Spring Valley	Spring	Valley Floor	No	No	No	No	No
1841610	Cleve Creek	Spring Valley	Stream	Mountain Block	---	---	---	---	---
1840704	Kalamazoo Creek	Spring Valley	Stream	Mountain Block	---	---	---	---	---
1842004	Negro Creek	Spring Valley	Stream	Mountain Block	---	---	---	---	---
1842702	Pine and Ridge Creeks	Spring Valley	Stream	Mountain Block	---	---	---	---	---
1843102	Shingle Creek	Spring Valley	Stream	Mountain Block	---	---	---	---	---
1953001	Clay Spring	Snake Valley	Spring	Alluvial Fan	No	No	No	No	No
---	Stateline Springs	Snake Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
---	Unnamed 1 Spring North of Big Springs	Snake Valley	Spring	Alluvial Fan	No	No	No	No	No
1951901	Big Springs	Snake Valley	Spring	Alluvial Fan	No	No	No	No	No
195 N10 E70 34DC	North Little Springs	Snake Valley	Spring	Alluvial Fan	No	No	No	No	No
1951301	Lehman Creek	Snake Valley	Stream	Mountain Block	---	---	---	---	---
1951403	Baker Creek	Snake Valley	Stream	Mountain Block	---	---	---	---	---
1951508	Snake Creek	Snake Valley	Stream	Mountain Block	---	---	---	---	---

Table C-4
Environmental Areas of Interest Model Simulated Drawdowns
(Page 2 of 2)

Site ID	Name	Hydrographic Area	Site Type	Geographic Location	Model Simulated Drawdown Greater than 50 ft for Specified Year				
					2029	2042	2062	2082	2117
1951902	Big Springs Creek	Snake Valley	Stream	Alluvial Fan/Valley Floor	No	No	No	No	No
1951605	Big Wash	Snake Valley	Stream	Mountain Block	---	---	---	---	---
183 N09 E65 02DA 1	Geyser Creek Spring	Lake Valley	Spring	Mountain Block	---	---	---	---	---
183 N09 E65 23AA 1	Wambolt Springs	Lake Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
Cave, Dry Lake, Delamar Valleys and Vicinity									
1800301	Parker Station Spring	Cave Valley	Spring	Valley Floor	No	No	No	No	No
---	Cave Valley Meadow	Cave Valley	Area	Valley Floor	No	No	No	No	No
1800101	Cave Spring	Cave Valley	Spring	Mountain Block	---	---	---	---	---
1810101	Meloy Spring	Dry Lake Valley	Spring	Mountain Block	---	---	---	---	---
1810401	Coyote Spring	Dry Lake Valley	Spring	Mountain Block	---	---	---	---	---
1820101	Grassy Spring	Delamar Valley	Spring	Mountain Block	---	---	---	---	---
2070901	Preston Big Spring	White River Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
2071501	Hardy Springs	White River Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
2071101	Moorman Spring	White River Valley	Spring	Valley Floor	No	No	No	No	No
2071401	Butterfield Spring	White River Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
2071301	Flag Springs	White River Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
2070501	Hot Creek Spring near Sunnyside, NV	White River Valley	Spring	Valley Floor	No	No	No	No	No
2090101	Hiko Spring	Pahranagat Valley	Spring	Valley Floor	No	No	No	No	No
2090401	Crystal Springs	Pahranagat Valley	Spring	Valley Floor	No	No	No	No	No
2090501	Ash Springs	Pahranagat Valley	Spring	Valley Floor	No	No	No	No	No
---	Pahranagat Ditch	Pahranagat Valley	Area	Valley Floor	No	No	No	No	No
2090201	Cottonwood Spring	Pahranagat Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
---	L Spring	Pahranagat Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
2090801	Maynard Spring	Pahranagat Valley	Spring	Alluvial Fan/Valley Floor	No	No	No	No	No
2191501	Moapa National Wildlife Refuge Warm Springs West	Muddy River Springs Area	Spring	Valley Floor	No	No	No	No	No

Source: Environmental Areas of Interest identified in Marshall and Luptowitz (2011).
[a]UTM, NAD83, Zone 11N

Table 6-4
Environmental Areas of Interest where the Model Simulation Criteria were Exceeded

Site ID	Name	Hydrographic Area	Site Type	Geographic Location	First Simulation Period where Criteria were Exceeded (Year)[a]	Comments
---	Swamp Cedar North	Spring Valley	Area	Valley Floor	2117	Current biologic monitoring location
1847701	Unnamed 5 Spring	Spring Valley	Spring	Valley Floor	2082	Current hydrologic and biologic monitoring location.
1847001	Four Wheel Drive Spring	Spring Valley	Spring	Alluvial Fan/ Valley Floor	2062	Current hydrologic and biologic monitoring location.
1845702[b]	South Millick Spring	Spring Valley	Spring	Valley Floor	2062	Current hydrologic and biologic monitoring location.
2071401[b]	Butterfield Spring	White River Valley	Spring	Alluvial Fan/ Valley Floor	2042	Current biologic monitoring location
2071301[b]	Flag Springs	White River Valley	Spring	Alluvial Fan/ Valley Floor	2042	Current hydrologic and biologic monitoring location.

[a]Criteria included where simulated drawdowns at the location exceeded 50 ft or where simulated spring flows were reduced by greater than 15 percent.
[b]While the drawdowns at these springs never exceed 50 ft, the model simulates a change in flow greater than 15 percent.