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IN THE SUPREME COURT OF THE STATE OF NEVADA

ADAM SULLIVAN, P.E., NEVADA STATE ENGINEER, DIVISION OF WATER RESOURCES, DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES; LAS VEGAS VALLEY WATER DISTRICT; SOUTHERN NEVADA WATER AUTHORITY; and CENTER FOR BIOLOGICAL DIVERSITY,

Appellants,

vs.

LINCOLN VALLEY WATER DISTRICT; VIDLER WATER COMPANY, INC.; COYOTE SPRINGS INVESTMENT, LLC; NEVADA COGENERATION ASSOCIATES NOS 1 AND 2; APEX HOLDING COMPANY, LLC; DRY LAKE WATER LLC; GEORGIA-PACIFIC GYPSUM, LLC; REPUBLIC ENVIRONMENTAL TECHNOLOGIES, INC.; MUDDY VALLEY IRRIGATION COMPANY; SIERRA PACIFIC POWER COMPANY, d/b/a NV ENERGY; NEVADA POWER COMPANY, d/b/a

Supreme Court No. 84739

Docket 84742 Document 2022-17609

NV ENERGY; THE CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS; MOAPA VALLEY WATER DISTRICT; WESTERN ELITE ENVIRONMENTAL, INC.; BEDROC LIMITED, LLC; and CITY OF NORTH LAS VEGAS, Respondents.	
CENTER FOR BIOLOGICAL DIVERSITY; SOUTHERN NEVADA WATER AUTHORITY; LAS VEGAS VALLEY WATER DISTRICT; MUDDY VALLEY IRRIGATION COMPANY; COYOTE SPRINGS INVESTMENT, LLC; LINCOLN COUNTY WATER DISTRICT; APEX HOLDING COMPANY, LLC; DRY LAKE WATER, LLC; NEVADA COGENERATION ASSOCIATES NOS. 1 AND 2; GEORGIA-PACIFIC GYPSUM, LLC; REPUBLIC ENVIRONMENTAL TECHNOLOGIES, INC; and VIDLER WATER COMPANY, INC.; Appellants, vs. NEVADA STATE ENGINEER; THE CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS; SIERRA PACIFIC POWER COMPANY d/b/a NV ENERGY AND NEVADA POWER COMPANY d/b/a NV ENERGY; MOAPA VALLEY WATER DISTRICT; CITY OF NORTH LAS VEGAS; WESTERN	**Supreme Court No. 84742**

ELITE ENVIRONMENTAL, INC.; and BEDROC LIMITED, LLC, Respondents.	
SOUTHERN NEVADA WATER AUTHORITY, Appellant, vs. COYOTE SPRINGS INVESTMENT, LLC; APEX HOLDING COMPANY, LLC; NEVADA COGENERATION ASSOCIATES NOS. 1 AND 2; GEORGIA-PACIFIC GYPSUM, LLC; DRY LAKE WATER, LLC; REPUBLIC ENVIRONMENTAL TECHNOLOGIES, INC.; LINCOLN COUNTY WATER DISTRICT; VIDLER WATER COMPANY, INC.; MUDDY VALLEY IRRIGATION COMPANY; THE CENTER FOR BIOLOGICAL DIVERSITY; SIERRA PACIFIC POWER COMPANY d/b/a NV ENERGY AND NEVADA POWER COMPANY d/b/a NV ENERGY; MOAPA VALLEY WATER DISTRICT; THE CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS; CITY OF NORTH LAS VEGAS; WESTERN ELITE ENVIRONMENTAL, INC.; BEDROC LIMITED, LLC, and ADAM SULLIVAN, P.E. NEVADA STATE ENGINEER, Respondents.	**Supreme Court No. 84741**

MUDDY VALLEY IRRIGATION COMPANY,

Appellant,

vs.

ADAM SULLIVAN, P.E., NEVADA STATE ENGINEER, DIVISION OF WATER RESOURCES, DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES; LAS VEGAS VALLEY WATER DISTRICT; SOUTHERN NEVADA WATER AUTHORITY; COYOTE SPRINGS INVESTMENT, LLC; APEX HOLDING COMPANY, LLC; DRY LAKE WATER, LLC; CENTER FOR BIOLOGICAL DIVERSITY; NEVADA COGENERATION ASSOCIATES NOS. 1 AND 2; GEORGIA-PACIFIC GYPSUM, LLC; REPUBLIC ENVIRONMENTAL TECHNOLOGIES, INC.; LINCOLN COUNTY WATER DISTRICT; VIDLER WATER COMPANY, INC.; SIERRA PACIFIC POWER COMPANY, d/b/a NV ENERGY AND NEVADA POWER COMPANY, d/b/a NV ENERGY; MOAPA VALLEY WATER DISTRICT; THE CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS; CITY OF NORTH LAS VEGAS; WESTERN ELITE ENVIRONMENTAL, INC.; AND BEDROC LIMITED, LLC,

Respondents.

Supreme Court No. 84809

VOLUME FOUR OF EXHIBITS IN SUPPORT OF EMERGENCY MOTION FOR STAY UNDER NRAP 27(E) AND JOINDER

Appellant, the Center for Biological Diversity, by and through counsel, submits Volume Four of its exhibits in support of its Emergency Motion for Stay Under NRAP 27(e) and Joinder pursuant to NRAP 8(a)(2).

Affirmation: The undersigned do hereby affirm that the preceding document and/or attachments do not contain the social security number of any person.

Dated this 2nd day of June, 2022.

/s/ Scott Lake

SCOTT LAKE, NV Bar No. 15765
CENTER FOR BIOLOGICAL DIVERSITY
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CERTIFICATE OF SERVICE

I certify that I am an employee of the Center for Biological Diversity, and that on this 2nd day of June, 2022 I served a true and correct copy of the foregoing by electronic service to the participants in this case who are registered with the Nevada Supreme Court's efiling system to this matter.

/s/ Scott Lake
Scott Lake

INDEX OF EXHIBITS/EXCERPTS OF RECORD

Exhibit No.	Description	Number of Pages
1	Findings of Fact, Conclusions of Law, and Order Granting Petitions for Judicial Review (April 19, 2022).	40
2	Nevada State Engineer Order 1309 (June 15, 2020) (SE ROA 2-69)	66
3	Nevada State Engineer Interim Order 1303 (Jan. 11, 2019) (SE ROA 70-88)	19
4	Nevada State Engineer Order 1169 (March 8, 2002) (SE ROA 659-669)	11
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6	Muddy River Decree (March 12, 1920) (SE ROA 33770-33816)	47
7	Dr. Tom Myers, Technical Memorandum Submitted in Response to State Engineer Interim Order 1303 (June 1, 2019) (SE ROA 33490-34516)	27
8	Dr. Tom Myers, Rebuttal Report Submitted in Response to Stakeholder Reports and State Engineer Interim Order 1303 (August 16, 2019) (SE ROA 34517-34546)	30
9	Application No. 46777 to Appropriate the Public Waters of the State of Nevada (March 31, 1983) (SE ROA 47837-47840)	4
10	Nevada State Engineer's Ruling 4542, Conditionally Granting Application No. 46777 (June 19, 1997) (SE ROA 48114-48130)	17
11	Memorandum of Agreement Among Southern Nevada Water Authority, U.S. Fish and Wildlife Service, Coyote Springs Investment LLC, the Moapa Band of Paiute Indians, and the Moapa Valley Water District (April 20, 2006) (SE ROA 9921-9946)	26
12	Stetson Engineers, Inc., Evaluation of Basin Hydrogeology and Assessment of the Sustainable Yield of the Lower White River Flow System, Southeastern Nevada, Prepared for Coyote Springs	113

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13	F. Eugene Rush, Index of Hydrographic Areas (Sept. 1968)[1]	43
14	Decision, *White Pine County et al. v. King*, No. CV1204049, (7th Jud. Dist. Ct. 2013).	23

[1] This technical report published by the Nevada Division of Water Resources and the U.S. Geological Survey was not designated by the State Engineer as part of the Record on Appeal, but was introduced in briefing by Appellant Coyote Springs Investment, LLC, and appears to have been implicitly relied upon by the District Court. *See* Order at 24-26.

Exhibit 13

STATE OF NEVADA

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF WATER RESOURCES

Carson City

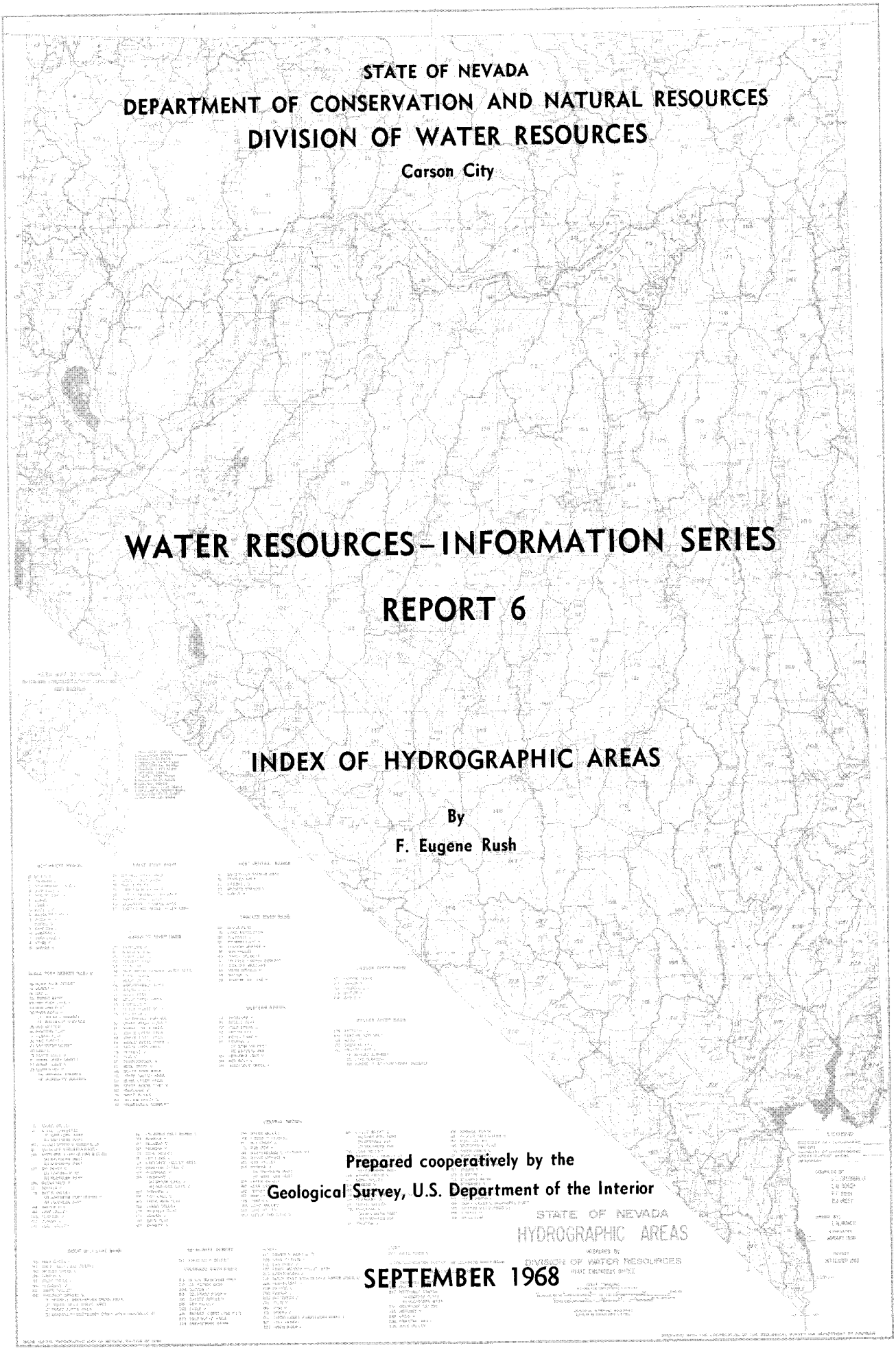
WATER RESOURCES–INFORMATION SERIES

REPORT 6

INDEX OF HYDROGRAPHIC AREAS

By

F. Eugene Rush



Prepared cooperatively by the

Geological Survey, U.S. Department of the Interior

SEPTEMBER 1968

WATER RESOURCES - INFORMATION SERIES

REPORT 6

INDEX OF HYDROGRAPHIC AREAS IN NEVADA

by

F. Eugene Rush

Hydrologist

Prepared cooperatively by the

Geological Survey, U.S. Department of the Interior

September 1968

CONTENTS

1. Number in parentheses is region or basin as shown on index map.

ILLUSTRATIONS

TABLES

INDEX OF HYDROGRAPHIC AREAS IN NEVADA

By F. Eugene Rush

SUMMARY

This report contains a map and three tables showing and describing the 14 hydrographic regions and basins and the 253 hydrographic areas of Nevada. The map was compiled by personnel of the U.S. Geological Survey and the State Engineer's office and was distributed by the State in January 1968. This report and the map have been prepared as a guide to all water-resources and other natural-resources and research agencies.

The tables present selected information on geographic features of each area and lists the hydrologic reports prepared by the U.S. Geological Survey that were published by the State and Federal Governments. Alphabetical and county lists of areas are also included.

INTRODUCTION

Purpose and Scope of the Report

Nevada is composed of more than 200 valleys bounded by mostly northtrending mountain ranges. Each valley is partly filled with alluvium, mostly derived by weathering and erosion from surrounding mountains. The alluvium is the principal storage reservoir for ground water. The valley floors are the principal ground-water and surface-water use areas. Thus, the valley commonly has become the basic unit of social, economic, and water-development activity in Nevada.

Miller and others (1953, p. 12) subdivided the State into what they called "cartographic areas." That report was a useful reference in preparing the detailed hydrographic map and tables of this report.

For the study, research, development, management, and administration of water resources, a need for a systematic identification of "valleys," or preferably "hydrographic areas," of Nevada was recognized by both the U.S. Geological Survey and the State Engineer's office. Because of the long-term cooperative program of water-resources evaluation between the Geological Survey and the State of Nevada, it was appropriate that personnel of the Survey and the State Engineer's office work together to compile a hydrographic areas map (Rush and others, 1968). A revised edition of the map is incorporated with this report, which includes geographic descriptions of the hydrographic regions and areas. The primary purpose for the report and map is to define and describe specifically the hydrographic regions, basins, and areas so that these descriptions and map can be available as an official guide to all water-resources and other natural-resources agencies. The hydrographic areas map (Rush and others, 1968) was compiled by F. E. Rush, Hydrologist, U.S. Geological Survey and J. L. Cardinalli, L. M. Roach, and B. J. Vasey, Engineers, Nevada State Engineer's Office.

Because this is the first known effort to identify completely and systematically the hydrographic regions and areas of Nevada, minor revision may be necessary after many engineers and hydrologists have had the opportunity to use and criticize the report and map. Revised editions are planned as and when the need develops.

For easy reference, the 14 regions and basins are listed and shown on the "Index map of Nevada," which is an inset on the large "Hydrographic areas" map (in pocket). In addition, the map lists all 253 hydrographic areas by regions and in alphabetical order by basins.

Acknowledgments

The compilation of this report required knowledge of a large number of persons familiar with the State of Nevada. The vast knowledge of George Hardman and Hugh Shamberger was utilized, as well as that of George Hennen and Tom Humphrey, all formerly with the Nevada Department of Conservation and Natural Resources. My colleagues, G. F. Worts, Jr. and Thomas Eakin, contributed much information. The single biggest source of information, however, was the topographic maps compiled by personnel of the Army Map Service and the Topographic Division, U.S. Geological Survey. Without these maps this report would not have been possible.

DEFINITION AND BOUNDARIES

The general term "hydrographic area" is used mostly in place of "valley," but it also applies to areas that are called flat, desert, basin, meadow, area, segment, plains, wash, canyon, and mesa. The names of the hydrographic areas, in most cases, are the names used by people who live in and near the areas. These names commonly are shown on U.S. Geological Survey and Army Map Service topographic maps. When more than one name was encountered for an area, the most commonly used name was selected. A few less commonly used names are shown parenthetically on the map and in the tables.

Most of the boundary lines of hydrographic areas are drawn along topographic ridges, as interpreted from the most detailed topographic maps available in 1967. In some localities, the lines are drawn across nearly flat alluvial terrain. Low divides were located with the aid of aerial photographs (scale about 1:60,000). In other areas, hydrographic-area boundaries were drawn on the basis of boundary decisions in published hydrologic reports or on the basis of the collective judgment of the authors of the map and others identified in the acknowledgments section of this report. Boundaries not drawn on topographic divides are shown as dotted lines.

Methods Used to Measure Areas

Each of the 253 hydrographic-area units was planimetered on the 1:500,000 scale (1 inch = 8 miles) edition of the hydrographic areas map. The sum of the computed areas was within 0.27 percent of the area of the State, which is 110,540 square miles (U.S. Dept. Commerce, 1965, p. 168). The difference was prorated and a correction factor applied so that the sum of the 253 areas would equal the total area of the State. The extent of each hydrographic region and basin was computed as the sum of the hydrographic areas of that region or basin. (See "Index map of Nevada" inset on large map showing "Hydrographic areas," in pocket.) The areal extents of the hydrographic areas are listed in table 1. For the computations, all digits are shown so that their arithmetic sum is equal to the total area of Nevada. However, because the areas were not surveyed, they may not be accurate to more than two to three figures and therefore may not agree precisely with areas listed in other reports.

HYDROGRAPHIC AREAS

The 253 hydrographic areas in Nevada range in size from about 9 square miles for Granite Basin and Newcomb Lake Valley to 2,182 square miles for the Carson Desert. The Carson Desert and 12 other hydrographic areas are larger than the small State of Rhode Island. The valley-floor altitudes range from 800 feet along the Colorado River (area 213) to 7,200 feet above sea level in little Stevens Basin (area 152).

For descriptive purposes, the sizes of the hydrographic areas may be grouped into three general categories: small (1-200 square miles), medium (201-1,000 square miles), and large (1,001-2,200 square miles). The average size of the areas is nearly 440 square miles, and the median size is 334 square miles.

The approximate altitudes of the valley floors shown in table 1 were taken from topographic maps. The altitudes are a rough measure or average of the altitude range of the valley lowlands. For descriptive purposes, these altitudes may be grouped into three broad categories: low (800-3,000 feet), medium (3,001-5,000 feet) and high (5,001-7,200 feet). In general, the southern part of Nevada in and near the Colorado River and Death Valley Basins contains most of the low-altitude hydrographic areas, the west-central part of the State generally contains most of the medium-altitude areas, and the east-central and northwestern parts of the State contain most of the high-altitude valleys. The following tabulation shows the size distribution of the 253 hydrographic areas:

Area range (square miles)	Number of areas	Area range (square miles)	Number of areas
1-100	53	801-900	5
101-200	29	901-1,000	9
201-300	28	1,001-1,200	7
301-400	31	1,201-1,400	5
401-500	24	1,401-1,600	1
501-600	28	1,601-1,800	3
601-700	13	1,801-2,000	1
701-800	13	2,001-2,200	3
		Total	253

Three tables are presented in this report. Table 1 is a compilation of the principal geographic features of the hydrographic areas. Also included in table 1 are report-references to hydrologic studies made in these areas by the Water Resources Division of the U.S. Geological Survey working in cooperation with the Nevada Department of Conservation and Natural Resources--the principal water-resources evaluating agencies conducting studies in Nevada.

The Desert Research Institute of the University of Nevada at Reno is a newly established research organization in the field of water resources, and additional reports on a few areas are available from that division of the university.

Most reports include consideration of the hydrology of the entire hydrographic area; however, many are limited in area to small parts of hydrographic areas or limited in scope to the consideration of specific hydrologic features of certain areas. In 1968, only 34 areas do not have some published hydrologic information. In table 1 the areas are listed in numerical order; on the map the area names (and numbers) are listed alphabetically.

Table 2 is an alphabetical listing of hydrographic areas indexed to region or basin number and hydrographic-area number.

In table 3 the areas are listed by counties and regions and basins.

HYDROGRAPHIC REGIONS AND BASINS

The hydrographic areas of Nevada were grouped into 14 hydrologic regions and basins. Large-scale unifying hydrographic features which were the general basis for the regions and basins fall into three broad categories, (1) drainage basins of large regional streams, (2) drainage basins that have no large regional stream, and (3) groups of mostly topographically closed valleys.

The drainage basins of large regional streams are commonly linear in form, most valleys forming segments like links of a chain. The basins included in this group are the Snake, Humboldt, Truckee, Carson, Walker, and Colorado Rivers.

The drainage basins that have no major regional streams are the Black Rock Desert Region and the Great Salt Lake, Escalante Desert, and the Death Valley Basins. In the Nevada parts of these basins and regions, the drainage may enter the sink area from several directions, but carry little streamflow.

The third type of hydrographic regions and basins, consisting mostly of topographically closed valleys, is isolated from other similar groups by region and basin types (1) and (2) listed above. This type includes the Northwest, West Central, Western, and Central Regions.

Brief descriptions of the 14 hydrographic regions and basins of Nevada are presented in the following sections. The regions and basins are shown on the index map of Nevada (on large map, in pocket).

Northwest Region (1)

The Northwest Region includes parts of Washoe and Humboldt Counties. The region includes 16 hydrographic areas and covers 3,073 square miles. It is characterized by small, high-altitude valleys and includes a mixture of isolated (topographically closed) and hydrologically connected valleys. The region is bounded on the west by California, on the north by Oregon, and on the southeast by the Black Rock Desert Region.

Black Rock Desert Region (2)

The Black Rock Desert Region includes parts of Washoe, Humboldt, and Pershing Counties. It includes 17 valleys, 2 of which are divided into two subareas each. The region covers 8,632 square miles and is characterized by both very large and small valleys, most of which are presently or were tributary to the Black Rock and Smoke Creek Deserts (areas numbered 28 and 21 on the map).

Snake River Basin (3)

The Snake River Basin in northern Nevada includes parts of Elko and Humboldt Counties. The entire basin is drained by the Snake River System in Idaho, which is tributary to the Columbia River. The basin in Nevada includes eight hydrographic areas, covers 5,230 square miles, and is characterized by high tablelands and highlands. Except for Independence Valley (area 36) the basin also is characterized by deep canyons.

Humboldt River Basin (4)

The Humboldt River Basin is in northern Nevada and includes parts of eight counties. The Humboldt River is the largest stream wholly within Nevada. The basin includes 34 hydrographic areas, covers 16,843 square miles, and is characterized by moderate- to large-sized, medium- to high- altitude valleys that are all tributary to the Humboldt River. The river flows westward, generally terminating in Lovelock Valley and White Plains (areas 73 and 74). No topographic divide exists between White Plains and the Carson Desert (area number 101), a part of the Carson River Basin. Because water seldom flows between the two areas and therefore between the two river basins, an arbitrary boundary was established.

West-Central Region (5)

The West-Central Region includes parts of Pershing, Lyon, and Churchill Counties. This small region covers 1,656 square miles and is composed of only five hydrographic areas. It is characterized by moderate and small sized, mostly medium-altitude valleys and is similar to the Central Region where topographically closed valleys predominate.

Truckee River Basin (6)

The Truckee River Basin in western Nevada includes parts of Washoe, Pershing, Douglas, Ormsby, and Storey Counties. It includes 12 valleys and river segments of the Truckee River, which ultimately discharges into Pyramid Lake (in area 81) and at one time also discharged into Winnemucca Lake (in area 80). The basin includes 2,300 square miles and is characterized by small, medium- to high-altitude valleys. The Truckee Canal now carries much of the Truckee River flow of the Tracy Segment (area 83) across the Fernley Area (area 76) of the West-Central Region to Churchill Valley (area 102) of the Carson River Basin, where it is stored in Lahontan Reservoir.

Western Region (7)

The Western Region is wholly within Washoe County; it consists of nine valleys, one of which, Lemmon Valley (area 92), is divided into two subareas by a low alluvial divide. The region includes 577 square miles and is characterized by small, medium- to high-altitude, mostly isolated valleys, and is similar to the Central Region where isolated valleys predominate.

Carson River Basin (8)

The Carson River Basin in western Nevada includes parts of six counties and consists of five valleys that ultimately discharge to the Carson Desert (Sink). The basin includes 3,519 square miles and is characterized by moderate- to large-sized, medium- to high-altitude valleys. As described above, the Carson River Basin receives flow diverted from the Truckee River Basin and intermittent natural flow from the Humboldt River Basin.

Walker River Basin (9)

The Walker River Basin in western Nevada includes parts of Mineral, Lyon, and Douglas Counties. The basin is composed of seven hydrographic areas and covers 3,048 square miles. It is characterized by small- to moderate-sized, medium- to high-altitude valleys. All areas are drained by the Walker River system which ultimately discharges into Walker Lake (in area 110B). Mason Valley (area 108) infrequently drains to Churchill Valley (area 102) of the Carson River Basin through Adrian Valley when the Walker River is at high flood stage.

Central Region (10)

The Central Region includes parts of 12 counties and has an area of about 46,783 square miles. It is by far the largest hydrographic region of Nevada, covering 42 percent of the State. The region includes 89 valleys that are generally large in size, medium to high in altitude, and are mostly isolated, though some have interflow of surface water.

Great Salt Lake Basin (11)

The Great Salt Lake Basin of eastern Nevada includes the easternmost parts of Elko, White Pine, and Lincoln Counties. It consists of 11 hydrographic areas and covers 3,807 square miles. The basin in Nevada is characterized by high-altitude areas that drain eastward to the Great Salt Lake Desert in Utah.

Escalante Desert Basin (12)

The Escalante Desert Basin, also called Escalante Valley, covers a large area in Utah but only a very small part of the basin is in Lincoln County, Nevada. Its area in Nevada is only 106 square miles. The Nevada part has a high altitude and surface water flows to Utah.

Colorado River Basin (13)

The Colorado River Basin of Nevada includes parts of Clark, Lincoln, Nye, and White Pine Counties and is divided into 27 hydrographic areas covering 12,376 square miles. The basin is characterized by small- to moderate-sized, medium- to low-altitude valleys. All but three of the hydrographic areas are tributary to the Colorado River system which flows to the Pacific Ocean. Two of the noncontributing areas, Garnet and Hidden Valleys (areas 216 and 217), are topographically closed but are completely surrounded by areas that drain to the Colorado River. The third noncontributing area is the southern part of Three Lakes Valley (area 211). Lee Canyon discharges flood water on an alluvial fan; the flow may go either eastward to the Colorado River drainage or northward to the dry lake in the southern part of Three Lakes Valley, depending upon which distributary channels the flow occupies.

Death Valley Basin (14)

The part of the Death Valley Basin in southern Nevada includes parts of Nye and Esmeralda Counties. It includes nine hydrographic areas and covers 2,593 square miles. The basin in Nevada is characterized by small- to moderate-sized, low-altitude valleys that are all tributary to Death Valley in California.

REFERENCES CITED

Miller, M. R., and others, 1953, Irrigation waters of Nevada: Univ. Nevada Agr. Expt. Sta. Bull. 187, 63 p.

Rush, F. E., and others, 1968 (revised September 1968), Hydrographic areas of Nevada: Nevada Dept. Conserv. and Nat. Resources, Division of Water Resources Map.

U.S. Department of Commerce, 1965, Statistical abstracts of the United States-1965: Washington, D. C., U.S. Government Printing Office, 1,047 p.

U.S. Geological Survey, 1968, Water resources investigations in Nevada: U.S. Geol. Survey Bibliog. Brochure.

Table 1.--Geographical features and numerical listing of the hydrographic areas

Counties: CH, Churchill; C, Clark; DS, Douglas; EL, Elko, ES, Esmeralda; EU, Eureka; HU, Humboldt; LA, Lander; LN, Lincoln, LY, Lyon; MN, Mineral, NY, Nye; OR, Ormsby, PE, Pershing ST, Storey, W, Washoe; WP, White Pine (same system as that used on license plates for Nevada venicles.)

Townships and ranges are all with reference to the Mount Diablo base line and meridian

Published hydrologic reports prepared by USGS: R, Nevada Water Resources - Reconnaissance Series Report; B, Nevada Water Resources Bulletin, both published by the Nevada Department of Conservation and Natural Resources, Nye Building, Carson City, Nevada 89701, W, Water-Supply Paper, U.S. Geological Survey; P, Professional Paper, U.S. Geological Survey, 222 E. Washington Street, Carson City, Nevada 89701 (see U.S. Geol. Survey, 1963)

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
			NORTHWEST REGION (1)						
1	Pueblo Valley	HU	44-47 N.	28-32	a 118	4,200	None	Denio	R-22
2	Continental Lake Valley	HU	43-47 N.	27-30	a 214	4,200	Both		R-22
3	Gridley Lake Valley	HU	42-45 N.	26-28	195	4,500	Outflow		R-22
4	Virgin Valley	HU	42-47 N.	23-27	a 494	4,300	do.	Sheldon Antelope Range	R-22
5	Sage Hen Valley	HU	46-47 N.	24-25	a 22	5,600	do.	do.	R-15
6	Guano Valley	W	45-47 N.	21-24	a 147	5,400	do.	Sheldon Nat. Antelope Refuge	R-15
7	Swan Lake Valley	W	42-46 N.	21-24	226	5,700	None	do.	R-15
8	Massacre Lake Valley	W	42-45 N.	20-22	176	5,700	do.		R-15

Table 1.--Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
9	Long Valley	W	39-47 N.	18-22	433	5,600	None	Vya	R-15
10	Macy Flat	W	46-47 N.	20-21	a 27	5,800	Inflow		R-15
11	Coleman Valley	W	46-47 N.	19-20	a 51	4,800	Outflow		R-15
12	Mosquito Valley	W	45-46 N.	19-20	32	5,700	None		R-15
13	Warner Valley	W	45-47 N.	18-19	a 82	5,300	Outflow		R-15
14	Surprise Valley	W	37-46 N.	18-19	a 214	4,500	do.		R-17
15	Boulder Valley	W	39-41 N.	18-20	88	5,700	None		R-15
16	Duck Lake Valley	W	34-39 N.	18-21	a 533	4,700	Inflow		R-17
			BLACK ROCK DESERT REGION (2)						
17	Pilgrim Flat	W	34-35 N.	18	a 12	6,400	Inflow		R-44
18	Painters Flat	W	33-35 N.	18	a 31	5,700	Outflow		R-44
19	Dry Valley	W	28-29 N.	18-19	39	4,200	None		R-44
20	Sano Valley	W	28 N.	20-21	12	4,000	do.		R-44
21	Smoke Creek Desert	W	27-36 N.	18-23	a 980	3,900	Inflow	Pyramid Lake Indian Res.	R-44
22	San Emidio Desert	W	27-32 N.	22-24	305	4,000	Both	Gerlach, Empire	R-44
23	Granite Basin	W	33 N.	23	9	5,000	Outflow		R-20
24	Hualapai Flat	W	33-37 N.	22-24	315	4,100	None		R-11
25	High Rock Lake Valley	W	37-43 N.	20-24	665	5,000	do.		R-20
26	Mud Meadow	HU	36-42 N.	24-26	495	4,000	Outflow		R-20
27	Summit Lake Valley	HU	41-42 N.	25-27	60	5,900	None	Summit Lake Indian Res.	R-20

Table 1.--Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
28	Black Rock Desert	HU, PE	31-43 N.	23-32	2,179	4,000	Both	Sulphur	R-20
29	Pine Forest Valley	HU	40-46 N.	29-33	528	4,000	do.		R-4
30	Kings River Valley	HU	41-47 N.	32-35	a 413	4,200	do.	Fort McDermitt Indian Res.	B-16,31, W-1619-L
A	Rio King Subarea	HU	43-47 N.	32-35	a 300	4,300	do.		B-16,31, W-1619-L
B	Sou House Subarea	HU	41-43 N.	33-35	113	4,200	do.		B-16,31, W-1619-L
31	Desert Valley	HU	34-42 N.	31-35	1,052	4,200	do.	Jungo	R-7
32	Silver State Valley	HU	36-41 N.	35-37	313	4,200	Outflow		B-14,34
33	Quinn River Valley	HU	40-47 N.	35-41	a 1,224	4,300	Both	Fort McDermitt Indian Res.	B-14,34
A	Orovada Subarea	HU	40-46 N.	35-39	632	4,200	do.	Orovada	B-14,34
B	McDermitt Subarea	HU	42-47 N.	34-41	a 592	4,500	do.	McDermitt	B-14,34
				SNAKE RIVER BASIN (3)					
34	Little Owyhee River Area	HU, EL	43-47 N.	41-47	a 716	5,100	Outflow		R-48
35	South Fork Owyhee River Area	EL	40-47 N.	46-53	a 1,310	5,000	Both	Duck Valley Indian Res.	R-48
36	Independence Valley	EL	38-42 N.	50-53	345	5,700	Outflow	Tuscarora	R-8,48
37	Owyhee River Area	EL	42-47 N.	51-56	a 533	5,300	do.	Duck Valley Indian Res.	R-48

Table 1.--Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
38	Bruneau River Area	EL	41-47 N.	53-58	a 514	5,000	Outflow		R-48
39	Jarbidge River Area	EL	45-47 N.	57-61	a 273	5,000	do.		R-48
40	Salmon Falls Creek Area	EL	41-47 N.	59-67	a 1,218	5,200	do.	Jackpot, Contact	R-48
41	Goose Creek Area	EL	44-47 N.	66-70	a 316	5,200	do.		R-48
			HUMBOLDT RIVER BASIN (4)						
42	Marys River Area	EL	36-45 N.	58-64	1,073	5,600	do.	Wells	B-32
43	Starr Valley Area	EL	33-36 N.	58-62	332	6,000	Both		B-32
44	North Fork Area	EL	35-43 N.	53-58	1,110	5,400	do.		B-32
45	Lamoille Valley	EL	31-35 N.	56-59	257	5,400	do.	Lamoille	B-32
46	South Fork Area	EL	30-32 N.	56-58	99	5,600	Outflow	Lee	R-35,B-32
47	Huntington Valley	EL,WP	24-32 N.	53-58	787	5,500	do.	Jiggs	R-35,B-32, W-1475-L
48	Dixie Creek--Tenmile Creek Area	EL	29-34 N.	53-57	392	5,400	Both	South Fork Indian Res.	R-35,B-32
49	Elko Segment	EL	32-37 N.	52-56	314	5,100	do.	Elko	B-12,32
50	Susie Creek Area	EL	33-37 N.	52-54	223	5,000	do.		B-32
51	Maggie Creek Area	EL,EU	32-36 N.	51-53	395	5,300	Outflow		B-32
52	Marys Creek Area	EU,EL	32-33 N.	51-52	61	5,200	Both	Carlin	B-32
53	Pine Valley	EU,EL	23-32 N.	48-54	1,002	5,400	Outflow		R-2,B-32
54	Crescent Valley	EU,LA	25-32 N.	45-51	752	5,000	Both	Beowawe	B-15,32, W-1581
55	Carico Lake Valley	LA	22-28 N.	43-46	376	5,100	Outflow		R-37,B-32
56	Upper Reese River Valley	LA,NY	11-24 N.	39-45	1,138	5,800	do.	Austin, Yomba Ind. Res.	R-31,B-32 W-425-D

Table 1.--Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
57	Antelope Valley	LA	19-27 N.	40-42	452	5,000	Outflow		R-19,B-32 W-425-D
58	Middle Reese River Valley	LA	24-28 N.	41-44	319	4,900	Both		R-19,B-32 W-425-D
59	Lower Reese River Valley	LA	27-32 N.	42-46	588	4,700	do.	Battle Mountain	B-25,32 W-425-D
60	Whirlwind Valley	EU,LA	30-32 N.	47-48	94	4,800	do.		B-32
61	Boulder Flat	EU,LA	32-37 N.	45-50	544	4,700	do.		B-32,W-425-D
62	Rock Creek Valley	LA,EL	33-36 N.	45-50	444	4,900	do.		B-32
63	Willow Creek Valley	EL	37-41 N.	45-50	405	5,100	Outflow		B-32
64	Clovers Area	HU,LA	32-39 N.	42-46	720	4,500	Both		B-32,W-425-D
65	Pumpernickel Valley	HU,PE	31-36 N.	39-43	299	4,500	do.		B-32
66	Kelly Creek Area	HU	36-40 N.	40-44	301	4,400	do.		B-32
67	Little Humboldt Valley	HU,EL	38-46 N.	39-47	975	4,600	Outflow		B-32
68	Marazcrabble Area	HU	42-45 N.	39-42	167	5,200	do.		B-32
69	Paradise Valley	HU	36-41 N.	37-41	600	4,500	Both	Paradise Valley	B-32
70	Winnemucca Segment	HU	34-38 N.	34-41	435	4,400	do.	Winnemucca Golconda	B-19,20,22, 24,25,27, 32,W-1669-M W-1754,1795, 1816,P-424-C P-450-B, R-29,B-32
71	Grass Valley	PE,HU	30-36 N.	36-40	520	4,400	Outflow		
72	Imlay Area	PE	30-34 N.	30-37	771	4,200	Both	Rye Patch Reservoir	R-5,B-32
73	Lovelock Valley	PE	24-30 N.	29-34	b 635	4,600	do.	Lovelock	R-32,B-2,32
A	Oreana Subarea	PE	28-30 N.	32-34	98	4,300	do.		R-32,B-32
74	White Plains	Ch	22-25 N.	27-29	164	3,900	do.		

Table 1.--Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
			WEST CENTRAL REGION (5)						
75	Bradys Hot Springs Area	Ch,LY	21-24 N.	27-29	178	4,200	Both		
76	Fernley Area	LY	19-21 N.	23-26	126	4,200	Inflow	Fernley	B-17, W-1619-AA
77	Fireball Valley	CH	22-24 N.	25-26	58	4,700	Outflow		
78	Granite Springs Valley	PE	24-31 N.	24-31	967	4,000	None		
79	Rumiva Valley	PE	27-32 N.	24-27	333	4,500	do.		
			TRUCKEE RIVER BASIN (6)						
80	Winnemucca Lake Valley	W,PE	24-30 N.	23-25	371	3,800	Inflow	Pyramid Lake Indian Res.	B-15, W-1539-C
81	Pyramid Lake Valley	W	21-29 N.	20-25	672	3,800	Both	Nixon, Sutcliff	
82	Dodge Flat	W	21-22 N.	23-24	92	4,200	do.	Pyramid Lake Indian Res.	
83	Tracy Segment	ST	17-21 N.	20-24	285	4,300	do.	Wadsworth	
84	Warm Springs Valley	W	21-24 N.	19-22	247	4,300	Outflow		R-43
85	Spanish Springs Valley	W	20-21 N.	20-21	76	4,500	do.		R-43
86	Sun Valley	W	20 N.	19-20	19	4,700	do.		R-43
87	Truckee Meadows	W	17-20 N.	18-21	203	4,500	Both	Reno, Sparks	B-28, W-1779-S, P-450-C

Table 1.--Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
88	Pleasant Valley	W	17 N.	18-20	39	4,500	Both		
89	Washoe Valley	W	15-17 N.	18-20	82	5,100	Outflow	Washoe City, Washoe Lake	R-41
90	Lake Tahoe Basin	W,DG,OR	13-17 N.	16-19	a 139	6,200	do.	Incline Village, Glenbrook	
91	Truckee Canyon Segment	W	17-20 N.	18	a 34	4,900	Both	Verdi	
				WESTERN REGION (7)					
92	Lemmon Valley	W	20-22 N.	18-20	93	5,000	None		R-43
A	Western part	W	20-22 N.	18-19	53	5,000	do.	Stead Air Force Base	R-43
B	Eastern part	W	20-21 N.	19-20	40	5,000	do.	Black Springs	R-43
93	Antelope Valley	W	22 N.	19-20	18	5,200	do.		R-43
94	Bedell Flat	W	21-24 N.	18-20	53	5,000	Outflow		R-43
95	Dry Valley	W	24-25 N.	18-20	a 80	4,600	do.		R-43
96	Newcomb Lake Valley	W	25 N.	18-19	9	5,200	None		R-43
97	Honey Lake Valley	W	25-28 N.	18-20	a 193	4,000	Outflow	Flanigan	R-43
98	Skedaddle Creek Valley	W	28-30 N.	18	a 43	4,800	do.		R-44
99	Red Rock Valley	W	22-24 N.	18-19	a 56	4,900	Both		R-43
100	Cold Spring Valley	W	20-22 N.	18	30	5,100	None		R-43
				CARSON RIVER BASIN (8)					
101	Carson Desert	CH,PE	15-20 N.	25-35	2,152	3,900	Inflow	Fallon	
102	Churchill Valley	LY,CH	14-19 N.	22-27	480	4,200	Both	Lahontan Reservoir	
103	Dayton Valley	LY,ST	14-18 N.	20-24	369	4,400	do.	Virginia City, Dayton, Gold Hill	

Table 1.--Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
104	Eagle Valley	OR	14-16 N.	19-20	69	4,700	Both	Carson City New Empire Stewart	R-39
105	Carson Valley	DS	10-14 N.	19-22	a 419	4,800	do.	Gardnerville Minden	
				WALKER RIVER BASIN (9)					
106	Antelope Valley	DS	8-11 N.	21-23	a 115	5,000	do.	Topaz Lake	
107	Smith Valley	LY,DS	7-14 N.	22-26	a 479	4,700	do.	Smith, Wellington	W-1228
108	Mason Valley	LY, MN	9-16 N.	24-28	516	4,500	do.	Yerington	
109	East Walker Area	LY,MN	5-11 N.	24-29	a 536	6,800	do.		
110	Walker Lake Valley	MN,LY	3-16 N.	26-33	1,350	4,300	Inflow		R-40
A	Schurz Subarea	MN,LY	11-16 N.	26-31	502	4,200	Both	Schurz, Walker River Indian Res.	R-40
B	Lake Subarea	MN	8-11 N.	28-32	307	4,000	do.	Walker Lake	R-40
C	Whiskey Flat-Hawthorne Subarea	MN	3-9 N.	28-33	541	4,800	Outflow	Hawthorne, Babbitt	R-40
				CENTRAL REGION (10)					
111	Alkali Valley	MN	4-5 N.	28-30	a 33	6,900	Outflow		
A	Northern part	MN	5 N.	29	18	7,050	None		
B	Southern part	MN	4-5 N.	28-30	a 65	6,850	Outflow		
112	Mono Valley	MN	3-4 N.	29-30	a 27	7,000	do.		
113	Huntoon Valley	MI	2-4 N.	30-32	a 97	5,800	Inflow		
114	Teels Marsh Valley	MN	1-5 N.	31-34	323	5,000	None		
115	Adobe Valley	MN	1-2 N.	30-31	a 15	5,400	Outflow		
116	Queen Valley	MN	1 S.-1 N.	31-33	a 65	6,200	do.		
117	Fish Lake Valley	ES	6 S.-1 N.	33-40	a 706	4,300	Both	Dyer	B-11,W-224
118	Columbus Salt Marsh Valley	ES,MN	1-5 N.	33-38	370	4,000	Inflow		

Table 1.--Continued

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119	Rhodes Salt Marsh Valley	MN	3-6 N.	34-36	109	4,600	None		
120	Garfield Flat	MN	5-7 N.	32-34	92	5,700	do.		
121	Soda Spring Valley	MN	6-9 N.	32-36	376	4,600	do.		
A	Eastern part	MN	6-9 N.	34-36	246	4,600	do.	Mina, Luning	
B	Western part	MN	7-9 N.	32-34	130	4,500	do.		
122	Gabbs Valley	MN,NY	7-15 N.	31-37	1,277	4,300	do.	Gabbs	R-9
123	Rawhide Flats	CH,MN	14-16 N.	28-32	227	4,000	do.	Walker River Indian Res.	R-40
124	Fairview Valley	CH	14-18 N.	32-35	285	4,200	do.		R-23
125	Stingaree Valley	CH	16-17 N.	34-35	43	4,400	Both		R-23
126	Cowkick Valley	CH	15-19 N.	34-36	110	4,700	do.		R-23
127	Eastgate Valley Area	CH	15-19 N.	36-38	216	4,800	Outflow	Eastgate	R-23
128	Dixie Valley	CH,PE	16-27 N.	33-40	1,303	3,600	Inflow	Dixie Valley	R-23
129	Buena Vista Valley	PE	24-31 N.	34-37	742	4,100	None	Unionville	B-13
130	Pleasant Valley	PE	26-30 N.	37-40	285	4,400	Outflow		R-23
131	Buffalo Valley	LA,PE	27-33 N.	40-43	504	4,700	None		B-32,W-425-D
132	Jersey Valley	PE	25-28 N.	39-41	142	4,200	Outflow		R-23
133	Edwards Creek Valley	CH	16-22 N.	36-40	416	5,200	None		R-26
134	Smith Creek Valley	LA,NY	13-20 N.	37-41	582	6,100	do.		R-28
135	Ione Valley	NY	8-14 N.	37-40	460	6,000	Outflow	Ione	R-28
136	Monte Cristo Valley	ES,MN	4-8 N.	36-38	284	5,400	None		
137	Big Smoky	NY,ES,LA	1 S.-20 N.	37-46	2,926	5,100	Inflow		B-3,W-423,375
A	Tonopah Flat	NY,ES	1 S.-10 N.	37-44	1,603	4,800	do.	Tonopah, Manhattan	B-3,W423,375
B	Northern Part	NY,LA	9-20 N.	41-46	1,323	5,500	None	Round Mountain	W-375,423
138	Grass Valley	LA,EU	20-26 N.	45-49	505	5,700	do.	Cortez	R-37

Table 1.--Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
139	Kobeh Valley	EU,LA	17-23½ N.	46-52	868	6,200	Both		R-30
140	Monitor Valley	NY,LA	8-18 N.	45-49	1,038	6,700	Outflow		R-30
A	Northern part	NY,LA	12-18 N.	45-49	529	6,500	do.	Potts	R-30
B	Southern part	NY	8-13 N.	45-48	509	7,000	None		R-30
141	Ralston Valley	NY	2-9 N.	42-47	971	5,600	Inflow	Belmont	R-12,45
142	Alkali Spring Valley	ES	3 S.-2 N.	40-43	313	5,000	None	Goldfield	R-45,W-423
143	Clayton Valley	ES	5 S.-1 N.	37-41	555	4,400	do.	Silver Peak	R-45,W-423, W-224
144	Lida Valley	ES,NY	3-7 S.	40-44	535	5,000	Outflow	Lida, Gold Point	R-45,W-224
145	Stonewall Flat	NY	1-5 S.	43-47	381	4,800	None		R-45,W-224
146	Sarcobatus Flat	NY	5-12 S.	42-47	812	4,100	Inflow	Death Valley National Monument	R-10,W-224
147	Gold Flat	NY	1-8 S.	46-51	604	5,200	None		W-224
148	Cactus Flat	NY	4 S.-1 N.	46-50	403	5,400	do.		
149	Stone Cabin Valley	NY	2 S.-9 N.	49-50	985	5,700	Outflow		R-12,45
150	Little Fish Lake Valley	NY	8-14 N.	48-51	434	6,600	None		R-38
151	Antelope Valley	EU,NY	14-19 N.	49-52	444	6,200	Outflow		R-30
152	Stevens Basin	EU	18-19 N.	52-53	17	7,200	None		R-30
153	Diamond Valley	EU	18-27 N.	51-55	752	5,900	Inflow	Eureka	R-6,B-35
154	Newark Valley	WP	16-24 N.	54-58	601	5,900	do.		R-1,W-1475-L
155	Little Smoky Valley	NY	6-18 N.	51-55	1,158	6,200	Outflow		R-38,W-1475-L
A	Northern part	NY,EU,WP	12-18 N.	51-55	591	6,100	do.		R-38,W-1475-L
B	Central part	NY	11-12 N.	52	57	6,500	None		R-38,W-1475-L
C	Southern part	NY	6-14 N.	52-55	510	5,900	do.		R-38,W-1475-L
156	Hot Creek Valley	NY	1-12 N.	49-52	1,036	5,300	Outflow	Tybo,Warm Springs	R-38,B-12
157	Kawich Valley	NY	3-8 S.	51-52	350	5,500	None		B-12,W-224

Table 1.--Continued

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158	Emigrant Valley	LN	5-11 S.	52-57	767	4,600	None		
A	Groom Lake Valley	LN,NY	5-10 S.	52-57	663	4,600	do.		W-224
B	Papoose Lake Valley	LN	9-11 S.	54-56	104	4,600	do.		
159	Yucca Flat	NY	8-12 S.	51-53	305	4,000	do.		W-224
160	Frenchman Flat	NY	10-15 S.	51-56	463	3,200	do.		W-224,365
161	Indian Springs Valley	C	10-18 S.	54-57	655	3,200	do.	Indian Springs	B-4,5,6 W-224,365
162	Pahrump Valley	C	17-23 S.	51-57	a 789	2,800	Outflow	Pahrump	B-3,5,6 W-224,365, W-450,1832
163	Mesquite Valley (Sandy Valley)	C	21-27 S.	55-58	a 236	2,600	do.	Sandy	R-46, W-224, W-450,490-B
164	Ivanpah Valley	C	23-29 S.	58-61	a 326	2,700	do.		R-46, W-224, W-450,490-B
A	Northern part	C	23-27 S.	58-61	253	2,700	None	Goodsprings, Jean	R-46, W-224, W-450,490-B
B	Southern part	C	27-29 S.	59-61	a 73	2,800	Outflow		R-46, W-224, W-450,490-B
165	Jean Lake Valley	C	23-26 S.	59-61	96	2,800	None		R-46, W-224, W-490-B
166	Hidden Valley (South)	C	24-25 S.	61	34	3,100	do.		R-46, W-224, W-490-B
167	Eldorado Valley	C	23-28 S.	61-65	530	1,800	do.	Boulder City	R-36, W-224, W-490-B
168	Three Lakes Valley, northern part	C	9-14 S.	57-60	299	3,600	do.		W-224,365
169	Tikapoo (Tickaboo) Valley	LN	4-14 S.	55-61	998	4,300	do.		W-224,365, W-1475-L
170	Penoyer Valley (Sand Spring Valley)	LN	2 N.-5 S.	52-58	700	5,000	do.	Tempiute	B-12,W-1475-L

Table 1.---Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
171	Coal Valley	LN	3 S.-4 N.	58-62	460	5,000	Inflow		R-18,B-33, W-365,1475-L
172	Garden Valley	LN	2 S.-5 N.	55-59	493	5,500	Outflow	Adaven	R-18,B-33, W-365,1475-L
173	Railroad Valley	NY	3 S.-16 N.	50-59	2,752	4,900	None		B-12,W-1475-L
A	Southern part	NY	3 S.-3 N.	50-54	603	4,900	do.		B-12,W-1475-L
B	Northern part	NY	2-16 N.	51½-59	2,149	4,800	Inflow	Duckwater Indian Res. Currant	B-12,W-365, W-1475-L
174	Jakes Valley	WP	14-19 N.	58-61	422	6,400	None		B-33,W-1475-L
175	Long Valley	WP	18-27 N.	56-60	651	6,100	do.		R-3,B-33, W-1475-L
176	Ruby Valley	EL	24-35 N.	57-61	1,004	6,000	do.		B-12,W-1475-L
177	Clover Valley	EL	31-37 N.	61-63	464	5,700	Outflow		B-12
178	Butte Valley	WP	18-31 N.	59-63	1,010	6,200	None		R-49,W-1475-L
A	Northern part	WP	27-31 N.	61-63	271	6,100	do.	Odgers Ranch Indian Reservation	R-49,W-1475-L
B	Southern part	WP	18-27 N.	59-63	739	6,300	do.		R-49,W-1475-L
179	Steptoe Valley	WP	10-29 N.	61-67	1,942	5,900	Outflow	Ely, McGill Ruth, Currie	R-42,W-467, W-1475-L
180	Cave Valley	LN	5-11 N.	62-64	362	6,100	None		R-13,B-33 W-365,1475-L
181	Dry Lake Valley	LN	5 S.-7 N.	63-66	832	4,800	do.		R-16,B-33, W-365,1475-L
182	Delamar Valley	LN	3-8 S.	62-65	383	4,600	do.		R-16,B-33, W-365,1475-L
183	Lake Valley	LN	5-11 N.	64-68	557	6,000	do.		R-24,W-365, W-1475-L
184	Spring Valley	LN	6-25 N.	65-69	1,661	5,700	do.		R-33,W-365, W-1475-L

Table 1.--Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
185	Tippett Valley	WP	21-25 N.	66-69	345	5,700	None	Tippett	W-1475-L
186	Antelope Valley	WP,EL	25-30 N.	66-69	335	5,700	do.		B-12,W-1475-L
A	Southern part	WP,EL	25-28 N.	67-69	125	5,900	do.		W-1475-L
B	Northern part	WP,EL	26-30 N.	66-68	270	5,600	do.		B-12,W-1475-L
187	Goshute Valley	EL	27-38 N.	63-68	954	5,600	Inflow	Oasis, Cobre	B-12
188	Independence Valley (Pequop Valley)	EL	31-39 N.	63-65	562	5,600	do.		B-12
			GREAT SALT LAKE BASIN (11)						
189	Thousand Springs Valley	EL	36-46 N.	61-70	a 1,446	5,400	Outflow		R-47
A	Merrell Siding-Brush Creek Area	EL	39-42 N.	61-65	163	5,900	do.		R-47
B	Toano-Rock Spring Area	EL	38-46 N.	64-68	618	5,600	Both		R-47
C	Rocky Butte Area	EL	40-43 N.	66-68	a 183	5,200	do.		R-47
D	Montello-Crittenden Creek Area (Montello Valley)	EL	36-44 N.	67-70	482	4,900	do.	Montello	R-47
190	Grouse Creek Valley	EL	40-44 N.	69-70	a 55	5,000	Outflow		R-47
191	Pilot Creek Valley	EL	33-38 N.	68-70	a 326	4,600	do.		
192	Great Salt Lake Desert	EL	27-37 N.	68-70	a 507	4,300	do.	Wendover	
193	Deep Creek Valley	LN	22-27 N.	69-70	a 208	5,200	do.	Goshute Indian Res.	W-1475-L
194	Pleasant Valley	WP	20-22 N.	69-70	a 75	6,200	do.		R-34,W-1475-L
195	Snake Valley	WP	10-21 N.	68-70	a 777	5,200	do.	Baker, Lehman Caves Nat'l Mon.	R-34,W-1475-L
196	Hamlin Valley	LN	3-12 N.	68-71	a 413	5,800	do.		R-34,W-1475-L

Table 1.--Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
				ESCALANTE DESERT (12)					
197	Escalante Desert	LN	3 S.-1 N.	69-71	a 106	5,800	Outflow		R-51,W-1475-L
				COLORADO RIVER BASIN (13)					
198	Dry Valley	LN	2 S.-1 N.	68-71	a 113	5,400	Both		R-27,B-7, W-365,1475-L
199	Rose Valley	LN	1 N.	69-70	12	5,500	do.		R-27,B-7, W-365,1475-L
200	Eagle Valley	LN	1-2 N.	69-71	52	5,600	do.	Ursine	R-27,B-7, W-365,1475-L
201	Spring Valley	LN	2-6 N.	68-71	a 287	6,000	Outflow		R-27,B-7, W-365,1475-L
202	Patterson Valley	LN	1 S.-5 N.	65-69	418	5,600	do.	Pioche	R-27,B-7, W-365,1475-L
203	Panaca Valley	LN	4 S.-1 N.	65-70	334	4,800	Both	Panaca, Caselton	R-27,B-7, W-365,1475-L
204	Clover Valley	LN	3-7 S.	67-71	a 364	5,000	Outflow		R-27,B-7, W-365,1475-L
205	Lower Meadow Valley Wash	LN	4-14 S.	64-69	379	2,600	Both	Caliente, Carp, Glendale	R-27,W-224, W-365,1475-L
206	Kane Springs Valley	LN	6-10 S.	63-66	234	3,300	Outflow		R-25,B-33, W-365
207	White River Valley	NY	3-16 N.	58-63	1,607	5,400	do.	Preston, Lund, Sunnyside	B-8,33, W-365,1475-L
208	Pahroc Valley	LN	3 S.-5 N.	63-66	508	5,000	Both		R-21,B-33, W-365,1475-L
209	Pahranagat Valley	LN	2-9 S.	58-63	768	3,700	do.	Hiko, Alamo	R-21,B-33, W-365,1475-L

Table 1.--Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
210	Coyote Spring Valley	LN	8-15 S.	61-64	657	2,500	Both		R-25,B-33, W-224,365
211	Three Lakes Valley, southern part[1/]	CL	14-18 S.	56-61	311	3,100	None		B-4,5,6, W-224,365
212	Las Vegas Valley	CL	15-24 S.	56-64	1,564	2,000	Outflow	Las Vegas, Henderson	B-3,4,5,6, B-18,23,29, W-224,365, W-490-B,849-D, W-1669-Q, W-1780
213	Colorado River Valley	CL	22-33 S.	63-66	a 583	800	Both	Lake Mead Nat. Rec. Area	R-36,W-224
214	Piute Valley	CL	27-32 S.	61-65	a 338	2,300	Outflow	Searchlight	R-36,W-224, W-490-B
215	Black Mountains Area	CL	16-23 S.	63-68	630	1,200	Both	Lake Mead Nat. Rec. Area	R-50,W-224, W-365,P-295, P-298
216	Garnet Valley[1/]	CL	15-19 S.	61-64	156	2,000	None	Dry Lake	R-50,W-224, W-365
217	Hidden Valley (North)[1/]	CL	15-17 S.	62-63	80	2,700	do.		R-50,W-224, W-365
218	California Wash Area	CL	14-16 S.	63-66	313	1,300	Both	Moapa, Moapa Indian Res.	R-50,W-224, W-365
219	Muddy River Springs Area (Upper Moapa Valley)	CL	12-15 S.	63-65	91	1,800	do.		R-25,B-33, W-224,365, P-501-D
220	Lower Moapa Valley	CL	12-17 S.	66-68	252	1,400	do.	Overton, Logandale	R-50,W-224, W-365
221	Tule Desert	LN	7-11 S.	68-70	192	3,200	Outflow		R-51
222	Virgin River Valley	CL	7-17 S.	67-71	a 907	1,500	Both	Mesquite Bunkerville	R-51,W-224, W-365

Table 1.---Continued

Area number on map	Hydrographic area shown on map	Location: Principal counties	Location: Townships	Location: Ranges E.	Approximate area (sq mi)	Approximate altitude of valley floor (feet)	Stream inflow and outflow	Principal geographic names in area	Published hydrologic reports by USGS
223	Gold Butte Area	CL	15-22 S.	68-71	533	1,200	Outflow	Lake Mead Nat. Rec. Area	R-50,W-224, W-365,P-295, P-298
224	Greasewood Basin	CL	15-20 S.	70-71	a 108	2,200	do.		R-50,W-224
				DEATH VALLEY BASIN (14)					
225	Mercury Valley	NY	15-17 S.	52-54	110	3,200	do.	Mercury	R-14,W-224, W-365
226	Rock Valley	NY	14-15 S.	50-52	82	3,300	do.		R-14,W-224
227	Fortymile Canyon	NY	8-15 S.	49-52	519	4,000	do.		R-14,W-224
A	Jackass Flats	NY	11-15 S.	49-52	279	3,500	Both		R-14,W-224
B	Buckboard Mesa	NY	8-11 S.	49-51	240	5,000	Outflow		R-14,W-224
228	Oasis Valley	NY	7-12 S.	46-50	460	3,300	do.	Beatty	R-10,W-224, P-475-b
229	Crater Flat	NY	11-15 S.	47-49	182	3,200	do.		R-14,W-224
230	Amargosa Desert	NY	11-19 S.	44-54	a 896	2,600	Both	Lathrop Wells, Death Valley Nat. Monument	R-14,B-3,
231	Grapevine Canyon	ES	8-12 S.	41-43	a 162	4,200	Outflow		R-45,W-224
232	Oriental Wash	ES	6-10 S.	38-42	a 182	4,000	do.		R-45,W-224

1. Noncontributing part of the Colorado River Basin.
a. Nevada part only.
b. Number does not include Oreana Subarea.

Table 2.--Alphabetical listing of hydrographic areas

Hydrographic area	Hydrographic region or basin number on index map	Area number on map and table 1
Adobe Valley	10	115
Alkali Valley	10	111
Alkali Spring Valley	10	142
Amargosa Desert	14	230
Antelope Valley	4	57
Antelope Valley	7	93
Antelope Valley	9	106
Antelope Valley	10	151
Antelope Valley	10	166
Bedell Flat	7	94
Big Smoky	10	137
Black Mountains Area	13	215
Black Rock Desert	2	28
Boulder Flat	4	61
Boulder Valley	1	15
Bradys Hot Spring Area	5	75
Bruneau River Area	3	38
Buckboard Mesa	14	227b
Buena Vista Valley	10	129
Buffalo Valley	10	131
Butte Valley	10	178
Cactus Flat	10	148
California Wash Area	13	218
Carico Lake Valley	4	55
Carson Desert	8	101
Carson Valley	8	105
Cave Valley	10	180
Churchill Valley	8	102
Clayton Valley	10	143
Clover Valley	10	177
Clover Valley	13	204
Clovers Area	4	64
Coal Valley	10	171
Cold Spring Valley	7	100
Coleman Valley	1	11
Colorado River Valley	13	213
Columbus Salt Marsh Valley	10	113
Continental Lake Valley	1	2
Cowkick Valley	10	126
Coyote Spring Valley	13	210
Crater Flat	14	229
Crescent Valley	4	54
Dayton Valley	8	103
Deep Creek Valley	11	193
Delamar Valley	10	182
Desert Valley	2	31
Diamond Valley	10	153
Dixie Creek-Tenmile Creek Area	4	48
Dixie Valley	10	128
Dodge Flat	6	82
Dry Lake Valley	10	181
Dry Lake Valley (see Garnet Valley)	13	216
Dry Valley	7	95
Dry Valley	2	19
Dry Valley	13	198
Duck Lake Valley	1	16
Eagle Valley	8	104
Eagle Valley	13	200
Eastgate Valley Area	10	127
East Walker Area	9	109
Edwards Creek Valley	10	133
Eldorado Valley	10	167
Elko Segment	4	49
Emigrant Valley	10	158
Escalante Desert	12	197
Fairview Valley	10	124
Fernley Area	5	76
Fireball Valley	5	77
Fish Lake Valley	10	117
Fortymile Canyon	14	227
Frenchman Flat	10	160
Gabbs Valley	10	122
Garden Valley	10	172
Garfield Flat	10	120
Garnet Valley	13	216
Gold Butte Area	13	223
Gold Flat	10	147
Goose Creek Area	3	41
Goshute Valley	10	187
Granite Basin	2	23
Granite Springs Valley	5	78
Grapevine Canyon	14	231

Table 2.--Continued

Hydrographic area	Hydrographic region or basin number on index map	Area number on map and table 1
Grass Valley	4	71
Grass Valley	10	138
Greasewood Basin	13	224
Great Salt Lake Desert	11	192
Gridley Lake Valley	1	3
Groom Lake Valley	10	158A
Grouse Creek Valley	11	190
Guano Valley	1	6
Hamlin Valley	11	196
Hardscrabble Area	4	68
Herrell Siding-Brush Creek Area	11	189A
Hidden Valley (North)	13	217
Hidden Valley (South)	10	166
High Rock Lake Valley	2	25
Honey Lake Valley	7	97
Hot Creek Valley	10	156
Hualapai Flat	2	24
Huntington Valley	4	47
Huntoon Valley	10	113
Imlay Area	4	72
Independence Valley	3	36
Independence Valley	10	188
Indian Springs Valley	10	161
Ione Valley	10	135
Ivanpah Valley	10	164
Jackass Flats	14	227A
Jakes Valley	10	174
Jarbidge River Area	3	39
Jean Lake Valley	10	165
Jersey Valley	10	132
Kane Springs Valley	13	206
Kawich Valley	10	157
Kelly Creek Area	4	66
Kings River Valley	2	30
Kobeh Valley	10	139
Kumiva Valley	5	79
Lake Subarea	9	110B
Lake Tahoe Basin	6	90
Lake Valley	10	163
Lamoille Valley	4	45
Las Vegas Valley	13	212
Lemmon Valley	7	92
Lida Valley	10	144
Little Fish Lake Valley	10	150
Little Humboldt Valley	4	67
Little Owyhee River Area	3	34
Little Smoky Valley	10	155
Long Valley	1	9
Long Valley	10	175
Lovelock Valley	4	73
Lower Meadow Valley Wash	13	205
Lower Moapa Valley	13	220
Lower Reese River Valley	4	59
Macy Flat	1	10
Maggie Creek Area	4	51
Marys Creek Area	4	52
Marys River Area	4	42
Mason Valley	9	108
Massacre Lake Valley	1	8
McDermitt Subarea	2	33B
Mercury Valley	14	225
Mesquite Valley	10	163
Middle Reese River Valley	4	58
Monitor Valley	10	140
Mono Valley	10	112
Monte Cristo Valley	10	136
Montello-Crittenden Creek Area	11	189D
Montello Valley	11	189D
Mosquito Valley	1	12
Muddy River Springs Area	13	219
Mud Meadow	2	26
Newark Valley	10	154
Newcomb Lake Valley	7	96
North Fork Area	4	44
Oasis Valley	14	228
Oreana Subarea	4	73A
Oriental Wash	14	232
Orovada Subarea	2	33A
Owyhee River Area	3	37

Table 2.--Continued

Hydrographic area	Hydrographic region or basin number on index map	Area number on map and table 1
Pahranagat Valley	13	209
Pahroc Valley	13	208
Pahrump Valley	10	162
Painters Flat	2	18
Panaca Valley	13	203
Papoose Lake Valley	10	158B
Paradise Valley	4	69
Patterson Valley	13	202
Penoyer Valley	10	170
Pequop Valley (see Independence Valley)	10	183
Pilgrim Flat	2	17
Pilot Creek Valley	11	191
Pine Forest Valley	2	29
Pine Valley	4	53
Piute Valley	13	214
Pleasant Valley	11	194
Pleasant Valley	10	130
Pleasant Valley	6	88
Pueblo Valley	1	1
Pumpernickel Valley	4	65
Pyramid Lake Valley	6	81
Queen Valley	10	116
Quinn River Valley	2	33
Railroad Valley	10	173
Ralston Valley	10	141
Rawhide Flats	10	123
Red Rock Valley	7	99
Reveille Valley (see Hot Creek and Railroad Valleys)	10	156,173A
Rhodes Salt Marsh Valley	10	119
Rio King Subarea	2	30A
Rock Valley	14	226
Rock Creek Valley	4	62
Rocky Butte Area	11	189C
Rose Valley	13	199
Ruby Valley	10	176
Sage Hen Valley	1	5
Salmon Falls Creek Area	3	40
Sand Spring Valley (see Penoyer Valley)	10	170
Sandy Valley (see Mesquite Valley)	10	163
San Emidio Desert	2	22
Sano Valley	2	20
Sarcobatus Flat	10	146
Schurz Subarea	9	110A
Silver State Valley	2	32
Skedaddle Creek Valley	7	98
Smith Creek Valley	10	134
Smith Valley	9	107
Smoke Creek Desert	2	21
Snake Valley	11	195
Soda Spring Valley	10	121
Sod House Subarea	2	30B
South Fork Area	4	46
South Fork Owyhee River Area	3	35
Spanish Springs Valley	6	85
Spring Valley	10	184
Spring Valley	13	201
Starr Valley Area	4	43
Steptoe Valley	10	179
Stevens Basin	10	152
Stingaree Valley	10	125
Stone Cabin Valley	10	149
Stonewall Flat	10	145
Summit Lake Valley	2	27
Sun Valley	6	86
Surprise Valley	1	14
Susie Creek Area	4	50
Swan Lake Valley	1	7
Teels Marsh Valley	10	114
Thousand Springs Valley	11	189
Three Lakes Valley, northern part	10	168
Three Lakes Valley, southern part	13	211
Tikapoo (Tickaboo) Valley	10	169
Tippett Valley	10	185
Toano-Rock Spring Area	11	189B
Tonopah Flat	10	137A
Tracy Segment	6	83
Truckee Canyon Segment	6	91
Truckee Meadows	6	87

Table 2.--Continued

Hydrographic area	Hydrographic region or basin number on index map	Area number on map and table 1
Tule Desert	13	221
Upper Moapa Valley (see Muddy River Springs Area)	13	219
Upper Reese River Valley	4	56
Virgin River Valley	13	222
Virgin Valley	1	4
Walker Lake Valley	9	110
Warm Springs Valley	6	84
Warner Valley	1	13
Washoe Valley	6	89
Whirlwind Valley	4	60
Whiskey Flat-Hawthorne Subarea	9	110C
White Plains	4	74
White River Valley	13	207
Willow Creek Valley	4	63
Winnemucca Lake Valley	6	80
Winnemucca Segment	4	70
Yucca Flat	10	159

Table 3.--County listing of hydrographic areas

Containment within county: P, partially in county; E, entirely in county

Area number on map	Hydrographic area	Containment within county
	CHURCHILL COUNTY (17 areas)	
	Humboldt River Basin	
73	Lovelock Valley	P
74	White Plains	P
	West Central Region	
75	Bradys Hot Springs Area	P
76	Fernley Area	P
77	Fireball Valley	E
78	Granite Springs Valley	P
	Carson River Basin	
101	Carson Desert	P
102	Churchill Valley	P
	Central Region	
122	Gabbs Valley	P
123	Rawhide Flats	P
124	Fairview Valley	P
125	Stingaree Valley	E
126	Cowkick Valley	E
127	Eastgate Valley	E
128	Dixie Valley	P
129	Buena Vista Valley	P
133	Edwards Creek Valley	P
	CLARK COUNTY (26 areas)	
	Central Region	
160	Frenchman Flat	P
161	Indian Springs Valley	P
162	Pahrump Valley	P
163	Mesquite Valley	E
164	Ivanpah Valley	
A	Southern part	E
B	Northern part	E
165	Jean Lake Valley	E
166	Hidden Valley (South)	E
167	Eldorado Valley	E
168	Three Lakes Valley, northern part	P
169	Tikapoo Valley	P
	Colorado River Basin	
205	Lower Meadow Valley Wash	P
210	Coyote Spring Valley	P
211	Three Lakes Valley, southern part	E
212	Las Vegas Valley	E
213	Colorado River Valley	E
214	Piute Valley	E
215	Black Mountains Area	E
216	Garnet Valley	E
217	Hidden Valley (North)	E
218	California Wash Area	E
219	Muddy River Springs Area	E
220	Lower Moapa Valley	P
222	Virgin River Valley	P
223	Gold Butte Area	E
224	Greasewood Basin	E
	DOUGLAS COUNTY (7 areas)	
	Truckee River Basin	
90	Lake Tahoe Basin	P
	Carson River Basin	
102	Churchill Valley	P
103	Dayton Valley	P
104	Eagle Valley	P
105	Carson Valley	P
	Walker River Basin	
106	Antelope Valley	E
107	Smith Valley	P
	ELKO COUNTY (45 areas)	
	Snake River Basin	
34	Little Owyhee River Area	P
35	South Fork Owyhee River Area	E
36	Independence Valley	E
37	Owyhee River Area	E
38	Bruneau River Area	E
39	Jarbidge River Area	E

Table 3.--Continued

Area number on map	Hydrographic area	Containment within county
	ELKO COUNTY (continued)	
	Snake River Basin (continued)	
40	Salmon Falls Creek Area	E
41	Goose Creek Area	E
	Humboldt River Basin	
42	Marys River Area	E
43	Starr Valley Area	E
44	North Fork Area	E
45	Lamoille Valley	E
46	South Fork Area	E
47	Huntington Valley	P
48	Dixie Creek-Tenmile Creek Area	E
49	Elko Segment	P
50	Susie Creek Area	E
51	Maggie Creek Area	P
52	Marys Creek Area	P
53	Pine Valley	P
61	Boulder Flat	P
62	Rock Creek Valley	P
63	Willow Creek Valley	E
64	Clovers Area	P
66	Kelly Creek Area	P
67	Little Humboldt Valley	P
	Central Region	
153	Diamond Valley	P
175	Long Valley	P
176	Ruby Valley	P
177	Clover Valley	E
178	Butte Valley	
A	Northern part	E
B	Southern part	P
179	Steptoe Valley	P
186	Antelope Valley	
A	Southern part	P
B	Northern part	P
187	Goshute Valley	E
188	Inuependence Valley (Pequop Valley)	E
	Great Salt Lake Basin	
189	Thousand Springs Valley	
A	Merrell Siding-Brush Creek Area	E
B	Toano-Rock Spring Area	E
C	Rocky Butte Area	E
D	Montello-Crittenden Creek Area	E
190	Grouse Creek Valley	E
191	Pilot Creek Valley	E
192	Great Salt Lake Desert	E
193	Deep Creek Valley	E
	ESMERALDA COUNTY (12 areas)	
	Central Region	
116	Queen Valley	P
117	Fish Lake Valley	E
118	Columbus Salt Marsh Valley	P
136	Monte Cristo Valley	P
137	Big Smoky Valley	
A	Tonopah Flat	P
141	Ralston Valley	P
142	Alkali Spring Valley	P
143	Clayton Valley	E
144	Lida Valley	P
146	Sarcobatus Flat	P
	Death Valley Basin	
231	Grapevine Canyon	E
232	Oriental Wash	E
	EUREKA COUNTY (16 areas)	
	Humboldt River Basin	
49	Elko Segment	P
51	Maggie Creek Area	P
52	Marys Creek Area	P
53	Pine Valley	P
54	Crescent Valley	P
59	Lower Reese River Valley	P
60	Whirlwind Valley	P
61	Boulder Flat	P
62	Rock Creek Valley	P

Table 3.--Continued

Area number on map	Hydrographic area	Containment within county
	EUREKA COUNTY (continued)	
	Central Region	
138	Grass Valley	P
139	Kobeh Valley	P
140	Monitor Valley	
A	Northern part	P
151	Antelope Valley	P
152	Stevens Basin	E
153	Diamond Valley	P
155	Little Smoky Valley	
A	Northern part	P
	HUMBOLDT COUNTY (29 areas)	
	Northwest Region	
1	Pueblo Valley	E
2	Continental Lake Valley	E
3	Gridley Lake Valley	E
4	Virgin Valley	P
5	Sage Hen Valley	E
6	Guano Valley	P
7	Swan Lake Valley	P
	Black Rock Desert Region	
24	Hualapai Flat	P
25	High Rock Lake Valley	P
26	Mud Meadow	E
27	Summit Lake Valley	E
28	Black Rock Desert	P
29	Pine Forest Valley	E
30	Kings River Valley	
A	Rio King Subarea	E
B	Soda House Subarea	E
31	Desert Valley	P
32	Silver State Valley	E
33	Quinn River Valley	
A	Orovada Subarea	E
B	McDermitt Subarea	E
	Snake River Basin	
34	Little Owyhee River Area	P
	Humboldt River Basin	
64	Clovers Area	P
65	Pumpernickel Valley	P
66	Kelly Creek Area	P
	Snake River Basin (continued)	
67	Little Humboldt Valley	P
68	Hardscrabble Area	E
69	Paradise Valley	E
70	Winnemucca Segment	E
71	Grass Valley	P
	Central Region	
131	Buffalo Valley	P
	LANDER COUNTY (19 areas)	
	Humboldt River Basin	
54	Crescent Valley	P
55	Carico Lake Valley	E
56	Upper Reese River Valley	P
57	Antelope Valley	E
58	Middle Reese River Valley	E
59	Lower Reese River Valley	E
60	Whirlwind Valley	P
61	Boulder Flat	P
62	Rock Creek Valley	P
64	Clovers Area	P
	Central Region	
128	Dixie Valley	P
131	Buffalo Valley	P
132	Jersey Valley	P
133	Edwards Creek Valley	P
134	Smith Creek Valley	P
137	Big Smoky Valley	
B	Northern part	P
138	Grass Valley	P
139	Kobeh Valley	P
140	Monitor Valley	
A	Northern part	P
	LINCOLN COUNTY (34 areas)	
	Central Region	
158	Emigrant Valley	
A	Groom Lake Valley	P
B	Papoose Lake Valley	P
160	Frenchman Flat	P
161	Indian Springs Valley	P

Table 3.--Continued

Area number on map	Hydrographic area	Containment within county
	LINCOLN COUNTY (continued)	
	Central Region (continued)	
168	Three Lakes Valley, northern part	P
169	Tikapoo Valley	
170	Penoyer Valley	P
171	Coal Valley	P
172	Garden Valley	P
173	Railroad Valley	
A	Southern part	P
B	Northern part	P
180	Cave Valley	P
181	Dry Lake Valley	E
182	Delamar Valley	E
183	Lake Valley	P
184	Spring Valley	P
	Great Salt Lake Basin	
196	Hamlin Valley	P
	Escalante Desert Basin	
197	Escalante Desert	E
	Colorado River Basin	
198	Dry Valley	E
199	Rose Valley	E
200	Eagle Valley	E
201	Spring Valley	E
202	Patterson Valley	E
203	Panaca Valley	E
204	Clover Valley	E
205	Lower Meadow Valley Wash	P
206	Kane Springs Valley	E
207	White River Valley	P
208	Pahroc Valley	P
209	Pahranagat Valley	E
210	Coyote Spring Valley	P
220	Lower Moapa Valley	P
221	Tule Desert	E
222	Virgin River Valley	P
	LYON COUNTY (11 areas)	
	West Central Region	
75	Bradys Hot Springs Area	P
76	Fernley Area	P
	Truckee River Basin	
83	Tracy Segment	P
	Carson River Basin	
101	Carson Desert	P
102	Churchill Valley	P
103	Dayton Valley	P
	Walker River Basin	
107	Smith Valley	P
108	Mason Valley	P
109	East Walker Area	P
110	Walker Lake Valley	
A	Schurz Subarea	P
	Central Region	
123	Rawhide Flats	P
	MINERAL COUNTY (23 areas)	
	Walker River Basin	
108	Mason Valley	P
109	East Walker Area	P
110	Walker Lake Valley	
A	Schurz Subarea	P
B	Lake Subarea	E
C	Whiskey Flat-Hawthorne Subarea	E
	Central Region	
111	Alkali Valley	
A	Northern part	E
B	Southern part	E
112	Mono Valley	E
113	Huntoon Valley	E
114	Teels Marsh Valley	E
115	Adobe Valley	E
116	Queen Valley	P
118	Columbus Salt Marsh Valley	P
119	Rhodes Salt Marsh Valley	E
120	Garfield Flat	E
121	Soda Spring Valley	
A	Eastern part	E
B	Western part	E
122	Gabbs Valley	P

Table 3.--Continued

Area number on map	Hydrographic area	Containment within county
	MINERAL COUNTY (continued)	
	Central Region (continued)	
123	Rawhide Flats	P
124	Fairview Valley	P
135	Ione Valley	P
136	Monte Cristo Valley	P
137	Big Smoky Valley	
A	Tonopah Flat	P
	NYE COUNTY (44 areas)	
	Humboldt River Basin	
56	Upper Reese River Valley	P
	Central Region	
122	Gabbs Valley	P
134	Smith Creek Valley	P
135	Ione Valley	P
137	Big Smoky Valley	
A	Tonopah Flat	P
B	Northern part	P
140	Monitor Valley	
A	Northern part	P
B	Southern part	E
141	Ralston Valley	P
142	Alkali Spring Valley	P
144	Lida Valley	P
145	Stonewall Flat	E
146	Sarcobatus Flat	P
147	Gold Flat	E
148	Cactus Flat	E
149	Stone Cabin Valley	E
150	Little Fish Lake Valley	E
151	Antelope Valley	P
155	Little Smoky Valley	
A	Northern part	P
B	Central part	E
C	Southern part	E
156	Hot Creek Valley	E
157	Kawich Valley	E
158	Emigrant Valley	
A	Groom Lake Valley	P
B	Papoose Lake Valley	P
159	Yucca Flat	E
160	Frenchman Flat	P
	Central Region (continued)	
161	Indian Springs Valley	P
162	Pahrump Valley	P
170	Penoyer Valley	P
171	Coal Valley	P
172	Garden Valley	P
173	Railroad Valley	
A	Southern part	P
B	Northern part	P
	Colorado River Basin	
207	White River Valley	P
208	Pahroc Valley	P
	Death Valley Basin	
225	Mercury Valley	E
226	Rock Valley	E
227	Fortymile Canyon	
A	Jackass Flats	E
B	Buckboard Mesa	E
228	Oasis Valley	E
229	Crater Flat	E
230	Amargosa Desert	E
231	Grapevine Canyon	P
	ORMSBY COUNTY (4 areas)	
	Truckee River Basin	
90	Lake Tahoe Basin	P
	Carson River Basin	
103	Dayton Valley	P
104	Eagle Valley	P
105	Carson Valley	P
	PERSHING COUNTY (19 areas)	
	Black Rock Desert	
22	San Emidio Desert	P
24	Hualapai Flat	P
28	Black Rock Desert	P
31	Desert Valley	P

Table 3.--Continued

Area number on map	Hydrographic area	Containment within county
	PERSHING COUNTY (continued)	
	Humboldt River Basin	
65	Pumpernickel Valley	P
71	Grass Valley	P
72	Imlay Area	E
73	Lovelock Valley	P
A	Oreana Subarea	E
74	White Plains	P
	West Central Region	
78	Granite Springs Valley	P
79	Kumiva Valley	E
	Truckee River Basin	
80	Winnemucca Lake Valley	P
	Carson River Basin	
101	Carson Desert	P
	Central Region	
128	Dixie Valley	P
129	Buena Vista Valley	P
130	Pleasant Valley	E
131	Buffalo Valley	P
132	Jersey Valley	P
	STOREY COUNTY (4 areas)	
	West Central Region	
76	Fernley Area	P
	Truckee River Basin	
83	Tracy Segment	P
	Carson River Basin	
102	Churchill Valley	P
103	Dayton Valley	P
	WASHOE COUNTY (45 areas)	
	Northwest Region	
4	Virgin Valley	P
6	Guano Valley	P
7	Swan Lake Valley	P
8	Massacre Lake Valley	E
9	Long Valley	E
10	Macy Flat	E
	Northwest Region (continued)	
11	Coleman Valley	E
12	Mosquito Valley	E
13	Warner Valley	E
14	Surprise Valley	E
15	Boulder Valley	E
16	Duck Lake Valley	E
	Black Rock Desert	
17	Pilgrim Flat	E
18	Painters Flat	E
19	Dry Valley	E
20	Sano Valley	E
21	Smoke Creek Desert	E
22	San Emidio Desert	P
23	Granite Basin	E
24	Hualapai Flat	P
25	High Rock Lake Valley	P
28	Black Rock Desert	P
	West Central Region	
76	Fernley Area	P
	Truckee River Basin	
80	Winnemucca Lake Valley	P
81	Pyramid Lake Valley	E
82	Dodge Flat	E
83	Tracy Segment	P
84	Warm Springs Valley	E
85	Spanish Springs Valley	E
86	Sun Valley	E
87	Truckee Meadows	E
88	Pleasant Valley	E
89	Washoe Valley	E
90	Lake Tahoe Basin	P
91	Truckee Canyon Segment	E
	Western Region	
92	Lemmon Valley	
A	Western part	E
B	Eastern part	E
93	Antelope Valley	E
94	Bedell Flat	E
95	Dry Valley	E
96	Newcomb Lake Valley	E

Table 3.--Continued

Area number on map	Hydrographic area	Containment within county
	WASHOE COUNTY (continued)	
	Western Region (continued)	
97	Honey Lake Valley	E
98	Skedaddle Creek Valley	E
99	Red Rock Valley	E
100	Cold Spring Valley	E
	WHITE PINE COUNTY (20 areas)	
	Humboldt River Basin	
47	Huntington Valley	P
	Central Region	
154	Newark Valley	E
155	Little Smoky Valley	
A	Northern part	P
173	Railroad Valley	
B	Northern part	P
174	Jakes Valley	E
175	Long Valley	P
176	Ruby Valley	P
178	Butte Valley	
B	Southern part	P
179	Steptoe Valley	P
180	Cave Valley	P
183	Lake Valley	P
184	Spring Valley	P
185	Tippett Valley	E
186	Antelope Valley	
A	Southern part	P
B	Northern part	P
	Great Salt Lake Basin	
193	Deep Creek Valley	P
194	Pleasant Valley	E
195	Snake Valley	E
196	Hamlin Valley	P
	Colorado River Basin	
207	White River Valley	P

INDEX MAP OF NEVADA SHOWING HYDROGRAPHIC REGIONS AND BASINS

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4. HUMBOLDT RIVER BASIN
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╛ NONCONTRIBUTING PART OF THE COLORADO RIVER BASIN

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STATE OF NEVADA
HYDROGRAPHIC AREAS

PREPARED BY
DIVISION OF WATER RESOURCES
STATE ENGINEERS OFFICE

SCALE 1:500,000
1 INCH EQUALS APPROXIMATELY 8 MILES
10 0 10 20 30 40 MILES
10 0 10 20 30 40 50 KILOMETERS

CONTOUR INTERVAL 500 FEET
DATUM IS MEAN SEA LEVEL

LEGEND

BOUNDARY OF HYDROGRAPHIC REGIONS
BOUNDARY OF HYDROGRAPHIC AREAS (DOTTED WHERE ARBITRARY)

COMPILED BY;
J.L. CARDINALLI
L.M. ROACH
F.E. RUSH
B.J. VASEY

DRAWN BY;
L.M. ROACH

COMPLETED
JANUARY 1968

REVISED
SEPTEMBER 1968

BASE: U.S.G.S. TOPOGRAPHIC MAP OF NEVADA, EDITION OF 1965.

PREPARED WITH THE COOPERATION OF THE GEOLOGICAL SURVEY, U.S. DEPARTMENT OF INTERIOR

Exhibit 14

Case No. CV1204049
Dept. 1

IN THE SEVENTH JUDICIAL DISTRICT COURT OF THE STATE OF NEVADA

IN AND FOR THE COUNTY OF WHITE PINE

WHITE PINE COUNTY and CONSOLIDATED CASES, E.T.. al.,

Plaintiffs,

vs.

DECISION

JASON KING, P.E., NEVADA STATE ENGINEER, STATE OF NEVADA, DIVISION OF WATER RESOURCES,

Defendant.

_____/

This matter is an appeal from the Nevada State Engineer, Jason Kings' rulings 6164, 6165, 6166 and 6167 concerning the grant of water rights to Southern Nevada Water Authority in Spring Valley (Lincoln and White Pine Counties), Cave Valley, Dry Lake Valley and Delarmar Valley.

Petitioners include the Great Basin Water Network, (GBWN),[1] White Pine County, Nevada, Millard and Juab County, Utah, Ely Shoshone and Duckwater Shoshone Tribes, Confederate Tribe of the Goshute Reservation and the Presiding Bishop of the Churchill of Latter-Day Saints on behalf of the Cleveland Ranch.

As explained below, the State Engineer's rulings is remanded: for recalculation of water available from the respective basins; for additional hydrological study of Delamar, Dry

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[1] GBWN is a non-profit corporation formed by over fifty individuals and related conservation groups.

Lake and Cave Valley; and to establish standards for mitigation in the event of a conflict with existing water rights or unreasonable effects to the environment or the public interest.

I
HISTORY

In 1989, Las Vegas Valley Water District applied for unappropriated water in hydrographic basins 180, 181, 182 and 184; Cave Valley, Dry Lake, Delamar Valley and Spring Valley respectively. In 1991, the current real party in interest, South Nevada Water Authority (SNWA) became the successor in interest to the Las Vegas Valley Water District.

Several protests were filed against the application in July of 1989. The Nevada State Engineer (Engineer) was required to rule on the application within one-year of the protest's filing date. NRS 533.370(2). The applications were not ruled on within one-year, however, hearings on the application were held in 2006. By 2006, the water rights had changed hands many times and few right holders received notice of the 2006 hearings. Great Basin Water Network v Nevada State Eng'r, 126 Nev. Adv. Op. 20, 234 P.3d 912 (2010).[2]

Prior to the 2006 hearings, The National Park Service, Bureau of Fish and Wildlife, Bureau of Land Management (BLM) and the Bureau of Indian Affairs (BIA) were actively protesting the orders granting water rights to SNWA: All of these entities are divisions of the Department of the Interior. ROA 000007. Each entity entered into an agreement with SNWA, withdrawing their protests in exchange for implementation of a hydrologic and biologic Monitoring, Management and Mitigation plan. ROA 000012; 020791; 020806; Ex. SE 041. This plan's stipulation was affirmed prior to the 2011 hearings, Id. and later revised to the current plan approved by the Engineer. Certain specifics of this agreement will be addressed later in this order. The Engineer is not a party to the stipulation, but has approved of the agreement and incorporated its terms into his rulings. ROA 000103-000106.

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[2] Subsequently, the Engineer's orders were vacated, new notices were sent, and the hearings rescheduled for September and November, 2011.

After the Fall 2011 hearings, the Engineer approved 61,127 acre-feet annually (afa) to SNWA from Spring Valley and reserving 4,000 afa for future growth in Order 6164 (March, 2012). ROA 000216. Other terms of the Order include:

A. First stage pumping is limited to 38,000 afa for eight years, data to be collected, modelled reported to the Engineer annually.

B. Stage two pumping shall be limited to 50,000 afa for a minimum of eight years with the data collection and modelling to be reported annually.

C. Stage three, SNWA will be allowed to pump the full 61,127 afa.

Id.

Further, the Enginner must approve each stage of pumping and SNWA must comply with the MMM plan prepared by SNWA and approved by the Engineer. ROA 000216-000217.

Orders 6165, 6166 and 6167 concern the water rights granted to SNWA in Cave Valley, Dry Lake Valley and Delamar Valley respectively. All three orders condition the water grants as Compliance with the Hydrologic MMM plan prepared by SNWA and the Biological Monitoring plan. ROA 00387-8; 000551; 00713-4. The MMM plan shall be subject to modification by the Engineer. SNWA must report annually and provide 10-25-100 year predictive models to the Engineer.

The Cave Valley appropriation is 5,235 afa with 50 afa reserved for future growth. Dry Lake Valley's appropriation is 11,584 afa, 50 afa for future growth. Delamar Valley's appropriation is 6,042 afa and 50 afa for future growth. Id.

The four rulings by the Engineer represent the largest water appropriations in Nevada history. The water basins concerned including Spring, Cave, Dry Lake and Delamar Valleys encompass 20,688 square miles of Nevada. ROA 000125.

The basins size has been compared to New England, encompassing great portions of Vermont, New Hampshire, Massachusetts, Connecticut and some of New York.

SNWA Ex. 339, ROA 020181. It is likely the largest interbasin transfer of water in U.S. history.

II
AUTHORITY AND OBLIGATIONS OF THE STATE ENGINEER

The Engineer "[s]hall approve an application submitted in proper form which contemplates the application to beneficial use if:"

(a) The application is accompanied by the prescribed fee;

(b) The proposed use or change, if within an irrigation district, does not adversely affect the cost of water for other holders of water rights in the district or lessen the efficiency of the district in its delivery or use of water; and

(c) The applicant provides proof satisfactory to the State Engineer of the applicant's:

(1) Intention is good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence; and
(2) Financial ability and reasonable expectation actually to construct the work and apply the water to the intended beneficial use with reasonable diligence.

NRS 533.370 (1).

Additionally, the Engineer must determine;

1. Whether there is unappropriated water;

2. Whether the proposed use will conflict with existing rights and/or domestic wells; or
(a) If the appropriation threatens to prove detrimental to the public interest,

"The State Engineer shall reject the application" NRS 533.370 (2).

The Engineer must also consider:

(a) Whether the applicant has justified the need to import the water from another basin.

(b) If the State Engineer determines that a plan for conservation of water is advisable for the basin into which the water is to be imported, whether the applicant has demonstrated that such a plan has been adopted and is being effectively carried out;

(c) Whether the proposed action is environmentally sound as it relates to the basin from which the water is exported;

(d) Whether the proposed action is an appropriate long-term use which will not unduly limit the future growth and development to the basin from which the water is exported; and

(e) Any other factor the State Engineer determines to be relevant.

NRS 533.370(3).

III
STANDARD OF REVIEW

After the Engineer issues the rulings, an aggrieved party is entitled to have the order or decision reviewed by the District Court, in the nature of an appeal. NRS 533.450. On a petition for judicial review, the Court is confined to considering the administrative record. NRS 533.450 (1). The proceedings in every case must be heard by the Court, and must be informal and a summary, but a full opportunity to be heard must be had before judgment is pronounced. NRS 533.450 (2).

In reviewing the record, the Court must treat the State Engineer's decision as "prima facie correct, and the burden of proof shall be upon the party" challenging the decision. NRS 533.450 (9). The Court may not substitute its judgment for that of the State Engineer, but is limited to determining whether there is substantial evidence in the record to support the decision. Revert v. Ray, 95 Nev. 782, 786, 603 P.2d 262, 264 (1979). Substantial evidence is "that which a reasonable mind might accept as adequate to support a conclusion." Bacher v. Office of the State Eng'r of Nev., 122 Nev. 1110, 1121, 146 P.3d 793, 800 (2006).

> [A] conclusion that substantial evidence supports the findings of the State Engineer does not, however, dispose of the . . . appeal. The applicable standard of review of the decisions of the State Engineer, limited to an inquiry as to substantial evidence, presupposes the fullness and fairness of the administrative proceedings: all interested parties must have had a "full opportunity to be heard," *See* NRS 533.450 (2); the State Engineer must clearly resolve all the crucial issues presented, *see Nolan v. State Dep't of Commerce,* 86 Nev. 428, 470 P.2d 124 (1970) (on rehearing); the decision maker must prepare findings in sufficient detail to permit judicial review, *id.; Wright v State*

> *Insurance Commissioner, 449 P.2d 419 (Or. 1969)*; see also *NRS 233B.125*. When these procedures, grounded in basic notions of fairness and due process, are not followed, and the resulting administrative decision is arbitrary, oppressive, or accompanied by a manifest abuse of discretion, this court will not hesitate to intervene. *State ex rel. Johns v. Gragson, 85 Nev. 478, 515 P.2d 65 (1973).*

Revert, 95 Nev. At 786, 603 P.2d at 264.

The Court is free to decide purely legal questions de novo. Town of Eureka v. Office of the State Eng'r of Nev., 108 Nev. 163, 165, 626 P.2d 948, 949 (1992). A purely legal question is one that is not dependant (sic) upon, and must necessarily be resolved without reference to, any fact in the case. Beavers v Department of Motor Vehicles & Pub. Safety, 109 Nev. 435, 438 n.1, 851 P.2d 432, 434 n.1 (1993). While the State Engineer's interpretation of law is persuasive, and the court should give it great deference when it is within the language of the applicable statutory provisions, it is not controlling. Town of Eureka, 108 Nev. at 165, 826 P.2d at 950; Andersen Family Assocs., v Ricci, 124 Nev. Adv. Rep. 17, 179 P.3d 1201, 1203 (2008).

IV

NEVADA ENGINEERS' RULINGS COMMON TO SPRING, DELAMAR, CAVE AND DRY LAKE VALLEY

"The State Engineer held a hearing on the Spring, Cave, Dry Lake and Delamar Valley application between September 26, 2011, and November 18, 2011." ROA 000010. NRS 533.370 (1) (c); (2) and (3) requires findings that water is available to be appropriated and that the statutory criteria for granting the water is satisfied by substantial evidence. "Both the Applicant [SNWA] and protestants submitted thousands of pages of scientific information, evidence and testimony for consideration during a record-long six-week hearing." ROA 000029.

The Engineer made the following findings of fact:

> That Southern Nevada provided substantial evidence of need for additional water "independent of the Colorado River," ROA 000037, and that "current available supplies [are] insufficient to meet projected future water demands under normal conditions." ROA 000038.
>
> That Southern Nevada provided substantial evidence that it "intends to construct the works necessary and put water from the applications to beneficial use . . . with reasonable diligence." ROA 000046.
>
> That Southern Nevada provided substantial evidence of financial ability and a "feasible conceptual plan of development. ROA 000047.

These findings were opposed by many of the Protestants and countered with expert opinions. However, there is no real question that the Engineer's findings above were not based on substantial evidence acceptable to a reasonable mind. Further, the Protestants had a full and fair opportunity to present their evidence. Thus, the Engineer's findings were not arbitrary or capricious.

V
OBJECTIONS MADE BY PROTESTANTS

Virtually all of the Protestants which include Cleveland Ranch (Corp. of the Church of Latter-Day Saints), White Pine, Eureka, Elko, and Nye counties, Nevada, The Confederate Tribes of the Goshute Reservation, Ely and Duckwater Shoshone Tribes and Millard and Juab counties, Utah, object to the Engineer's orders on the basis of the Monitor, Manage and Mitigate Plan (MMM). The Protestants allege that as the plan is currently written it cannot adequately protect existing rights or the environment.

Most of the Protestants object to the Orders alleging that any amount of water awarded to SNWA is excessive or should not be granted at all, citing to evidence and arguments presented to the Engineer at the 2011 hearings. Essentially, the objections are that the award is neither environmentally sound nor in the public interest, pursuant to NRS 533.370. The objections are either relating to the entire Spring Valley Basin and/or Delamar,

Cave or Dry Lake Valleys, or localized areas inhabited or used by the Ely, Duckwater and Goshute Native Americans.

Other, more specific objections are that NRS 533.3705 (which allows staged development of a water award) is inapplicable to the instant case because the statute is not retroactive to SNWA's 1989 application; and that hydrological knowledge of the respective basins is so incomplete that any water award is premature and; that the perennial yield of Delamar, Dry Lake, and Cave Valley, as part of the White Pine River Flow System is already appropriated in the lower parts of the flow system.

Some of the Protestants argue that SNWA failed to meet its burden of proving need, good faith intentions to construct the infrastructure, and financial ability to perform the construction. As stated above, this court finds the Engineer's ruling valid regarding need, good faith and financial ability.

Regarding the argument that NRS 533.3705, allowing staged development, does not apply retroactively, as interpretation is a matter of law, this court finds that NRS 533.3705 does apply in this case. Enacted in 2007 the law states "[u]pon approval of an application to appropriate water, the State Engineer may limit the initial use of water to a quantity that is less that the total amount approved for the application." The applications in question were approved in March, 2012, after the enactment of the statute. *See generally* PEBP v LVMPD, 124 Nev. 138 (2008).

Millard and Juab counties, Utah, object that Ruling 6164 does not specifically include Snake Valley, Utah in the mitigation process. Snake Valley is specifically to be monitored by six (6) wells and sixteen (16) monitoring sites. ROA 000114-115. Snake Valley, Utah is not specifically mentioned as a mitigation site. Whether the omission was inadvertent or not, Ruling 6164 is remanded to include Snake Valley, Utah in the mitigation plan.

The Confederated Tribes of the Goshute Reservation argue that pursuant to the Public Trust Doctrine, the Spring Valley awards must be vacated.

> If the current law governing the water Engineer does not clearly direct the Engineer to continuously consider in the course of his work the public's interest in Nevada's natural water resources, the law is deficient. It is then appropriate, if not our constitutional duty, to expressly reaffirm the Engineer's continuing responsibility as a public trustee to allocate and supervise water rights so that the appropriations do not substantially impair the public interest in the lands and waters remaining. [The public trust] is an affirmation of the duty of the state to protect the people's common heritage of streams, lakes, marshlands, and tidelands, surrendering that right of protection only in rare cases when the abandonment of that right is consistent with the purposes of the trust. Our dwindling natural resources deserve no less.

Lawrence v Clark County, 127 Nev. Adv. Op. 32, 254 P.2d. 606, 611 (2011).

The Goshute's argument is well taken, but whether Spring Valley groundwater is part of the Public Trust Doctrine or not, Nevada law requires the Engineer to oversee an environmentally sound stewardship of the water, the same goal as the doctrine.

VI
SPRING VALLEY APPROPRIATIONS

A. THE AWARD OF 61,127 AFA VIOLATES THE STATE ENGINEER'S RULES

The Engineer relied on substantial evidence, produced from numerous sources, when determining the amount of water available for the Spring Valley appropriation granted to SNWA. ROA 000057-000090. Considering the evidence of evapotranspiration, inter-basin flow and recharge, the Engineer found 84,000 afa available. ROA 000090. Further, he found, "there is no substantial evidence that the proposed use will conflict with protectable interests in existing domestic wells, or that the use will threaten to prove detrimental to the public interest." ROA 000215.

The Engineer began his calculation of the Spring Valley appropriation with the "estimated average groundwater evapotranspiration (E.T.)," at 84,100 afa. Thus, the perennial yield of Spring Valley is 84,000 afa. ROA 000214. Existing water rights are 18,873 afa and "an additional 4,000 afa is reserved for future growth and development for a total of

22,873 afa of water committed to the basin. Subtracting 22,873 afa from the perennial yield of 84,000 afa leaves 61,127 afa available for appropriation." ROA 000215.

Perennial yield has been for many years defined by the Engineer as:

> The perennial yield of a groundwater reservoir may be defined as the maximum amount of groundwater that can be salvaged each year over the long term without depleting the groundwater reservoir. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be salvaged for beneficial use. The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is less.

ROA 000056.

In theory, with enough time the water removed from the system equals the recharge of the system thereby reaching equilibrium. However, reaching equilibrium may take hundreds of years, and "always involves the depletion of water from transitional storage." Engineer Ans. Brief, p.54. If more water comes out of a reservoir than goes into the reservoir, equilibrium can never be reached. This is known as water mining and "[w]hile there is no statute that specifically prevents groundwater mining, the policy of the Engineer for over one hundred (100) years has been to disallow groundwater mining. This policy remains today. Id.

The Engineer defines groundwater mining as pumping exceeding the perennial yield over time such that the system never reaches equilibrium. ROA 56. Natural discharge in Spring Valley is almost exclusively E.T. ROA 000057. E.T. occurs by plants and phreatophytes discharging the groundwater from the basin through use. In Spring Valley, this is the water sought for beneficial use. Of course, to do so, the phreatophytes must be completely eliminated. Engineer Ans. Brief, p.53-54.

Obviously, any water-well cannot capture all of the E.T., and while pumping and E.T. are both occurring, the water table drops. A reasonable lowering of the water table and death of most of the phreatophytes is a trade-off for a beneficial use of the water. "It is a condition of each appropriation of groundwater acquired under this Chapter that the right of

the appropriator relates to a specific quantity of water and that the right must allow for a reasonable lowering of the static water level at the appropriator's point of diversion." NRS 534.110(4). The Engineer specifically found "there is no provision in Nevada water law that addresses time to capture, and no State Engineer has required that E.T. be captured within a specific period of time. It will often take a long time to reach near equilibrium in large basins . . . and this is no reason to deny water right applications." ROA 000090. The Engineer is correct that the time to reach equilibrium is not a valid reason to deny the grant of water, but it may very well be a reason to limit the appropriation below the calculated E.T.

Here, there is no valid evidence of when SNWA will capture E.T., if ever. Evidence was submitted at the hearing over many days, the Engineer stated that seventy-five (75) year models of groundwater pumping are appropriate due to "existing data." ROA 000146. However, over seventy-five (75) years becomes less certain. Id. Moreover, the Engineer did not require SNWA to prove that they could capture all of the E.T. SNWA did claim that after two hundred (200) years; their evidence showed that eighty-four (84%) percent of the E.T. would be captured and eighty four percent [is] close to a hundred percent." SNWA Ans. Brief p.288. Simple arithmetic shows that after two hundred (200) years, SNWA pumping and evapotranspiration removes 70,977 afa from the basin with no equilibrium in sight. That is 9,780 afa more than SNWA's grant.

Mr. Stockton, arguing on behalf of the Engineer stated that, "requiring these E.T. salvage projects . . . it's just not appropriate. It can't be done in most basins because the federal government owns the land. They're not going to allow it to be dotted with wells all over the place and the State Engineer found that it wasn't appropriate to require an E.T. salvage project." SE Ans. Brief, Vol. I, p.54. SNWA stated that "[t]he whole question of groundwater mining and E.T. capture and timed equilibrium are not part of the water law and they are not necessary." SNWA Ans. Brief, Vol. I, p.69.

The Engineer acknowledged that it is unlikely all of the E.T. in a basin will be captured. Additionally, "[i]t is unclear where [Cleveland Ranch] got the impression that groundwater development in Nevada is required to be an E.T. salvage project, which is certainly not contained in statutory law." Engineer Ans. Brief, p.54. Perhaps Cleveland Ranch and the other Protestants "got the impression" from the Engineer's definition: "Perennial yield is ultimately limited to the maximum amount of natural discharge that can be salvaged for beneficial use." ROA 000056. Moreover, in the Engineer's Ruling 5726 he defined perennial yield as an "assumption that water lost to natural E.T. can be captured by wells and placed to beneficial use." Cleveland Ranch Opening Brief, App. 1 at 27, citing Ruling 5726. The Nevada Supreme Court stated, "[t]he perennial yield of a hydrological basin is the equilibrium amount or maximum amount of water that can safely be used without depleting the source." *Pyramid Lake Paiute Tribe of Indians v Ricci*, 126 Nev. Adv. Op. 48; 245 P.3d 1146, 1147 (2010).

The Engineer 's finding that equilibrium in Spring Valley water basin will "take a long time" was not based on substantial or reliable evidence, and is incorrect. Indeed, by his own statements – and evidence – equilibrium will never be reached.

The Engineer has also said that "[d]rawdown of less than 50 feet over a seventy-five year period is generally a reasonable lowering of the static water table." ROA 000132. However, after two hundred (200) years of pumping the water table is losing 9,780 afa over and above the amount SNWA has been authorized to pump. SNWA's expert certified that uncaptured E.T. would have to be deducted from the perennial yield. ROA 34928. This, the Engineer did not do.

This Court finds that the Engineer's own calculations and findings, show that equilibrium, with SNWA's present award, will never be reached and that after two hundred (200) years, SNWA will likely capture but eighty-four (84%) of the E.T. Further, this court finds that losing 9,780 afa from the basin, over and above E.T. after 200 years is unfair to

following generations of Nevadans, and is not in the public interest. In violating the Engineer's own standards, the award of 61,127 afa is arbitrary and capricious.

This finding by the court requires that this matter be remanded to the State Engineer for an award less than the calculated E.T. for Spring Valley, Nevada, and that the amended award has some prospect of reaching equilibrium in the reservoir.

B. THERE ARE NO OBJECTIVE STANDARDS AS TO WHEN THE MITIGATION PART OF THE MONITOR, MANAGE AND MITIGATE PLAN GO INTO EFFECT

SNWA's expert reports make it clear that the hydrology of Spring Valley, as well as Delamar, Dry Lake and Cave Valley, is not completely understood. Much of the data collected over the years is analyzed by computer models and is "significantly" limited in accuracy concerning the hydrological framework, actual precipitation, recharge and other factors. ROA 010704; 010708-9. The experts recognize that inaccuracies exist because of a lack of data collection over vast areas of Spring Valley, Delamar, Dry Lake and Cave Valleys. ROA 010706. For example, 10 years of data collection generally means an accurate predictive model for the next 10 years. ROA 000146. Thus, the Engineer has stated that a 75 year model is a reasonable simulation because there are 75 years of existing data. "Over 75 years becomes less certain." Id. "[U]ncertainty is reduced overtime as more baseline and operational data become available." ROA 013244. "Much is not known about the groundwater-influenced ecosystems in the [initial biological monitoring area] (e.g., relationship, between groundwater levels and spring-flow: relative dependence of certain vegetation on groundwater versus other sources of water), and the response of these systems to groundwater withdrawal by SNWA." Biological Monitoring Plan Spring Valley Stipu. ROA 020648.

Recognizing that no one really knows what the impact of pumping water from Spring Valley on such a large scale will be (ROA 000135-6 and 020066), the Engineer found that staged pumping is environmentally sound and will insure no conflicts with existing rights.

ROA 000151. Additionally, the Engineer adopted the MMM Plan created by SNWA and the National Park Service, Bureau of Fish and Wildlife, and the Bureau of Indian Affairs. A description of the plan is contained in State Engineer's Order No. 6164. ROA 000103-120.

The MMM plan is a stipulation between SNWA and Federal agencies (supra). In summary, SNWA's pumping will be managed to avoid "unreasonable harm to scenic values" in the Great Basin National Park and the "loss of surface vegetation." ROA 020496. The three principal components are:

> *Monitoring Requirements* – including, but not limited to monitoring wells, spring flow measurements, water chemistry analyses, quality control procedures, and reporting requirements; and
>
> *Management Requirements* – including, but not limited to the creation of a Technical Review Panel ("TRP") to review information collected under this Plan and advise the Executive Committee (a group consisting of one management-level person from each Party, as described below in Management Requirements), the use of an agreed-upon regional groundwater flow system numerical model(s) to predict effects of groundwater withdrawals by SNWA in the Spring Valley HB, and the establishment of a consensus-based decision-making process; and
>
> *Mitigation Requirements* – including, but not limited to the modification relocation or reduction in points of diversion and/or rates and quantities of groundwater withdrawals or the augmentation of Federal Water Rights and/or Federal Resources as well as measures designed and calculated to rehabilitate, repair or replace any and all Federal Water Rights and Resources if necessary to achieve the goals set forth in Recital G of the Stipulation.

ROA 20791.

Similarly, the Biologic Monitoring, Management and Mitigation Plan has been instituted to "determine the appropriate course of action to avoid and/or mitigate any effects to Water-dependent Ecosystems . . . within the Great Basin National Park [and other Federal] 'Areas of Interest.'" ROA 020806. The Biologic monitoring is to "determine potential indicator species and appropriate parameters to monitor for early warning of unreasonable adverse effects and of any effect within the boundaries of Great Basin National Park . . .

resulting from SNWA's withdrawal of ground water from the Spring Valley HB." Id. The Mitigation portion of the Plan briefly describes what could possibly be done to mitigate unreasonable effects. Id.

Appendix B of NSE Ruling 5726 contains objectives 6, 7, and 8 of the "Plan":

> 6. During the Pre-Withdrawal Phase, establish the range of variation for each indicator (or suite of indicators) that will be considered acceptable.
>
> 7. Define what constitutes an "unreasonable adverse effect" during the Pre-Withdrawal Phase.
>
> 8. In coordination with TRP, during the Pre-Withdrawal Phase, establish criteria that will initiate the BWG consultation process as outlined in the Stipulation.
>
> The Stipulation directs there be no "unreasonable adverse effect" to groundwater-influenced ecosystems in the IBMA and no adverse effect to GBNP as a result of SNWA's groundwater withdrawal in Spring Valley. In order to meet these requirements, it is imperative that impacts are detected and assessed, and appropriate management actions are initiated, prior to such effect occurring.

ROA 020647.

As noted above, the Engineer has instituted the MMM Plan as a condition of the SNWA appropriations (ROA 000181), and has been involved in developing the Plan. ROA 013243-44. However, the MMM Plan is flawed in several respects, most notably: "Mitigation planning is not part of this plan but will be handled separately when impact location and magnitude are better understood." ROA 020648. Nonetheless, the MMM Plan emphasizes that mitigation will cure any adverse effects and the Engineer has found that the existing, non-Federal rights are sufficiently protected by the Plan. ROA 000215.

There are no objective standards to determine when mitigation will be required and implemented. The Engineer has listed what mitigation efforts can possibly be made, i.e., stop pumping, modifying pumping, change location of pumps, drill new wells, or increase or improve leopard frog populations in a different location from one that suffers an

unreasonable impact. ROA 000190. Also, the Engineer has noted that if pumping has an adverse effect on swamp cedars, SNWA could mitigate, ROA 000189. but does not cite objective standards of when mitigation is necessary. The Engineer states: "where unreasonable impacts may occur and how bad the impacts may be is not understood and thus mitigation cannot be part of the plan at the present." Not knowing where or how bad an impact is, is not the same thing as defining what an adverse impact..

The Engineer has found that it is "premature to attempt to set quantitative standards or triggers for mitigation actions," because "[f]actors such as natural variation in the environmental resources must be understood before any standards or triggers are set." ROA 000311. "Selecting specific standards before a full baseline is developed would be premature. It would not lead to sound scientific decisions." ROA 000182-183.

While this Court cannot completely disagree with the Engineer's statement above, he has also stated: "The State Engineer finds that the applicant [SNWA,] gathered and presented substantial environmental resource baseline material and that the environmental resource baseline information provides a platform for sound, informed decision making." ROA 00176. Thus, if SNWA, and thereby the Engineer, has enough data to make informed decisions, setting standards and "triggers" is not premature. Curiously, the Engineer has made the finding that a failure to even make "Mitigation" a part of the current MMM plan "demonstrates Applicant's determination to proceed in a scientifically informed, environmentally sound manner." ROA 000183. It seems that if there is enough data to make informed decisions, exactly when an unreasonable impact to either the environment or existing rights occurs, the Engineer or SNWA should recognize it and make the decision to mitigate. If there is not enough data (as shown earlier, no one really knows what will happen with large scale pumping in Spring Valley), granting the appropriation is premature. The ruling is arbitrary and capricious.

Still other flaws with the MMM Plan are evident. The Engineer stated: "the regulation of water rights is in the State Engineer's purview, and the State Engineer proactively monitors impacts to existing rights and the environment." ROA 000183. Also, "[t]he State Engineer finds that the potentially impacted water rights . . . are or will be monitored and that this monitoring will allow for early warning of potential impacts to these water rights . . . and will exercise his authority as needed to protect these existing rights and will require mitigation if needed." ROA 000139-140.

The Engineer found that lowering the Spring Valley water table by 50 feet is "reasonable," but has avoided any mention of what is unreasonable. Nor did he state how monitoring will be accomplished, or what constitutes an impact, potential or otherwise. There is no standard to know how much of an impact is unreasonable to leopard frogs, or to swamp cedars, before mitigation is necessary. The Engineer gives a vague statement of how mitigation can be done, but has no real plan or standard of when mitigation would be implemented. Without a stated, objective standard, the ruling is arbitrary and capricious.

Regarding monitoring and proactive monitoring by the Engineer, there is no plan. The Federal/SNWA stipulation requires yearly reports to the Engineer, but even a cursory examination of the stipulation reveals that between SNWA, the Federal agencies and existing water right holders, the goals and motivations of each party will certainly conflict. The Engineer finds that he has jurisdiction to oversee the "environmental soundness" of the project "and will do so." ROA 000178. Again, he has not stated how this will be accomplished. If the Engineer believes that his department will monitor the non-Federal rights and environment, he has not said how it will be done. The Engineer pointed out in *Great Basin Water Network v. State Engineer*, 126 Nev. Adv. Op. 20; 234 P.3d 912 (2010), that he is short staffed. There are 172,605 acres in Spring Valley alone. ROA 18788. Without a plan to monitor that large of an area, a statement that the Engineer will monitor the area is also arbitrary and capricious.

Impliedly, the Engineer has ceded the monitoring responsibilities to SNWA. "The State Engineer finds that [SNWA] has the ability to identify impacts of the project through its environmental monitoring plan." ROA 000193. Yet, the plan has failed to set any standard of how impacts may be recognized. Essentially, the Engineer is simply saying, "we can't define adverse impacts, but we will know it when we see it."

Both SNWA and the Engineer have properly referenced the successful MMM plan used at Devil's Hole in the Armagosa Valley. In Devil's Hole, aside from being a small fraction of area compared to Spring Valley, Delamar, Dry Lake and Cave Valley, the MMM plan specifically has a "trigger." When the water level falls 2.7 feet below a copper washer, mitigation must occur. Transcript, Vol. I, p.65. This is an objective and recognizable standard.

The Engineer has stated several times that "under specific conditions" SNWA will be required to modify or curtail pumping. ROA 013248 and 013264. Yet again, there are no specifics stated.

The Engineer rightly recognized his "heavy burden of ensuring" that this water project is environmentally sound. ROA 000173. A heavy burden indeed and one which is not complete. Several of the Protestants noted that the MMM plan is filled with good intentions but lacks objective standards. This Court agrees. Granting water to SNWA is premature without knowing the impacts to existing water right holders and not having a clear standard to identify impacts, conflicts or unreasonable environmental effects so that mitigation may proceed in a timely manner. Based on the above, this matter must be remanded to the State Engineer until objective standards can be established and stated – as to when mitigation must occur.

VII
CAVE, DRY LAKE AND DELAMAR VALLEY

A. THE WATER AWARDED TO SNWA IN RULINGS 6165, 6166 AND 6167 IS ALREADY APPROPRIATED IN THE LOWER BASINS

Cave, Dry Lake, and Delamar Valley (CDD) are contiguous and linear, stretching from White Pine County, Nevada, southerly, into Lincoln County. It is approximately sixty (60) miles from the Northern tip of Cave Valley to the Southern end of Delamar Valley. ROA 020507. Unlike Spring Valley, which is a "closed valley", the CDD basins are "not closed". ROA 000599. In closed valleys, natural water discharge is by evapotranspiration (E.T.). In CDD, water is discharged by water flow from one basin into another. "Just like water in streams, groundwater moves from areas of higher hydraulic heads to areas of lower hydraulic heads." ROA 017407.

The Engineer described the CDD basins as part of the White River Flow system, consisting of ten (10) additional hydrographic basins, which discharge primarily into the White River Valley, Pahranagat Valley, and the Muddy Springs Area. ROA 000599. Approximately 2,000 afa flow into Dry Lake Valley from Pahroc. ROA 010588. "There is no groundwater E.T. in Dry Lake Valley, (ROA 017415) so all groundwater in Dry Lake Valley flows down gradient to the south to Delamar Valley." Id. and continues from Delamar to northern Coyote Springs Valley. Id.

The Protestants allege that the CDD water allocation to SNWA, has been previously appropriated. The awarding SNWA water from the higher gradient of the White River Flow allows SNWA to take the water before it recharges the lower basins, which conflicts with earlier established water rights. In other words, the same water has been awarded twice, once in the upper basins, and again in the lower basins.

The Engineer tacitly acknowledges the double appropriation of the same water but rationalizes it in two different ways. First, he refers to the rights in Coyote Springs as "paper water rights." Oral Arg. Trans., Vol. II, p.255. Exactly what the Engineer means by "paper water rights" is unclear, but this Court takes it to mean: valid, existing rights. If the rights were invalid, there would be no over appropriation. Second, the Engineer states that "up-

gradient use will not, if at all, measurably affect down-gradient supply for hundreds of years." ROA 000599-600. Further, he found that "if no measurable impacts to existing rights occur within hundreds of years, then the statutory requirement of not conflicting with existing water rights is satisfied." ROA 000600.

Considering that models which project water disbursement longer than seventy-five (75) years are uncertain (ROA 020061) – and giving some deference to the Engineer's ruling, (see *Town of Eureka*, 108 Nev. 163 (1992)), this Court cannot agree with the Engineer's interpretation of NRS 533.370 (2). The statute is unequivocal, if there is a conflict with existing rights, the applications "shall" be rejected.

Moreover, it is also unseemly to this court, that one transitory individual may simply defer serious water problems and conflict to later generations, whether in seventy-five (75) years or "hundreds," especially when the "hundreds" of years is only a *hoped* for resolution.

There may be water from the CDD basins which could properly be appropriated without conflicting with down-gradient rights. The current orders do not contain such a calculation. For this reason, rather than an outright reversal of the appropriations from Cave, Dry Lake and Delamar Valleys, the matter is remanded to the Engineer for recalculation of possibly unappropriated water.

B. LIKE SPRING VALLEY, THE MONITOR, MANAGE AND MITIGATION PLAN REQUIRES SPECIFIC STANDARDS TO BE AN EFFECTIVE PLAN

The analysis of the MMM Plan and the requirement for standards to be applied to determine when mitigation is necessary in the Cave, Dry Lake and Delamar Valleys is much the same as in Spring Valley. There is still a great deal of uncertainty regarding the hydrology of CDD. ROA 000671. Because of the unknowns, the Engineer has adopted the MMM Plan in the CDD valleys:

> The State Engineer finds an effective management program that includes monitoring activities, management tools and mitigation options is critical to the determination that the Applications will not

> conflict with existing water rights or with protectable interests in existing domestic wells.

ROA 000632.

The Engineer has also found that a drawdown of less than fifty (50) feet over a seventy-five (75) year period is a reasonable lowering of the static water table "made on a case-by-case basis". ROA 000653. He has presumably accepted testimony of SNWA's expert predicting one (1%) percent to seventeen (17%) percent spring flow reductions in the White River and Pahranagat Valleys and has determined a seventeen (17%) percent flow reduction is reasonable.

Additionally, he found that "Federal and state laws, including the National Environmental Policy Act ("NEPA"), the [Environmental Species Act (ESA)], the Clean Water Act ("CWA") and Nevada water law, require environmental protection through comprehensive permitting and regulatory process." ROA 000683. "The ESA imposes strict substantive protections, in the form of reasonable and prudent alternatives, that include minimization and mitigation measures that prevent jeopardy to listed species or their critical habitat." ROA 000684. Further, "non-listed" species will also be protected – "resulting in an even greater breadth of coverage." Id. Notwithstanding the Federal involvement, the Engineer states that he still has the jurisdiction and responsibility to determine environmental soundness independently of other agencies – "and will do so." ROA 000684.

The Engineer has, in effect, relinquished his responsibilities to others. Again, the Engineer has failed to state under what specific conditions he will require mitigation. The Engineer also recognizes that SNWA will extensively monitor springs and sensitive sites in the CDD valleys and finds that the Applicants' monitoring plan will be effective. ROA 000636-000640.

Like the Spring Valley Plan, the Engineer finds that it is premature to set standards and/or triggers because there is not enough "baseline" data. ROA 000641. Yet, the

Engineer has also made the specific finding "that the Applicant gathered and presented substantial environmental resource baseline material and that the environmental resource baseline information provides a platform for sound, informed decision-making." ROA 000683. Whether this is contradictory or not (sufficient baseline data v. insufficient baseline data), standards, triggers or thresholds, however phrased, must be objective to provide notice of when and where mitigation is necessary. Without standards, any decision to mitigate is subjective and thus, arbitrary and capricious.

Stated differently, the Engineer decided that because the final configuration of the wells and locations of wells within the valleys is unknown at the present, setting quantitative standards, "or triggers" for mitigation is pre-mature because it must be known how the aquifer responds to pumping. ROA 000641. It seems that when and where unreasonable effects occur, is not the same as recognizing an unreasonable effect, wherever or whenever it appears. Paraphrasing Samuel Clemens, show me a man who knows what's reasonable and I'll show you a man who knows what isn't.

Further, the Engineer found that "natural variability in the system must be documented to determine if observed changes are due to pumping, rather than natural fluctuations due to seasonal recharge or other factors." ROA 000641. The Engineer has already found that SNWA has gathered and presented enough baseline data to make sound and informed decisions, not to mention that SNWA has been studying the basins and valleys for at least twenty-five (25) years and likely longer. In short, without standards, triggers or thresholds the MMM Plan is not a "comprehensive" plan, "critical to the determination that the Applications will not conflict with existing water rights or with protectable interests in existing domestic wells". ROA 000632.

This Court is charged with "determining whether there is substantial evidence in the record to support the [Engineer's] decision." *Revert v. Ray*, 95 Nev. 782, 786 (1979). Here, the Engineer said, however not quite consistently, that there is not enough evidence to

implement, what he has characterized as "critical," the MMM Plan. Thus, if there is insubstantial evidence and it is premature to set triggers and thresholds, it is premature to grant water rights.

As stated in the Plan, a definition of an unreasonable adverse effect, i.e. a trigger, a standard, a threshold must be defined. ROA 020647. Absent a thorough plan and comprehensive standards for mitigation, any mitigation, (or lack thereof) is subjective, unscientific, arbitrary and capricious. This matter must be remanded to the Engineer so that objective standards may be established.

VIII
CONCLUSION

After an in-depth review of the record this Court will not disturb the findings of the Engineer save those findings that are the subject of this Order. This Court remands orders 6164, 6165, 6166 and 6167 for:

1. The addition of Millard and Juab counties, Utah in the mitigation plan so far as water basins in Utah are affected by pumping of water from Spring Valley Basin, Nevada;

2. A recalculation of water available for appropriation from Spring Valley assuring that the basin will reach equilibrium between discharge and recharge in a reasonable time;

3. Define standards, thresholds or triggers so that mitigation of unreasonable effects from pumping of water are neither arbitrary nor capricious in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley, and;

4. Recalculate the appropriations from Cave Valley, Dry Lake and Delamar Valley to avoid over appropriations or conflicts with down-gradient, existing water rights.

DATED this 10th day of December, 2013.

ROBERT E. ESTES
SENIOR DISTRICT JUDGE