IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA

FILED
JUL 29 2005
STATE ENGINEER'S OFFICE

IN THE MATTER OF APPLICATION NUMBER 72573
FILED BY TUFFY RANCH PROPERTIES, LLC
OF SPARKS, STATE OF NEVADA
ON APRIL 11, 2005
TO APPROPRIATE THE WATERS OF UNDERGROUND

PROTEST

Comes now Daniel J. McGlothlin, on behalf of the United States Department of the Interior, National Park Service, whose post office address is 1201 Oak Ridge Drive, Suite 250, Fort Collins, Colorado, 80525, whose occupation is Acting Chief, Water Rights Branch, Water Resources Division, National Park Service, and protests the granting of Application Number 72573 filed on April 11, 2005, by Tuffy Ranch Properties, LLC of Sparks, State of Nevada, to appropriate the waters of underground, situated in Lincoln County, State of Nevada, for the following reasons and on the following grounds, to wit:

See Exhibit A attached.

THEREFORE the protestant requests that the application be denied

Signed Daniel J. McGlothlin
Agent or protestant

Daniel J. McGlothlin
Printed or typed name, if agent

Address 1201 Oak Ridge Drive, Suite 250
Street No. or P.O. Box No.

Fort Collins, CO 80525
City, State and Zip Code No.

FLORA B. ROMERO NOTARY PUBLIC STATE OF COLORADO

Subscribed and sworn to before me this 28th day of July, 2005.

Flora B. Romero
Notary Public

State of Colorado

County of Larimer

My Commission expires Flora B. Romero, Notary Public State of Colorado My Commission Expires 7/31/2006

IN THE MATTER OF APPLICATION 72573
EXHIBIT A - CONTINUED

Protest by Daniel J. McGlothlin
on behalf of the United States, Department of the Interior
National Park Service

GENERAL

I. The mission of the National Park Service (NPS) may be paraphrased from 16 U.S.C. 1, as conserving the scenery, natural and historic objects, and wildlife, and providing for enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.

Great Basin National Park

II. Great Basin National Park (NP) was created by Congressional Act in 1986 (100 Stat. 3181), to preserve a portion of the Great Basin possessing outstanding resources and significant geologic and scenic values for the benefit and inspiration of the people.

III. Water resources at Great Basin NP include lakes, streams, springs, seeps, and ground water. Ground water is thought to play an important role in maintaining the features and ecology of Lehman Caves. The caves contain living limestone formations, such as stalactites, stalagmites, plate-like shields, cave coral, rimstone dykes, curling helictites, flowstone, and draperies. However, little is known about the ecology of the caves and the role played by water. There may be additional caves and cave systems within Great Basin NP that have not yet been discovered.

IV. In the legislation establishing Great Basin NP, Congress explicitly excluded the establishment of any new Federal reserved water right, but stated that the United States was entitled to reserved rights associated with the initial establishment and withdrawal of Humboldt National Forest and Lehman Caves National Monument. The priority dates for these reserved rights are the dates of initial establishment of National Forest lands and Lehman Caves National Monument. These reserved rights have not been judicially quantified.

V. Located near the town of Baker, in the E½ NW¼ Sec. 9, T13N, R70E, MDBM, is an administrative site, originally on public domain land. The site was withdrawn from entry (Exec. Order 1354, May 16, 1911) for use by the United States Forest Service (USFS) and later established as an administrative site for NPS. NPS currently uses the site as a ranger station, office and residence, with water supplied by a well developed when the USFS occupied the site.

The United States has Federal reserved water rights for the purposes of the withdrawal, which include use as a ranger station with supporting facilities. The priority dates for the administrative site are the dates upon which land was withdrawn. These reserved rights have not been judicially quantified.

The site will likely include administrative offices, a park maintenance facility, and residences for park staff. Adequate facilities of this kind are vital to the protection and management of the nationally important Great Basin NP for the benefit and inspiration of the people.

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VI. NPS holds a state appropriative water right to Cave Springs (In the Matter of the Determination of the Relative Rights in and to the Waters of Baker and Lehman Creeks and Tributaries in the County of White Pine, Findings of Fact and Conclusions of Law, and Decree, 7th Judicial Distr., Oct. 16, 1934, Proof 01065), with a priority date of 1890. By Application Number 20794, Certificate Record No. 7573, the point of diversion, manner and place of use were changed. The point of diversion is within the SW¼ NE¼ Sec. 9, T13N, R69E, MDBM. This right provides water for the current visitor center, picnic area, maintenance area, trailer dump station, and park housing; and for the watering of lawns and an historic orchard.

VII. In addition, NPS holds a state appropriative right to Baker and Lehman Creeks with a priority date estimated to be 1904. (In the Matter of the Determination of the Relative Rights in and to the Waters of Baker and Lehman Creeks and Tributaries in the County of White Pine, Findings of Fact and Conclusions of Law, and Decree, 7th Judicial Distr., Oct. 16, 1934, Proof 01066). The point of diversion is within Section 9, T13N, R70E, MDBM.

VIII. In 2004, approximately 80,000 persons visited Great Basin NP, contributing to the local economy.

IX. NPS reserves the right to amend this exhibit as more information becomes available.

Lake Mead National Recreation Area

X. Since 1936, the National Park Service has managed the recreational activities within the Boulder Canyon Project area now known as Lake Mead National Recreation Area (NRA). Lake Mead NRA was established on October 8, 1964 (78 Stat. 1039) to be administered for "...general purposes of public recreation, benefit, and use, and in a manner that will preserve, develop, and enhance, so far as practicable, the recreation potential, and in a manner that will preserve the scenic, historic, scientific, and other important features of the area.... The Secretary shall permit hunting, fishing, and trapping on the lands and waters under his jurisdiction within the recreation area."

XI. NPS is entitled to Federal reserved water rights for reserved lands within Lake Mead NRA. The priority dates for these reserved rights are the dates when the lands were reserved and are senior to the appropriation sought by Applicant. These rights have not been judicially quantified.

XII. The Muddy River, which originates from large discharge springs located northwest of Moapa, Nevada, flows into Lake Mead NRA at the north end of the lake's Overton Arm. The State of Nevada, Department of Wildlife, is leasing part of Lake Mead NRA adjoining the Muddy River for the purposes of the Overton Wildlife Management Area.

This area supports a variety of waterfowl and vegetation. The United States has a State appropriative water right to water in the Muddy River, Certificate No. 5126.

XIII. Springs and water-related resource attributes are important features of Lake Mead NRA. The springs provide water for vegetation and wildlife habitat and create an environment that many visitors use and enjoy. Most springs are not fed by water from Lake Mead and could be affected by upgradient diversions. Springs include Blue Point, Rogers, Corral, and Kelsey's Springs, and other smaller, unnamed springs. Visitation to Blue Point and Rogers Springs has been estimated at 5,000 visitors per year. Desert bighorn sheep are also dependent upon the springs in Lake Mead NRA. A herd of approximately 150 use springs in the northern part of the National Recreation Area. The relict Las Vegas Valley leopard frog, *Rana onca*, has been found at Rogers, Corral, and Blue Point Springs. Current taxonomic studies indicate a high potential for listing of this relict population, previously believed extinct, as protected under the Endangered Species Act.

XIV. The United States has Nevada state appropriative water rights for Lake Mead National Recreation Area as follows:

Name	Point of Diversion	Certificate Number
Kelsey's Spring	SW¼, NW¼, Sec. 20, T16S, R68E, MDB&M	296
Rogers Spring	SE¼, SE¼, Sec. 12, T18S, R67E, MDB&M	4476
Muddy Creek (River)	NW¼, SE¼, Sec. 19, T16S, R68E, MDB&M	5126

XV. In 2004, approximately 7,758,000 persons visited Lake Mead NRA, contributing to the local economy.

XVI. NPS reserves the right to amend this exhibit as more information becomes available.

Applications

XVII. This Application 72573 seeks to appropriate 10 cfs, or up to 7240 acre feet annually, of ground water in Lake Valley Hydrographic Basin for irrigation and domestic purposes. This application is one of a total of thirteen applications (Applications 72565 – 72577) filed simultaneously by Applicant in Lake Valley Hydrographic Basin. In total, these applications seek to divert up to 130 cfs (10 cfs for each application) with an annual duty of up to 94,120 acre feet (7240 acre feet for each application).

XVIII. In addition, Applicant has 53 applications (Applications 72296 - 72349), with a total maximum duty of 22,054 acre feet per year, pending in this same general location. Change applications have been filed on these applications to change the manner of use to municipal and domestic purposes, and to change the place of use to Coyote Spring Valley.

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EXHIBIT A - CONTINUED

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FINDINGS

The proposed appropriation would be located in the Lake Valley hydrographic basin. In evaluating the subject application, three potential concerns were evaluated including: (1) whether water is available for appropriation, (2) whether NPS water rights for Great Basin National Park would be injured, or (3) whether NPS water rights for Lake Mead National Recreation Area (NRA) would be injured.

Regarding whether water is available for appropriation in Lake Valley Hydrographic Basin

I. According to the Nevada Department of Conservation and Natural Resources (Nevada DCNR) (1992) the perennial yield of Lake Valley is 12,000 afy, based on investigations conducted by the USGS and published in Nevada DCNR Reconnaissance Series Report #24 (Rush and Eakin, 1963).

II. According to information in the hydrographic basin summary for Lake Valley (Nevada Division of Water Resources [NDWR], 2005), existing water rights in Lake Valley currently total 25,152 afy.

III. In addition, pending water right applications in Lake Valley with filing dates prior to the Tuffy Ranch applications total an additional 23,168 afy (NDWR special hydrographic abstract, Lake Valley, 2005). These consist of applications filed by: (1) Las Vegas Valley Water District (LVVWD) in 1989 that total 6,703 afy; and (2) Lincoln County and Vidler Water Company in 1998 that total 14,480 afy (now listed in the NDWR database as "Lincoln County").

IV. Therefore existing water rights in Lake Valley hydrographic basin already exceed the perennial yield published by Nevada DCNR (1992). In addition, pending water rights filed prior to the subject applications total almost twice the perennial yield. Tuffy Ranch Properties, LLC Application Nos. 72565 through 72577 total almost 8 times the perennial yield of Lake Valley. Therefore, there is no perennially renewable water available for appropriation.

Regarding whether NPS water rights for Great Basin National Park (NP) would be injured

V. Lake Valley is part of the White River subregion of the Carbonate-Rock Province of the Great Basin (Prudic and others, 1995). Great Basin NP also lies within this province; however, it is situated between Snake Valley and Spring Valley, both of which are part of the Great Salt Lake Desert regional ground water flow system (Hood and Rush, 1965; Dettinger, 1989; and Harrill and others, 1988, Sheet 2).

VI. The White River subregion according to Prudic and others (1995) contains basin-fill and carbonate-rock aquifers that appear to be hydraulically connected. Dettinger and others (1995) discuss this interconnection for the entire Carbonate-Rock Province. The presence

of these interconnections means that development of ground water in basin-fill aquifers can lower the hydraulic head in the underlying carbonate-rock aquifer, and vice versa.

VII. The Carbonate-Rock Province is typified by complex interbasin regional flow systems that include both basin-fill and carbonate-rock aquifers (Harrill and others, 1988). Ground water flows along complex pathways through basin-fill aquifers, carbonate-rock aquifers, or both, from one basin to another. Ground water flow system boundaries, and thus interbasin ground-water flows, are poorly defined for most of the carbonate-rock province (Harrill and others, 1988). The potential for interbasin flow is borne out by carbonate rocks present at the surface at the location of the gentle topographic divide at the north end of Lake Valley (which is the south end of Spring Valley). Furthermore, carbonate rocks might very well underlie the volcanic rocks to the east and northeast of the proposed point of diversion (Plume and Carlton, 1988).

VIII. In the vicinity of the proposed pumping site, Thomas and others (1986) delineated potentiometric ground water contours for the basin fill deposits that suggest a potential ground water divide between Lake and Spring valleys through the Fortification Range. For consolidated rocks in this same vicinity, however, Thomas and others (1986) indicate a single potentiometric contour in Lake Valley that ends in the vicinity of the Fortification Range. There are no carbonate-rock aquifer wells in Lake Valley, and few in the surrounding basins. Consequently, the absence of a contour in this portion of the map reflects the fact that the direction and magnitude of ground water movement is very uncertain here, as it is throughout much of the regional carbonate-rock aquifer in Nevada.

IX. It is possible that no ground water divide exists within the carbonate-rock aquifer between Lake Valley and Spring Valley. If this is correct, then pumping either the basin-fill or carbonate-rock aquifers within Lake Valley would lower the heads in adjacent Spring Valley. Moreover, even if a ground water divide was present within the carbonate-rock aquifer there, this would not preclude that pumping within Lake Valley could affect Spring Valley water levels. This is because long-term, large-scale ground water pumping could lower the hydraulic head within Lake Valley, and thereby shift the location of the groundwater divide to the north. This, in turn, could decrease the amount of ground water within Spring Valley.

X. Results of deep-flow simulations by Harrill and Prudic (1998) substantiate the potential for pumping in Lake Valley affecting ground water levels in Spring Valley, and also indicate that deep ground water flow in the vicinity of the proposed point of diversion might move northeastward into the Bonneville deep-flow region.

XI. Committed ground water resources and proposed ground water appropriations for Spring Valley total over 170,000 afy and exceed the recharge rate listed by the Nevada DCNR (2000).

XII. A regional ground water potential map prepared by Harrill and others. (1988), indicates general regional ground water movement from Spring Valley to Snake Valley through Hamlin Valley (See also Prudic and others, 1995).

XIII. The estimated perennial yield for Snake Valley is 25,000 afy (Nevada Department of Conservation, 1992). Committed ground water resources and senior ground water applications in Snake Valley amount to at least 77,500 afy (Nevada Department of Conservation and Natural Resources, 2000). Therefore, there is also no water available for appropriation in Snake Valley.

XIV. Great Basin NP encompasses part of the Snake Range, which is composed of carbonate rocks that have been strongly deformed by folding and repetitive faulting. Connected solution cavities and fractures caused by the folding and faulting in these rocks provide conduits for the transmission of ground water. Therefore, Lehman Caves and various surface water features positioned along the eastern edge of the park are susceptible to any ground water pumping that could affect water levels in these carbonate rocks.

<u>Regarding whether NPS water rights for Lake Mead National Recreation Area (NRA) would be injured</u>

XV. Lake Valley is part of the White River subregion of the Great Basin Carbonate-Rock Province (Prudic and others, 1995). Ground water generally flows from southern Lake Valley through Patterson Valley to Panaca Valley, and then southward through Meadow Valley Wash towards Muddy River Springs.

XVI. According to Harrill and others (1988), the ground water recharge rate for Lake Valley is about 13,000 afy from precipitation. Approximately 3,000 afy is discharged from the valley as evapotranspiration and 3,000 afy is discharged as underflow to Patterson Valley. According to the Nevada Department of Conservation and Natural Resources (1992), the perennial yield of Lake Valley is 12,000 afy.

XVII. Rush (1964) estimates ground water recharge from precipitation to be 6,000 afy for Patterson Valley. About 3,000 afy additionally flows into Patterson Valley as groundwater from Lake Valley. Patterson Valley has only minor amounts of evapotranspiration (Rush, 1964). According to the Nevada Department of Conservation and Natural Resources (1992), the perennial yield of Patterson Valley is 4,500 afy. From Patterson Valley, ground water flows towards Panaca Valley. Panaca Warm Spring discharges approximately 8,000 afy of surface water. Of this amount, it is estimated that about one-half (4,000 afy) filters back into the ground to recharge underlying aquifers. The remainder is lost to evapotranspiration (Rush, 1964). According to the Nevada Department of Conservation and Natural Resources (1992), the perennial yield of Panaca Valley is 9,000 afy.

XVIII. Ground water flows from Panaca Valley south towards Lower Meadow Valley Wash (Prudic and others, 1995). The recharge rate of Meadow Valley Wash is 12,400 afy,

mostly originating as underflow. According to the Nevada Department of Conservation and Natural Resources (1992), the perennial yield of Lower Meadow Valley Wash is 5,000 afy. An additional 7,000 afy of ground-water may be discharged into the Muddy River area from Lower Meadow Valley Wash (see Exhibit 13 submitted by the National Park Service in the matter of the hearing regarding Applications Nos. 55450 and 58269 filed by the Moapa Valley Water District; numbers based on Rush, 1964). Burbey (1997) states that underflow from Lower Meadow Valley Wash may support spring discharge in the Muddy River Springs area. The rate of ground water underflow to the Muddy River area from Coyote Spring Valley and Lower Meadow Valley Wash combined may be as large as 58,000 afy.

XIX. Ruling No. 4542 noted that existing water rights in the Muddy River Springs Area are about 45,260 afy (which probably includes some ground water rights in California Wash.) About 10,005 afy are for ground water sources and about 35,250 afy for surface water rights under the Muddy River decree. (See transcripts for hearing regarding Applications Nos. 55450 and 58269 filed by the Moapa Valley Water District.)

XX. Committed ground water resources in Lower Meadow Valley Wash are 29,680 afy (Nevada Department of Conservation and Natural Resources, 1992); 28,134 afy in Panaca Valley; 5,435 in Patterson Valley; and 28,981 afy in Lake Valley. Combined committed groundwater resources for Lake Valley, Patterson Valley, Panaca Valley, and Lower Meadow Valley Wash (92,230 afy) exceed groundwater recharge and the combined perennial yield of 30,500 afy for these valleys. Existing ground water withdrawals in these hydrographic basins, and pending appropriations in Lake Valley, if granted, could reduce the discharge of the Muddy Springs, if the ground water withdrawals are large enough and occur over a sufficiently long period of time.

XXI. Rights to water in the Muddy River were decreed by the Tenth Judicial Court of the State of Nevada in the case entitled *Muddy Valley Irrigation Company vs. Moapa and Salt Lake Produce Company*. According to the January 21, 1920, Order of Determination and the March 11, 1920, Further and Supplemental Order of Determination of the Nevada State Engineer, there is no water available for appropriation in the Muddy River, its headwaters, sources of supply, and tributaries (Muddy Valley Irrigation Company, 1938).

XXII. Lake Mead NRA springs, located within the Black Mountains Areas, are discharge points for regional ground water flow systems and may be affected by the proposed appropriation. The water issuing from the springs probably originates in the easternmost part of Lower Meadow Valley Wash and the Virgin River Valley (Pohlmann and others, 1998). Given that pumping occurs over a long period of time, the NPS is concerned that the ground water withdrawals proposed under the subject application others, as well as existing ground water uses in the White River ground water flow system, if developed, will reduce or eliminate the discharge of the springs within Lake Mead NRA by capturing water destined for the springs.

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EXHIBIT A - CONTINUED

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CONCLUSIONS

I. There is no water available for appropriation because committed water resources within Lake Valley already exceed ground-water recharge.

II. There is no water available for appropriation because the proposed pumping would decrease ground water in hydrographic basins located down-gradient of Lake Valley, including Patterson Valley, Panaca Valley, and Lower Meadow Valley Wash, where committed water resources already exceed ground-water recharge and perennial yield.

III. There is no water available for appropriation because the proposed pumping would decrease discharge of the Muddy Springs, where the Nevada State Engineer has determined that there is no water available for appropriation.

IV. The approval and development of the appropriation proposed by this application would impair the water rights of the United States through depletion that would occur as a result of the lowering of ground-water levels and/or alterations in the directions of ground-water movement. Specific impairment would occur because:

A. The withdrawals proposed by Tuffy Ranch Properties, LLC could reduce the quantity of ground water within Spring Valley and Snake Valley and thereby impair existing water rights Lehman Caves and various surface water features associated with Great Basin NP.

B. The withdrawals proposed by Tuffy Ranch Properties, LLC could further reduce the discharge of the Muddy River. The United States' senior water right and other existing rights to the Muddy River would be impaired, if the appropriation was approved and developed.

C. The proposed appropriation, in combination with existing appropriations and pending applications in the White River subregion, if approved and developed, could reduce the discharge of Lake Mead NRA springs.

D. The effects of the appropriation proposed by this application, when combined with other existing and proposed appropriations, could impair the senior water rights of Lake Mead NRA more quickly and/or to a degree greater than the withdrawal proposed under this application alone.

V. The public interest would not be served, by granting a permit to this application, because:

A. The water and water-related resources in the nationally important Great Basin NP could be diminished or impaired, as a result of the appropriation proposed by this application, reducing the aesthetic value of the park for the visitor and thus contributions to the local economy.

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B. The water and water-related resources in the nationally important Lake Mead NRA would be diminished or impaired, as a result of the appropriation proposed by this application, reducing the aesthetic value of the park for the visitor and thus contributions to the local economy.

REFERENCES CITED

Burbey, T.J., 1997, Hydrogeology and potential for ground-water development, carbonate-rock aquifers, southern Nevada and southeastern California: U.S. Geological Survey Water Resources Investigations 95-4168, 65 p.

Dettinger, M.D., 1989, Distribution of carbonate-rock aquifers in southern Nevada and the potential for their development, Summary of Findings, 1985-88: Program for the Study and Testing of Carbonate-Rock Aquifers in Eastern and Southern Nevada Summary Report No. 1, 37p.

Dettinger, M.D., Harrill, J.R., Schmidt, D.L., 1995, Distribution of carbonate rock aquifers and the potential for their development, southern Nevada and adjacent parts of California, Arizona and Utah: U.S. Geological Survey Water resources Investigations Report 91-4146, 110 p.

Harrill, J.R., Gates, J.S., and Thomas, J.M., 1988, Major ground-water flow systems in the Great Basin region of Nevada, Utah, and adjacent states: U.S. Geological Survey Hydrologic Investigations Atlas HA-694-C, 2 sheets.

Harrill, J.R., and Prudic, D.E., 1998, Aquifer systems in the Great Basin region of Nevada, Utah, and adjacent states -- summary report: U.S. Geological Survey Professional Paper 1409-A, pg. A1-A66.

Hood, J.W., and Rush, F.E., 1965, Water-resources appraisal of the Snake Valley area, Utah and Nevada: Utah State Engineer Technical Publication 14, 43 p.

Muddy Valley Irrigation Company, 1938, Protest of the Muddy Valley Irrigation Company in the Matter of Application No. 10188 by the United States Department of Agriculture, Bureau of Biological Survey, for Permission to Appropriate Water From Muddy Creek, Filed March 9, 1938: Nevada State Engineer's Office, Carson City, Nevada, 2 p.

Nevada Department of Conservation and Natural Resources, 1988, Hydrographic Basin Statistical Summary: Division of Water Planning, Carson City, Nevada.

Nevada Department of Conservation and Natural Resources, 1992, Hydrographic basin statistical summary -- Ground water basins 001-232: State of Nevada, Division of Water Resources and Water Planning, Carson City, Nevada, approximately 250 p.

Nevada Department of Conservation and Natural Resources, 2000, February 3, 2000 print out of Hydrographic basin summary for Basin 195 (Preliminary Copy), Snake Valley: Division of Water Planning, Carson City, Nevada.

Nevada Division of Water Resources, 2005, Water Rights Database; Hydrographic basin summary and special hydrographic abstract – Basin 183 (Lake Valley): State of Nevada, Division of Water Resources, Carson City, Nevada, July 12, 2005, 13 p.

Plume, R.W., and Carlton, S.M., 1988, Hydrogeology of the Great Basin region of Nevada, Utah, and adjacent states: U.S. Geological Survey Hydrologic Investigations Atlas HA-694-A, 1 sheet.

Prudic, D.E., Harrill, J.R., and Burbey, T.J., 1995, Conceptual evaluation of regional ground-water flow in the carbonate-rock province of the Great Basin, Nevada, Utah, and adjacent States: U.S. Geological Survey Professional Paper 1409-D, p. D1-D102.

Pohlmann, K.F., Campagna, D.J., Chapman, J.B., Earman, S., 1998, Investigation of the Origin of Springs in the Lake Mead National Recreation Area: Desert Research Institute, Water Resources Center Publication No. 41161, 51 p.

Rush, F.E., 1964. Ground-Water Resources - Reconnaissance Series. Report 27. Ground-Water Appraisal of the Meadow Valley Area, Lincoln and Clark Counties, Nevada. State of Nevada, Department of Conservation and Natural Resources, Carson City, Nevada. 43 p.

Rush, F.E., and Eakin, T.E., 1963, Ground-water appraisal of Lake Valley in Lincoln and White Pine counties, Nevada: State of Nevada, Department of Conservation and Natural Resources, Ground-Water Resources - Reconnaissance Series Report 24, 30 p.

Schaefer, D.E., and Harrill, J.R., 1995, Simulated effects of proposed ground-water pumping in 17 basins of east-central and southern Nevada: U.S. Geological Survey Water-Resources Investigations Report 95-4173, 71p.

Thomas, J.M., Mason, J.L., and Crabtree, J.D., 1986, Ground-water levels in the Great Basin region of Nevada, Utah, and adjacent states: U.S. Geological Survey Hydrologic Investigations Atlas HA-694-B, 2 sheets.