IN THE OFFICE OF THE STATE ENGINEER

IN THE MATTER OF APPLICATION 51632) FILED TO APPROPRIATE THE PUBLIC) WATERS OF AN UNDERGROUND SOURCE) WITHIN THE PAHRUMP VALLEY GROUND) WATER BASIN, NYE AND CLARK COUNTIES,) NEVADA.)

SUPPLEMENTAL RULING ON REMAND

GENERAL

Application 51632 was filed on December 15, 1987, by William W. Morris to appropriate 1.0 c.f.s. of water from an underground source for quasi-municipal and domestic (Subdivision) purposes within the NE¼ of Section 28, T.20S., R.57E., M.D.B.&M. The point of diversion is described as being within the NW¼ NE¼ Section 28, T.20S., R.57E, M.D.B.&M.[1]

On March 25, 1988 the State Engineer issued a written ruling[2] denying Applications 51465, 51632 and 51813 on the grounds as set forth in the ruling. The ruling is available at the office of the State Engineer in Carson City as a matter of public record.

On April 25, 1988 the applicant under Application 51632 filed a notice of petition for judicial review pursuant to NRS 533.450.[2]

On June 10, 1988 the Eighth Judicial District court entered a certain order entitled, Stipulation and Order[2] and remanded the matter of the denial of Application 51632 to the office of the State Engineer for a hearing on the issues of the denial as stipulated and agreed by both parties.

On June 30, 1988 a hearing on Stipulated Remand, Morris vs State Engineer, Case No. A 264713; Application 51632, was scheduled for 9:00 A.M., Thursday, July 28, 1988, at the State Engineer's Branch Office, 1515 E. Tropicana Blvd., Suite 375, Las Vegas, Nevada.[3]

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[1] Public record in the office of the State Engineer.

[2] Public record in the office of the State Engineer under Application 51632.

[3] Public record in the office of the State Engineer in hearing file titled "Morris vs State Engineer.

The hearing was held as scheduled on July 28, 1988.

In 1986, U.S. Geological Survey Water Supply Paper 2279, "Ground Water Storage Depletion in Pahrump Valley, Nevada-California, 1962-1975", by James R. Harrill, was prepared cooperatively by the Nevada Department of Conservation and Natural Resources and the U.S. Department of the Interior, Geological Survey. This report is available for review in the office of the State Engineer.

In 1975, Geological Survey Professional Paper 712-C, "Hydrogeologic and Hydrochemical Framework, South-Central Great Basin, Nevada-California, with Special Reference to the Nevada Test Site", was prepared by the United States Department of the Interior, Geological Survey. This report is available for review in the office of the State Engineer.

In 1967, U.S. Geological Survey Water Supply Paper 1832, "Hydrology of the Valley-Fill and Carbonate-Rock Reservoirs, Pahrump Valley, Nevada-California", was prepared cooperatively by Nevada Department of Conservation and Natural Resources and the United States Department of the Interior, Geological Survey. This report is available for review in the office of the State Engineer.

In 1948, Water Resources Bulletin No. 5, "Geology and Water Resources of Las Vegas, Pahrump, and Indian Springs Valleys, Clark and Nye Counties Nevada", was prepared by G.B. Maxey and C.H. Jameson. This report is available for review in the office of the State Engineer.

FINDINGS OF FACT

I.

Application 51632 has its' respective point of diversion located within the area described as the Pahrump Valley Ground Water Basin.

II.

The perennial yield of a ground water reservoir may be defined as the maximum amount of water of useable chemical quality that can be withdrawn and consumed economically each year for an indefinite period of time, and can be determined by a comparison analysis of ground water recharge (inflow) and the maximum amount of natural discharge (outflow) available for recapture. In Pahrump Valley, virtually all inflow consists of recharge by precipitation. The natural recharge to and discharge from

the ground water system is estimated by scientific methods.[4] Natural discharge consists of spring discharge, subsurface outflow and natural evapotranspiration by phreatophytes. Spring discharge is either consumed by evapotranspiration or may return to the ground water and be discharged as subsurface outflow. It is estimated that 18,000 acre-feet annually leaves the Pahrump Valley as subsurface outflow through deep carbonate-rock aquifers forming a multi-valley flow system. Pahrump Valley is a part of the intervalley flow system which contributes ground water to low areas adjacent to Death Valley. Based upon the scientific analysis of natural conditions observed, it would be very difficult to capture appreciable amounts of subsurface outflow from Pahrump Valley. As of 1976 only about 200 acre-feet of the estimated 18,000 acre-feet outflow had been captured and by the year 2040, a capture of only 600 to 700 acre-feet annually is currently projected. Since most of the spring discharge was located near areas where heavy pumping centers have developed, this type of natural discharge was most readily captured by pumping and has ceased to be a significant outflow since 1975. Spring discharge decreased from 10,000 acre-feet annually under natural conditions (non-pumping) to about 1,400 acre-feet annually in 1962 and to about 200 acre-feet annually in 1975 (from Manse Spring in winter months only). Ground water evapotranspiration however, is being captured more slowly by pumping than was spring discharge. As of 1975, 2,600 acre-feet annually of ground water evapotranspiration remained of the estimated 14,000 acre-feet annually discharged under natural conditions. The capture of all ground water by pumping will probably not occur in the foreseeable future because some remaining areas of active evapotranspiration are too remote from concentrated pumping areas. Consequently, the State Engineer finds that the maximum amount of natural discharge available for capture and therefore, the perennial yield does not exceed 19,000 acre-feet annually.[5]

III.

Testimony by the applicant indicated that the point of diversion and place of use of Application 51632 lie outside of the boundaries of areas designated under State Engineer's Order No. 176, dated March 11, 1941, Order No. 193, dated January 15, 1948, Order No. 205, dated January 23, 1953, Order No. 206, dated May 5, 1953 and Order No.

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4 U.S. Geological Survey Water Supply Papers 2279 and 1832.

5 U. S. Geological Water Supply Paper 2279, Pages 38, 43, 47 and 49.

381 excluding irrigation from being a preferred use, dated June 1, 1970.[6] U.S. Geological Survey Water Supply Paper 2279 addresses the ground water hydrology of the Pahrump Hydrographic Basin which includes the areas under the aforementioned State Engineer's Orders. Therefore, the State Engineer finds that estimates derived in said Water Supply Paper are applicable on a basin-wide basis.

IV.

Testimony and evidence presented by the applicant indicate that water recharge to the Manse Fan originates in a different location than the water which recharges Lovell Canyon.[7] Deuterium analysis[8] lends strong support to this conclusion based upon the substantial difference noted in concentrations from a Manse Spring well, Hidden Hills Ranch well and the Sky Mountain Resort well. The geology associated with Lovell Canyon also precludes the water found in said canyon from being direct recharge to Manse Fan.[9] Although water does not recharge the Manse Fan area it does ultimately flow into the Pahrump Ground Water Basin. Consequently, the State Engineer finds that the area of origin of recharge from the Spring Mountain for Manse Fan and Lovell Canyon are different but the final destination of recharge is the Pahrump Ground Water Basin.

V.

Maximum steady-state pumping rates[5] also known as "maximum sustained yield or safe yield"[10] is defined as follows: "If it is assumed that water quality will not be a problem or that quality problems can be handled by treatment, the maximum steady-state pumping rate that can be sustained is a function of both the amount of natural

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6 See transcript, pages 27-31, Applicant's Exhibit A, testmiony of Thomas Smales.

7 See transcript, pages 45-129, testimony of Robert C. Broadbent.

8 See transcript, pages 93-95, testimony of Robert C. Broadbent, Applicant's Exhibit C, pages 7-8, and Applicant's Exhibit F.

9 See transcript, pages 65-76, testimony of Robert C. Broadbent, Applicant's Exhibit E.

10 Page 114 of "Reporter's Transcript of Remand Hearing Proceedings" "In the Matter of: Application 51632 - Hearing on Stipulated Remand, Morris v. State Engineer, Case No. A 264713; Application 51632."

discharge that can be captured and the amount of pumpage recycled back to the ground water."[11]

The maximum steady-state pumping rate was determined to be 26,000 acre-feet/year based on 1975 pumpage conditions in the Pahrump Groundwater Basin. Currently, the State Engineer determines that this equation presents a reasonable scenario of ground water cycling in the ground water basin under existing conditions.

VI.

Withdrawals of ground water in excess of perennial yield contribute to adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased economic pumping lifts, land subsidence and possible reversal of ground water gradients which could result in significant changes in the recharge/discharge relationship. These conditions have developed in several other ground water basins

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[11] Steady-State Pumping Rate is determined by the equation:

$$SPR = \frac{CND}{1 - RFA\,(PCTA) + RFB(\,PCTB) + RFC\,(PCTC)}$$

in which:
SPR = maximum steady-state pumping rate;
CND = maximum amout of natural discharge that can be captured by pumping;
PCTA = fraction of the total pumpage used for agriculture;
PCTB = fraction of the total pumpage used for self-supplied domestic;
PCTC = fraction of the total pumpage used for public-supply and commercial use;

RFA = fraction of pumpage for agricultural use that is return flow;
RFB = fraction of pumpage for self-supplied domestic use that is return flow;
RFC = fraction of pumpage for public-supply and commercial use that is return flow.

Under 1975 conditions,

CND = 19,000 acre-feet per year
PCTA = 0.93
PCTB = about 0.02
PCTC = 0.05
RFA = 0.25
RFB = 0.70 and
RFC = 0.50

Substituting into the equation and solving,

$$SPR = \frac{19,000}{1 - 0.025\,(0.93) + 0.70\,(0.02) + 0.50\,(0.05)}$$

= 26,000 acre=feet/year.

within the State of Nevada where storage depletion and declining water tables have been recorded and documented and provide substantial evidence of the adverse effect of these conditions.[12]

Analysis and evaluation indicates that land subsidence is active in at least parts of the Pahrump Valley.[13]

VII.

Overdraft may be defined as the amount by which the net pumping draft exceeds the perennial yield. By applying the steady-state pumping rate equation to the ground water pumpage inventory for 1962 through 1987 an overdraft occurred from 1962 to 1980. During the period from February 1962 to February 1975, pumping in Pahrump Valley has resulted in a depletion of approximately 219,000 acre-feet of water from storage and a total depletion of 375,000 acre-feet since 1913. Of this depletion, 155,000 acre-feet was from the draining of unconsolidated material, 46,000 acre-feet was from the compaction of fine-grained sediments and 18,000 acre-feet from the elastic response of the aquifer and water. It is estimated that 2.3 million acre-feet of water stored in the upper 200 feet of saturated valley fill is within economic pumping lifts.[13]

VIII.

The greatest declines of ground water levels in Pahrump Valley have occurred along the base of the Pahrump and Manse fans located in the east side of the basin. Maximum declines of about 100 feet were observed between predevelopment in the basin and February 1976 levels, with up to 60 feet of decline occurring from 1962 to 1975.

During the period 1962-1975, water levels along the fans generally declined at rates between one to four and a half feet annually while the central part of the valley declined at less than one foot annually.[13]

Ground water levels of many wells measured within the Pahrump Valley have continued to show a decline from 1976 to 1985.[13]

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[12] See attached Appendix of References.

[13] U.S. Geological Survey, Water Supply Paper 2279. The State Engineer's office and the U.S. Geological Survey have maintained water level networks and measurements continuously since 1962. Public record in the office of the State Engineer.

IX.

Permits and Certificates have been issued in Pahrump Valley that have the potential to withdraw over 80,000 acre-feet of ground water per year when fully developed. Of this amount 60,000 acre-feet annually is for irrigation purposes and 20,000 acre-feet annually represents municipal/quasi-municipal and commercial useage. Should Application 51632 be granted a permit, an additional 450 acre-feet annually could be withdrawn from the Pahrump Valley Ground Water Basin for quasi-municipal and domestic purposes.

Several applications to appropriate ground water for quasi-municipal purposes within Pahrump Valley have been previously denied.[14]

X.

Based upon records and information available to the Office of the State Engineer, Pahrump Valley is experiencing a large real estate development phase, especially within the Calvada area. There is currently a total of 39,830 approved lots within the Nye County portion of Pahrump Valley, of which 26,063 approved lots are in the Calvada area consisting of the Calvada Meadows, Calvada North and Calvada Valley subdivision.[1] Ground water is the sole source of water for large scale development in Pahrump Valley, and will remain so in the future. During the period 1962-1985, ground water withdrawals increased from 29,000 acre-feet annually in 1962 to a maximum of 48,000 acre-feet annually in 1968 and then steadily declined from about 44,500 acre-feet annually in 1976 to a minimum of 19,174 acre-feet annually in 1987. The decrease in pumpage is due primarily to the transitional change of agricultural land to real estate development. The pumpage records indicate an initial decline in non-irrigation water usage from 7,355 acre-feet in 1976 to 781 acre-feet in 1979 and then steadily increased to 3,900 acre-feet in 1985. Irrigation water usage, however, declined at a disproportionate rate of change from 37,100 acre-feet in 1976, 33,088 acre-feet in 1979 to 15,424 acre-feet in 1986.[13]

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[14] Public record in the office of the State Engineer. See also State Engineer's Ruling Nos. 1854, 1897, 1918, 1919, 2713, 2787, 2836, 3216, 3248 and 3462.

CONCLUSIONS

I.

The State Engineer has jurisdiction of the parties and the subject matter of this action.[15]

II.

The State Engineer is prohibited by law from granting a permit under an application to appropriate the public waters where:[16]

A. There is no unappropriated water at the proposed source, or

B. The proposed use conflicts with existing rights, or

C. The proposed use threatens to prove detrimental to the public interest.

III.

Based on the "maximum steady-state pumping rate" theory a basin-wide overdraft existed from 1962 to 1975. Static water levels in some wells have continued to decline in wells off of the Manse and Pahrump fans. Wells off of these fans are continuing to cause decline in the static water levels, although pumpage fell below the recommended steady-state pumping rate of 26,000 acre-feet annually in 1980. This rate yields a consumptive use of 19,000 acre-feet annually which is the perennial yield of the basin. Capture of a substantial portion of the 18,000 acre-feet of underflow is not predicted as being feasible. Therefore, the deep aquifer cannot be counted on as an additional source of ground water.

At this time over 75% of the total amount of water rights committed within the Pahrump Valley Ground Water Basin remains under irrigation use. As the basin shifts from agricultural to residential use of water a temporary decline in pumpage as currently evidenced will occur. With the residential and commercial population increase there will be an increase in pumpage to support the new uses. Therefore, there is substantial

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15 NRS Chapters 533 and 534.

16 NRS 533.370(2)(3)

probability that transfer of water rights to other areas within the Pahrump Valley Ground Water Basin will occur in order to accommodate residential and commercial development that expand beyond the confines of the acreage currently used for agriculture.

IV.

The granting of Application 51632 would allow an additional appropriation of 450 acre-feet annually in a groundwater basin which is currently overappropriated. Historically, the Pahrump Valley Ground Water Basin has had continuous static water level declines when thirty-six to sixty percent of the existing water rights have been utilized. The potential for full utilization of these rights becomes greater as residential and commercial use replaces existing agricultural use. Therefore, additional burden and stress would be created upon the Pahrump Valley Ground Water Basin with the approval of Application 51632 which would further aggravate a historical basin-wide overdraft and declining static water levels, and would conflict with existing rights and be detrimental to the public interest.

RULING

The denial of Application 51632 is herewith affirmed on the grounds that the granting thereof would interfere with and impair existing rights and therefore be detrimental to the public interest.

Respectfully submitted,

PETER G. MORROS
State Engineer

PGM/jjs

Dated this 2nd day of

June, 1989.