

**IN THE OFFICE OF THE STATE ENGINEER**

IN THE MATTER OF APPLICATIONS 51773,) 51774, 51775, 51816, 51881, 51882 and 51929) FILED TO APPROPRIATE WATER FROM THE) SAN EMIDIO DESERT GROUNDWATER BASIN,) WASHOE COUNTY, NEVADA. )

**RULING**

**GENERAL**

I.

Application 51773 was filed on January 19, 1988, by Thomas J. DeMull to appropriate 3.0 c.f.s. of water from an underground source for mining, milling and domestic purposes. The proposed point of diversion is within the NE1/4 NE1/4 Section 5, T.29N., R.23E., M.D.B.&M.

Application 51774 was filed on January 19, 1988, by Thomas J. DeMull to appropriate 3.0 c.f.s. of water from an underground source for mining, milling and domestic purposes. The proposed point of diversion is within the SE1/4 NW1/4 Section 33, T.30N., R.23E., M.D.B.&M.

Application 51775 was filed on January 19, 1988, by Thomas J. DeMull to appropriate 3.0 c.f.s. of water from an underground source for mining, milling and domestic purposes. The proposed point of diversion is within the NW1/4 NE1/4 Section 4, T.29N., R.23E., M.D.B.&M.

Application 51816 was filed on February 5, 1988, by AMOR II Corporation to appropriate 5.2 c.f.s. of water from an underground (geothermal) source for industrial (power generation) purposes. The proposed point of diversion is within the SW1/4 NE1/4 Section 21, T.29N., R.23E., M.D.B.&M.

Application 51881 was filed on March 1, 1988, by Michael B. Stewart to appropriate 4.456 c.f.s. of water from an underground (geothermal) source for power generation purposes. The proposed point of diversion is within the SW1/4 SE1/4 Section 16, T.29N., R.23E., M.D.B.&M.

Application 51882 was filed on March 1, 1988, by Michael B. Stewart to appropriate 4.456 c.f.s. of water from an underground (geothermal) source for power generation purposes. The proposed point of diversion is within the NW1/4 NE1/4 Section 21, T.29N., R.23E., M.D.B.&M.

Application 51929 was filed on March 16, 1988, by AMOR II Corporation to appropriate 1.0 c.f.s. of water from an underground source for industrial (power plant cooling water) purposes. The proposed point of diversion is within the SE1/4 NE1/4 Section 36, T.30N., R.22E., M.D.B.&M.

II.

Applications 51773, 51774 and 51775 were assigned on May 9, 1988, by Thomas J. DeMull to AMAX Gold, Inc., (hereinafter "AMAX") deed filed June 3, 1988, in file No. 51773 in the office of the State Engineer.

III.

Applications 51773, 51774 and 51775 were timely protested by United States Gypsum Company (hereinafter "U.S. Gypsum") on April 18, 1988, for the following reasons and on the following grounds, to wit:

The appropriation of this water when added to the already approved designated users of the San Emidio Basin will exceed the annual recharge of the basin as determined by the State Engineer. Use of this magnitude could very well lower the water table and degrade the quality of water from existing wells such that it would not be suitable for the manufacture of wallboard and/or for use as drinking and domestic water by our employees.

Protestant U.S. Gypsum requests Applications 51773, 51774 and 51775 be denied.

Applications 51773, 51774 and 51775 were timely protested by Michael B. Stewart (hereinafter "Stewart") on May 12, 1988, for the following reasons and on the following grounds, to wit:

Ground water recharge to the San Emidio Desert Area is mainly derived from precipitation within the area. A geological survey estimates the perennial yield of the San Emidio Desert Area basin to be 2,500 acre-feet of water per year. Approval of this application would substantially exceed the perennial yield of the ground water basin. Fourteen

applications have been denied on the grounds that their granting would tend to impair the value of existing rights and be otherwise detrimental to the public welfare.

Protestant Stewart requests Applications 51773, 51774 and 51775 be denied.

Applications 51773, 51774 and 51775 were timely protested by the Pyramid Lake Paiute Tribe of Indians (hereinafter "Pyramid Tribe") on May 23, 1988, for the following reasons and on the following grounds, to wit:

1. The water sought to be used is subject to the Pyramid Lake Paiute Tribe's prior and paramount reserved water rights.
2. Granting or approving Application(s) 51773, 51774 and 51775 would conflict with and tend to impair the value of the Pyramid Lake Paiute Tribe's reserved water rights and would adversely affect the availability of water for future wells constructed or authorized by the Pyramid Lake Paiute Tribe within the San Emidio Desert portion of the Pyramid Lake Indian Reservation.
3. Granting or approving Application(s) 51773, 51774 and 51775 would be detrimental to the public welfare.
4. On information and belief, Application(s) 51773, 51774 and 51775 should be denied because the ground water basin is fully appropriated.
5. The Pyramid Lake Paiute Tribe of Indians will be adversely affected if Application(s) 51773, 51774 and 51775 are granted because it would impair and interfere with the tribe's ability to utilize the ground water resources of the Pyramid Lake Indian Reservation.

THEREFORE the protestant requests that the above referenced applications be denied and that an order be entered for such relief as the State Engineer deems just and proper.

III.

Application 51816 was timely protested by the Pyramid Tribe for the following reasons and on the following grounds, to wit:

1. The water sought to be used is subject to the Pyramid Lake Paiute Tribe's prior and paramount reserved water rights.
2. Granting or approving Application No. 51816 would conflict with and tend to impair the value of the Pyramid Lake Paiute Tribe's water rights.
3. Granting or approving Application No. 51816 would be detrimental to the public welfare.
4. On information and belief, Application No. 51816 should be denied because the ground water basin is fully appropriated.
5. The Pyramid Lake Paiute Tribe of Indians will be adversely affected if Application No. 51816 is granted because it would impair and interfere with the Tribe's ability to utilize the ground water resources of the Pyramid Lake Indian Reservation.

THEREFORE the protestant requests that the above referenced application be denied and that an order be entered for such relief as the State Engineer deems just and proper.

IV.

Applications 51881 and 51882 were timely protested by the Pyramid Tribe on May 26, 1988, for the following reasons and on the following grounds, to wit:

1. The water sought to be used is subject of the Pyramid Lake Paiute Tribe's prior and paramount reserved water rights.
2. Granting or approving Application(s) 51881 and 51882 would conflict with and tend to impair the value of the Pyramid Lake Paiute Tribe's reserved water rights and would adversely affect the availability of water for future wells constructed or authorized by the Pyramid Lake Paiute Tribe within the San Emidio Desert portion of the Pyramid Lake Indian Reservation.
3. Granting or approving Application(s) 51881 and 51882 would be detrimental to the public welfare.
4. On information and belief, Application(s) 51881 and 51882 should be denied because the ground water basin is fully appropriated.
5. The Pyramid Lake Paiute Tribe of Indians will be adversely affected if Application(s) 51881 and 51882 are granted because it would impair and interfere with the Tribe's ability to utilize the ground water resources of the Pyramid Lake Indian Reservation.

THEREFORE the protestant requests that the above referenced applications be denied and that an order be entered for such relief as the State Engineer deems just and proper.

Applications 51881 and 51882 were timely protested by AMOR II Corporation (hereinafter "AMOR II") on May 31, 1988, for the following reasons and on the following grounds, to wit:

Granting of Application(s) 51881 and 51882 may likely have a significant negative impact on AMOR II Corporation's (AMOR II's) existing 3.66 MW (net) binary geothermal power plant located immediately south of the point of diversion proposed under application(s) No. 51881 and No. 51882. The San Emidio Desert geothermal reservoir tapped by AMOR II's project is a small, thin, permeable zone which may extend a short distance north of the existing production area within the lease. As such, the appropriation of this water may create a pressure decline in the geothermal reservoir that will negatively impact AMOR II's production. No further development beyond AMOR II's geothermal wellfield should be permitted until sufficient data has been collected to evaluate the northern extent of the geothermal reservoir and it has been satisfactorily proven that the reservoir has sufficient capacity to support further development.

V.

Application 51929 was timely protested by U.S. Gypsum on April 18, 1988, for the following reasons and on the following grounds, to wit:

The appropriation of this water when added to the already approved designated users of the San Emidio Basin will exceed the annual recharge of the basin as determined by the State Engineer. Use of this magnitude could very well lower the water table and degredate the quality of water from existing wells such that it would not be suitable for the manufacture of wallboard and/or for use as drinking and domestic water by our employees.

Protestant U.S. Gypsum requests Application 51929 be denied.

Application 51929 was timely protested by the Pyramid Tribe on May 23, 1988, for the following reasons and on the following grounds, to wit:

1. The water sought to be used is subject to the Pyramid Lake Paiute Tribe's prior and paramount reserved water rights.
2. Granting or approving Application No. 51929 would conflict with and tend to impair the value of the Pyramid Lake Paiute Tribe's reserved water rights and would adversely affect the availability of water for future wells constructed or authorized by the Pyramid Lake Indian Reservation.
3. Granting or approving Application No. 51929 would be detrimental to the public welfare.
4. On information and belief, Application No. 51929 should be denied because the ground water basin is fully appropriated.
5. The Pyramid Lake Paiute Tribe of Indians will be adversely affected if Application No. 51929 is granted because it would impair and interfere with the Tribe's ability to utilize the ground water resources of the Pyramid Lake Indian Reservation.

THEREFORE the protestant requests that the above referenced application be denied and that an order be entered for such relief as the State Engineer deems just and proper.

Application 51929 was timely protested by Michael B. Stewart on May 31, 1988, for the following reasons and on the following grounds, to wit:

Ground water recharge to the San Emidio Desert Area is mainly derived from precipitation within the area. A geological survey estimates the perennial yield of the San Emidio Desert Area basin to be 2,500 acre-feet of water per year. Approval of this application would substantially exceed

the perennial yield of the ground water basin. Futhermore, AMOR II does not need the additional water because Michael B. Stewart has a lease agreement that already serves them with sufficient cooling water. This lease agreement is an integral part of File #50552. Approval of this application would infringe on existing water rights.

Protestant Stewart requests Application 51929 be denied.

### FINDINGS OF FACT

#### I.

Applications 51773, 51774, 51775, 51816, 51881, 51882 and 51929 all propose to divert water for various beneficial uses from the San Emidio Desert Groundwater Basin, Washoe County, Nevada.

#### II.

The San Emidio Desert Groundwater Basin was designated by the State Engineer on May 28, 1980, as an area in need of additional administration as provided in NRS 534.030, et seq.<sup>1</sup>

#### III.

After all of the subject parties had been duly notified as required under NRS 533.365 (3), a hearing was held beginning on August 15, 1988, and continued to August 16, 1988, and August 24, 1988, for the filing of evidence and testimony deemed necessary by the State Engineer for a full understanding of the above-referenced applications and protests.<sup>2</sup> A significant amount of testimony and evidence was developed at the subject hearing as all parties were provided a full opportunity to present their respective

-----  
<sup>1</sup> State Engineer's Order No. 746, State's Exhibit No. 30.

<sup>2</sup> Exhibit 1, Administrative Hearing August 15, 1988.

positions. Post-hearing written briefs were submitted to the State Engineer by the parties that had standing in the proceedings. The State Engineer took administrative notice of certain matters more fully set forth in the transcript of the hearing.

IV.

It was agreed upon by all parties at the outset of the proceedings that the fresh water filings and geothermal filings would be treated separately and distinctly from each other.<sup>3</sup> Uncontroverted expert testimony established the geothermal reservoir as physically distinct from the alluvial aquifers.

V.

Protestant U.S. Gypsum withdrew its protests to Applications 51773, 51774 and 51775 at the hearing.<sup>5</sup>

VI.

Applicant Stewart requested at the hearing that any action by the State Engineer on Applications 51881 and 51882 be withheld until further notice.<sup>6</sup>

VII.

Subsequent to the hearing, protestant Pyramid Tribe withdrew its protest to the granting of Application 51816 on September 26, 1988, pursuant to an agreement by and between the parties, dated September 19, 1988.<sup>7</sup> Application 51816 proposes to develop geothermal water with no additional consumptive use proposed.

---

<sup>3</sup> Transcript of Administrative Hearing August 15, 1988, pp. 17-18 (hereinafter Tr., (page)).

<sup>4</sup> Tr., pp.253-254; Tr., pp. 468-471; Ex. N and Ex. O.

<sup>5</sup> Tr., pp. 177-181.

<sup>6</sup> Tr., pp. 505-507.

<sup>7</sup> See Agreement dated September 19, 1988, in File No. 51816.

VIII.

The total combined volume of water requested by AMAX under Applications 51773, 51774 and 51775 was amended by AMAX during the hearing to 1800 acre-feet annually. In addition, the record reflects that efforts by AMAX and AMOR II were being pursued to utilize a portion of the spent geothermal water to further reduce AMAX's proposed withdrawals from the fresh groundwater basin.<sup>8</sup>

IX.

Water Resources - Reconnaissance Series Report 44, "Water-Resources Appraisal of Smoke Creek - San Emidio Desert Area, Nevada and California", (hereinafter "Report 44") was prepared by the United States Geological Survey in cooperation with the Nevada Department of Conservation and Natural Resources. The State Engineer takes administrative notice of Report 44 and recognizes it as a reconnaissance level compilation of hydrologic data, from which preliminary estimates were made regarding the amount of underground water that may be available for appropriation on a perennial yield basis. This perennial yield is the amount of underground water of suitable chemical quality that is estimated by the U.S. Geological Survey to be available within a groundwater basin for withdrawal on an average annual basis. Withdrawals of groundwater in excess of the perennial yield on a continuing, long-term basis will result in a depletion of groundwater in storage over and above the amount that replenishes the basin from precipitation. This results in a continued decline of water levels in wells for as long as the withdrawals exceed the perennial yield. Withdrawals of groundwater in excess of the 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 groundwater basins 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. (See attached appendix of references). Report 44 estimates that the perennial yield in the San Emidio Desert Groundwater Basin is 2500 acre-feet annually.<sup>9</sup>

-----  
<sup>8</sup> Tr., p. 206; Tr., pp. 212-214; Tr., pp. 218-219.

<sup>9</sup> See Report 44, p. 46.

X.

Applicant AMOR II provided expert testimony and evidence that refined the Report 44 estimates of groundwater recharge (perennial yield) utilizing present day methods of analysis. Witness William Nork testified that estimating precipitation values for an area with the "Spreen Method" is much more accurate than the Hardman Analysis presented in Report 44, and is a widely accepted methodology in the Western United States. Mr. Nork further testified that the resulting groundwater recharge values using the USGS recharge factors, were more on the order of 4600 acre-feet annually.<sup>10</sup> Mr. Nork confirmed this value in a basin-wide water budget (imbalance) analysis, noting that Report 44 displayed a 36% imbalance between its recharge and discharge estimates while Mr. Nork's refined value of recharge brought the water budget picture to within 11% of balance. The USGS qualified their own estimates in Report 44 by noting:

"The imbalances largely result from inadequacies of the assumptions used in making the estimates of recharge and discharge. For lack of conclusive data that would provide confidence to favor either the recharge or discharge estimates, average annual ground-water budgets are balanced by averaging the two estimates, which are shown in table 15 as the "selected value of recharge and discharge."<sup>11</sup>

The State Engineer recognizes the Spreen Method may not be completely accurate,<sup>12</sup> but further recognizes that since the USGS estimated discharge value exceeded the recharge value in Report 44, the actual value of perennial yield is likely higher than 2500 acre-feet and may well approach 4600 acre-feet annually.

-----  
<sup>10</sup> Tr., pp. 380-387, See Exhibit "M".

<sup>11</sup> See Report 44, p. 40.

<sup>12</sup> Wilson v. Westergard, Case No. 323027, Second Judicial District Court, State of Nevada. September 3, 1981.

XII.

The total volume of underground water appropriated under existing permits and certificates in the San Emidio Desert Groundwater Basin is 7436 acre-feet annually. Testimony was received that the Stewart agricultural rights are being fully utilized,<sup>13</sup> and the State Engineer finds that all existing rights in the San Emidio Desert Groundwater Basin are being substantially exercised.

XIII.

Report 44 further addresses the concept of transitional storage reserve, and describes it as "the amount of stored water available for withdrawal by pumping during the nonequilibrium period of development or period of lowering water levels....transitional storage reserve is a specific part of the total ground-water resource that can be taken from storage; it is a quantity additional to that of perennial yield, but can be withdrawn on a once-only basis." (Emphasis added). The estimated 300,000 acre-feet of water available under this concept is based on seven idealistic assumptions dealing with the manner in which the storage depletion takes place and the reaction of the basin in hydrologic response to groundwater development of this magnitude.<sup>14</sup> Evidence and testimony presented by both AMAX and AMOR II dealt extensively with predicting the response of the groundwater basin to their respective utilization of a portion of this transitional storage reserve.<sup>15</sup> San Emidio Desert is a relatively small groundwater basin with a minimal recharge. To permit additional appropriations of up to 2524 acre-feet would only increase the already over-stressed condition that exists in the basin.

AMAX witness George Ball testified that the total annual groundwater withdrawals, if all proposed and existing appropriations are fully realized, would amount to a utilization of 19.3 percent of the transitional storage reserve. This would result in a water table decline on an overall area-wide basis of approximately 10 feet.<sup>16</sup> The State Engineer finds no evidence that would cast doubt on the methodology used by Mr. Ball in

---

<sup>13</sup> Tr., pp. 35-36.

<sup>14</sup> See Report 44, p. 47.

<sup>15</sup> Tr., pp. 257-260; pp. 267-271.

<sup>16</sup> Tr., p. 271.

this analysis nor on the estimates generated therefrom. The record reflects no evidence that would demonstrate that the actual development of the groundwater basin under the proposed applications would realistically be able to develop the water under the guidelines presented as the foundation of the transitional storage reserve concept. It is only logical that in order to develop water that is available in theory, the fundamental assumptions made to support the theory must be adhered to during actual development or the theory itself may as well not even exist. The State Engineer finds, after a thorough review of the record, that the concept of utilizing the transitional storage reserve as unappropriated water as presented by the applicants, is unrealistic and would result in a depletion of the resource that would adversely affect existing rights and, therefore, would not be in the public interest.

Applicants AMAX and AMOR II represented their respective proposed appropriations would in fact be over and above the perennial yield and would be withdrawing underground water from the transitional storage reserve.

### CONCLUSIONS

#### I.

The State Engineer has jurisdiction in the parties and subject matter of this action pursuant to NRS 533.365 and NRS 533.370 and NRS 534.020(1).

#### II.

Application 51816 proposes to develop non-consumptive use of water from a separate and distinct geothermal reservoir. The protest of the Pyramid Tribe has been withdrawn, Application 51816 can be approved based on non-consumptive use of water from the geothermal reservoir.

#### III.

San Emidio Desert is a designated groundwater basin pursuant to State Engineer's Order No. 746 and as such is subject to the provisions of NRS 534.030, et seq.

#### IV.

The State Engineer is prohibited by law (NRS 533.370(3) and NRS 534.110(3)) from issuing permits where:

1. There is no unappropriated water in the proposed source of supply, or
2. The proposed use conflicts with existing rights, or
3. The proposed use threatens to prove detrimental to the public interest.

V.

The State Engineer concludes from the record of evidence that the granting of the subject applications would adversely effect existing rights and therefore would not be in the public interest.

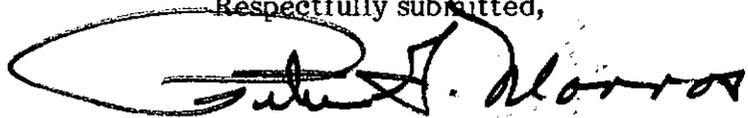
VI.

With 7436 acre-feet in existing appropriations and a maximum of 4600 acre-feet in available recharge annually, there is no unappropriated water in the San Emidio Desert Groundwater Basin. NRS 533.370(3) and 534.110(3) require the State Engineer reject Applications 51773, 51774, 51775 and 51929 and refuse to issue the permits asked for.

**RULING**

The protests to the granting of Applications 51773, 51774, 51775 and 51929 are upheld and the subject applications are herewith denied on the grounds that there is no unappropriated water in the proposed source of supply, the granting thereof would adversely effect existing rights and would not be in the public interest. Application 51816 will be approved upon receipt of statutory permit fees.

Respectfully submitted,



PETER G. MORROS  
State Engineer

PGM/TKG/bk

Dated this 28th day of  
November, 1988.

## APPENDIX OF REFERENCES

Land Subsidence in Las Vegas Valley, 1935-63, Information Series No. 5 U.S.G.S.

State of Nevada, Department of Highways, Report on Land Subsidence in Las Vegas Valley.

Evaluation of the Water Resources of Lemmon Valley with Emphasis on Effects of Ground-Water Development to 1971, J.R. Harrill, Water Resources Bulletin No. 42, United States Geological Survey and State of Nevada, State Engineer's Office, Division of Water Resources, Department of Conservation and Natural Resources, 1972.

Hydrologic Response to Irrigation Pumping in Diamond Valley, Eureka and Elko Counties, Nevada, 1950-65, J.R. Harrill, Water Resources Bulletin No. 35, United States Geological Survey and State of Nevada, State Engineer's Office, Division of Water Resources, Department of Conservation and Natural Resources, 1968.

Effects of Irrigation Development on the Water Supply Quinn River Valley area, Nevada and Oregon, 1950-1964, C.J. Huxel, Jr., Water Resource Bulletin No. 34, United States Geological Survey and State of Nevada, State Engineer's Office, Division of Water Resources, Department of Conservation and Natural Resources, 1966.

Hydrologic Response to Irrigation Pumping in Hualapai Flat, Washoe, Pershing and Humboldt Counties, Nevada, 1960-1967, J.R. Harrill, Water Resource Bulletin No. 37, United States Geological Survey and State of Nevada, State Engineer's Office, Division of Water Resources, Department of Conservation and Natural Resources, 1969.

The Effects of Pumping on the Hydrology of Kings River Valley, Humboldt County, Nevada, 1957-1964, G.T. Malmberg and G.F. Worts, Jr., Water Resource Bulletin No. 31, United States Geological Survey and State of Nevada, State Engineer's Office, Division of Water Resources, Department of Conservation and Natural Resources, 1966.

Effects of Ground-Water Development on the Water Regimen of Paradise Valley, Humboldt County, Nevada, 1948-1968, and Hydrologic Reconnaissance of the Tributary Areas, J.R. Harrill and D.O. Moore, Water Resource Bulletin No. 39, United States Geological Survey, 1970.

Ground-Water Storage Depletion in Pahrump Valley, Nevada-California, 1962-75, J.R. Harrill, Open File Report 81-635, United States Geological Survey, 1982, prepared in cooperation with Nevada Division of Water Resources.

Development of a Relation for Steady State Pumping Rate for Eagle Valley Ground-Water Basin, Nevada, F.E. Arteaga, T.J. Durbin, United States Geological Survey, 1978, prepared in cooperation with Nevada Division of Water Resources.

Basic Ground-Water Hydrology, Ralph C. Heath, U.S. Geological Survey Water Supply Paper 2220, 1983.

Methods of Determining Permeability, Transmissibility and Drawdown, U.S. Geological Survey Water Supply Paper 1536-1, R.H. Brown, J.G. Ferris, C.E. Jacob, D.B. Knowles, R.R. Meyer, H.E. Skibitzke and C.F. Theis, 1963.

Subsidence in Las Vegas Valley, John w. Bell, Nevada Bureau of Mines and <sup>\*</sup>Geology Bulletin 95.

Subsidence in United States due to Ground-Water Overdraft - A Review, J.F. Poland, Proceedings of the Irrigation and Drainage Division Specialty Conference, April 1973, American Society of Civil Engineers.

Ground-Water Hydraulics, S.W. Lohman, U.S. Geological Survey Professional Paper 708, 1979.