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

IN THE MATTER OF THE POSSIBLE FORFEITURE OF PERMIT 11101, AMENDED CERTIFICATE 3117, FILED TO APPROPRIATE THE PUBLIC WATERS OF THE LAS VEGAS ARTESIAN GROUNDWATER BASIN (212), CLARK COUNTY, NEVADA.	)	**RULING** **#4630**

GENERAL

I.

Permit 11101 was granted by the State Engineer to R. J. Kaltenborn on July 3, 1944, to appropriate 0.20 cubic feet per second (cfs) of the underground waters of the Las Vegas Artesian Groundwater Basin for domestic and irrigation purposes on 20 acres within the S½ SW¼ NW¼ of Section 20, T.20S., R.61E., M.D.B.&M.[1] The point of diversion is described as being located within the SW¼ NW¼ of said Section 20. After filing proof of beneficial use of the waters as allowed under the permit, the State Engineer issued Amended Certificate 3117 which allows for the diversion of underground water at a rate of 0.2 cfs[2] for irrigation and domestic purposes appurtenant to 20 acres within the S½ SW¼ NW¼ of Section 20, T.20S., R.61E., M.D.B.&M.[1]

II.

After all parties of interest were duly noticed by certified mail, a public administrative hearing was held on December 17, 1996, before representatives of the office of the State Engineer to consider the possible forfeiture of a portion of Permit 11101, Amended Certificate 3117, under the terms of Nevada Revised Statute § 534.090.[3]

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[1] File No. 11101, official records in the office of the State Engineer.

[2] The authorized diversion rate of 0.2 cfs equates to 90 gallons per minute (gpm).

[3] Exhibit No. 1, public administrative hearing before the State Engineer, December 17, 1996.

FINDINGS OF FACT

I.

The statutory provisions for issuing certificates on applications filed between March 22, 1913, and March 9, 1945, allowed for a maximum diversion of 1.0 cfs per 100 acres of irrigation with no duty established. The State Engineer finds that Amended Certificate 3117 was issued in compliance with the applicable statutes under which the application was filed.

II.

The records in the office of the State Engineer reflect that Permit 11101, Amended Certificate 3117, is a non-revocable water right issued for irrigation and domestic purposes within 20 acres, serving eight two and one-half acre parcels of land improved with dwellings, gardens and lawns, and an area designated as alfalfa under cultivation. The map filed in the office of the State Engineer that accompanied the application was also used for filing the Proof of Beneficial Use and was used for issuing the certificate. The map depicts an area of approximately 11 acres of irrigation on the north side of the parcels along with eight dwellings and their associated landscaping.[4] The State Engineer finds those eight dwellings and their associated landscaping and irrigation are the only legal use of the water as authorized under Permit 11101, Amended Certificate 3117.

III.

The records in the office of the State Engineer as of the date of the administrative hearing reflect that no conveyance had been made to change the ownership of the water right under Permit 11101, Amended Certificate 3117, from the original permittee to any other person or entity claiming ownership of the water right. Evidence as to the title issue was submitted during the administrative hearing and are part of this record. The conveyance of ownership of the

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[4] Exhibit No. 3, public administrative hearing before the State Engineer, December 17, 1996.

subject water right can be addressed through the statutory provisions. The duties of the State Engineer concerning conveyances are outlined in NRS § 533.382 through 533.387, inclusive. The issue of title was not the purpose of the administrative hearing. Therefore, the State Engineer finds that issue of ownership of the water right is not determined in this ruling.

IV.

Each year from 1988 through 1993, employees of the office of the State Engineer performed what are known as groundwater pumpage inventories which documented the use of water under Permit 11101, Amended Certificate 3117.[5] For each of the years 1988 through 1993, inclusive, the pumpage inventories indicated that there was no irrigation of a crop such as alfalfa in the sense of cultivation for harvest, and that between 16 and 20 acre-feet of water had been used under the certificate. At the administrative hearing, those claiming ownership of the water right (Coran Lane Water Users Association) provided evidence of the kilowatt hours (kWh) of electricity used in pumping the permitted well for the five years in question.[6] Those records indicate that the maximum kWh hours used during the years 1988 through 1993 was 17,839 kWh and that the well was equipped with a pump and motor rated at 15 horsepower.[7] Legal counsel for the Coran Lane Water Users Association in closing argument tried to present evidence of the quantity of water used by using a formula to convert kWh to acre-feet used. The State Engineer finds that Mr. Walch as legal counsel was not a witness to

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[5] Transcript, pp.24-29, Exhibit No. 5, public administrative hearing before the State Engineer, December 17, 1996.

[6] Exhibit Nos. 9 and 10, public administrative hearing before the State Engineer, December 17, 1996.

[7] Exhibit No. 13, public administrative hearing before the State Engineer, December 17, 1996.

this proceeding and could not present evidence for the State Engineer's consideration. However, be that as it may, the State Engineer finds he is qualified to make the same analysis based on the evidence in this record.

V.

The subject well did not have a totalizing meter on the discharge pipe during the years 1988 to 1993. However, various methodologies have been developed and refined over the years that can quantify the amount of water actually put to beneficial use using other evidence such as kilowatt hours. A portion of the evidence received during the administrative hearing consisted of electric power meter records. The power meter records are from Nevada Power Company to the Coran Lane Water Association. The power records are in kilowatt hours and were summarized in Exhibit 10.[8] There is a way to estimate pumping time and groundwater withdrawals using energy-consumption data and the authorized diversion rate of 90 gpm.

The maximum use of power occurred in 1993.[8] Using an overall efficiency of 85%[9] for the pump and motor combination the State Engineer assumed the following:[10]

1. that the discharge from the pump is into the atmosphere and not into a pressurized delivery system that requires

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[8] Exhibit No. 10, public administrative hearing before the State Engineer, December 17, 1996.

[9] Exhibit No. 15, public administrative hearing before the State Engineer, December 17, 1996. The efficiency of the pump and motor combination of 85% is recognized by the State Engineer as very favorable to the permittee. A more appropriate efficiency for the pump and motor combination would be 66% even for a new submersible pump.

[10] All assumptions are in favor of the permittees. The assumptions applied in using the equations to determine the total amount of water pumped are for the best case scenario.

pressure head to be delivered by the pump, head is defined as the difference in elevation between intake and discharge points of a liquid;

2. that the pump is designed for peak efficiency at the required lift to deliver the water from the water table to the surface;
3. that all friction losses are neglected throughout the system due to the energy loss per unit weight of water and the frictional losses through the delivery system; and
4. that the horsepower (hp) input (I_p) is the rated hp multiplied by the overall efficiency.[11]

Using the following accepted formulas to determine the amount of water pumped from the subject well using the kWh meter readings:[12]

Bp = Brake Horsepower = horsepower rating on pump

Ip = Input Horsepower = horsepower delivered to pump (efficiency provided by testimony - State Engineer finds extremely high number, but benefit given to permittee)

Em = Motor Efficiency

Q = Discharge (gal/min)

hp = Horsepower (33,000 ft-lb)

hp/hr = 0.7457 kWh

1 acre-foot = 325,851 gallons

$$Ip = \frac{Bp}{Em}$$

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[11] Everyone of these assumptions is conservative and would work in favor of the water right owner. Obviously the pump and motor have to lift the water from the pumping level to the surface, but also to provide pressure to the users. The pump may not be operating at peak efficiency, only a new pump could. There are obvious friction losses in the system that were not considered. Actual horsepower may be somewhat less than the rated horsepower.

[12] Colt Industries Inc., Hydraulic Handbook, p. 16 (9th ed. 1975).

$$\text{(T) Hours pumped} = \frac{\left(\frac{1\ \text{hp/hr}}{0.7457\ \text{kWh}}\right)(\text{kWh})}{\text{Ip [hp]}}$$

$$\text{(T)} = \frac{\left[\left(\frac{1}{0.7457}\right)(17{,}839)\right]}{[(0.85)(15)]}$$

$$\text{(T)} = 1{,}876.3 \text{ hrs well pumped in 1993}$$

$$\text{Water pumped (acre-feet)} = \frac{[Q(60\text{min/hr})(T)]}{325{,}851\ \text{gal}}$$

$$\text{Water pumped (acre-feet)} = \frac{[(90\ \text{gpm})(60\ \text{min})(1{,}876.3)]}{325{,}851\ \text{gal}}$$

$$\text{Water pumped (acre-feet)} = 31.1 \text{ acre-feet}$$

The State Engineer finds the maximum quantity of water used from 1988 to 1993 was 31.1 acre-feet annually at the authorized diversion rate.

VI.

For comparative analysis, a second method that may be used to quantify the amount of water placed to beneficial also uses kilowatt hours to estimate the acre-feet pumped. In this analysis, the State Engineer used the following conservative assumptions which again are all in favor of the permittee:

1. the pounds per square inch (psi) of pressure in the delivery system is 40 psi;
2. the head loss (h_L) due to pipe friction per 100 feet (ft.) of delivery pipe is 1.33 ft.;[13] and
3. the length of the delivery system is 1,125 lineal

[13] Colt Industries, Inc., Hydraulic Handbook, Table 1, Section II, "Friction loss per 100 feet for water in schedule 40 steel pipe (4")", p. 46, (9th ed. 1975).

ft., even though the sizes of the pipes vary in the delivery system, the age of the pipe is not known, and other characteristics for friction loss in the delivery system are not taken into consideration which is a benefit to the permittee.

BHP = Brake Horsepower

TDH[14] = Total Dynamic Head [lift (ft.) + pressure (ft.) + friction (ft.)]

e = efficiency = 85%[9]

h_L = Head friction loss = 11.25 x 1.33 = 14.96 ft.

$$BHP = \frac{Q_{gpm}\ (TDH)}{3{,}960e}$$

TDH = 225 ft.[15] + (40 x 2.31) + 14.96 = 332.4 ft.

$$BHP = \frac{90\ (332.4)}{3{,}960\ (0.85)}$$

BHP = 8.89 hp for Q = 90 gpm

BHP = 14.8 hp for Q = 150 gpm

The State Engineer finds that the pump and motor combination can deliver the required horsepower to deliver water under the assumed conditions.

To convert kWh per 1,000 gallons of water is as follows:

kWh per 1,000 gallons of water = KH

K = coefficient determined from Table 15, Section III[16]

and using e = 85% k = 0.00369

H = Total dynamic head (ft)

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[14] The horsepower of the pump not only has to lift the water from the water table to the surface, it also must provide pressure to the user and overcome any friction loss in the system.

[15] Exhibit 15, public administrative hearing before the State Engineer, December 17, 1996.

[16] Colt Industries, Inc., Hydraulic Handbook, p. 74 (9th ed. 1975).

$$kWh_{1,000\ gal} = 0.00369 \times 332.4$$

$$kWh_{1,000\ gal} = 1.22\ kWh\ per\ 1,000\ gal$$

$$Q\ (gallons\ pumped) = 17,839\ kWh \times \frac{1,000\ gal}{1.22\ kWh}$$

$$Q = 14,623,233\ gallons$$

$$Q = 44.9\ acre\text{-}feet$$

The State Engineer finds that by using this methodology, the maximum quantity of water used from 1988 to 1993 was 44.9 acre-feet.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.[17]

II.

The State Engineer concludes that in order for a water right permit to ripen into a water right certificate the permittee must file proof of the application of the water to beneficial use within the time frame set forth in the permit or in any extension of time granted by the State Engineer.[18] After a certificate is issued on a permit, failure for five successive years on the part of the certificate holder to use beneficially all or any part of the underground water of the State of Nevada for the purpose for which the right is acquired or claimed works a forfeiture of the right to the use of that water or the extent of the nonuse.[19]

Forfeiture must be demonstrated by clear and convincing evidence. Clear and convincing evidence is that evidence which falls somewhere between a preponderance of the evidence and the

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[17] NRS Chapters 533 and 534.

[18] NRS § 533.140.

[19] NRS § 534.090.

higher standard of beyond a reasonable doubt.[21] To establish a fact by clear and convincing evidence a party must persuade the trier of fact that the proposition is highly probable, or must produce in the mind of the fact finder a firm belief or conviction that the allegations in question are true.[22] The State Engineer concludes, based on the pumpage inventories and the evidence of those claiming the water right as presented through the power records from the well in question, that a portion of the certificated water right was not placed to beneficial use as authorized under Permit 11101, Amended Certificate 3117. The State Engineer further concludes giving all the benefits to the permittees that the greatest quantity of water placed to beneficial use under Amended Certificate 3117 from 1988 to 1993, as demonstrated by using the electric power consumption records and converting those figures to acre-feet, was 44.9 acre-feet annually.

III.

The forfeiture statute in Nevada is exclusive of who owns the water right and therefore the issue of ownership is not considered. The conveyance of the ownership of Permit 11101, Amended Certificate 3117, to those claiming an interest by submittal of evidence does not change the consideration of forfeiture. The State Engineer concludes that the issue of ownership has no bearing on the forfeiture proceeding.

RULING

The issue of ownership of the water rights is not determined by this action. The portion of the water right under Permit 11101, Amended Certificate 3117, not beneficially used during the forfeiture period is hereby declared forfeited. The right to beneficially use 0.20 cfs in an amount not to exceed 44.9 acre-feet

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[21] 1 Clifford S. Fishman, Jones on Evidence § 3:10, (7th ed. 1993).

[22] Id. at 239.

annually for irrigation and domestic purposes under Permit 11101, Amended Certificate 3117, appurtenant to the S½ SW¼ NW¼ of Section 20, T.20S., R.61E., M.D.B.& M. is not forfeited. A change application must be filed under the provisions of NRS § 533.325 and NRS § 533.345 to change the manner of use to quasi-municipal use for the 12 households that now exist and are using the well. Domestic use as defined in NRS § 533.013 is limited to a single family dwelling.

Respectfully submitted,

R. MICHAEL TURNIPSEED, P.E.
State Engineer

RMT/RKM/cl

Dated this 7th day of

May, 1998.