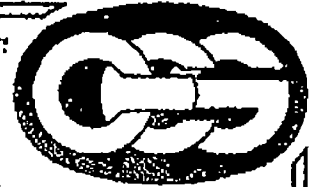
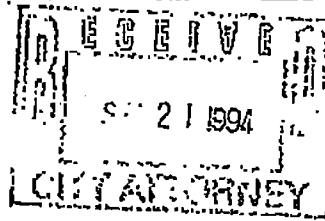


September 20, 1994



William Isaeff
Chief Deputy City Attorney
Cities of Reno and Sparks
P.O. Box 1900
Reno, NV 89505

RE: TMWRF Effluent Water Rights

Job No. 93059.42

Dear Mr. Isaeff:

In accordance with the letter to you from the State Engineer's office dated July 6, 1994, I have researched the water production data and the wastewater flow data for the past 11 years. I have endeavored to follow explicitly the procedure requested in the letter, and the calculations are summarized on the attached forms.

As indicated in the tables, I calculate an effluent return flow of 54.10% of the water produced, when the production data is corrected for flows to Stead, Silver Lake Water Co., and the Mogul water system. Also based on historical production data, the groundwater portion of the water produced represents 20.16% of the total production on average during the last 11 years.

According to SPPCo's Water Resource Plan, the current total commitments are 73,491 Acre Feet. I corrected this number for unsewered customers and out-of-basin transfers, and arrived at 61,822 AF committed to TMWRF-sewered customers. Based upon this commitment, the groundwater portion of the committed water represents 6,743 AF annually.

The water production and commitment data is taken from SPPCo's Water Resource Plan and additional data received directly from Randy Alstadt and Scott Estes at SPPCo. The wastewater flow data was received from John Gonzales at the treatment facility.

I was not able to find any specific data on the unsewered customers served water by SPPCo. I assumed a number of 10%, which should be conservative. In addition, this same percentage is subtracted both from current production and future commitment data, and thus does not figure in the final total in any major part. I also corrected the committed out-of-basin transfers for the Mogul water system, which was added to SPPCo's system in 1992, but is served by septic tanks.

CONSULTING ENGINEERING SERVICES, INC.
1105 Terminal Way, Suite 304
Reno, Nevada 89502
Ph. (702) 786-5873 • Fax (702) 786-6138

EXHIBIT

tabbles

TOWD 257

Bill Isaef
September 20, 1994
Page 2 of 2

You should note that the above calculations are based on the total of the existing usage and the future water supplies committed to the Truckee Meadows. If the return flow water rights were limited to the existing flows only, the estimated effluent due to groundwater rights is 54.1% times 20.16% times 52,956 Af, which equals 5,776 Af.

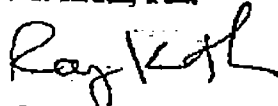
Please let me know if you wish to make any additional refinements to the calculations, or if you have any questions.

Sincerely,

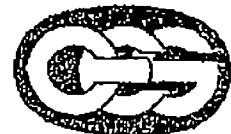
CONSULTING ENGINEERING SERVICES, INC.

Raymond C. Kruth, P.E.

encl.



c.c. w/encl. Tom Kelly, CES
Larry Quilici, Sparks



**CALCULATION OF AVAILABLE EFFLUENT
(BASED ON FUTURE COMMITTED WATER)**

(PROCEDURES PER ST. ENGINEER LETTER OF 7/6/94)

R. K. 09/20/94

1. CURRENT SIERRA PACIFIC DEMAND

ACTUAL PRODUCTION DATA FOR 1993 FOR SIERRA PACIFIC, EXCLUDING
WILL-SERVES UNDER CONSTRUCTION

59,374 ACRE FEET (SPPCO RESOURCE PLAN, p. 6-2)

COMMITMENTS NOT YET COMPLETED:

15,117 ACRE FEET (SPPCO RESOURCE PLAN, p. 6-2)

TOTAL CURRENT COMMITMENTS:

~~73,491 ACRE FEET~~ (SUM OF ABOVE 2 NUMBERS) *100*

2. OUT OF BASIN TRANSFERS

1,488 ACRE FEET (ALLOCATION TO SEVER LAKE WATER CO.
SPPCO. WATER RES. PLAN, EXEC. SUMMARY, p. 11)

1,986 ACRE FEET (ALLOCATION TO STEAD SERVICE AREA)

1,328 ACRE FEET (ALLOCATION TO MOGUL SERVICE AREA)

4,799 TOTAL (AF) OUT-OF-BASIN TRANSFERS

~~68,692 ACRE FEET~~ (COMMITTED TO USERS OF THE TRUCKEE MEADOWS USERS)

3. UNSEWERED PORTION OF TRUCKEE MEADOWS AREA

10.00% (ESTIMATE ONLY)

6,869 ACRE FEET (ESTIMATED CONTRIB. TO UNSEWERED CUSTOMERS)

~~61,822 ACRE FEET~~ (COMMITTED TO USERS OF THE TMWRF)

4. GROUNDWATER AND SURFACE WATER COMMITTED

20.16% GROUNDWATER (CALCULATED FROM AVG. ACTUAL DATA)

79.84% SURFACE WATER (CALCULATED FROM AVG. ACTUAL DATA)

~~12,463 ACRE FEET~~ GROUNDWATER COMMITTED TO TMWRF USERS

~~49,359 ACRE FEET~~ SURFACE WATER COMMITTED TO TMWRF USERS

5. EFFLUENT PRODUCED DUE TO COMMITTED GROUNDWATER

54.10% RATIO WW/WATER (CALCULATED FROM ACTUAL DATA,
CORRECTED FOR UNSEWERED CUSTOMERS)

~~6,743 ACRE FEET~~ EFFLUENT PRODUCED FROM GROUNDWATER SUPPLY

~~28,705 ACRE FEET~~ EFFLUENT PRODUCED FROM SURFACE WATER SUPPLY

485 mgd
will this number

WATER AND WASTEWATER PRODUCTION DATA - 1983-1993

WATER PRODUCTION AND WASTEWATER GENERATION FOR LAST 11 YEARS

YEAR	WATER PRODUCTION DATA			
	(SIERRA/PACIFIC DATA)			
	PRODUCTION (MG)	TOTAL PRODUCTION (AF)	GROUNDWATER PUMPAGE (AF)	SURFACE WATER (AF)
1983	16,308,319,000	50,048	10,488	39,562
1984	19,068,775,000	58,520	10,670	47,850
1985	20,185,234,000	61,946	10,560	51,366
1986	20,747,366,000	63,671	13,104	50,567
1987	20,630,972,000	63,314	9,100	54,214
1988	19,832,781,000	60,865	11,911	48,954
1989	19,891,717,000	61,046	12,812	48,234
1990	20,573,563,000	63,138	14,557	48,581
1991	19,290,269,000	59,200	14,467	44,733
1992	19,112,284,000	58,654	15,649	43,005
1993	18,017,128,000	58,361	9,491	48,870
AVERAGE:	19,514,402,545	59,888	12,075	47,812
	Percentages:	100.00%	20.16%	79.84%

R.K. 09/20/94

WATER DELIVERED TO STEAD, SILVER LAKE & MOGUL		
(SPRGO DATA)		
STEAD & SILVER LK (MG)	MOGUL (MG)	TOTAL (AF)
270.4	0.0	830
393.7	0.0	1,208
337.7	0.0	1,036
433.2	0.0	1,329
416.7	0.0	1,279
293.7	0.0	901
311.5	0.0	956
325.8	0.0	1,000
294.4	0.0	903
274.3	0.0	842
272.1	132.5	1,242
329.41	12.05	1,048

For Projects

73,491

4,799

WATER PROVIDED TO TRUCKEE MEADOWS		
UNSEWERED CUSTOMERS (EST. @ 10%) (AF)	TMWRF SERVICE AREA (CALCULATED) (AF)	
49,219	4,922	44,297
57,312	5,731	51,581
60,910	6,091	54,819
62,342	6,234	56,108
62,035	6,204	55,832
59,963	5,996	53,967
60,090	6,009	54,081
62,138	6,214	55,924
58,296	5,830	52,467
57,812	5,781	52,031
57,120	5,712	51,408
58,840	5,884	52,956

60,157

61,882

$$\frac{D}{(A-C)(0.9)} = X$$

$$A-C(0.9)(B) \times GW \text{ portion}$$

Factor

$$51,887 (60,157)(0.9)(0.9) = 6,709 \text{ AF}$$

WASTEWATER FLOW DATA (CITY OF SPARKS DATA)	
ANNUAL AVG. (MGD) (AF)	
23.83	26,693
23.86	26,727
24.24	27,152
28.47	29,650
28.26	29,415
28.76	28,855
26.32	29,462
26.93	30,166
25.68	28,768
24.94	27,933
26.42	29,593
25.52	28,585

D

GW Factor for Year

5593
4829
4657
7623
4227
5617
6188
6355
7030
7452
4812
65067
x = 5915

RATIO OF TWRF WATER TO WASTEWATER (CALCULATED)	
7383	60.26%
1984	51.82%
85	49.53%
86	52.85%
87	52.68%
88	53.47%
89	54.52%
90	53.94%
91	54.83%
92	53.69%
93	57.56%
54.10%	

X

Using 11 year average
5776 AF GW Conv.

Acc'd on 7 Dec 94