CAL STATE FULLERTON
Department of Geological Sciences
(714) 278-3883 / Fax (714) 278-7266

October 14, 2002

To: Lance Eckhart, Mojave Water Agency
From: W. Richard Laton, Ph.D.

RE: Old Women Springs, San Bernardino County, Water and Flow Analysis

October 13, 2002

Arrived at Old Women Springs (OWS) at 10:00 am. California State University, Fullerton, Department of Geology (CSUF) performed flow measurements and field chemistry on a series of flowing springs in the vicinity of OWS. The following represents a summary of that work. We sampled 4 springs and took general chemistry from various spots throughout the area.

Flow Summary for entire area:

Spring	Volume (acre-ft/year)	Comments
1	241 - 253	Good flow
2	80 ± 10%	Moderate flow
3	≈ 10	Highly vegetated no visible flow
4	≈ 30	Highly vegetated no visible flow

The total surface spring flow is 361 – 381 acre-ft/year as of October 13, 2002. The water chemistry is moderate with TDS reading averaging 450 ppm. It should be pointed out the flow of water that was measured is only spring flow and does not necessarily reflect the groundwater resource available within the Old Women Springs area.

If you have any questions please feel free to contact either Dr. John Foster or myself.

W. Richard Laton, Ph.D., RG, CPG
Assistant Professor of Hydrogeology
California State University, Fullerton, Department of Geological Sciences
714-278-7514
wlaton@fullerton.edu

Spring Summaries

1) Spring 1: (grotto)

a) Midpoint between grotto and lake - sampling location (N 34.39273; W 116.70840)
Water sample taken at 10:30 am for Laboratory analysis.

Flow:

2 secs/5 gallons = 0.334 cfs = 241 acre-ft/year

Field Chemistry:

Horiba

	Value	Units
pH	7.62	
Conductivity	677	µmos
Dissolved Oxygen	9.4	mg/L
Salinity	.02	%
Turbidity	10	NTU
Temperature	21.02	°C

CSUF – Hanna Multiprobe

	Value	Units
pH	7.63	
Conductivity	875	µmos
TDS	435	ppm
Temperature	20.06	°C

b) Grotto Pond area:

Flow:

Flow was calculated using a pigmy current meter in association with a pipe flow. The flow at the exit portion of the pipe leaving the main grotto pond area was 60 revolutions per 1 minute 6 sec average. One revolution = one ft/sec of flow.

0.35 cfs = 253 acre-ft/year

Note: The 8 " diameter pipe length was 18 feet 3 inches.



Field Chemistry:

Horiba

	Value	Units
pH	7.7	
Conductivity	666	µmos
Dissolved Oxygen	10	mg/L
Salinity	.02	%
Turbidity	10	NTU
Temperature	22.9	°C

CSUF – Hanna Multiprobe

	Value	Units
pH	7.93	
Conductivity	866	µmos
TDS	441	ppm
Temperature	22.9	°C

c) Spring 1 Recharge Lake: (N 34.39357; W 116.70798)

Horiba

	Value	Units
pH	8.9	
Conductivity	667	µmos
Dissolved Oxygen	15.4	mg/L
Salinity	-	%
Turbidity	-1	NTU
Temperature	18	°C

CSUF – Hanna Multiprobe

	Value	Units
pH	8.9	
Conductivity	817	µmos
TDS	423	ppm
Temperature	18.8	°C

2) Spring 2: (near House)

a) Spring 2 outlet to Lake (N 34.39533; W 116.70940)

Flow:

6 secs/5 gallons = 0.111 cfs = 80 acre-ft/year
Note: Some leakage occurred around the bucket may lead to ± 10 % variance.

Field Chemistry:

Horiba

	Value	Units
pH	7.9	
Conductivity	672	µmos
Dissolved Oxygen	7.9	mg/L
Salinity	0	%
Turbidity	-1	NTU
Temperature	22	°C

CSUF – Hanna Multiprobe

	Value	Units
pH	7.97	
Conductivity	942	µmos
TDS	471	ppm
Temperature	21.8	°C

b) Spring 2: (headwaters)(N 34.39467; W 116.71009)
Water sample taken at 12:30 am for Laboratory analysis.


Horiba

	Value	Units
pH	7.8	
Conductivity	672	µmos
Dissolved Oxygen	7.2	mg/L
Salinity	0	%
Turbidity	-1	NTU
Temperature	22	°C

CSUF – Hanna Multiprobe

	Value	Units
pH	7.62	
Conductivity	978	µmos
TDS	468	ppm
Temperature	21.8	°C

c) Spring 2: (Lake)

Horiba

	Value	Units
pH	8.1	
Conductivity	740	µmos
Dissolved Oxygen	7.6	mg/L
Salinity	0	%
Turbidity	-1	NTU
Temperature	21	°C

CSUF – Hanna Multiprobe

	Value	Units
pH	8.04	
Conductivity	967	µmos
TDS	478	ppm
Temperature	18.5	°C

3) Spring 3:

a) Spring 3 (N 34.39803; W 116.71305)
Water sample taken at 1:00 am for Laboratory analysis.

Flow: Very little flow. Was wet with some facultative wetland plant species present.

Field Chemistry:

Horiba

	Value	Units
pH	7.8	
Conductivity	700	µmos
Dissolved Oxygen	6.8	mg/L
Salinity	0	%
Turbidity	-1	NTU
Temperature	20	°C

CSUF – Hanna Multiprobe

	Value	Units
pH	7.63	
Conductivity	923	µmos
TDS	458	ppm
Temperature	18.8	°C

4) Spring 4: Cottonwood Spring

a) Spring 4 (N 34.2419; W 116.4315)
Water sample taken at 1:30 am for Laboratory analysis.

Flow: Flow was minimal, however the over growth of vegetation was substantial. The vegetation consisted of extremely high transpiration plants. If cleaned of water draining plants flow could be measured.



Field Chemistry:

Horiba

	Value	Units
pH	7.7	
Conductivity	680	µmos
Dissolved Oxygen	10.7	mg/L
Salinity	0	%
Turbidity	-1	NTU
Temperature	15	°C

CSUF – Hanna Multiprobe

	Value	Units
pH	7.46	
Conductivity	946	µmos
TDS	470	ppm
Temperature	15	°C