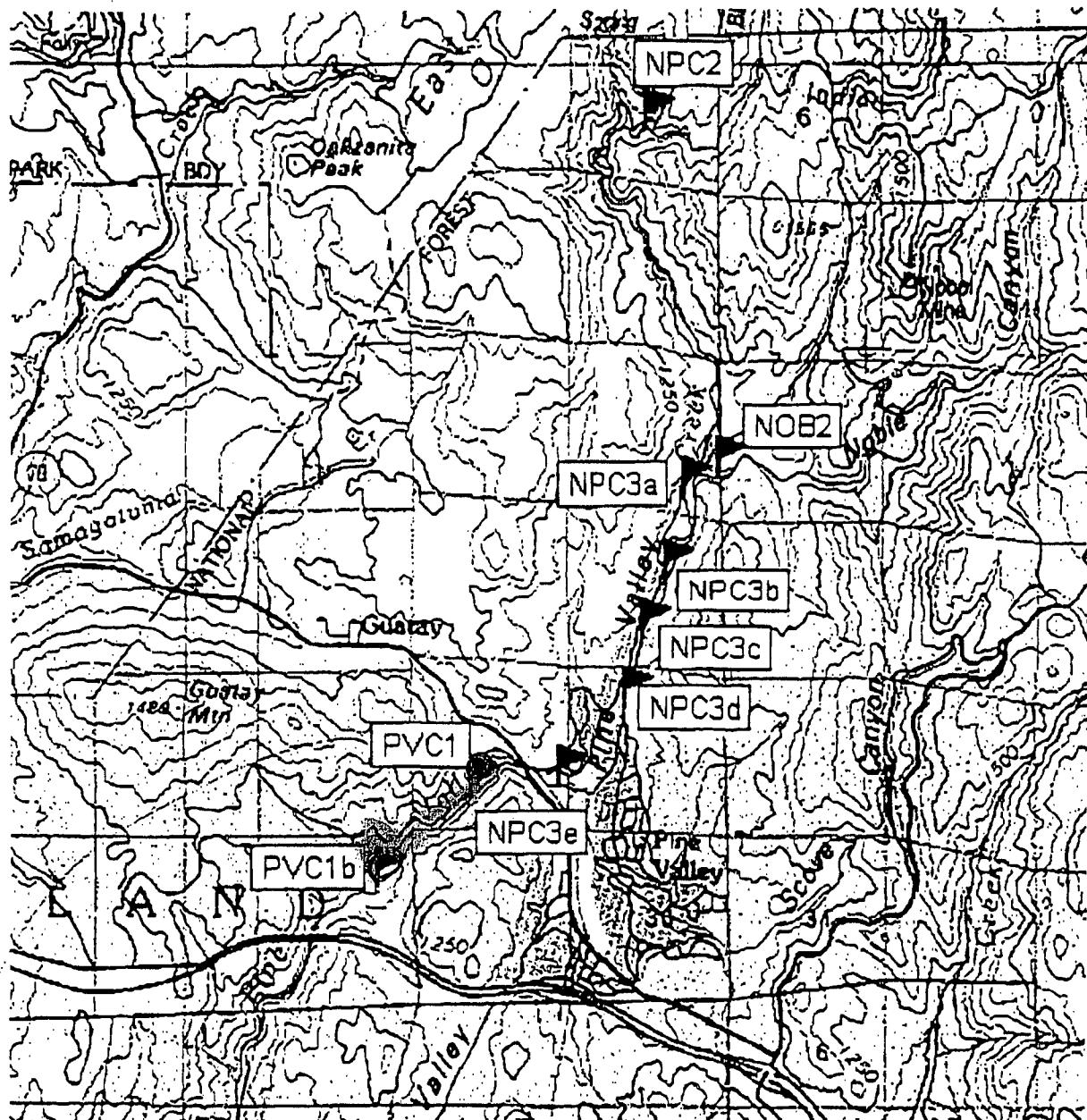


Dave Giblin



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Int below stable

1000 Total
1000 local
Feed 200
Entero 35

file://C:\TEMP\pcap_map.jpg Poor Sewage 100,000 to 1,000,000 3/16/99

City of San Diego, Water Department
Cleveland National Forest, Descanso Ranger District
Pine Creek Assessment Project (PCAP), 1998
Raw Bact Data

Station	Date	Total Coliform Bacteria MPN/100ml (MPN method)	Fecal Coliform Bacteria CFU/100ml (MF method)	Enterococcus Bacteria CFU/100ml (MF method)
NPC3A	01/14	1300	1	15
	02/04	1100	48	440
	02/24	800	17	96
	03/04	240	2	13
	03/18	170	21	6
	04/15	500	11	21
	05/20	130	38	21
	06/18	70	89	57
	07/14	110	7	58
	08/18	300	19	>80
	09/15	NS	NS	NS
NPC3B	01/14	220	<1	37
	02/04	5000	20	280
	02/24	1100	21	90
	03/04	300	1	8
	03/18	140	13	4
	04/15	700	8	18
	05/20	110	37	17
	06/18	1100	75	44
	07/14	110	22	100
	08/18	140	35	>80
	09/15	NS	NS	NS
NPC3C	01/14	240	4	140
	02/04	1100	5	580
	02/24	2200	20	120
	03/04	170	1	9
	03/18	170	12	6
	04/15	500	14	15
	05/20	130	38	20
	06/18	280	73	44
	07/14	500	21	74
	08/18	170	100	>80
	09/15	NS	NS	NS
NPC3D	01/14	NS	NS	NS
	02/04	3000	95	2400
	02/24	800	58	190
	03/04	500	<1	8
	03/18	170	6	9
	04/15	300	140	48
	05/20	170	27	20
	06/18	240	35	38
	07/14	300	8	81
	08/18	NS	NS	NS
	09/15	NS	NS	NS
PVC1A to PVC1H below cool pine creek & South Pine Creek trib	01/14	44	9	20
	02/04	30000	20000	23000
	02/24	17000	740	2400
	03/04	90	42	50
	03/18	350	8	27
	04/15	8000	470	230
	04/20	220	110	100
	06/18	1100	81	480
	07/14	500	66	120
	08/18	240	100	280
	09/15	240	23	100

911.4 upper = 1160 mls
PVC1A to PVC1H

sources:
1) Horse stables - 800
2) Encampments - 1 illegal alien 102
3) Livestock 100

location
= end pt.
8 miles
below old Hwy 80
crossing
through pine creek wilderness
55 data pts
12/55 = 22% wet weather

Not Absorb -
PVC1A to PVC1H
= 55% (15) none
= std

Est -
2.15
2.11
2.11
2.11
2.11
2.11
2.11
2.11
2.11
2.11

City of San Diego, Water Department
Cleveland National Forest, Descanso Ranger District
Illegal Immigrant Impact Project (IIIP), 1997

Average Values Each value is the arithmetic mean of six samples (except *, which is five samples)

	Date	Total Coliform Bacteria MPN/100ml (MPN method)		Fecal Coliform Bacteria CFU/100ml (MF method)		Enterococcus Bacteria CFU/100ml (MF method)	
		Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
Upper Cottonwood Site	01/14	3047	2753	70	56	no data, lab error	
	02/04	725	562	2	14	2	2
	03/04	3783	1883	2	1	5	3
	04/01	520	686	1	1	14	10
Cibbetts Flat Site	01/14	478	143	1	1	12	19
	02/19	138	60	16	2	8	11
	03/12	103	227	1	2	7	11
	04/09	86	11	1	1	13	18
	05/13	66	118	1	4	28	65
Pine Valley Creek Site	01/16	2650	1000	281✓	8	2417	78
	02/19	314	174*	3	7*	11	12*
	03/19	141	120	10	1	10	8
	04/15	865	130	32	29	1	3
	05/20	438	328	85	13	79	57
Middle Cottonwood Site <i>Hawwa</i>	04/21	130	933	20	147	45	213
	06/25	118	1067	8	80	52	178
	07/29	56	38	4	14	41	162
	08/26	65	917	4	23	48	435
	09/30	112	1400	6	92	118	567

Log-mean Values Each value is the arithmetic mean of six samples (except *, which is five samples)

	Date	Total Coliform Bacteria MPN/100ml (MPN method)		Fecal Coliform Bacteria CFU/100ml (MF method)		Enterococcus Bacteria CFU/100ml (MF method)	
		Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
Upper Cottonwood Site	01/14	1646	1605	69	56	no data, lab error	
	02/04	393	295	2	11	2	1
	03/04	3277	1757	1	1	4	3
	04/01	358	531	1	1	14	10
Cibbetts Flat Site	01/14	311	112	1	1	12	19
	02/19	106	51	13	1	8	10
	03/12	80	179	1	2	7	11
	04/09	44	10	1	1	13	16
	05/13	53	104	1	3	27	57
Pine Valley Creek Site	01/16	1826	815	222	7	2344	76
	02/19	211	120*	3	7*	10	12*
	03/19	104	95	10	1	10	7
	04/15	678	78	31	29	1	3
	05/20	401	261	83	12	33	56
Middle Cottonwood Site	04/21	129	903	20	144	45	212
	06/25	114	989	8	79	51	177
	07/29	47	433	4	13	41	133
	08/26	62	825	3	22	48	429

h:\wtrshed\data\cw\iiip_97.wk4 7/13/01 + dwg

PINE VALLEY CREEK

At this time, it is not recommended that Pine Valley Creek be added to the 303(d) list.

Watershed Characteristics

The Tijuana River Watershed comprises a region of approximately 1,750 square miles that lies astride the California-Baja California border. Approximately one third of the watershed is in the United States and two thirds is in Mexico. Pine Creek is located within the Tijuana River Watershed. The creek is 27 miles long and has a hydrologic unit basin number of 11.30-11.41. Beneficial uses of the creek include municipal, agricultural, and industrial service and process supply. Other uses include freshwater replenishment, contact and non-contact recreation, warm and cold habitats, and wildlife habitats.

Water Quality Objectives not Obtained

Nutrients, TDS and turbidity data did not exceed water quality objectives.

Evidence of Impairment

N/A

Extent of Impairment

N/A

Potential Sources

N/A

TMDL Priority

At this time, it is not recommended that Pine Valley Creek be added to the 303(d) list. No exceedances of water quality objectives were reported.

Pine Creek
(Valley?)

USDA FOREST SERVICE
CLEVELAND NATIONAL FOREST
PALOMAR RANGER DISTRICT

1634 Black Canyon Road
Ramona, Ca. 92065
Telephone #: (760) 788-0250
Fax #: (760) 788-6130

FAX TRANSMITTAL COVER SHEET

Date: 6/27 Total # of pages including cover sheet: 6

Urgent? Yes [] No [☒]

TO: NAME JIMMY SMITH FAX #: 858-571-6972
UNIT R-9 STAFF SWCC13

FROM: Ron Wright

MESSAGE/SPECIAL INSTRUCTIONS: Here's the raw data -
pls call if you need more detailed
description of areas or lab
procedures
R

City of San Diego, Water Department
Cleveland National Forest, Descanso Ranger District
Pine Creek Assessment Project (PCAP), 1998
Raw Bactl Data

Station	Date	Total Coliform Bacteria	Fecal Coliform Bacteria	Enterococcus Bacteria
		MPN/100ml (MPN method)	CFU/100ml (MF method)	CFU/100ml (MF method)
NPC3A	01/14	1300	1	15
	02/04	1100	48	440
	02/24	800	17	98
	03/04	240	2	13
	03/18	170	21	6
	04/15	500	11	21
	05/20	130	38	21
	06/18	70	69	57
	07/14	110	7	58
	08/18	300	19	>80
	09/15	NS	NS	NS
NPC3B	01/14	220	<1	37
	02/04	5000	20	280
	02/24	1100	21	90
	03/04	300	1	8
	03/18	140	13	4
	04/15	700	8	16
	05/20	110	37	17
	06/18	1100	75	44
	07/14	110	22	100
	08/18	140	35	>80
	09/15	NS	NS	NS
NPC3C	01/14	240	4	140
	02/04	1100	5	580
	02/24	2200	20	120
	03/04	170	1	9
	03/18	170	12	6
	04/15	500	14	15
	05/20	130	38	20
	06/18	280	73	44
	07/14	500	21	74
	08/18	170	100	>80
	09/15	NS	NS	NS
NPC3D	01/14	NS	NS	NS
	02/04	3000	95	1400
	02/24	800	58	190
	03/04	500	<1	8
	03/18	170	6	9
	04/15	300	140	48
	05/20	170	27	20
	06/18	240	35	38
	07/14	300	8	81
	08/18	NS	NS	NS
	09/15	NS	NS	NS
PVC1A	01/14	44	9	20
	02/04	30000	20000	20000
	02/24	17000	740	2100
	03/04	80	42	50
	03/18	350	8	27
	04/15	8000	470	530
	05/20	220	110	100
	06/18	1100	81	140
	07/14	500	66	130
	08/18	240	100	280
	09/15	240	23	100

City of San Diego, Water Department
 Cleveland National Forest, Descanso Ranger District
 Pine Creek Assessment Project (PCAP), 1998
 Main Sampling Stations
 Log Transformed Bacti Data

Station	Date	Total Coliform Bacteria MPN/100ml (MPN method)	Fecal Coliform Bacteria CFU/100ml (MF method)	Enterococcus Bacteria CFU/100ml (MF method)
NPC3A	01/14	3	0	1
	02/04	3	2	3
	02/24	3	1	2
	03/04	2	0	1
	03/18	2	1	1
	04/15	3	1	1
	05/20	2	2	1
	06/16	2	2	2
	07/14	2	1	2
	08/18	2	1	>1.78
	09/15	NS	NS	NS
NPC3B	01/14	2	<0	2
	02/04	4	1	2
	02/24	3	1	2
	03/04	2	0	1
	03/18	2	1	1
	04/15	3	1	1
	05/20	2	2	1
	06/16	3	2	2
	07/14	2	1	2
	08/18	2	2	>1.78
	09/15	NS	NS	NS
NPC3C	01/14	2	1	2
	02/04	3	1	3
	02/24	3	1	2
	03/04	2	0	1
	03/18	2	1	1
	04/15	2	1	1
	05/20	2	2	1
	06/16	2	2	2
	07/14	3	1	2
	08/18	2	2	>1.78
	09/15	NS	NS	NS
NPC3D	01/14	NS	NS	NS
	02/04	3	2	3
	02/24	3	2	2
	03/04	3	<0	1
	03/18	2	1	1
	04/15	2	2	2
	05/20	2	1	1
	06/16	2	2	2
	07/14	2	1	2
	08/18	NS	NS	NS
	09/15	NS	NS	NS
PVC1A	01/14	2	1	1
	02/04	4	4	4
	02/24	4	3	3
	03/04	2	2	2
	03/18	3	1	1
	04/15	4	3	3
	05/20	2	2	2
	06/16	3	2	2
	07/14	3	2	2
	08/18	2	2	2
	09/15	2	1	2

City of San Diego, Water Department
 Cleveland National Forest, Descanso Ranger District
 Pine Creek Assessment Project (PCAP), 1996
 Main Sampling Stations
 Raw Nutrients Data 0-1

Station	Date	Nitrate Nitrogen (mg/l) MCL 0.2 mg/l	Orthophosphate (mg/l) MCL 0.02 mg/l	Total Phosphorous (mg/l) MCL 0.025 mg/l	TDS (mg/l) (unfiltered)	Turbidity NTU
NPC3A	01/14	nd	nd	nd	na	0.48
	02/04	0.668	nd	0.0414	115.0	11.6
	02/24	0.482	nd	0.0384	88.0	4.38
	03/04	0.028	0.042	nd	132.1	1.15
	03/18	nd	0.041	0.54	184.0	0.84
	04/15	nd	0.1	0.038	94.0	2.73
	05/20	nd	na	nd	158.0	1.10
	06/16	nd	na	nd	203.0	0.7
	07/14	nd	na	nd	na	0.42
	08/18	nd	na	nd	259.0	0.28
	09/15	NS	NS	NS	NS	NS
NPC3B	01/14	0.531	nd	nd	na	0.21
	02/04	0.682	nd	0.263	124	10.6
	02/24	0.502	nd	0.0536	89.3	4.71
	03/04	nd	0.038	nd	132.0	1.11
	03/18	nd	0.034	0.343	181.0	0.88
	04/15	nd	0.057	0.0654	92.0	2.83
	05/20	nd	na	nd	159.0	1.18
	06/16	nd	na	nd	184.7	0.50
	07/14	nd	na	nd	na	0.53
	08/18	nd	na	nd	244.0	0.22
	09/15	NS	NS	NS	NS	NS
NPC3C	01/14	0.503	nd	nd	na	0.5
	02/04	0.820	nd	0.0618	117.0	23.9
	02/24	0.489	nd	0.0545	88.0	5.38
	03/04	nd	0.041	nd	131.0	1.16
	03/18	nd	0.062	nd	179.0	0.99
	04/15	0.029	0.052	nd	89.0	2.86
	05/20	nd	na	nd	156.7	1.25
	06/16	nd	na	nd	186.0	0.72
	07/14	nd	na	nd	na	0.81
	08/18	nd	na	nd	232.0	0.47
	09/15	NS	NS	NS	NS	NS
NPC3D	01/14	NS	NS	NS	NS	NS
	02/04	0.88	nd	0.143	126.0	23.5
	02/24	0.51	nd	0.057	89.0	6.48
	03/04	0.048	0.03	nd	132.0	0.99
	03/18	nd	0.039	0.0259	176.0	5.27
	04/15	nd	0.046	0.0268	98.0	4.44
	05/20	nd	na	nd	158.7	1.13
	06/16	nd	na	nd	186.7	0.53
	07/14	nd	na	nd	na	0.55
	08/18	NS	NS	NS	NS	NS
	09/15	NS	NS	NS	NS	NS
PVC1A	01/14	3.52	nd	nd	na	0.46
	02/04	4.04	0.982	1.03	79.6	475
	02/24	1.025	nd	0.0531	79.2	82.9
	03/04	0.85	0.042	nd	139.5	2.25
	03/18	0.739	0.044	0.0401	179.0	1.19
	04/15	0.908	0.104	0.123	103.0	40.3
	05/20	1.22	na	nd	188.0	1.81
	06/16	1.1	na	nd	202.0	0.52
	07/14	2.1	na	nd	na	0.78
	08/18	3.62	na	nd	na	0.75
	09/15	3.35	nd	nd	287.0	0.48

na = not analyzed

nd = not detected

NS = not sampled

Stream Data on Trabuco/Holy Jim and San Juan/Hot Springs drainages inside the Rec Residence Tracts - 1998 data

Sample Identification	phosphorus mg/l	pH	Nitrate mg/L	Coliform MPN/100 mL	Fecal Coliform MPN/100mL	Streptococcus MPN/100mL	Enterococcus MPN/100mL	Yr	Month	Day	Time	Drainage
SJHL#1	0.1	8.0	ND	50	4	23	8	98	June	26	955	Hot Springs/San Juan
SJHL#2	ND	8.0	ND	120	23	80	50	98	June	26	1010	Hot Springs/San Juan
SJHL#3	ND	8.0	ND	2400	2400	130	130	98	June	26	1022	Hot Springs/San Juan
SJHL#4	ND	8.0	ND	300	170	30	30	98	June	26	1040	Hot Springs/San Juan
SJHL#5	ND	8.0	ND	230	80	300	50	98	June	26	1050	Hot Springs/San Juan
SJHL#6	ND	8.2	ND	230	50	23	8	98	June	26	1100	Hot Springs/San Juan
SJHL#2	0.1	8.2	ND	90	26	240	130	98	October	30	940	Hot Springs/San Juan
SJHL#4	ND	7.9	ND	230	230	130	30	98	October	30	1000	Hot Springs/San Juan
SJHL#5	ND	8.2	ND	110	50	110	50	98	October	30	1005	Hot Springs/San Juan
SJHL#6	ND	8.4	ND	300	230	50	50	98	October	30	1010	Hot Springs/San Juan
SJHL#7	ND	8.6	ND	80	2	80	22	98	October	30	1030	Hot Springs/San Juan
HJT#1	ND	7.5	ND	130	50	50	8	98	June	25	955	Holy Jim/Trabuco
HJT#2	ND	7.4	ND	500	2	13	13	98	June	25	1010	Holy Jim/Trabuco
HJT#3	ND	7.6	ND	4	4	50	2	98	June	25	1020	Holy Jim/Trabuco
HJT#4	ND	7.7	ND	130	30	50	30	98	June	25	1105	Holy Jim/Trabuco
HJT#5	ND	8.0	ND	34	13	27	4	98	June	25	1120	Holy Jim/Trabuco
HJT#6	ND	8.1	ND	50	8	23	2	98	June	25	1030	Holy Jim/Trabuco
HJT#7	ND	8.1	ND	50	30	50	2	98	June	25	1132	Holy Jim/Trabuco
HJT#8	ND	8.0	ND	50	30	23	2	98	June	25	1045	Holy Jim/Trabuco
HJT#9	ND	8.1	ND	130	130	17	4	98	June	25	1055	Holy Jim/Trabuco
HJT#1	ND	7.2	ND	22	2	17	2	98	October	29	1020	Holy Jim/Trabuco
HJT#3	ND	7.8	ND	30	2	4	2	98	October	29	1040	Holy Jim/Trabuco
HJT#4	ND	8.1	ND	230	8	11	2	98	October	29	1205	Holy Jim/Trabuco
HJT#5	ND	8.1	ND	50	2	2	2	98	October	29	1100	Holy Jim/Trabuco
HJT#6	ND	7.5	ND	130	2	23	8	98	October	29	1145	Holy Jim/Trabuco
HJT#7	ND	7.6	ND	50	8	13	2	98	October	29	1150	Holy Jim/Trabuco
HJT#8	ND	8.2	ND	80	30	240	50	98	October	29	1115	Holy Jim/Trabuco
HJT#9	ND	8.3	ND	50	4	70	13	98	October	29	1125	Holy Jim/Trabuco

Stream Data on Trabuco/Holy Jim and San Juan/Hot Springs drainages inside the Pac Residence Tracts - 1998 data

Sample Identification	phosphorus mg/l	pH	Nitrate mg/L	Coliform MPN/100 mL	Fecal Coliform MPN/100mL	Streptococcus MPN/100mL	Enterococcus MPN/100mL	Yr	Month	Day	Time	Drainage
SJHJ#1	0.1	8.0	ND	50	4	23	8	98	June	26	955	Hot Springs/San Juan
SJHJ#2	ND	8.0	ND	130	23	80	50	98	June	26	1010	Hot Springs/San Juan
SJHJ#3	ND	8.0	ND	2400	2400	130	130	98	June	26	1022	Hot Springs/San Juan
SJHJ#4	ND	8.0	ND	300	170	30	30	98	June	26	1040	Hot Springs/San Juan
SJHJ#5	ND	8.0	ND	230	80	300	50	98	June	26	1050	Hot Springs/San Juan
SJHJ#6	ND	8.2	ND	230	50	23	8	98	June	26	1100	Hot Springs/San Juan
SJHJ#2	0.1	8.2	ND	90	26	240	130	98	October	30	940	Hot Springs/San Juan
SJHJ#4	ND	7.9	ND	230	230	130	30	98	October	30	1000	Hot Springs/San Juan
SJHJ#5	ND	8.2	ND	110	50	110	50	98	October	30	1005	Hot Springs/San Juan
SJHJ#6	ND	8.4	ND	300	230	50	50	98	October	30	1010	Hot Springs/San Juan
SJHJ#7	ND	8.6	ND	80	2	80	22	98	October	30	1030	Hot Springs/San Juan
HJT#1	ND	7.5	ND	130	50	50	8	98	June	25	955	Holy Jim/Trabuco
HJT#2	ND	7.4	ND	500	2	13	13	98	June	25	1010	Holy Jim/Trabuco
HJT#3	ND	7.8	ND	4	4	50	2	98	June	25	1020	Holy Jim/Trabuco
HJT#4	ND	7.7	ND	130	30	50	30	98	June	25	1105	Holy Jim/Trabuco
HJT#5	ND	8.0	ND	34	13	27	4	98	June	25	1120	Holy Jim/Trabuco
HJT#6	ND	8.1	ND	50	8	29	2	98	June	25	1030	Holy Jim/Trabuco
HJT#7	ND	8.1	ND	50	30	50	2	98	June	25	1132	Holy Jim/Trabuco
HJT#8	ND	8.0	ND	50	30	23	2	98	June	25	1045	Holy Jim/Trabuco
HJT#9	ND	8.1	ND	130	130	17	4	98	June	25	1055	Holy Jim/Trabuco
HJT#1	ND	7.2	ND	22	2	17	2	98	October	29	1020	Holy Jim/Trabuco
HJT#3	ND	7.8	ND	30	2	4	2	98	October	29	1040	Holy Jim/Trabuco
HJT#4	ND	8.1	ND	230	8	11	2	98	October	29	1205	Holy Jim/Trabuco
HJT#5	ND	8.1	ND	50	2	2	2	98	October	29	1100	Holy Jim/Trabuco
HJT#6	ND	7.5	ND	130	2	23	8	98	October	29	1145	Holy Jim/Trabuco
HJT#7	ND	7.6	ND	50	8	13	2	98	October	29	1150	Holy Jim/Trabuco
HJT#8	ND	8.2	ND	80	30	240	50	98	October	29	1115	Holy Jim/Trabuco
HJT#9	ND	8.3	ND	50	4	70	13	98	October	29	1125	Holy Jim/Trabuco

This data set is from the Trabuco Ranger District
in ORANGE CO.

THE STREAMS INCLUDE

Trabuco
Holy Jim
San Juan
Hot Springs

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3A

DATE

31-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/31/97 10:57	33197	115030	12.95	0.51	94.2	9.92	0	8.01	187
03/31/97 10:58	33197	115100	12.95	0.51	93.5	9.84	0	7.98	187
03/31/97 10:58	33197	115113	12.95	0.51	93.3	9.82	0	7.98	187
03/31/97 11:00	33197	115311	12.94	0.511	92	9.69	0	7.98	189

AVERAGE

12.9475	0.51025	93.25	9.8175	0	7.9875	187.5
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Observations:

Flow		cfs
Sky	PC 60%	
Wind	10	
Direction	NW	
Air Temp	18.6	C

Comments:

Site inspection and sampling.
Sampling for Pine Valley Project.
Hester Dendy samplers in place and undisturbed. Flow decreased at least 30% since sampling.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0

CPOM	0
Organics	0
Crypto-Giardia	0

--

DWG
YSI #1

TDS

g/l

0.255

0.255

0.255

0.255

0.255

last

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3A

DATE

13-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/13/97 12:11	31397	130605	16.41	0.484	91.4	8.93	0.1	8.07	217
03/13/97 12:15	31397	131005	16.51	0.485	91.5	8.92	0.1	8.07	218
03/13/97 12:16	31397	131054	16.52	0.484	91.5	8.92	0.1	8.07	219
03/13/97 12:16	31397	131104	16.53	0.484	91.5	8.91	0.1	8.07	219
03/13/97 12:16	31397	131114	16.53	0.484	91.5	8.91	0.1	8.07	219

Observations:

Flow	14.99	cfs
Sky	clear	
Wind	calm	
Direction		
Air Temp	17	C

Comments:

Site inspection and survey. Good flow over cobbles. Few invertebrates observed - no hydropsyches or other stationary web/retreat building caddis larvae. Site undisturbed by human activity although much is evident in the area - trails, hikers, bikes etc. Little or no over storey on site. Most of the willows are dead or just recovering from severe drought. Site just upstream of the recreational community of interest to the Descanso CNF.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	1
Organics	0

Crypto-Giardia	0

--

DWG
YSI #1

TDS

g/l

0.263

0.264

0.264

0.264

0.264

y

seasonal

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3C

DATE

01-Jan-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/13/97 10:57	31397	115158	14.6	0.47	88.2	8.95	0.1	7.83	202
03/13/97 10:58	31397	115326	14.65	0.47	88.3	8.96	0	7.83	203
03/13/97 10:59	31397	115410	14.68	0.47	88.2	8.94	0	7.82	201
03/13/97 11:00	31397	115506	14.71	0.47	88.3	8.94	0	7.82	199
03/13/97 11:03	31397	115801	14.85	0.471	88.7	8.96	0	7.84	196

Observations:

Flow	8.53	cfs
Sky	clear	
Wind	calm	
Direction	calm	
Air Temp	18.5	C

Comments:

Site inspection and monitoring. Approx. 0.5 miles downstream of NPC3B. Just upstre of the lower crossing of Pine Creek. Flow lower, due to groundwater recharge? Cobbl and gravel on site. Partially covered by willows and trees. Poor coverage downstream both above and below crossing.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0
CPOM	0
Organics	0

Crypto-Giardia	0

--

DWG
YSI #1

TDS

g/l

0.245

0.245

0.245

0.246

0.247

am

les

1

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3D

DATE

13-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/13/97 10:17	31397	111139	11.48	0.555	84.5	9.2	0	7.86	137
03/13/97 10:17	31397	111210	11.51	0.555	87.6	9.53	0	7.86	144
03/13/97 10:17	31397	111222	11.52	0.555	88.3	9.6	0	7.86	147

Observations:

Flow	12	cfs
Sky	clear	
Wind	calm	
Direction	calm	
Air Temp	21.13	C

Comments:

Site in arroyo just above confluence with South Fork of Pine Creek (SPC2). Flow mod high. This site takes in Scove Creek Flows also. Trout observed just downstream in a pool. Site heavily disturbed by horse and hikers on trail. Just upstream, site is undistu

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0
CPOM	0
Organics	0

DWG
YSI #1

TDS

g/l

0.268

0.268

0.268

erately
large
urbed.

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3D

DATE

31-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY	TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/31/97	10:13	33197	110547	12.01	0.588	91.7	9.86	-0.3	7.78	196
03/31/97	10:13	33197	110649	12.11	0.588	94.3	10.12	-0.3	7.73	197
03/31/97	10:14	33197	110714	12.14	0.587	94.7	10.15	-0.3	7.72	197
03/31/97	10:14	33197	110733	12.15	0.587	94.9	10.17	-0.3	7.72	197

AVERAGE

12.10 0.59 93.90 10.08 -0.30 7.74 196.75

Observations:

Flow		cfs
Sky	PC 100%	
Wind	12	
Direction	NW	
Air Temp	18.7	C

Comments:

Site inspection and sampling.
Observed small trout (1 each) in plunge pool above the confluence with SPC and in be pool below confluence with SPC.

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0

DWG
YSI #1

TDS

g/l

0.287

0.288

0.288

0.288

0.29

bedrock

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3B

DATE

13-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY	TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/13/97	11:26	31397	122120	15.31	0.488	96.3	9.63	-0.1	8.01	203
03/13/97	11:27	31397	122219	15.31	0.488	95.6	9.56	0	8	204
03/13/97	11:29	31397	122353	15.33	0.488	95.1	9.5	0	8	206
03/13/97	11:30	31397	122520	15.29	0.489	94.3	9.43	-0.1	8	206

Observations:

Flow	14.38	cfs
Sky	clear	
Wind	calm	
Direction	calm	
Air Temp	20.8	C

Comments:

Site inspection and monitoring. At the Noble Canyon trailhead crossing. Sandy channel with little or no over storey. Some willows upstream; mostly small (<7'). Poor habitat for BMI/CPOM analysis. Site moderately to heavily disturbed by hikers and bikers are departing the trailhead. Tracks in streambed. Some trash.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0
CPOM	0
Organics	0

DWG
YSI #1

TDS

g/l

0.259

0.259

0.259

0.259

nel
ating
riving

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC2

DATE

13-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY	TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/13/97	12:53	31397	134812	13.17	0.439	84.5	8.85	0	7.84	238
03/13/97	12:54	31397	134922	13.35	0.44	82.1	8.57	0	7.85	239
03/13/97	12:54	31397	134941	13.32	0.439	82.1	8.57	0	7.89	239
03/13/97	12:56	31397	135047	13.22	0.44	81.8	8.56	0	7.85	239
03/13/97	12:56	31397	135123	13.35	0.437	81.2	8.47	0	7.83	239
03/13/97	12:56	31397	135140	13.15	0.438	81.2	8.51	0	7.84	240

Observations:

Flow	8.69	cfs
Sky	clear	
Wind	calm	
Direction	calm	
Air Temp	21	C

Comments:

Site inspection and monitoring. General watershed monitoring samples and YSI profile. Site moderately disturbed since last inspection. Some trash and channel modification in area of the weir and pool. Site is an old mining/milling site approximately 0.5 miles below an abandoned mine name unknown. Access by 4wd although probably accessible by prudent two wheel drive vehicle operator.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0
CPOM	0
Organics	0

DWG
YSI #1

TDS

g/l

0.221

0.222

0.222

0.222

0.221

0.22

e.

ible

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3A

DATE

13-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/13/97 12:11	31397	130605	16.41	0.484	91.4	8.93	0.1	8.07	217
03/13/97 12:15	31397	131005	16.51	0.485	91.5	8.92	0.1	8.07	218
03/13/97 12:16	31397	131054	16.52	0.484	91.5	8.92	0.1	8.07	219
03/13/97 12:16	31397	131104	16.53	0.484	91.5	8.91	0.1	8.07	219
03/13/97 12:16	31397	131114	16.53	0.484	91.5	8.91	0.1	8.07	219

Observations:

Flow	14.99	cfs
Sky	clear	
Wind	calm	
Direction		
Air Temp	17	C

Comments:

Site inspection and survey. Good flow over cobbles. Few invertebrates observed - no hydropsyches or other stationary web/retreat building caddis larvae. Site undisturbed by human activity although much is evident in the area - trails, hikers, bikes etc. Little or no over storey on site. Most of the willows are dead or just recovering from severe drought. Site just upstream of the recreational community of interest to the Descanso CNF.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	1
Organics	0

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3A

DATE

31-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/31/97 10:57	33197	115030	12.95	0.51	94.2	9.92	0	8.01	187
03/31/97 10:58	33197	115100	12.95	0.51	93.5	9.84	0	7.98	187
03/31/97 10:58	33197	115113	12.95	0.51	93.3	9.82	0	7.98	187
03/31/97 11:00	33197	115311	12.94	0.511	92	9.69	0	7.98	189

AVERAGE

12.9475 0.51025 93.25 9.8175 0 7.9875 187.5

Observations:

Flow		cfs
Sky	PC 60%	
Wind	10	
Direction	NW	
Air Temp	18.6	C

Comments:

Site inspection and sampling.
Sampling for Pine Valley Project.
Hester Dendy samplers in place and undisturbed. Flow decreased at least 30% since sampling.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3B

DATE

31-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY	TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/31/97	10:43	33197	113638	12.97	0.502	99.6	10.48	0	7.95	181
03/31/97	10:44	33197	113711	12.99	0.502	99.6	10.48	0	7.95	182
03/31/97	10:44	33197	113740	12.99	0.502	99.5	10.47	0	7.95	183

AVERAGE

12.98	0.50	99.57	10.48	0.00	7.95	182.00
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Observations:

Flow		cfs
Sky	PC 65%	
Wind	10	
Direction	NW	
Air Temp	19	C

Comments:

Site inspection and sampling.
Decreased flow since last sampling at least 30% by visual estimation.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3C

DATE

01-Jan-97

SAMPLER
UNIT

DATE MM/DD/YY	TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/13/97	10:57	31397	115158	14.6	0.47	88.2	8.95	0.1	7.83	202
03/13/97	10:58	31397	115326	14.65	0.47	88.3	8.96	0	7.83	203
03/13/97	10:59	31397	115410	14.68	0.47	88.2	8.94	0	7.82	201
03/13/97	11:00	31397	115506	14.71	0.47	88.3	8.94	0	7.82	199
03/13/97	11:03	31397	115801	14.85	0.471	88.7	8.96	0	7.84	196

Observations:

Flow	8.53	cfs
Sky	clear	
Wind	calm	
Direction	calm	
Air Temp	18.5	C

Comments:

Site inspection and monitoring. Approx. 0.5 miles downstream of NPC3B. Just upstre of the lower crossing of Pine Creek. Flow lower, due to groundwater recharge? Cobbl and gravel on site. Partially covered by willows and trees. Poor coverage downstream both above and below crossing.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0
CPOM	0
Organics	0

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3C

DATE

31-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY	TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/31/97	10:26	33197	111908	12.48	0.473	90.5	9.63	-0.2	7.98	182
03/31/97	10:27	33197	112004	12.47	0.472	88.9	9.46	0	7.96	180
03/31/97	10:27	33197	112026	12.45	0.472	88.6	9.43	0	7.95	179
03/31/97	10:43	33197	113630	12.97	0.502	99.7	10.49	0	7.95	181

AVERAGE

12.59 0.48 91.93 9.75 -0.05 7.96 180.50

Observations:

Flow		cfs
Sky	PC75%	
Wind	15	
Direction	NW	
Air Temp	18.7	C

Comments:

Site inspection and sampling.
Flow substantially reduced, no longer reaches road crossing. Probably last sampling possible on this site for the season.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3D

DATE

13-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/13/97 10:17	31397	111139	11.48	0.555	84.5	9.2	0	7.86	137
03/13/97 10:17	31397	111210	11.51	0.555	87.6	9.53	0	7.86	144
03/13/97 10:17	31397	111222	11.52	0.555	88.3	9.6	0	7.86	147

Observations:

Flow	12	cfs
Sky	clear	
Wind	calm	
Direction	calm	
Air Temp	21.13	C

Comments:

Site in arroyo just above confluence with South Fork of Pine Creek (SPC2). Flow mod high. This site takes in Scove Creek Flows also. Trout observed just downstream in a pool. Site heavily disturbed by horse and hikers on trail. Just upstream, site is undistu

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0
CPOM	0
Organics	0

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
NPC3D

DATE

13-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY	TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/13/97	10:17	31397	111139	11.48	0.555	84.5	9.2	0	7.86	137
03/13/97	10:17	31397	111210	11.51	0.555	87.6	9.53	0	7.86	144
03/13/97	10:17	31397	111222	11.52	0.555	88.3	9.6	0	7.86	147

Observations:

Flow	<table border="1"><tr><td>12</td></tr></table> cfs	12
12		
Sky	<table border="1"><tr><td>clear</td></tr></table>	clear
clear		
Wind	<table border="1"><tr><td>calm</td></tr></table>	calm
calm		
Direction	<table border="1"><tr><td>calm</td></tr></table>	calm
calm		
Air Temp	<table border="1"><tr><td>21.13</td></tr></table> C	21.13
21.13		

Comments:

Site in arroyo just above confluence with South Fork of Pine Creek (SPC2). Flow mod high. This site takes in Scove Creek Flows also. Trout observed just downstream in a pool. Site heavily disturbed by horse and hikers on trail. Just upstream, site is undistu

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0
CPOM	0
Organics	0

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed	Cottonwood	DATE	31-Mar-97	SAMPLER
Drainage	Pine Creek			UNIT
Station	NPC3D			

DATE	DATE	TIME	TEMP	SP COND	DO %	DO CONC	DEPTH	PH	ORP
MM/DD/YY TIME	MMDDYY		C	mS/cm	%	mg/l	m		mV
03/31/97 10:13	33197	110547	12.01	0.588	91.7	9.86	-0.3	7.78	196
03/31/97 10:13	33197	110649	12.11	0.588	94.3	10.12	-0.3	7.73	197
03/31/97 10:14	33197	110714	12.14	0.587	94.7	10.15	-0.3	7.72	197
03/31/97 10:14	33197	110733	12.15	0.587	94.9	10.17	-0.3	7.72	197

AVERAGE

12.10	0.59	93.90	10.08	-0.30	7.74	196.75
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Observations:

Flow		cfs
Sky	PC 100%	
Wind	12	
Direction	NW	
Air Temp	18.7	C

Comments:

Site inspection and sampling.
Observed small trout (1 each) in plunge pool above the confluence with SPC and in be pool below confluence with SPC.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0

Pine Creek Drainage Water Quality Data

Sample Date: 15-Apr-97

Station:	Parameter				
	NH3-N	NO2-N	NO3-N	PO4 P	Turbidity
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(NTU)
NPC2	NS	NS	NS	NS	NS
NPC3A	NS	NS	NS	NS	NS
NPC3B	NS	NS	NS	NS	NS
NPC3C	NS	NS	NS	NS	NS
NPC3D	NS	NS	NS	NS	NS
PVC1A	NS	NS	NS	NS	NS
PVC1B					
PVC2					

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed	Cottonwood
Drainage	Pine Creek
Station	PVC1A

DATE 13-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/13/97 08:47	31397	94140	7.89	0.581	84.5	10.01	-0.9	7.95	154
03/13/97 08:53	31397	94835	8.06	0.581	84.7	9.99	-0.9	7.95	147
03/13/97 09:09	31397	100351	8.5	0.58	85.8	10.02	-0.9	7.92	152
03/13/97 09:10	31397	100445	8.52	0.579	85.9	10.02	0	7.92	153
03/13/97 09:10	31397	100526	8.54	0.579	85.9	10.02	0	7.92	153
03/13/97 09:16	31397	101121	8.73	0.579	86.4	10.03	0	7.92	156
Average			8.37	0.580	85.53	10.02	-0.45	7.93	152.50

Observations:

Flow	14.59 cfs
Sky	clear
Wind	calm
Direction	cam
Air Temp	15.5 C

Comments:

Site inspection and monitoring. Set four hester-dendy samplers in two pairings. Site relatively undisturbed. Moderate flow. Observed many small fish less than 3" long but no larger fish. Observed many BMI's on rocks and gravel substrates. Cattle activity in the area - tracks and feces in and along stream channel.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	1

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
PVC1

DATE

15-Apr-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
04/15/97 09:15	41597	100657	12.25	0.635	93	9.94	0	7.95	184
04/15/97 09:16	41597	100733	12.27	0.634	93	9.94	0	7.95	184
04/15/97 09:16	41597	100805	12.3	0.635	93	9.93	0	7.95	184
04/15/97 09:46	41597	103743	13.25	0.634	93.8	9.8	0	7.97	197

AVERAGE

12.52	0.63	93.20	9.90	0.00	7.96	187.25
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Observations:

Flow	14.1	cfs
Sky	clear	
Wind	calm	
Direction		
Air Temp	27.5	C

Comments:

Site inspection and sampling.
Illegal Immigrant Impact Project sampling. Protocol modified to sample at station PVC rather than PVC1B. Ride along and meeting with Jim Harrington and assistant of CDF
Observed 20-30 stickleback fish in pool 2.
Discussed monitoring, sampling and protocol for Southern California Streams.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	6
Solids	0
Plankton	0
TOC	0
BMI	1

WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Pine Valley Creek
Station	PVC1a

Sampling Date	19-May-97
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YSI Datasonde Physicochemical Data

DATE MM/DD/YY	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
05/19/97 09:10	51997	95722	15.69	0.654	77.9	7.72	0	7.76	141
05/19/97 09:14	51997	100203	15.89	0.649	85.6	8.45	0	7.85	129
05/19/97 09:14	51997	100259	15.91	0.65	85.8	8.46	0	7.85	128
05/19/97 09:15	51997	100347	15.93	0.65	85.8	8.46	0	7.85	128
05/19/97 09:25	51997	101323	16.15	0.649	86	8.44	0	7.86	120
05/19/97 09:54	51997	104300	16.7	0.649	86.6	8.4	0	7.85	110
05/19/97 09:55	51997	104307	16.7	0.649	86.6	8.4	0	7	110

AVERAGE

16.14	0.650	84.90	8.33	0.00	7.72	123.71
-------	-------	-------	------	------	------	--------

Observations:	
Flow	5.8 cfs
Habitat Score	111
Sky	PC 10%
Wind	1-2
Direction	W
Air Temp	74.8 F

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0

Comments:

Watershed sampling and surveillance with Roy Tamanaha.
 RT collected one CG sample upstream from reach "a."
 Nasturtium dominates the site, clogging the channel nearly 100% from the gradient drc
 the pool downstream from the fenceline until the stream leaves the canopy of willows (
 Sticklebacks observed feeding on small insects in open pools and slow runs.
 Cattle observed in flood channel Fresh feces were observed along with tracks of both
 along the streambed.

Red flagging at head of reach. Both Hester-Dendy sampler sets in place and undisturt
 will be retrieved next week.

WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Pine Valley Creek
Station	PVC1a

Sampling Date:	19-May-97
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YSI Datasonde Physicochemical Data

DATE MM/DD/YY	TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
05/19/97	09:10	51997	95722	15.69	0.654	77.9	7.72	0	7.76	141
05/19/97	09:14	51997	100203	15.89	0.649	85.6	8.45	0	7.85	129
05/19/97	09:14	51997	100259	15.91	0.65	85.8	8.46	0	7.85	128
05/19/97	09:15	51997	100347	15.93	0.65	85.8	8.46	0	7.85	128
05/19/97	09:25	51997	101323	16.15	0.649	86	8.44	0	7.86	120
05/19/97	09:54	51997	104300	16.7	0.649	86.6	8.4	0	7.85	110
05/19/97	09:55	51997	104307	16.7	0.649	86.6	8.4	0	7	110

AVERAGE

16.14	0.650	84.90	8.33	0.00	7.72	123.71
-------	-------	-------	------	------	------	--------

Observations:	
Flow	5.8 cfs
Habitat Score	111
Sky	PC 10%
Wind	1-2
Direction	W
Air Temp	74.8 F

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0

Comments:
Watershed sampling and surveillance with Roy Tamanaha. RT collected one CG sample upstream from reach "a." Nasturtium dominates the site, clogging the channel nearly 100% from the gradient drc the pool downstream from the fenceline until the stream leaves the canopy of willows (Sticklebacks observed feeding on small insects in open pools and slow runs. Cattle observed in flood channel Fresh feces were observed along with tracks of both along the streambed.

Red flagging at head of reach. Both Hester-Dendy sampler sets in place and undisturt will be retrieved next week.

Plankton	0
TOC	0
BMI	2
CPOM	1
Organics	0
Crypto-Giardia	1

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents	HACH Method	Results	Habitat Assessment				Benthic Macroinvertebra		
			Ref. Sta.	Score	% Comp.	Rating	Metric	Ref. Sta.	Study Site
NH4-N (mg/l)	380	0.08	CWD3a	143	77.62%	Supporting	MFBI		
NO2-N (mg/l)	371	0.005	LCC2	113	98.23%	Comparable	TR		
NO3-N (mg/l)	351	0.19			#DIV/0!		PER CONT		
PO4 P (mg/l)	490	0.36			#DIV/0!		EPT		
Turbidity (NTU)	2100P	0.54	Ideal	155	71.61%	Partially	% EPT		
Mn (mg/l)	290						EPT/CHIR		
Fe (Ferrous, mg/l)	255						SCFL		
Cu (mg/l)	135						HBI		
Al (mg/l)	10						CLI		
Analysis Date:	21-May-97		Analysis Date:	19-May-97		Analysis Date:	01-Jan-97		
Analyst:			Analyst:			Analyst:			

Habitat Assessment Scale

Metric Asses

> 90%	Comparable to reference	Excellent	Metric	Excellent	Very Good
75-88%	Supporting	Good	MFBI		
60-73%	Partially supporting	Fair	TR		
<58%	Not supporting	Poor	PER CONT		
			EPT		
			% EPT		
			EPT/CHIR		
			SCFL		
			HBI		
			CLI		

SAMPLER	DWG
UNIT	YSI #1

TDS
g/l

0.35
0.348
0.349
0.349
0.35
0.355
0.355

0.35

op above
(~400ft).

adults and calves

bed. They

WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Pine Valley Creek
Station	PVC1A

Sampling Date	11-Jun-97
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YSI Datasonde Physicochemical Data

DATE	DATE	TIME	TEMP	SP COND	DO %	DO CONC	DEPTH	PH	ORP	
MM/DD/YY	TIME	MMDDYY	C	mS/cm	%	mg/l	m		mV	
06/11/97	11:28	61197	121338	19.12	0.653	103	9.51	0	8.01	87
06/11/97	11:30	61197	121544	19.19	0.654	103.1	9.51	0	8.02	86
06/11/97	11:31	61197	121646	19.2	0.655	103.1	9.5	0	8.01	86
06/11/97	11:33	61197	121942	19.29	0.653	103	9.48	0	8.02	85
06/11/97	11:34	61197	122036	19.3	0.654	103	9.47	0	8.02	85

AVERAGE

19.22	0.654	103.04	9.49	0.00	8.02	85.80
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Observations:

Flow	<2	cfs
Habitat Score	108	
Sky	Clear	
Wind	3	
Direction	W	
Air Temp	81	F

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0

Comments:

Watershed sampling and surveillance with Verne Chancer. Reach 3 at stream crossing sampled. Upstream reaches 1 and 2 both 100% covered by heavily grazed watercress (*Nasturtium* sp.) No free flow at reach 1 and minimal free flow at reach 2. Notified Forest Service on 5/6/97 of cattle intrusion in this protected area. A second cattle guard was placed to the CNF office in Alpine on 6/12/97. Lower habitat score resulting from seasonally diminished flows and decreasing wet channel size.

Plankton	0
TOC	0
BMI	1
CPOM	0
Organics	0
Crypto-Giardia	0

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents	HACH Method	Results	Habitat Assessment				Benthic Macroinvertebra		
			Ref. Sta.	Score	% Comp.	Rating	Metric	Ref. Sta.	Study Site
NH4-N (mg/l)	380		CWD3a	143	75.52%	Supporting	MFBI		
NO2-N (mg/l)	371		LCC2	113	95.58%	Comprable	TR		
NO3-N (mg/l)	351				#DIV/0!		PER CONT		
PO4 P (mg/l)	490				#DIV/0!		EPT		
Turbidity (NTU)	2100P		Ideal	155	69.68%	Part. Supp.	% EPT		
Mn (mg/l)	290						EPT/CHIR		
Fe (Ferrous, mg/l)	255						SCFL		
Cu (mg/l)	135						HBI		
Al (mg/l)	10						CLI		
Analysis Date:	11-Jun-97		Analysis Date:	11-Jun-97			Analysis Date:	11-Jun-97	
Analyst:			Analyst:				Analyst:		

Habitat Assessment Scale

Metric Asses

> 90%	Comparable to reference	Excellent	Metric	Excellent	Very Good
75-88%	Supporting	Good	MFBI		
60-73%	Partially supporting	Fair	TR		
<58%	Not supporting	Poor	PER CONT		
			EPT		
			% EPT		
			EPT/CHIR		
			SCFL		
			HBI		
			CLI		

SAMPLER	DWG
UNIT	YSI #1

TDS
g/l

0.377
0.378
0.378
0.378
0.379

0.38

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all was

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WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Pine Creek
Station	PVC1A

Sampling Date:	09-Oct-97
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YSI Datasonde Physicochemical Data

DATE MM/DD/YY	TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
10/09/97	14:09	100997	144319	16.39	0.647	120.2	11.74	0	8.41	118
10/09/97	14:10	100997	144417	16.4	0.647	120.5	11.77	0	8.42	118
10/09/97	14:11	100997	144512	16.41	0.647	120.5	11.76	0	8.43	119
10/09/97	14:11	100997	144532	16.41	0.647	120.6	11.77	0	8.43	119
10/09/97	14:12	100997	144546	16.41	0.648	120.6	11.77	0	8.43	118

AVERAGE

16.40	0.647	120.48	11.76	0.00	8.42	118.40
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Observations	
Flow	0.39 cfs
Habitat Score	106
Sky	PC 40
Wind	calm
Direction	na
Air Temp	26.3 C

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0

Comments:

Watershed sampling and surveillance.

Site grazed by cattle recently. Fresh tracks and pats observed in creek banks.

Low flows observed. Small fishes and few benthic invertebrates observed.

Little or no trash on site. Stream vegetation grazed to stubbs - nasturtium, grasses, ca

Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	0
Organics	0
Crypto-Giardia	0
Photo Documentation	4

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents	HACH Method	Results	Habitat Assessment				Benthic Macroinvertebra		
			Ref. Sta.	Score	% Comp.	Rating	Metric	Ref. Sta.	Study Site
NH4-N (mg/l)	380	0.06	CWD3a	143	74.13%		MFBI		
NO2-N (mg/l)	371	0.002	LCC2	113	93.81%		TR		
NO3-N (mg/l)	351	0.10			#DIV/0!		PER CONT		
PO4 P (mg/l)	490	0.17			#DIV/0!		EPT		
Turbidity (NTU)	2100P	0.31	Ideal	155	68.39%		% EPT		
Mn (mg/l)	290						EPT/CHIR		
Fe (Ferrous, mg/l)	255						SCFL		
Cu (mg/l)	135						HBI		
Al (mg/l)	10						CLI		
Analysis Date:	10-Oct-97		Analysis Date:	09-Oct-97			Analysis Date:	10-Oct-97	
Analyst:			Analyst:				Analyst:		

SAMPLER	DWG
UNIT	YSI #1

TDS
g/l

0.352
0.352
0.352
0.352
0.352

0.35

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attails and tules.

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed	Cottonwood	DATE	19-Feb-97	SAMPLER
Drainage	Pine Creek			UNIT
Station	PVC1B			

DATE	DATE	TIME	TEMP	SP COND	DO %	DO CONC	DEPTH	PH	ORP
MM/DD/YY TIME	MMDDYY		C	mS/cm	%	mg/l	m		mV
02/19/97 09:35	21997	103043	6.67	0.609	90.8	11.09	-0.9	8.18	226
02/19/97 09:35	21997	103232	6.7	0.609	105.2	12.84	-0.9	8.16	225
02/19/97 09:46	21997	104340	6.87	0.607	105.5	12.82	-0.9	8.13	222
02/19/97 09:49	21997	104608	6.94	0.608	92.2	11.18	-0.9	8.14	222
02/19/97 10:02	21997	105921	7.2	0.608	92.9	11.2	-0.9	8.13	224
02/19/97 10:22	21997	111856	7.46	0.606	91.8	10.99	-0.9	8.14	227
02/19/97 10:38	21997	113538	7.92	0.606	92.7	10.97	-0.9	8.15	229
02/19/97 10:48	21997	114541	8.16	0.606	93.5	11	-0.9	8.16	230
Average			7.24	0.61	95.58	11.51	-0.90	8.15	225.63

Observations:

Flow	16.18	cfs
Sky	clear	
Wind	calm	
Direction	calm	
Air Temp	22.4	C

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	0
Bacti	6
Solids	0
Plankton	0
TOC	0

Comments:

Illegal Immigrant Impact Project sampling and general watershed monitoring.
 Assisted by Dennis_____. Open channel flow estimation. Site relatively undisturb
 Cattle have heavily grazed this area. Numerous fecal piles observed throughout the ai
 Observed BMI's through Pluck and Pick method.
 Simuliidae
 Lepidostomatidae
 Brachycentridae
 Gomphiidae (in sand)
 Hydropsychidae
 Psychomyiidae
 Chironomidae - Tanytarsini
 Chironomidae- Orthocladiinae

BMI	0
CPOM	0
Organics	0
Crypto-Giardia	0

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DWG
YSI #1

TDS

g/l

- 0.257
- 0.257
- 0.258
- 0.259
- 0.261
- 0.262
- 0.265
- 0.267

0.26

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WATERSHED WATER QUALITY REPORT SHEET

Watershed	Cottonwood
Drainage	Pine Valley Creek
Station	PVC1b

Sampling Date:	20-May-97
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YSI Datasonde Physicochemical Data

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
05/20/97 10:36	52097	112440	19.68	0.648	99.8	9.11	0	8.09	83
05/20/97 10:39	52097	112711	19.79	0.649	99.9	9.1	0	8.1	82
05/20/97 10:45	52097	113303	20.08	0.648	100.2	9.07	0	8.1	78
05/20/97 10:51	52097	113932	20.37	0.648	100.2	9.02	0	8.13	76

AVERAGE

19.98	0.648	100.03	9.08	0.00	8.11	79.75
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Observations:	
Flow	8.7 cfs
Habitat Score	135
Sky	Clear
Wind	1-2
Direction	WSW
Air Temp	76.8 F

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	6
Solids	0

Comments:
Watershed sampling and surveillance.
Illegal Immigrant Impact Sampling. Six bacti samples collected over 90 minutes at 15 intervals.
Stream flow increased over upstream site PVC1a. Livestock have recently entered this Area is also used extensively by hikers and equestrians. Light to moderate trash levels on the trail and stream banks.
Stream confined to a narrow, natural channel of 3-5ft in an open flood plain. Very little vegetation upstream of site. Site within an open, mature riparian zone dominated by w spaced willows, sycamores, and live oaks with a very thin understory of grasses and fo Streambed composed of cobbles and boulders within a gravel and sand matrix. In stre vegetation sparse; small clumps of nasturtium and tules were observed in the slower r

Plankton	0
TOC	0
BMI	1
CPOM	0
Organics	0
Crypto-Giardia	0

pools. Only small amounts of leaf litter were observed.

BMI composed primarily of Hydropsyche, Pyschomyiidae, Baetidae, Glossosomatidae, Coenagrionidae, and Bracycentridae.

Water Chemistry Profile

Rapid Bioassessment Protocol

Constituents	HACH Method	Results	Habitat Assessment				Benthic Macroinvertebra		
			Ref. Sta.	Score	% Comp.	Rating	Metric	Ref. Sta.	Study Site
NH4-N (mg/l)	380	0.07	CWD3a	143	94.41%	Comparable	MFBI		
NO2-N (mg/l)	371	0.001	LCC2	113	119.47%	Supporting	TR		
NO3-N (mg/l)	351	0.04			#DIV/0!		PER CONT		
PO4 P (mg/l)	490	0.2			#DIV/0!		EPT		
Turbidity (NTU)	2100P	0.64	Ideal	155	87.10%	Supporting	% EPT		
Mn (mg/l)	290						EPT/CHIR		
Fe (Ferrous, mg/l)	255						SCFL		
Cu (mg/l)	135						HBI		
Al (mg/l)	10						CLI		
Analysis Date:	21-May-97		Analysis Date:	20-May-97			Analysis Date:	01-Jan-97	
Analyst:			Analyst:				Analyst:		

Habitat Assessment Scale

Metric Asses

> 90%	Comparable to reference	Excellent	Metric	Excellent	Very Good
75-88%	Supporting	Good	MFBI		
60-73%	Partially supporting	Fair	TR		
<58%	Not supporting	Poor	PER CONT		
			EPT		
			% EPT		
			EPT/CHIR		
			SCFL		
			HBI		
			CLI		

SAMPLER	DWG
UNIT	YSI #1

TDS
g/l

0.378
0.38
0.382
0.384

0.38

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YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
PVC2

DATE 19-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/19/97 09:37	31997	103134	13.81	0.713	98.9	10.21	0.6	8.46	238
03/19/97 09:49	31997	104347	14.02	0.714	99.3	10.20	0.6	8.47	239
03/19/97 10:02	31997	105638	14.25	0.713	100	10.22	0.6	8.47	239
03/19/97 10:03	31997	105739	14.26	0.713	100	10.22	0	8.47	240
03/19/97 10:22	31997	111621	14.59	0.713	100.9	10.24	0	8.50	240
03/19/97 10:34	31997	112820	14.80	0.713	101.4	10.24	0	8.50	240
AVERAGE			14.48	0.713	100.6	10.23		8.49	239.8

Observations:

Flow ~20.00 cfs
Sky clear
Wind calm
Direction calm
Air Temp 29.5 C

Comments:

Illegal Immigrant Impact Project sampling with Darcy Bestor and two Santana High School Special Education teachers (Steve and Mike). Six Bacti samples taken at 15 minute intervals from cascade just above a large pool about 0.2 miles upstream from the main trail crossing. Site consists of deep bedrock pools and short cobble and boulder or bedrock riffles/run. Vegetation sparse, consisting of shrubs and small isolated trees (willows and live oaks). No fish observed in pools other than a few small minnow sized fish. Illegal immigrant trail alongside creek on site, fair amount of trash on site and evidence of large numbers of people passing through area (>100).

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	6
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	0
Organics	0

DWG
YSI #1

TDS

g/l

0.365

0.367

0.369

0.369

0.371

0.373

0.371

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YSI WATER QUALITY PROFILE REPORT SHEET

Watershed	Cottonwood	DATE	31-Mar-97	SAMPLER
Drainage	Pine Creek			UNIT
Station	NPC2			

DATE	DATE	TIME	TEMP	SP COND	DO %	DO CONC	DEPTH	PH	ORP
MM/DD/YY TIME	MMDDYY		C	mS/cm	%	mg/l	m		mV
03/31/97 11:59	33197	125219	12.03	0.475	92.6	9.95	0	7.98	213
03/31/97 11:59	33197	125243	12.04	0.474	92.5	9.94	0	7.98	213
03/31/97 12:03	33197	125638	12.17	0.474	93	9.97	0	7.98	214

AVERAGE

12.08	0.4743333	92.7	9.9533333	0	7.98	213.33333
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Observations:

Flow		cfs
Sky	PC 60%	
Wind	10-12	
Direction	NW	
Air Temp	18.6	C

Comments:

Site inspection and sampling.
 Checked out site and found claim marker above the dam inscribed "FREE COINAGE MILL SITE". Moderate recent impact by day trippers or campers on site. More activity downstream at the spur. Good flow and a deep pool below the dam.

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0

CPOM	0
Organics	0
Crypto-Giardia	0

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DWG
YSI #1

TDS

g/l

0.232

0.232

0.233

0.2323333



YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
SPC2

DATE 13-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/13/97 10:15	31397	111011	10.73	0.535	83.5	9.25	0	7.79	130
03/13/97 10:15	31397	111040	10.69	0.533	82.7	9.17	0	7.79	129

Observations:

Flow	0.5	cfs
Sky	clear	
Wind	calm	
Direction	calm	
Air Temp	19	C

Comments:

Site inspection and sampling. Just downstream of horse boarding facility. Water laden with rusty red mineralization on substrate. Oily film observed on water.
No BMI's observed. Took samples anyway.

Samples Taken	Number
Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	1
CPOM	1
Organics	0

Crypto-Giardia	0

--

DWG
YSI #1

TDS

g/l

0.253

0.252

n

YSI WATER QUALITY PROFILE REPORT SHEET

Watershed
Drainage
Station

Cottonwood
Pine Creek
SPC2

DATE 31-Mar-97

SAMPLER
UNIT

DATE MM/DD/YY TIME	DATE MMDDYY	TIME	TEMP C	SP COND mS/cm	DO % %	DO CONC mg/l	DEPTH m	PH	ORP mV
03/31/97 10:10	33197	110249	11.74	0.548	95.7	10.35	-0.3	8.12	192
03/31/97 10:10	33197	110332	11.55	0.546	93.6	10.17	-0.3	7.97	195
03/31/97 10:11	33197	110405	11.44	0.543	92.3	10.05	-0.3	7.92	195
03/31/97 10:11	33197	110448	11.34	0.538	91.3	9.97	-0.3	7.88	195

AVERAGE

11.52	0.54	93.23	10.14	-0.30	7.97	194.25
-------	------	-------	-------	-------	------	--------

Observations:

Flow		cfs
Sky	O 100%	
Wind	10	
Direction	NW	
Air Temp	18.7	C

Comments:

Site inspection and sampling.
Lower flow than last sample. Still very reddish deposits in stream. Observed dumping of horse manure upstream by Pine Valley Stables.

Samples Taken Number

Nutrients	1
TON/Turbidity	1
Metals	1
Bacti	0
Solids	0
Plankton	0
TOC	0
BMI	0

CPOM	0
Organics	0
Crypto-Giardia	0

--

DWG
YSI #1

TDS

g/l

0.266

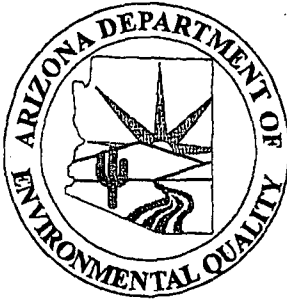
0.264

0.261

0.259

0.26





ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Fax: (520) 770-3540

FAX TRANSMISSION

TO: Claudia Villacorta - California Regional Water
Quality Control Board

FAX: 858-571-6972

FROM: Plácido dos Santos - Border Environmental Manager
Direct Line: (520) 628-6744

DATE: August 2, 2001

NUMBER OF PAGES INCLUDING THIS COVER: 24

Claudia,

I am sorry that I have not been able to e-mail you these documents. Unfortunately, our agency has restricted the receipt and delivery of e-mails with attachments to protect our system from a flood of viruses that we are being attacked by.

Here are the spanish and english versions of both MOUs that ADEQ recently developed with our sonoran counterparts. I faxed Bart the english versions yesterday.

If you still need the electronic versions, please let me know and I will transmit them to you at a later date. Regards.

Placido



Jane Dee Hull
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Jacqueline E. Schafer
Director

ADEQ Contract Number 01-0122
June 30, 2001

MEMORANDUM OF UNDERSTANDING
between the
State of Arizona Department of Environmental Quality
and
State of Sonora Drinking Water And Sewage Commission
(Comisión de Agua Potable y Alcantarillado
del Estado de Sonora)

for the

"NOGALES SONORA WASTEWATER PRETREATMENT PROGRAM"

This Memorandum of Understanding is entered into by and between the State of Arizona Department of Environmental Quality, hereinafter referred to as ADEQ, and the Sonoran Drinking Water and Sewage Commission (Comisión de Agua Potable y Alcantarillado del Estado de Sonora), hereinafter referred as COAPAES.

I - Background

The growth of population and industry in Mexico's northern border region has put increased pressure on state and municipal governments in the border region to provide effective and efficient public services particularly in the area of potable water and wastewater. The border region of Nogales, Sonora-Nogales, Arizona is no exception. The international wastewater treatment plant that serves both cities is being expanded to account for the increased wastewater treatment demand in this border region. The United States Environmental Protection Agency (EPA) is considering the award of Border Environment Infrastructure Fund (BEIF) grants to the City of Nogales, AZ and Nogales, Sonora, Mexico for a proposed project that includes the rehabilitation, upgrade and construction of wastewater infrastructure facilities in these communities. An industrial wastewater pretreatment program is being required by EPA as part of this grant and is needed in Nogales, Sonora, Mexico to protect the plant and collection system investments. The city of Nogales, Arizona already has a pretreatment program in place approved by EPA.

The Arizona and Sonora State governments have previously agreed on recommendations to support pollution prevention and pretreatment programs in the border region. In 1998, the

Arizona-Mexico Commission's Environment Committee recommended the exchange of information between the state agencies to promote pollution prevention activities for maquiladoras along the Arizona-Sonora border. In 1999, the Environment Committee recommended promoting the establishment of industrial wastewater pretreatment programs for border communities including Ambos Nogales, in order to protect the environment and wastewater infrastructure investments being made in both states.

COAPAES has initiated preliminary characterization of industrial wastewater discharges in the City of Nogales, Sonora. Through cooperation with ADEQ, COAPAES can enhance its water quality characterization in other areas of the wastewater collection systems. In addition, COAPAES has expressed interest in joint visits to municipalities in Arizona that have already established an industrial pretreatment program (such as the City of Phoenix) and industrial facilities that have implemented a wastewater pretreatment/pollution control system. ADEQ is also interested in participating in joint visits to the industrial facilities located in the Sonoran side of the border. Furthermore, COAPAES has expressed interest in establishing a regional laboratory in the Nogales, Sonora area that would provide water and wastewater analytical services to the Sonoran northern region and has expressed special interest in visiting the Arizona Department of Health Services (ADHS) State Laboratory to observe analytical procedures related to wastewater samples.

The ADEQ is prepared to support COAPAES on the additional industrial discharges characterization in Nogales, Sonora and to provide laboratory in-kind services for analytical services in support of its projects. The State of Arizona will provide up to \$20,000 for analyses of samples collected in Mexico. ADEQ is also prepared to work with COAPAES and municipalities in Arizona (such as the City of Phoenix) and the ADHS State Laboratory, and will help COAPAES arrange a technology transfer opportunity for COAPAES staff. The purpose of this technology transfer opportunity is to provide guidance in facility inspections and in analytical capabilities when COAPAES decides to pursue the establishment of a regional laboratory in Sonora. This project will also benefit Arizona border communities by providing updated technical training and access to sampling equipment on pretreatment and helping to maintain a close interaction with their counterparts in Sonora.

II - Objectives

This Memorandum of Understanding clarifies the roles and responsibilities of the ADEQ and COAPAES in performance of this project. A primary focus of this Memorandum of Understanding is clarification of data management authorities and responsibilities for water quality information which results from the use of State of Arizona funds in analysis of water samples collected in Mexico.

III - Agreements

ADEQ and COAPAES agree to the following principles and commitments:

1. ADEQ will provide funding, subject to availability and up to a maximum of \$20,000, for laboratory in-kind services performed by the Arizona State Laboratory. The \$20,000 amount will not be paid to COAPAES ; the funding is directed to the Arizona State Laboratory. This funding is being made available for analysis of wastewater samples collected at industrial discharges as part of the Nogales, Sonora pretreatment program objectives. The sampling points must be located within the Sonoran portion of the binational watershed of this project.
2. In accordance with Arizona's laws, any data generated through the use of State of Arizona funds or personnel must be subject to public data release and will be available for use by ADEQ. ADEQ personnel will perform a Quality Assurance and Quality Control (QA/QC) review of the analytical results derived from samples collected in Nogales, Sonora, Mexico. Within 7 days of completing the QA/QC review, the Arizona State Laboratory's analytical results will be sent by certified mail to COAPAES for a final 30-day long review opportunity. Upon conclusion of this 30-day review period, such data will be posted to Arizona's public databases if ADEQ determines that the data conform to ADEQ's QA/QC requirements. Regardless of whether the data is posted to ADEQ's database, the data will be subject to Arizona's Public Records Law following the conclusion of the thirty day period.
3. COAPAES is responsible for notifying the appropriate agencies if data from the field sampling and/or analytical activities indicate that an immediate environmental or public health threat exists in Mexico or if there is an indication of a violation of Mexican laws. COAPAES is solely responsible for making such a determination for water quality samples from Mexico which are processed at the Arizona State Laboratory. ADEQ will not conduct public notification or government notification processes in Mexico for analytical results of samples collected within Mexico and processed at the Arizona State Laboratory.
4. ADEQ will provide technical advisory guidance to the project implementors throughout the duration of this Memorandum of Understanding.
5. COAPAES will conform to the ADEQ Quality Assurance Project Plan for samples destined to be analyzed at the Arizona State Laboratory. The ADEQ agrees to review the project sampling plan and provide comments regarding its conformance to Arizona requirements.
6. COAPAES will be the lead entity for collection of all samples in Mexico. ADEQ will provide technical field support, including providing any necessary equipment and sample collection containers, in the collection of the samples. ADEQ and COAPAES agree to follow Chain of Custody procedures for handling and transporting samples from the points of collection in Nogales, Sonora, Mexico to the Arizona State Laboratory (ASL). ADEQ will be responsible

for transporting samples to the Arizona State Lab in accordance with chain of custody procedures. ADEQ may, at its discretion, provide support in the collection of additional project samples in Nogales, Sonora, Mexico if requested to do so.

7. ADEQ may, at its discretion, review and comment on draft project reports if requested by COAPAES. ADEQ does not agree to perform interpretive, statistical or any other form of data analysis for data derived from Mexico as part of this project.

8. COAPAES will conform to the appropriate ADEQ sampling methodologies for collecting the water quality samples for this project. To ensure integrity of the data and appropriate use of Arizona's funds, the samples must be collected according to sampling and QA/QC methodologies accepted by ADEQ.

9. COAPAES will provide field personnel for the field sampling activities. ADEQ will fulfill a supporting role if given adequate advance notice.

10.- Subject to COAPAES own funding, ADEQ will make a reasonable effort to facilitate the COAPAES visits to one Arizona municipality that has already established an industrial pretreatment program, to two industrial facilities that have implemented a wastewater pretreatment and pollution control system, and for the training and technology transfer opportunity at the Arizona State Laboratory in Phoenix. This training and technology transfer opportunity will focus on analysis of water samples as performed by the Arizona State Laboratory. COAPAES is responsible for communicating directly to ADEQ the desired date, time, and objectives of the planned visits and training. In addition, at COAPAES request, and based on ADEQ availability, ADEQ will participate in a minimum of two joint visits to industrial facilities located in Nogales, Sonora.

IV - Correspondence

All analytical results and technical correspondence for this project or regarding the provisions of this Memorandum of Understanding will be directed to the following for COAPAES:

Carlos Gonzales
Director de Asuntos Fronterizos y Proyectos Especiales
Comisión de Agua Potable Y Alcantarillado del Estado de Sonora
Ocampo # 49
Colonia Centenario
83000 Hermosillo, Sonora, Mexico

(01152) 62-122867
(01152) 62-171058 fax
cgonzlez@coapaes.gob.mx

All analytical results and technical correspondence for this project or regarding the provisions of this Memorandum of Understanding will be directed to the following for ADEQ:

Mario Castañeda
Water Border Technical Coordinator
Hydrologic Support and Assessment Section
Water Quality Division
Arizona Department of Environmental Quality
3033 N. Central
Phoenix, Arizona 85012

(602) 207-4409
(602) 207-4528 fax
castaneda.mario@ev.state.az.us

Termination or Modification of This Memorandum

This Memorandum of Understanding expires on December 31, 2002. This memorandum may be revoked at any time by a thirty business day written notification by either party. This memorandum may be modified only through mutual written consent.

Signed on this 30th day of June, 2001.

Jacqueline E. Schafer
Director
Arizona Department of Environmental Quality

Ing. César Alfonso Lagarda Lagarda
Director General
Comisión de Agua Potable
y Alcantarillado del Estado de Sonora

Ing. Francisco Javier Hernández Armenta
- Honorary Witness -
Secretario
Secretaría de Infraestructura Urbana y Ecología
del Estado de Sonora



Jane Dee Hull
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Jacqueline E. Schafer
Director

ADEQ Contract Number 01-0142
June 30, 2001

MEMORANDUM OF UNDERSTANDING between the State of Arizona Department of Environmental Quality and the University of Sonora

for

"WATER QUALITY SAMPLING IN SONORA'S BINATIONAL WATERSHEDS"

This Memorandum of Understanding is entered into by and between the State of Arizona Department of Environmental Quality, hereinafter referred to as ADEQ, and the University of Sonora, hereinafter referred to as UNISON.

I - Background

The growth of population and industry in Mexico's northern border region has put increased pressure on state and municipal governments in the border region to provide effective and efficient public services particularly in the area of potable water and wastewater. There is also a paucity of environmental information in many regions of the U.S.-Mexico border including segments of Arizona and Sonora.

With assistance and guidance from non-governmental organizations and the University of Sonora, the Sonoran border municipalities of Cananea, Naco, and Agua Prieta implemented in 1996 a water quality monitoring project to assess the water quality of the three municipal areas, the San Pedro River, and the Sonora River to allow for a more thorough understanding of the water quality in the northern Sonora, Mexico. This effort, named the *"Sonoran Regional Water Quality Sampling Project"* provided a baseline of environmental information regarding surface water and groundwater quality in the transboundary watersheds of the region. It also helped them to identify and isolate specific water quality problems in this watershed. The University of Sonora's Department of Scientific Research and Technology (Departamento de Investigaciones Cientificas y Tecnologicas de la Universidad de Sonora - DICTUS), was subcontracted by Enlace Ecologico, a Mexican non-governmental organization, to carry out the water quality monitoring and assessment for this project. The U.S. Agency for International Development (USAID) supported this project through a \$100,000 grant administered by the International City/County Management Association (ICMA).

ADEQ and UNISON signed a Memorandum of Understanding (MOU) in 1997 to allow for ADEQ participation on this Mexican project. The MOU clarified the roles and data management authorities and responsibilities of the ADEQ and the UNISON for water quality information resulting from the use of State of Arizona funds in analysis of water samples collected in Mexico. ADEQ provided laboratory in-kind services and technical support for this water quality project. The El Paso Community Foundation provided additional funding to the Sonoran nongovernmental organization for continuation of this project in 1998. The ADEQ-UNISON MOU was then extended in 1998 for another year. The enhancement of institutional capacity and technology transfer in Mexico were the primary objectives of the prior MOUs.

Based on these previous interactions, the ADEQ and UNISON are now interested in expanding this collaboration to include the transboundary portions of other binational watersheds of the Sonora border region where the UNISON may be participating in water quality projects. These binational surface water basins include: San Pedro, Rio Yaqui, Santa Cruz, Rio Magdalena and Lower Colorado River. These water quality projects would support border activities such as the development of the U.S.-Mexico Border XXI Program's surface water and ground water quality indicators for the border region. ADEQ, subject to funding availability, is prepared to provide laboratory in-kind services for water quality projects that UNISON may be developing in conjunction with these border efforts in these shared binational watersheds along the Arizona-Sonora border. UNISON is also interested in continuing with the technology transfer opportunity that was provided in prior MOUs by the Arizona Department of Health Services State Laboratory. ADEQ is also interested in continuing to provide a support role with the technology transfer opportunity in Phoenix between personnel from UNISON and the Arizona Department of Health Services (ADHS) State Laboratory. The purpose of this technology transfer opportunity is to provide guidance in the event that the UNISON decides to pursue such laboratory analytical capabilities. The enhancement of institutional capacity and technology transfer in Mexico are still the primary objectives of this MOU.

II - Objectives

This Memorandum of Understanding clarifies the roles and responsibilities of the ADEQ and the UNISON in performance of these projects. A primary focus of this Memorandum of Understanding is clarification of data management authorities and responsibilities for water quality information which results from the use of State of Arizona funds in analysis of water samples collected in Mexico.

III - Agreements

ADEQ and UNISON agree to the following principles and commitments:

- 1.- UNISON will notify ADEQ in writing at least 21 days in advance when a water quality project implemented by UNISON in the binational watershed will call upon ADEQ services that may be provided under this MOU.
2. ADEQ will provide funding, subject to availability and up to a maximum of \$10,000, for Fiscal year 2002 for laboratory in-kind services performed by the Arizona State Laboratory. ADEQ, subject to funding availability, expects to pursue a similar amount for Fiscal Year 2003. These amounts will not be paid to the University of Sonora; the funding is directed to the Arizona State Laboratory or to any other laboratory that ADEQ may subcontract with for these support activities. This funding is being made available for analysis of groundwater, surface water and sediment samples collected in Mexico as part of these projects. Only split samples collected in Mexico by ADEQ with UNISON will be analyzed in Arizona. ADEQ may, at its discretion and through collaborative efforts with other U.S. and State agencies, pursue additional funding and field support for these activities. The sampling points must be located within the Sonoran portion of the binational watersheds of these projects.
3. In accordance with Arizona's laws, any data generated through the use of State of Arizona funds or personnel must be subject to public data release and will be available for use by ADEQ. ADEQ personnel will perform a Quality Assurance and Quality Control (QA/QC) review of the analytical results for split samples collected in Mexico. Within 7 days of completing the QA/QC review, the Arizona State Laboratory or ADEQ contract laboratories' analytical results will be sent by certified mail to the UNISON for a final review opportunity of up to 30 days. Upon conclusion of this 30-day review period, such data will be posted to Arizona's public databases if ADEQ determines that the data conform to ADEQ's QA/QC requirements. Regardless of whether the data is posted to ADEQ's database, the data will be subject to Arizona's Public Records Law following the conclusion of the thirty day period.
4. The UNISON is responsible for notifying the Mexican National Water Commission (Comision Nacional del Agua - CNA) and the Mexican Section of the International Boundary and Water Commission (Comision Internacional de Limites y Aguas - CILA, Seccion Mexicana), if data indicate that an immediate environmental or public health threat exists in Mexico. The UNISON is solely responsible for making such a determination for water quality split samples from Mexico which are processed at the Arizona State Laboratory or ADEQ contract laboratories. ADEQ will not conduct public notification or government notification processes in Mexico for analytical results of split samples collected within Mexico and processed at the Arizona State Laboratory and/or ADEQ contract laboratories.
5. The UNISON will provide copies of the laboratories' analytical reports of samples analyzed from the ADEQ to the Mexican National Water Commission (Comision Nacional del Agua - CNA), and other appropriate federal, state, and local agencies within 30 days after receiving these results.

6. ADEQ will provide technical advisory guidance to the project implementors throughout the duration of this Memorandum of Understanding.

7. The UNISON will conform to the ADEQ Quality Assurance Project Plan for split samples destined to be analyzed at the Arizona State Laboratory or ADEQ contract laboratories. The ADEQ agrees to review the project sampling plan and provide comments regarding its conformance to State of Arizona requirements.

8. The UNISON will be the lead entity for collection of all samples in Mexico. ADEQ will provide technical field support, including providing any necessary equipment and sample collection containers, or ADEQ subcontract personnel, in the collection of the split samples. ADEQ and UNISON agree to follow Chain of Custody procedures for handling and transporting split samples from the points of collection in Mexico to the Arizona State Laboratory (ASL) or other ADEQ contract laboratories. ADEQ will be responsible for transporting split samples to the Arizona State Lab or other ADEQ contract laboratories in accordance with chain of custody procedures. ADEQ may, at its discretion, provide support in the collection of additional project samples in Mexico if requested to do so.

9. ADEQ may, at its discretion, review and comment on draft project reports if requested by the UNISON. ADEQ does not agree to perform interpretive, statistical or any other form of data analysis for UNISON for data derived from Mexico as part of this project.

10. Subject to the availability of funding, the UNISON will make necessary logistical arrangements with ADHS for a training and technology transfer opportunity to be held at the Arizona State Laboratory in Phoenix. The UNISON is responsible for communicating the desired date, time and objectives of this planned training directly with personnel from the Arizona State Laboratory. ADEQ will make a reasonable effort to facilitate this process for the UNISON if so requested.

11. UNISON will conform to the appropriate ADEQ sampling methodologies for collecting the split samples for these projects that are sent to the Arizona State Lab or ADEQ contract laboratories. To ensure integrity of the data the samples must be collected according to sampling and QA/QC methodologies accepted by ADEQ and UNISON.

12. UNISON will provide field personnel for the field sampling activities. ADEQ will fulfill a supporting role if given adequate advance notice.

13. ADEQ is collecting surface water and groundwater water quality information on the Arizona side of the border as part of its monitoring activities. ADEQ agrees to provide the UNISON with copies of these analytical results from its work in Arizona, if requested by UNISON. The UNISON agrees to provide the ADEQ with copies of analytical results from its work in the Sonoran binational watersheds, if requested by ADEQ.

IV - Correspondence

All analytical results and technical correspondence for these projects or regarding the provisions of this Memorandum of Understanding will be directed to the following for the UNISON:

M.C. Arturo Villalba Atondo
Profesor-Investigador
Departamento de Investigaciones Cientificas y Tecnologicas
de la Universidad de Sonora
Ave. Rosales y Niños Heroes s/n
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(01152) 62-134564
(01152) 62-123271 fax
villalba@guayacan.uson.mx

All analytical results and technical correspondence for these projects or regarding the provisions of this Memorandum of Understanding will be directed to the following for ADEQ:

Mario Castañeda
Water Border Technical Coordinator
Hydrologic Support and Assessment Section
Water Quality Division
Arizona Department of Environmental Quality
3033 N. Central
Phoenix, Arizona 85012

(602) 207-4409
(602) 207-4528 fax
castaneda.mario@ev.state.az.us

Termination or Modification of This Memorandum

This Memorandum of Understanding expires on June 30, 2003. This memorandum may be revoked at any time by a thirty business day written notification by either party. This memorandum may be modified only through mutual written consent.

Signed on this 30th day of June 2001.

Jacqueline E. Schafer
Director
Arizona Department of Environmental Quality

M.C. Pedro Ortega Romero
Rector
Universidad de Sonora

Ing. Francisco Javier Hernández Armenta
- Honorary Witness -
Secretario
Secretaría de Infraestructura Urbana y Ecología
del Estado de Sonora



Jane Dee Hull
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Jacqueline E. Schafer
Director

ADEQ Contrato Número 01-0122
30 de junio 2001

MEMORANDO DE ENTENDIMIENTO

entre el
Departamento de Calidad Ambiental Del Estado De Arizona
y
La Comisión De Agua Potable Y Alcantarillado Del Estado De Sonora
para el

"PROGRAMA DE PRETRATAMIENTO DE AGUAS RESIDUALES DE NOGALES, SONORA"

Este Memorando de Entendimiento se establece entre El Departamento De Calidad Ambiental Del Estado De Arizona, referido como ADEQ, y La Comisión de Agua Potable y Alcantarillado del Estado de Sonora, referido como COAPAES..

1.- Antecedentes

El crecimiento de la población y la industria en la región fronteriza nortea de México ha producido una presión en los gobiernos estatales y municipales en la región fronteriza para proveer servicios públicos efectivos y eficientes particularmente en el área de agua potable y aguas residuales. La región fronteriza de Nogales, Sonora-Nogales, Arizona no es la excepción. La planta internacional de tratamiento de aguas negras que sirve a ambas ciudades está siendo expandida para cubrir el aumento de la demanda de tratamiento de aguas negras en esta región fronteriza. La Agencia de Protección Ambiental de los Estados Unidos (EPA) está considerando la otorgación de préstamos a fondo perdido de su programa de Infraestructura Ambiental Fronteriza (BEIF, por sus siglas en Inglés) a las ciudades de Nogales, Arizona y Nogales, Sonora, México para un proyecto propuesto que incluye la rehabilitación, actualización, y construcción de las instalaciones de infraestructura para aguas negras en estas comunidades. EPA está solicitando el desarrollo de un programa de pretratamiento de aguas residuales industriales como un requisito para la asignación de estos fondos y el programa se necesita en la ciudad de Nogales, Sonora, México para proteger la inversión en la planta y los sistemas de colección. La ciudad de Nogales, Arizona ya tiene un programa de pretratamiento aprobado por la EPA.

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L O
s gobiernos estatales de Arizona y Sonora han previamente acordado recomendaciones para apoyar programas de prevención de la contaminación y de pretratamiento en la región fronteriza. En 1998, el Comité de Medio Ambiente de la Comisión Sonora-Arizona recomendó el intercambio de información entre las agencias estatales para promover actividades de prevención de la contaminación para las maquiladoras localizadas a lo largo de la frontera de Arizona-Sonora. En 1999, el Comité del Medio Ambiente recomendó promover el establecimiento de programas de pretratamiento de aguas residuales industriales para las comunidades fronterizas incluyendo a Ambos Nogales, a fin de proteger el medio ambiente y las inversiones a la infraestructura de tratamiento de aguas negras que se estaban haciendo en ambos estados.

COAPAES ha iniciado caracterizaciones preliminares de las descargas industriales en la ciudad de Nogales, Sonora. A través de la cooperación con el ADEQ, COAPAES puede incrementar la caracterización de la calidad del agua en otras áreas de los sistemas de colección de aguas negras. Además, COAPAES ha expresado el interés de realizar visitas conjuntas a las municipalidades de Arizona que ya han establecido un programa de pretratamiento industrial (como la Ciudad de Phoenix) y a plantas industriales que han implementado un sistema de pretratamiento/control de la contaminación de aguas residuales. ADEQ también está interesado en las visitas conjuntas a las plantas industriales localizadas en el lado Sonorense de la frontera. Adicionalmente, COAPAES ha manifestado su interés en implementar un laboratorio regional en el área de Nogales, Sonora que proporcionaría servicios de laboratorio para análisis de agua/aguas residuales a la región norte de Sonora y ha expresado un interés especial en visitar el Laboratorio Estatal del Departamento de Salud Pública de Arizona (ADHS) para observar los procedimientos de análisis de muestras de aguas residuales.

ADEQ está preparado para apoyar a COAPAES en las caracterizaciones adicionales de las descargas industriales en Nogales, Sonora y de proveer servicios de laboratorio para este proyecto. El Estado de Arizona proveerá hasta \$20,000 dólares para estos análisis de muestras recolectadas en México. ADEQ está también preparado para trabajar con COAPAES y las municipalidades en Arizona (como la Ciudad de Phoenix) y el Laboratorio Estatal del ADHS y ayudará a COAPAES en la transferencia de tecnología para el personal de COAPAES. El propósito de esta transferencia de tecnología es el de proveer una guía en las inspecciones a plantas y en servicios analíticos cuando COAPAES decida desarrollar el laboratorio regional. Este proyecto también beneficia a las comunidades fronterizas de Arizona al proveer entrenamiento técnico actualizado y acceso a equipo de muestreo sobre pretratamiento y al ayudar a mantener una interacción cercana con sus contrapartes en Sonora.

ADEQ Contrato Número 01-0122
30 de junio 2001

Page 3 of 6

II. Objetivos

Este Memorando de Entendimiento clarifica el papel y las responsabilidades del ADEQ y COAPAES en este proyecto. El motivo principal de este memorando de entendimiento es la clarificación sobre las responsabilidades y autoridad sobre el manejo de la información de la calidad del agua que resulte del uso de fondos del Estado de Arizona en el análisis de muestras de agua recolectadas en México.

III. Acuerdos

ADEQ Y COAPAES ACUERDAN LOS SIGUIENTES PRINCIPIOS Y OBLIGACIONES:

1. ADEQ proveerá fondos, sujeto a disponibilidad y hasta un máximo de \$20,000 dólares para servicios de laboratorio realizados por el Laboratorio Estatal de Arizona. La cantidad de \$20,000 dólares no será pagada directamente a COAPAES; los fondos serán dirigidos al Laboratorio Estatal de Arizona. Estos fondos están disponibles para el análisis de muestras de aguas residuales recolectadas en las descargas industriales como parte de los objetivos del programa de pretratamiento de Nogales, Sonora. Los puntos de muestreo deberán estar localizados dentro de la porción Sonorense de la cuenca binacional de este proyecto.
2. De acuerdo con las leyes de Arizona, todo dato generado con el uso de fondos ó personal del Estado de Arizona deberá estar sujeto a ser distribuido al público y disponible para ser usado por ADEQ. Personal de ADEQ llevará a cabo una revisión de aseguramiento y control de la calidad (QA/QC) de los resultados analíticos derivados de las muestras recolectadas en Nogales, Sonora, México. Dentro de siete días de terminar la revisión QA/QC de los resultados, estos resultados analíticos del Laboratorio Estatal de Arizona serán enviados por correo certificado a COAPAES para una revisión mas larga de 30 días, período que inicia desde el momento del envío de los resultados. Terminado el período de revisión de 30 días, esta información será puesta en las bases de datos públicas de Arizona si ADEQ determina que los datos conforman con los requerimientos de QA/QC. Los datos serán sujetos a la ley de petición de información pública de acuerdo a la Ley de Registro Público de Arizona después del período de 30 días sin tener en cuenta si los datos fueron puestos en las bases de datos de ADEQ ó no.
- 3.- COAPAES es responsable de notificar a las autoridades competentes si los datos de las actividades de muestreo y/o servicios analíticos indican que existe una amenaza inmediata ambiental ó de salud en México ó de si existe un indicio de una violación a las leyes Mexicanas. COAPAES es el único responsable para hacer esta determinación de las muestras de calidad de agua de México que serán procesadas por el Laboratorio Estatal de Arizona. ADEQ no conducirá ningún proceso de notificación pública u gubernamental en México por los resultados analíticos de las muestras recolectadas dentro de México y procesadas en el Laboratorio Estatal de Arizona.

4. ADEQ proveerá asesoría técnica a los implementadores del proyecto a través de la duración de este Memorando de Entendimiento.
5. COAPAES seguirá el Plan de Aseguramiento de Calidad de ADEQ para muestras que sean destinadas a ser analizadas por el Laboratorio Estatal de Arizona. ADEQ acuerda revisar el plan de muestreo del proyecto y proporcionar comentarios acerca de su conformación con los requerimientos de ADEQ.
6. COAPAES será la entidad líder para la recolección de las muestras en México. ADEQ proveerá apoyo técnico de campo, incluyendo la provisión de cualquier equipo necesario y los recipientes correspondientes, en la recolección de las muestras. ADEQ y COAPAES acuerdan seguir el procedimiento de Cadena de Custodia durante el manejo y transporte de las muestras desde el punto de recolección en México hasta el Laboratorio Estatal de Arizona. ADEQ será responsable por la transportación de muestras al Laboratorio Estatal de Arizona en acuerdo con el procedimiento de la cadena de custodia. ADEQ, a su discreción, proveerá apoyo en la recolección de muestras adicionales del proyecto en Nogales, Sonora, Mexico si se le solicita.
7. ADEQ, puede, a su discreción, revisar y comentar sobre los borradores de los reportes del proyecto si lo solicita COAPAES. ADEQ no acuerda en llevar a cabo un análisis interpretativo, estadístico ó de cualquier otra forma para COAPAES sobre los datos derivados de México de este proyecto.
8. COAPAES seguirá las metodologías apropiadas de muestreo de ADEQ durante la recolección de muestras por VOCs y pesticidas de este proyecto. A fin de asegurar la integridad de los datos y el uso apropiado de los fondos de Arizona, las muestras deberán ser recolectadas de acuerdo a las metodologías de muestreo y de QA/QC aceptadas por ADEQ.
9. COAPAES proveerá el personal de campo para las actividades de muestreo. ADEQ jugará un papel de apoyo si se le avisa de antemano en forma adecuada.
10. Sujeto a la disponibilidad de recursos propios de COAPAES, ADEQ hará un esfuerzo razonable para facilitar las visitas de COAPAES a una municipalidad en Arizona que tienen ya establecido un programa de pretratamiento industrial, a dos plantas industriales que han implementado un sistema de pretratamiento/control de contaminación, y para el entrenamiento y la transferencia de tecnología que se llevará a cabo en el Laboratorio Estatal de Arizona., en Phoenix. Este entrenamiento y transferencia de tecnología estará enfocado en los análisis de muestras de agua relacionadas con el programa de pretratamiento de Nogales, Sonora realizados por el Laboratorio Estatal de Arizona. COAPAES es responsable para comunicar directamente a ADEQ la fecha, hora y objetivos deseados para las visitas planeadas y entrenamiento. Además, bajo la petición de COAPAES, y en base a la disponibilidad de ADEQ, ADEQ participará en un mínimo de dos visitas conjuntas a plantas industriales localizadas en Nogales, Arizona.

IV. Correspondencia

Todos los resultados analíticos e información técnica para este proyecto relacionado con las provisiones de este Memorando de Entendimiento serán dirigidas al siguiente, por COAPAES:

Carlos Gonzalez
Director de Asuntos Fronterizos y Proyectos Especiales
Comision de Agua Potable Y Alcantarillado del Estado de Sonora
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(01152) 62-122867
(01152) 62-171058 fax
cgonzlez@coapaes.gob.mx

Todos los resultados analíticos e información técnica para este proyecto relacionado con las provisiones de este Memorando de Entendimiento será dirigida al siguiente por ADEQ

Mario Castañeda
Water Border Technical Coordinator
Hydrologic Support and Assessment Section
Water Quality Division
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Terminación ó Modificación de Este Memorando

Este Memorando de Entendimiento expira en Diciembre 31, 2002. Este Memorando puede ser revocado en cualquier tiempo con una notificación por escrito hecha con treinta días hábiles con anticipación por cualquiera de las partes. Este memorando puede ser modificado únicamente a través de consentimiento mutuo por escrito.

Firmado en el 30 de Junio de 2001:

Jacqueline E. Schafer
Director
Arizona Department of Environmental Quality

Ing. César Alfonso Lagarda Lagarda
Director General
Comisión de Agua Potable
y Alcantarillado del Estado de Sonora

Ing. Francisco Javier Hernández Armenta
- Testigo de Honor -
Secretario
Secretaría de Infraestructura Urbana y Ecología
del Estado de Sonora



Jane Dee Hull
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Jacqueline E. Schafer
Director

ADEQ Contrato Numero 01-0142
30 de junio de 2001

MEMORANDO DE ENTENDIMIENTO
entre el
Departamento de Calidad Ambiental del Estado de Arizona
y la
Universidad de Sonora
para el

***"MUESTREO DE LA CALIDAD DEL AGUA EN
LAS CUENCAS BINACIONALES DE SONORA"***

Este Memorando de Entendimiento se establece entre El Departamento De Calidad Ambiental Del Estado De Arizona, referido como ADEQ, y La Universidad De Sonora, referido como UNISON.

I.- Antecedentes

El crecimiento de la población y la industria en la región fronteriza nortea de México ha producido una presión en los gobiernos estatales y municipales en la región fronteriza para proveer servicios públicos efectivos y eficientes particularmente en el área de agua potable y aguas residuales. Existe también una escasez de información ambiental en muchas regiones de la frontera México-Estados Unidos incluyendo segmentos de Arizona y Sonora.

Con ayuda y guía de organizaciones no-gubernamentales y la Universidad de Sonora, los municipios fronterizos de Cananea, Naco, y Agua Prieta implementaron un proyecto de monitoreo de la calidad de agua para determinar la calidad de agua en las áreas de esos tres municipios, el Río San Pedro, y el Río Sonora para tener una mejor idea de la calidad de agua en la región nortea Sonorense, en México. Este esfuerzo, denominado "*Proyecto Regional Sonorense Para El Muestreo De La Calidad De Agua*" proveyó información ambiental base respecto a la calidad del agua superficial y subterránea en las cuencas transfronterizas de la región. También ayudó a identificar y aislar problemas de calidad de agua específicos en esta cuenca. El Departamento De Investigaciones Científicas y Tecnológicas de la Universidad de Sonora - DICTUS, fué subcontratado por Enlace Ecológico, una organización no-gubernamental Mexicana, para llevar a cabo el monitoreo y la evaluación de la calidad del agua de este proyecto.

Northern Regional Office
1515 East Cedar Avenue • Suite F • Flagstaff, AZ 86004
(520) 779-0313

Southern Regional Office
400 West Congress Street • Suite 433 • Tucson, AZ 85701
(520) 628-6733

La Agencia de Estados Unidos para el Desarrollo Internacional (USAID) apoyó este proyecto a través de una cantidad de \$100,000 dólares que fué administrada por la Asociación Internacional de Manejo de Ciudad/Municipio (ICMA).

ADEQ y UNISON firmaron un Memorando de Entendimiento (MOU) en 1997 para permitir la participación de ADEQ en este proyecto. El MOU clarificó los papeles y responsabilidades sobre la autoridad en el manejo de la información y las responsabilidades de ADEQ y UNISON para la información de la calidad de agua resultantes del uso de fondos del Estado de Arizona en el análisis de muestras de agua tomadas en México. ADEQ proveyó servicios de laboratorio y apoyo técnico para este proyecto de calidad de agua. La Fundación Comunitaria de El Paso (El Paso Community Foundation) proveyó de fondos adicionales a la organización no gubernamental de Sonora para la continuación de este proyecto en 1998. El MOU entre ADEQ y UNISON fué extendido en 1998 por otro año. El reforzamiento de capacidad institucional y transferencia de tecnología en México fueron los objetivos principales de los anteriores MOUs.

En base a estas interacciones previas, ADEQ y UNISON están ahora interesados en expandir esta colaboración para incluir las porciones transfronterizas de otras cuencas binacionales de la región fronteriza de Sonora donde la UNISON pudiera participar en proyectos de calidad de agua. Estas cuencas de agua superficial incluyen: San Pedro, Río Yaqui, Santa Cruz, Río Magdalena, and Lower Colorado River. Estos proyectos de calidad de agua apoyarían actividades fronterizas como el desarrollo de indicadores de calidad de agua del programa Frontera 21 entre México y Estados Unidos para la región fronteriza. El ADEQ, sujeto a la disponibilidad de fondos, está preparada para proveer servicios de laboratorio para los proyectos de calidad de agua que la UNISON pudiera desarrollar con estos esfuerzos fronterizos en estas cuencas binacionales compartidas a lo largo de la frontera Arizona-Sonora. La UNISON está también interesada con las oportunidades de transferencia de tecnología que fué proporcionada en los anteriores MOUs por el laboratorio estatal del Departamento de Servicios de Salud de Arizona. El ADEQ está también interesado en continuar con el papel de apoyo en la transferencia de tecnología en Phoenix entre personal de la UNISON y el Laboratorio Estatal del Departamento de Servicios de Salud de Arizona (ADHS). El propósito de esta oportunidad de transferencia de tecnología es la de proveer una guía en el evento de que la UNISON decida desarrollar tales técnicas de análisis. El refuerzo de la capacidad institucional y la transferencia de tecnología a Mexico son aún los objetivos principales de este MOU.

II. Objetivos

Este Memorando de Entendimiento clarifica el papel y las responsabilidades del ADEQ y la Universidad de Sonora en este proyecto. El motivo principal de este memorando de entendimiento es la clarificación sobre las responsabilidades y autoridad sobre el manejo de la información de la calidad del agua que resulte del uso de fondos del Estado de Arizona en el análisis de muestras de agua recolectadas en México.

III. Acuerdos

ADEQ Y UNISON ACUERDAN LOS SIGUIENTES PRINCIPIOS Y OBLIGACIONES:

- 1.- Cuando un proyecto de calidad de agua vaya a ser implementado por la UNISON en la cuenca binacional y requiera de servicios que pudieran ser proporcionados bajo este MOU, la UNISON notificará a ADEQ por escrito al menos 21 días de anticipación.
2. ADEQ proveerá fondos, sujeto a disponibilidad y hasta un máximo de \$10,000 dólares para el Año Fiscal de 2002 para servicios de laboratorio realizados por el Laboratorio Estatal de Arizona. El ADEQ, sujeto a la disponibilidad de fondos, espera buscar una cantidad similar para el Año Fiscal de 2003. Estas cantidades no serán pagadas a la Universidad de Sonora; los fondos serán dirigidos al Laboratorio Estatal de Arizona ó a cualquier otro laboratorio que ADEQ pueda subcontratar para estas actividades de apoyo. Estos fondos están disponibles para el análisis de muestras de aguas subterráneas, aguas superficiales, y sedimento recolectadas en México como parte de estos proyectos. Sólomente serán analizadas en Arizona muestras divididas recolectadas en México por ADEQ con la UNISON. ADEQ podrá, bajo su discreción y a través de sus esfuerzos de colaboración con otras agencias federales y estatales de Estados Unidos, buscar fondos y apoyo de campo adicionales para estas actividades. Los puntos de muestreo deberán de estar localizados dentro de la porción binacional de la cuenca Sonorense de estos proyectos.
3. De acuerdo con las leyes de Arizona, todo dato generado con el uso de fondos ó personal del Estado de Arizona deberá estar sujeto a ser distribuido al público y disponible para ser usado por ADEQ. Personal de ADEQ llevará a cabo una revisión de aseguramiento y control de la calidad (QA/QC) de los resultados analíticos de las muestras divididas recolectadas en México. Dentro de siete días de terminar la revisión QA/QC de los resultados, estos resultados analíticos de las muestras analizadas por el Laboratorio Estatal de Arizona ó los laboratorios subcontratados por ADEQ serán enviados por correo certificado a UNISON para su revisión final, misma que tendrá una duración hasta de 30 días. Terminado el periodo de revisión de 30 días, esta información será puesta en las bases de datos públicas de Arizona si ADEQ determina que los datos conforman con los requerimientos de QA/QC. Independientemente de que los datos sean puestos en las bases de datos de ADEQ, la información estará sujeta a la Ley de Registro Público de Arizona al terminar el periodo de treinta días.
- 4.- La UNISON es responsable de notificar a la Comision Nacional De Agua y a la Sección Mexicana de La Comision Internacional De Límites y Aguas-CILA si los datos indican que existe una amenaza inmediata ambiental ó de salud en México. La UNISON es la única responsable para hacer esta determinación con la informacion de las muestras divididas de calidad de agua de México que serán procesadas por el Laboratorio Estatal de Arizona ó por los laboratorios subcontratados por ADEQ. ADEQ no conducirá ningún proceso de notificación pública u gubernamental en México por los resultados analíticos de las muestras recolectadas dentro de México y procesadas en el Laboratorio Estatal de Arizona ó por los laboratorios que ADEQ subcontrate.

5.- La UNISON proveerá copias de los reportes analíticos del Laboratorio Estatal de Arizona y/o laboratorios subcontratados por ADEQ a la Comisión Nacional Del Agua y otras agencias Mexicanas federales, estatales y locales dentro de los 30 días después de recibir estos resultados.

6. El ADEQ proveerá asesoría técnica a los implementadores del proyecto a través de la duración de este Memorando de Entendimiento.

7. La UNISON seguirá el Plan de Aseguramiento de Calidad de ADEQ para muestras divididas que sean destinadas a ser analizadas por el Laboratorio Estatal de Arizona. El ADEQ acuerda revisar el plan de muestreo del proyecto y proporcionar comentarios acerca de su conformación con los requerimientos del ADEQ.

8. La UNISON será la entidad líder para la recolección de las muestras en México. ADEQ proveerá apoyo técnico de campo, incluyendo la provisión de cualquier equipo necesario y los recipientes correspondientes, en la recolección de las muestras divididas. El ADEQ y la UNISON acuerdan seguir el procedimiento de Cadena de Custodia durante el manejo y transporte de las muestras desde el punto de recolección en México hasta el Laboratorio Estatal de Arizona u otro laboratorio subcontratado por ADEQ. El ADEQ será responsable por la transportación de las muestras divididas al Laboratorio Estatal de Arizona u otro laboratorio subcontratado por ADEQ en acuerdo con procedimiento de la Cadena de Custodia. ADEQ, a su discreción, proveerá apoyo en la recolección de muestras adicionales del proyecto si se le solicita.

9. ADEQ, puede, a su discreción, revisar y comentar sobre los borradores de los reportes del proyecto si lo solicita la UNISON. ADEQ no acuerda llevar a cabo un análisis interpretativo, estadístico ó de cualquier otra forma para la UNISON sobre los datos derivados de México de este proyecto.

10. Sujeto a la disponibilidad de recursos, la UNISON hará los arreglos necesarios con el ADHS para el entrenamiento y la transferencia de tecnología que se llevará a cabo en el Laboratorio Estatal de Arizona, en Phoenix. La UNISON es responsable para comunicar la fecha, hora y objetivos deseados para este entrenamiento directamente con el personal del Laboratorio Estatal de Arizona. ADEQ hará un esfuerzo razonable para facilitar este proceso para la UNISON si se le solicita.

11. La UNISON seguirá las metodologías apropiadas de muestreo de ADEQ durante la recolección de muestras divididas de estos proyectos que sean enviadas al Laboratorio Estatal de Arizona ó a los laboratorios subcontratados por ADEQ. A fin de asegurar la integridad de los datos las muestras deberán ser recolectadas de acuerdo a las metodologías de muestreo y de QA/QC aceptadas por ADEQ y la UNISON.

12. La UNISON proveerá el personal de campo para las actividades de muestreo. ADEQ jugará un papel de apoyo si se le avisa de antemano en forma adecuada.

13. ADEQ está recolectando información de calidad de agua subterránea y superficial en el lado fronterizo de Arizona como parte de sus actividades de monitoreo. El ADEQ acuerda proporcionar a la UNISON con copias de estos resultados analíticos de su trabajo en Arizona, si se lo solicita la UNISON. La UNISON acuerda proporcionar al ADEQ copias de los resultados analíticos de su trabajo en las cuencas binacionales Sonorenses en caso de que ADEQ lo solicite.

IV. Correspondencia

Todos los resultados analíticos e información técnica de estos proyectos relacionados con las provisiones de este Memorando de Entendimiento serán dirigidos al siguiente, por la UNISON:

M.C. Arturo Villalba Atondo
Profesor-Investigador
Departamento de Investigaciones Científicas y Tecnológicas
De La Universidad De Sonora
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(01152) 62-123271 fax

Todos los resultados analíticos e información técnica para estos proyectos relacionados con las provisiones de este Memorando de Entendimiento serán dirigidos al siguiente por ADEQ

Mario Castañeda
Water Border Technical Coordinator
Hydrologic Support and Assessment Section
Water Quality Division
Arizona Department of Environmental Quality
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Terminación ó Modificación de Este Memorando

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Firmado en el 30 de Junio 2001.

Jacqueline E. Schafer

Director

Arizona Department of Environmental Quality

M.C. Pedro Ortega Romero

Rector

Universidad de Sonora

Ing. Francisco Javier Hernández Armenta

- Testigo de Honor -

Secretario

Secretaría de Infraestructura Urbana y Ecología
del Estado de Sonora