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State of New Mexico
ENVIRONMENT DEPARTMENT
DOE OVERSIGHT BUREAU
P.O. Box 1663, MS/J-993
Los Alamos, New Mexico 87545

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

November 28, 1995

Ivan Trujillo DOE/AIP/POC
Dept. of Energy
Los Alamos Area Office
MS: A316
Los Alamos, NM 87545

Re: Submittal of 1994 and 1995 Environmental Surveillance surface water data (on-site), Los Alamos National Laboratory (LANL), Los Alamos, New Mexico

Dear Mr. Trujillo:

The New Mexico Environment Department (NMED) Department of Energy Oversight Bureau (DOE OB) personnel performed surface water sampling and habitat assessment during 1994 and 1995 at LANL (on-site), in Upper Pajarito canyon, Starmer's Gulch, Bulldog Gulch and Cañon de Valle. The preliminary data (see attachment) are being submitted for your thirty-day review as stated in the Agreement-in-Principle Umbrella Protocol. After DOE has had the opportunity to review and comment on the data, it will be released to interested parties within thirty (30) days of receipt of this letter.

Contact Ralph Ford-Schmid at 827-1536 if you have any questions regarding this matter.

Sincerely,

Stephen Yanicak

Steve Yanicak,
Point of Contact/LANL,
NMED, DOE OB

SY:rfs

attachment
cc: Neil Weber, Chief, NMED, DOE OB
Jim Piatt, Chief, NMED, SWQB
Alex Puglisi, UC-LANL/ESH-18, MS K497
Steve Rae, LANL, ESH-18, MS K490

5468

NMED - DOE OB

1994 & 1995
Preliminary Water Quality Data
and
Habitat Assessment Ratings

Methods:

Benthic Macroinvertebrate Methods

Three replicate modified Hess Circular (Jacobie, 1978) samples (.059 m^2) were collected from rubble substrate that represented the best habitat quality at each location. Samples were stored individually in 70% isopropyl alcohol for analysis by Dr. Gerald Z. Jacobie of Highlands University. Samples were sorted in their entirety and macroinvertebrates were identified to the lowest taxonomic level possible using available keys (Merritt & Cummins, 1984), (Pennak, 1989), (Usinger, 1956), (Wiggins, 1978) and (Bauman, 1977). Chironomidae were enumerated and sub-contracted out for identification to the genus level. As of 11-28-95, no benthic macroinvertebrate results are available.

Habitat Assessment Methods

Benthic invertebrate habitat quality was rated using the EPA's Rapid Bioassessment Protocol(RBP) (Plafkin, 1989). This method rates nine habitat parameters and weights the scores on their degree of importance to biological communities. Habitat parameters are divided into three categories, primary, secondary and tertiary. The range of scores for each category are: primary (score 0-20), secondary (score 0-15) and tertiary (score 0-10). All nine scores are totaled and the maximum score a site could receive is 135.

In the EPA RBP, flow is considered a primary habitat parameter and is scored from 0 to 20 for flows ranging from <0.5 cfs (225 gpm) to >2 cfs (898 gpm). Since base flows on LANL streams are normally less than 250 gpm and therefor resulted in a score of 0 for all streams, I modified the scoring range to account for flows normally encountered at LANL. The following scores were used: Flow of <5-25 gpm scored 0-5, flow of 25-50 gpm scored 5-10, flow of 50-150 gpm scored 10-15 and flow of 150->250 gpm scored 15-20. Flow was measured monthly from February, 1995 through November, 1995, with a bucket and stopwatch at a natural waterfall. Three to five measurements were taken, averaged and the lowest monthly measurement was considered the base flow. Base flow was used to determine the score for flow.

Water Quality Sampling Methods

To aid in assessing the suitability of each location for colonization by macro-invertebrates, field parameters (pH, DO, conductivity and temperature) were collected at each station and water samples were collected and sent to the Scientific Laboratory Division (SLD) of the New Mexico Environment Department and analyzed for total and dissolved metals, nutrients, and general water chemistry. Samples analyzed for dissolved metals were filtered through a 0.45 micron filter. Samples analyzed for total and dissolved metals were preserved with nitric acid. Samples analyzed for nutrients where preserved with sulfuric acid. All samples were stored on ice at 4°C until analyzed at SLD.

Map Designations

All sample stations are designated by incoporating the first two letters of the canyon and measuring the distance from the Rio Grande using USGS topographic maps. This applies to streams that empty into the Rio Grande. When a tributary joins a main canyon, the map designation is the first two letters of that canyon and the distance from it's junction with the main canyon. For example, PA 9.0 is in Pajarito canyon, nine miles from the Rio Grande. Starmer Gulch joins Pajarito canyon at this point, therefore a sample taken in Starmer Gulch, at the junction, would be designated ST 0.0 A sample taken in Pajarito canyon, below the junction of Starmer Gulch would be designated PA 9.0.

REFERENCES

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Usinger, R.L. ed. 1956. Aquatic Insects of California. Univ. of California.

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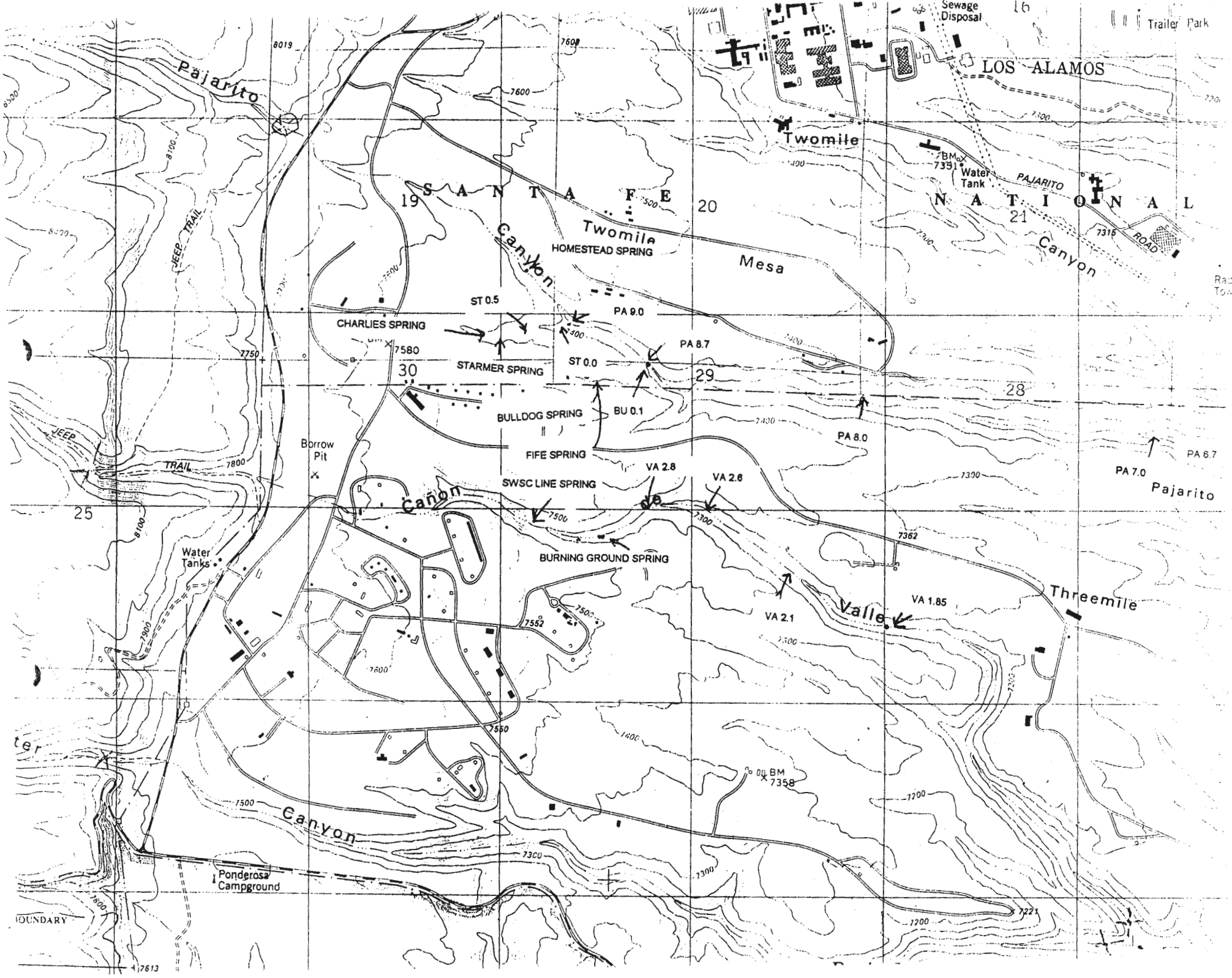
Sewage Disposal
Trailer Park
LOS ALAMOS
Pajarito
Twomile
BM 7351
Water Tank
PAJARITO
ROAD
S A N T A F E
N A T I O N A L
19
20
21
Canyon
Twomile
HOMESTEAD SPRING
Mesa
JEEP TRAIL
ST 0.5
PA 9.0
CHARLIES SPRING
7580
PA 8.7
STARMER SPRING
ST 0.0
30
29
28
BULLDOG SPRING
BU 0.1
PA 8.0
JEEP
TRAIL
Borrow Pit
FIFE SPRING
PA 6.7
PA 7.0
Pajarito
VA 2.8
VA 2.6
SWSC LINE SPRING
Canon
25
Water Tanks
BURNING GROUND SPRING
7362
Threemile
VA 1.85
VA 2.1
Valle
7552
BM 7358
Canyon
Ponderosa Campground
7613
7221

UPPER PAJARITO CANYON WATER CHEMISTRY 1994

UPPER PAJARITO SAMPLING		ST 0.0	PA 9.0	BU 0.0	PA 6.7
STATIONS	DATE	1-Jul-94	22-Jul-94	22-Jul-94	22-Jul-94
	TIME	1320	1445	1300	1117
WATER CHEMISTRY	UNITS				
AIR TEMP	(C)				
WATER TEMPERATURE (FIELD)	(C)	12.5	14.3	14.6	16.5
CONDUCTIVITY (FIELD)	(uhmo)	122			
O2 DISSOLVED (FIELD)	(mg/L)	7.4	8.8	8.4	7.8
pH (FIELD)	(S.U.)	8.00	8.45	7.98	7.81
NITRATE+NTE	(mg/L)	0.20	0.20Q	0.40Q	0.10KQ
AMMONIA	(mg/L)	0.10Q	0.10Q	0.30Q	0.10KQ
KJELDAHL N	(mg/L)	0.30Q	0.10Q	0.20Q	0.40Q
TOTAL PHOSPHORUS	(mg/L)	0.09KQ	0.09KQ	0.09KQ	0.09KQ
Ca	(mg/L)	8.60Q	10.00Q	16.00Q	12.00Q
Mg	(mg/L)	6.40Q	3.10Q	4.20Q	3.40Q
K	(mg/L)	5.00Q	4.00Q	4.00Q	4.00Q
Na	(mg/L)	9.00Q	10.00Q	18.00Q	13.00Q
HARDNESS	(mg/L)	35.00Q	38.00Q	58.00Q	44.00Q
ALKALINITY	(mg/L)	38.00Q	42.00Q	65.00Q	52.00Q
BICARBONATE	(mg/L)	46.00Q	52.00Q	79.00Q	64.00Q
CARBONATE	(mg/L)	0.00Q	0.00Q	0.00	0.00Q
CHLORIDE	(mg/L)	8.00	8.00	12.00	9.00
FLOURIDE	(mg/L)	0.10K	0.10	0.30	0.20
SULFATE	(mg/L)	6.00	7.00	9.00	6.00
COLOR TEST	(units)	25.00	20.00	15.00	50.00L
CONDUCTIVITY (LAB)	(uS/cm)	113.00Q	120.00	197.00	153
pH (LAB)	(S.U.)	7.90Q	6.95Q	7.34Q	6.81Q
TDS	(mg/L)	154	122	174	162
TSS	(mg/L)	5	4	3K	3K

K = Less than Q = Did not meet holding time NA = Not analyzed for

UPPER PAJARITO DISSOLVED TOTAL METALS 1994

UPPER PAJARITO SAMPLING		ST 0.0	PA9.0	BU 0.0	PA 6.7
STATIONS	DATE	1-Jul-94	22-Jul-94	22-Jul-94	22-Jul-94
	TIME	1320	1445	1300	1117
DISSOLVED METALS	UNITS				
Al	(ug/l)	500	700	400	800
Ba	(ug/l)	100K	100K	100K	100K
Be	(ug/l)	100K	100K	100K	100K
B	(ug/l)	100K	100K	100K	100K
Ca	(ug/l)	9600	10,000	16000	12000
Co	(ug/l)	50K	50K	50K	50K
Cu	(ug/l)	10KQ	10K	10KQ	10KQ
Fe	(ug/l)	300	1,000	200	500
Mg	(ug/l)	2900	3,400	4300	3600
Mn	(ug/l)	50K	50K	50K	50K
Mo	(ug/l)	1KQ	100K	100K	100K
Ni	(ug/l)	100K	100L	100K	100K
Si	(ug/l)	19000	NA	21000	18000
Ag	(ug/l)	100K	100K	100K	100K
Sr	(ug/l)	100K	100K	100K	100K
Sn	(ug/l)	100K	100K	100K	100K
V	(ug/l)	100K	100K	100K	100K
Zn	(ug/l)	10KQ	10	20Q	1KQ
U	(ug/l)	1KQ	NA	NA	NA
As	(ug/l)	1KQ	1K	2Q	2Q
Cd	(ug/l)	1KQ	1K	1KQ	1KQ
Cr	(ug/l)	1KQ	1K	1KQ	1KQ
Pb	(ug/l)	1KQ	1K	1KQ	1KQ
Hg	(ug/l)	0.5K	0.5K	0.5K	0.5K
Se	(ug/l)	5K	5K	5K	5K

UPPER PAJARITO SAMPLING		ST 0.0	PA9.0	BU 0.0	PA 6.7
STATIONS	DATE	1-Jul-94	22-Jul-94	22-Jul-94	22-Jul-94
	TIME	1320	1445	1300	1117
TOTAL METALS	UNITS				
Al	(ug/l)	1000	700	900	2,400
Ba	(ug/l)	100K	100K	100K	100K
Be	(ug/l)	100K			100K
B	(ug/l)	100K			100K
Ca	(ug/l)	16000			12,000
Co	(ug/l)	50K	50K	50K	50K
Cu	(ug/l)	10KQ	10K	10KQ	10K
Fe	(ug/l)	500	500	600	1,400
Mg	(ug/l)	3100	3,100	4300	3,700
Mn	(ug/l)	50K	50K	50K	50K
Mo	(ug/l)	1KQ	100K	100K	100K
Ni	(ug/l)	100K	100K	100K	100K
Si	(ug/l)	19000	20,000	19000	1,200
Ag	(ug/l)	100K	100K	100K	100K
Sr	(ug/l)	100K	100K	100K	100K
Sn	(ug/l)	100K	100K	100K	100K
V	(ug/l)	100K	100K	100K	100K
Zn	(ug/l)	10KQ	10K	10Q	1
U	(ug/l)	1KQ	NA	NA	NA
As	(ug/l)	1KQ	1K	4Q	2
Cd	(ug/l)	1KQ	1K	1KQ	1K
Cr	(ug/l)	1Q	1K	3Q	3
Pb	(ug/l)	1K	1K	2Q	2
Hg	(ug/l)	0.5K	0.5K	0.5K	0.5K
Se	(ug/l)	5K	5K	5K	5K

K = Less than Q = Did not meet holding time NA = Not analyzed for

K = Less than Q = Did not meet holding time NA = Not analyzed for

RADIOISOTOPIC ANALYSIS SPRINGS 1994

UPPER PAJARITO CANYON de VALLE SPRINGS	DATE	TIME	Gross-alpha Am-241 ref (pCi/L)	Sigma (pCi/L)	D. Lmt. (pCi/L)	Gross-alpha U-nat ref (pCi/L)	Sigma (pCi/L)	D. Lmt. (pCi/L)	Gross-beta Cs-137 ref (pCi/L)	Sigma (pCi/L)	D. Lmt. (pCi/L)
Upper Pajarito Springs											
Homestead Spring	9-Aug-94	1325	1.10	0.40	0.60	1.20	0.40	0.70	3.40	0.70	1.20
Starmer Spring	22-Jul-94	1320	0.40	0.50	1.00	0.50	0.50	1.00	4.40	1.00	1.60
Charlies Spring	22-Jul-94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulldog Gulch Springs											
Fife Spring	9-Aug-94	1150	4.00	0.90	0.90	4.90	1.00	1.10	6.40	1.10	1.70
Bulldog Spring TA-9	9-Aug-94	1100	12.00	3.00	1.20	19.00	3.00	1.90	17.10	1.80	1.90
Canyon de Valle Springs											
Burning Site Spring @ TA-16	12-Aug-94	1005	1.00	0.50	0.80	1.10	0.50	1.00	5.20	1.10	1.70
SWSC Line Spring @ TA-16	12-Aug-94	1104	13.00	3.00	1.30	25.00	4.00	2.50	31.00	3.00	1.90

UPPER PAJARITO CANYON de VALLE SPRINGS	DATE	TIME	Gross-beta Sr/Y-90 ref (pCi/L)	Sigma (pCi/L)	D. Lmt. (pCi/L)	Gamma Peaks Observed
Upper Pajarito Springs						
Homestead Spring	9-Aug-94	1325	3.40	0.70	1.20	0
Starmer Spring	22-Jul-94	1320	4.20	1.00	1.60	0
Charlies Spring	22-Jul-94	NA	NA	NA	NA	0
Bulldog Gulch Springs						
Fife Spring	9-Aug-94	1150	6.10	1.00	1.70	0
Bulldog Spring TA-9	9-Aug-94	1100	15.40	1.50	1.70	0
Canyon de Valle Springs						
Burning Site Spring @ TA-16	12-Aug-94	1005	5.10	1.10	1.70	0
SWSC Line Spring @ TA-16	12-Aug-94	1104	27.00	2.00	1.70	0

NA = Not Analyzed For

Springs Water Chemistry 1994

UPPER PAJARITO AND CANYON DE VALLE SPRINGS		Upper Pajarito Canyon Springs			Bulldog Gulch Springs		Canyon de Valle Springs	
		Homestead Spring	Starmer Spring	Charlies Spring	Fife Spring	Bulldog Spring TA-9	Burning Site Spring @ TA-16	SWSC Line Spring @ TA-16
	DATE	9-Aug-94	22-Jul-94	22-Jul-94	9-Aug-94	9-Aug-94	12-Aug-94	12-Aug-94
	TIME	1328	1420	1430	1153	1056	1004	1059
WATER CHEMISTRY	UNITS							
NITRATE+ITE	(mg/L)	0.30	0.20Q	0.30	1.10Q	0.60Q	1.10Q	1.00
AMMONIA	(mg/L)	0.20Q	0.10Q	0.20Q	0.10KQ	0.40Q	0.20Q	0.20Q
KJELDAHL N	(mg/L)	0.30Q	0.30Q	0.30Q	0.20Q	0.40Q	0.10Q	0.70Q
TOT PHOS	(mg/L)	0.09KQ	0.09KQ	0.09KQ	0.09KQ	0.09KQ	0.09KQ	0.10Q
Ca	(mg/L)	11.00Q	10.00Q	10.00Q	19.00Q	14.00Q	20.00Q	18.00Q
Mg	(mg/L)	2.90Q	3.20Q	3.30Q	4.60Q	1.30Q	4.90Q	2.50Q
K	(mg/L)	5.00Q	4.00Q	4.00Q	4.00Q	4.00Q	5.00Q	5.00Q
Na	(mg/L)	11.00Q	9.00Q	10.00Q	20.00Q	14.00Q	19.00Q	19.00Q
HRDNESS	(mg/L)	39.00Q	38.00Q	39.00Q	67.00Q	39.00Q	69.00Q	55.00Q
ALKALIN	(mg/L)	37.00Q	41.00Q	42.00Q	11.00	54.00Q	75.00Q	74.00Q
BICARB	(mg/L)	46.00Q	50.00Q	52.00Q	86.00	66.00Q	95.00Q	90.00Q
CARB	(mg/L)	0.00	0.00Q	0.00Q	0.00	0.00	0.00	0.00
CL-	(mg/L)	17.00	8.00	8.00	16.00	12.00	15	15.00
FLOR	(mg/L)	0.10K	0.10	0.10	0.30	0.20	0.2	0.20
SULFATE	(mg/L)	6.00	7.00	6.00	12.00	9.00	10	10.00
COLOR TEST	(units)	50.00L	15	15.00	10.00	40.00	5.00	10.00
CONDUC LAB	(uS/cm)	145.00Q	120	132.00	233.00Q	178.00	235.00	225.00
pH LAB	(S.U.)	7.12	7.28Q	6.79Q	7.22	6.98	7.19	7.37
TDS	(mg/L)	158	142	132	184	172	172	176
TSS	(mg/L)	15	18	20	29	252	8	448

K = Less than Q = Did not meet holding time NA = Not analyzed for

DISSOLVED TOTAL METALS SPRINGS 1994

UPPER PAJARITO	UPPER PAJARITO CANYON			BULLDOG GULCH		CANYON de VALLE	
CANYON de VALLE	Homestead	Starmer	Charlies	Fife	Bulldog	Burning Site	SWSC Line
SPRINGS	Spring	Spring	Spring	Spring	Spring TA-9	Spring @ TA-16	Spring @ TA-16
DATE	9-Aug-94	22-Jul-94	22-Jul-94	9-Aug-94	9-Aug-94	12-Aug-94	12-Aug-94
TIME	1327	1420	1430	1152	1100	1000	1100
DISSOLVED METALS(ug/l)							
Al	2300	700	700	400	900	300	300
Ba	100K	100K	100K	100K	100K	300	300
Be	100K	100K	100K	100K	100K	100K	100K
B	100K	100K	100K	100K	100K	100K	100K
Ca	10,000	9,600	10,000	17,000	13,000	18,000	18,000
Co	1k	50K	50K	1K	1K	1K	1K
Cu	10K	10KQ	10KQ	10K	10K	10K	10K
Fe	1500	300	300	300	600	100K	200
Mg	3700	3200	3400	4600	3,900	5300	5400
Mn	50K	50K	50K	50K	80	50K	50K
Mo	1K	100K	100K	1K	1K	1K	1K
Ni	100K	100K	100K	100K	100K	100K	100K
Si	13,000	20,000	21,000	14,000	17,000	22,000	22,000
Ag	100K	100K	100K	100K	100K	100K	100K
Sr	100K	100K	100K	100	100K	100	100
Sn	100K	100K	100K	100K	100K	100K	100K
V	100K	100K	100K	100K	100K	100K	100K
Zn	20	20Q	10Q	30	30	10	20
U	1K	NA	NA	1K	1K	1K	1K
As	1	1KQ	1KQ	2	2	1K	1K
Cd	IK	1KQ	1KQ	1K	1K	1K	1K
Cr	3	1KQ	1KQ	2	3	1	1K

UPPER PAJARITO	UPPER PAJARITO CANYON			BULLDOG GULCH		CANYON de VALLE	
CANYON de VALLE	Homestead	Starmer	Charlies	Fife	Bulldog	Burning Site	SWSC Line
SPRINGS	Spring	Spring	Spring	Spring	Spring TA-9	Spring @ TA-16	Spring @ TA-16
DATE	9-Aug-94	22-Jul-94	22-Jul-94	9-Aug-94	9-Aug-94	12-Aug-94	12-Aug-94
TIME	1327	1420	1430	1152	1100	1000	1100
TOTAL METALS (ug/l)							
Al	NA	600	1,100	NA	NA	400	4300
Ba	NA	100K	100K	NA	NA	300	500
Be	NA	100K	100K	NA	NA	100K	100K
B	NA	100K	100K	NA	NA	100K	100K
Ca	NA	9,800	10,000	NA	NA	18,000	20,000
Co	NA	50K	50K	NA	NA	1K	2
Cu	NA	10KQ	10K	NA	NA	10K	10K
Fe	NA	300	700	NA	NA	300	3,400
Mg	NA	3,300	3,300	NA	NA	5,300	5,900
Mn	NA	50K	50K	NA	NA	50K	160
Mo	NA	100K	100K	NA	NA	1K	1
Ni	NA	100K	100K	NA	NA	100K	100K
Si	NA	20,000	17,000	NA	NA	20,000	17,000
Ag	NA	100K	100K	NA	NA	100K	100K
Sr	NA	100K	100K	NA	NA	100	100K
Sn	NA	100K	100K	NA	NA	100K	100K
V	NA	100K	100K	NA	NA	100K	100K
Zn	NA	10KQ	10	NA	NA	10K	20
U	NA	NA	NA	NA	NA	1K	1K
As	NA	1KQ	1K	NA	NA	5K	5K
Cd	NA	1KQ	1K	NA	NA	1K	1K
Cr	NA	1Q	3K	NA	NA	2	6
Pb	NA	1KQ	3	NA	NA	1K	7
Hg	NA	0.5K	0.5K	NA	NA	0.5K	0.5K
Se	NA	5K	5K	NA	NA	5K	5K

K = Less than Q = Did not meet holding time NA = Nct analyzed for

FIELD DATA/FLOW MEASUREMENTS CANYON de VALLE

	STATION DESCRIPTION	DATE	TIME	TEMP.	pH	D.O.	COND	FLOW	LATITUDE	LONGITUDE
VA 2.7	Canyon de Valle @ culvert below MDA P	20-Jan-95						18 gpm		
VA 2.7	Canyon de Valle @ culvert below MDA P	17-Mar-95						69 gpm		
VA 2.7	Canyon de Valle @ culvert below MDA P	22-Mar-95						71.5 gpm		
VA 2.7	Canyon de Valle @ culvert below MDA P	30-Mar-95						74.4 gpm		
VA 2.7	Canyon de Valle @ culvert below MDA P	5-May-95						79.88 gpm		
VA 2.7	Canyon de Valle @ culvert below MDA P	16-Jun-95		12	7.75		172	46.1 gpm		
VA 2.7	Canyon de Valle @ culvert below MDA P	8-Aug-95						18 gpm		
VA 2.7	Canyon de Valle @ culvert below MDA P	31-Aug-95		13.9	7.51	5.1	242	39.4 gpm		
VA 2.7	Canyon de Valle @ culvert below MDA P	16-Nov-95						15.5 gpm		
VA 2.6	Canyon de Valle .1 mi below culvert below MDA P	16-Jun-95		11.7	8.08		175		35 51 0530N	106 19 5525W
VA 2.6	Canyon de Valle .1 mi below culvert below MDA P	16-Nov-95		3		11.2		17-18gpm		
VA 2.1	Canyon de Valle .6 mi below culvert below MDA P	16-Jun-95		12.1	8.77		182		35 50 5742N	106 19 3265W
VA 2.1	Canyon de Valle .6 mi below culvert below MDA P	16-Nov-95		5.3		9.6		7.95gpm		
VA 1.85	Canyon de Valle .85 mi below culvert below MDA P	16-Jun-95		10.1	7.7		191	10-12 gp	35 50 5111N	106 19 2129W
VA 1.85	Canyon de Valle .85 mi below culvert below MDA P	31-Aug-95		14.5	7.04	3.3	226	3-5 gpm	35 50 5111N	106 19 2129W
VA 1.85	Canyon de Valle .85 mi below culvert below MDA P	16-Nov-95		7.5		9.1		9.51gpm		

95 FIELD PARAM. PAJARITO CA.

	STATION DESCRIPTION	DATE	TIME	TEMP.	pH	D.O.	COND	FLOW	LATITUDE	LONGITUDE
PA 8.9	Pajarito Canyon .1 mi below Jct/w Starmer Gulch	10-Feb-95						60 gpm	35 51 31N	105 21 20W
PA 8.9	Pajarito Canyon .1 mi below Jct/w Starmer Gulch	24-Feb-95						120 gpm		
PA 8.9	Pajarito Canyon .1 mi below Jct/w Starmer Gulch	28-Apr-95						180 gpm		
PA 8.9	Pajarito Canyon .1 mi below Jct/w Starmer Gulch	19-May-95						160(est)		
PA 8.9	Pajarito Canyon .1 mi below Jct/w Starmer Gulch	20-Jun-95		11	7.31	8.7	187	200 gpm		
PA 8.9	Pajarito Canyon .1 mi below Jct/w Starmer Gulch	9-Aug-95		11.9	7.73	8.35		95 gpm		
PA 8.9	Pajarito Canyon .1 mi below Jct/w Starmer Gulch	27-Oct-95						42 gpm		
PA 8.9	Pajarito Canyon .1 mi below Jct/w Starmer Gulch	16-Nov-95						38.8 gpm		
PA 8.9	Pajarito Canyon .1 mi below Jct/w Starmer Gulch									
BU 0.1	Bulldog Gulch 75 ft above Jct/w Pajarito Canyon	10-Feb-95						12-15 gpm	35 51 23N	106 19 53W
BU 0.1	Bulldog Gulch 75 ft above Jct/w Pajarito Canyon	20-Jun-95		14	7.55	7.9	200	12-15 gpm		
BU 0.1	Bulldog Gulch 75 ft above Jct/w Pajarito Canyon	9-Aug-95		15.2	7.78	7.33		12-15 gpm		
BU 0.1	Bulldog Gulch 75 ft above Jct/w Pajarito Canyon									
BU 0.1	Bulldog Gulch 75 ft above Jct/w Pajarito Canyon									
PA 8.0	Pajarito Canyon .7 mi below Jct/w Bulldog Gulch									
PA 7.0	Pajarito Canyon above Jct/w Two Mile Canyon	27-Oct-95		3	7.9	11.2		35 (est)		
	2 mi below Jct/w Starmer Gulch									
PA 7.0	Pajarito Canyon above Jct/w Two Mile Canyon									
	2 mi below Jct/w Starmer Gulch									
PA 7.0	Pajarito Canyon above Jct/w Two Mile Canyon									
	2 mi below Jct/w Starmer Gulch									
PA 7.0	Pajarito Canyon above Jct/w Two Mile Canyon									
	2 mi below Jct/w Starmer Gulch									
ST 0.5	Starmer's Gulch above Jct/w Pajarito Canyon	27-Oct-95		7.4	6.97		116	25 (est)	35 51 31N	106 20 21W
ST 0.0	Starmer's Gulch @ Jct/w Pajarito Canyon	9-Nov-95						20 gpm		

1995 HABITAT ASSESSMENT FIELD DATA										
HABITAT PARAMETER	LA 12.2	ST 0.05	BU 0.05	PA 8.0	PA 7.0	PA 7.0	VA 2.6	VA 2.6	VA 2.1	VA 1.85
Date	25-Apr-95	20-Jun-95	20-Jun-95	22-Jun-95	22-Jun-95	27-Oct-95	16-Jun-95	16-Nov-95	16-Jun-95	16-Jun-95
Lattitude	35 53 00.1	35 51 54N					35 51 02N	35 51 02N	35 50 56N	35 50 46N
Longitude	106 21 11.74	106 20 05W					106 19 53W	106 19 53W	106 19 31W	106 19 23W
Elevation	7600 ft	7400 FT					7467	7467	7217	7100
Bottom substrate instream cover	18	16	16	17	18	18	17	12	14	15
Embeddedness	17	16	16	17	18	13	12	9	11	12
Flow *	3	5	3	8	8	8	3	3	3	1
Channel alteration	12	11	12	13	13	14	7	7	6	6
Bottom scouring and deposition	12	11	13	13	13	13	8	7	7	6
Pool/riffle, run/bend ratio	12	14	8	7	12	14	12	12	10	9
Upper bank stability	9	9	8	8	4	3	10	10	10	10
Bank vegetative protection	9	9	8	7	8	7	10	10	10	10
Streamside cover	8	8	8	6	10	10	8	8	8	8
Total Score	*100*	*99*	*92*	*96*	*104*	*100*	*87*	*78*	*79*	*77*
Percent Reference	88.50	87.61	81.42	84.96	92.04	88.50	76.99	69.03	69.91	68.14
SAMPLE TYPE	QUANT	QUANT	QUANT	QUANT	QUANT		QUANT	QUANT	QUANT	QUANT
SAMPLES PER STATION	3	3	3	3	3		3	3	3	3
FIELD PARAMETERS										
Temperature		10.9	14			3	11.8	5.3	12.1	10.1
Dissolved Oxygen		8.8	7.97			11.2		11.2		
pH		7.32	7.55			7.9	7.75		8.77	7.7
Conductivity		186	200				172		182	191
* Current Base Flow recorded										
11-NOV-95 @ PA 8.9 = 39 gpm										
10-Nov-95 @ ST 0.0 & BU 0.0										
ST 0.0 = 20 GPM										
BU 0.0 = 16 GPM										
16-NOV-95 @ VA 2.8 = 15.5 GPM										

94 HABITAT ASSESSMENT LANL

1994 HABITAT ASSESSMENT FIELD DATA							
				LANL REFFERENCE			
HABITAT PARAMETER	ST 0.5	PA 9.0	PA 9.0	PA 8.7	PA 6.7	BU 0.1	BURN GRND. SPRING
Date	22-Jul-94	1-Jul-94	22-Jul-94	22-Jul-94	22-Jul-94	9-Aug-94	12-Aug-94
Lattitude	35 51 31	35 51 31	35 51 31	35 51 23	35 51 14	35 51 23	35 50 56
Longitude	106 20 21	106 21 20	106 21 20	106 19 53	106 17 46	106 19 53	106 20 15
Elevation	7400 ft.	7360 ft	7360 ft	7300 ft	7100 ft	7300 ft.	7050
Bottom substrate instream cover	11	15	15	15	10	14	6
Embeddedness	16	16	16	19	6	11	16
Flow *	4	8	8	9	6	3	1
Channel alteration	11	12	12	15	7	12	14
Bottom scouring and deposition	9	9	9	15	7	12	15
Pool/riffle, run/bend ratio	15	12	12	11	10	15	4
Upper bank stability	10	10	10	10	10	10	10
Bank vegetative protection	9	10	10	10	10	10	10
Streamside cover	10	9	9	9	9	8	10
Total Score	*95*	*101*	*101*	*113*	*75*	*95*	*86*
Percent Reference	84.07	89.38	89.38	100.00	66.37	84.07	76.11
SAMPLE TYPE	QUANT	100/RPB	QUANT	QUANT	QUANT	QUANT	QUANT
SAMPLES PER STATION	3	3	3	3	3	3	2 - ONE LOST
FIELD PARAMETERS							
Temperature	11.7	12.5	14.3	14.6	16.5	16.1	10.3
Dissolved Oxygen	8.8	7.4	8.8	8.4	7.8	8.4	10.8
pH	7.45	8	8.45	7.98	7.81	7.89	6.78
Conductivity	120	122	138	193	144	200	155
* Current Base Flow recorded							
27-OCT-95 @ PA 8.9 = 39 gpm							6 gpm
10-Nov-95 @ ST 0.0 & BU 0.0							
ST 0.0 = 20 GPM							
BU 0.0 = 16 GPM							
16-NOV-95 @ VA 2.8 = 15.5 gpm							