VALLEY CAMP OF UTAH, INC.
SCOFIELD ROUTE
HELPER, UTAH 84526

(801)-448-9413

March 30, 1993

Mr. Lowell P. Braxton
Acting Director
Department of Natural Resources
Division of Oil, Gas and Mining
355 West North Temple
Salt Lake City, Utah 84180-1203

Re: **1992 Annual Report, Valley Camp of Utah, Inc., Belina Complex, ACT/007/001, Folder #2, Carbon County, Utah**

Enclosed please find the Annual Report in book form utilizing the R645 number format. I believe all items have been addressed at this time, should you find otherwise, please let me know.

Thanks for your time and consideration concerning this Annual Report.

Sincerely,

Steven K. Tanner
Environmental Coordinator

Enclosure:

RECEIVED
MAR 30 1993
DIVISION OF
OIL GAS & MINING

1992 ANNUAL REPORT

VALLEY CAMP OF UTAH, INC.

SCOFIELD ROUTE

HELPER, UTAH 84526

(801)-448-9413

BELINA COMPLEX

ACT/007/001, FOLDER #2

CARBON COUNTY, UTAH

VALLEY CAMP OF UTAH, INC.
SCOFIELD ROUTE
HELPER, UTAH 84526

BELINA COMPLEX-ACT/007/001
CARBON COUNTY, UTAH

COAL MINING AND RECLAMATION OPERATIONS FOR 1992

MINE NAME AND MSHA NUMBERS:

Belina No. 1 (42-1279), Belina No. 2 & Valcam Loadout (42-1280)

COMPANY REPRESENTATIVE:

Steven K. Tanner-Environmental Coordinator

RESIDENT AGENT:

% James L. Litman-Vice President Mining
Valley Camp Coal Company

Robert Q. Fox-General Superintendent
Valley Camp of Utah, Inc.

DATE OF INITIAL PERMANENT PROGRAM PERMIT:

The Mined Lands Reclamation Contract was entered into October 8, 1976 for Belina No. 1 and No. 2 Mines and May 11, 1978 for Valcam (Utah No. 2 Mine).

The initial Permit Program Permit Permit Application Package was submitted 2/9/81.

DATE OF MID-TERM PERMIT REVIEW:

August 1992

DATE OF LAST PERMIT RENEWAL:

October 1990

QUANTITY OF COAL MINED (tonnage) 1992:

250,694 Belina No. 2; Belina No. 1 (Idle Status)

CURRENT MINE MAPS:

See envelope marked Belina No. 1 & 2 Progress Maps.

VALLEY CAMP OF UTAH, INC.

BELINA COMPLEX SUMMARY OF 1992

The parent company, Valley Camp Coal Company, 206 Seneca Street, P. O. Box 900, Oil City, PA. 16301, wholly owned and controlled by Quaker State Corporation, P. O. Box 989, Oil City, PA. 16301, put Valley Camp of Utah, Inc. up for sale in 1992 on the open market. The current officers and directors are listed in the Mid-Term Permit Review (Feb. 1993).

In the fall of 1992 Valley Camp submitted the Mid-Term Permit Review and associated appendices and maps, marked (February 1993) to APPENDICES, the deficiencies were addressed and collectively reviewed by APPENDICES and Valley Camp March of 1993. Valley Camp is now in the process of extracting all the baseline data, historic information, and appropriate maps from the PAP for reinserting in the above mentioned appendices. By removing the said information a reviewable MRP will be generated. The MRP will contain only those operational/reclamation commitments, language and maps which are relative to insure the protection of the environmental needs.

The next Annual Report will be found "1993 MRP Appendices", with alike MRP formatting. This rational is intended to reserve the MRP absolute until renewal. By employing the appendices as the chronological working document rather than the MRP, a reviewer will be able to follow and understand necessary changes made to the MRP during any five year time frame. All MRP alterations requiring an approval within the annual appendices will be entered in the MRP text at each Mid-Term Permit Review or renewal as needed.

Soil sampling and coal analysis other than that disclosed within the PAP which are conducted by or for Valley Camp are kept at the General Office.

Valley Camp not is not currently maintaining database files for water monitoring, nor is it foreseen in the near future, however, if the Division wishes to enter the data in database files, permission is hereby granted to do so. The current UPDES permit can be found in the Hydrology Section of the Mid-Term Permit Review (February 1993).

All precipitation and other climatological data is taken at the National Weather Station located at the Utah Fuel operation, with the data submitted to the National Weather Bureau in Salt Lake City, Utah.

The most current list of officers for Quaker State/Valley Camp Coal Company/Valley Camp of Utah, Inc. can be found in the February 1993 Mid-Term Permit Review.

Monitoring Activities are listed on the following page and can be found in the 1993 MRP Appendices.

Valley Camp is not aware of any Outstanding Issues.

VALLEY CAMP OF UTAH, INC.

MONITORING ACTIVITIES:

SECTION	ACTIVITIES
R645-301-100	None
R645-301-200	Mt. Nebo 5 Year Summary
R645-301-300	Mt. Nebo 5 Year Summary
R645-301-400	None
R645-301-500	Pond Certification 001A-005A
R645-301-600	None
R645-301-700	Water Quality Data, Spring Depletion, Subsidence Map, Color Photo's taken during The 1992 Pedestrian Survey
R645-301-800	None

MT NEBO SCIENTIFIC
research & consulting

January 16, 1992

RECEIVED
JAN 20 1993
VALLEY CAMP OF UTAH, INC.

Mr. Steve Tanner
VALLEY CAMP OF UTAH, INC.
Scofield Route
Helper, Utah 84526

Dear Steve:

Enclosed you will find the results of the 1992 vegetation monitoring for the Utah and Belina test plots. I have also expanded these results into a summary for the five sample years (1988-1992).

As you will note, most of the trends were upward with some fair to good results. Additional shrubs may be helpful in the seed mix for reclamation and/or some seedling plantings.

I hope you find the report is satisfactory. Please let me know if I can help you further (we now specialize in all aspects of mine permitting, engineering and reclamation). Thanks Steve!

Sincerely,

Patrick D. Collins

Enclosure

330 East 400 South, Ste. 6, P.O. Box 337, Springville, Utah 84663
(801) 489-6937, (fax) 489-6779

SUMMARY OF VEGETATION MONITORING FOR THE UTAH & BELINA TEST PLOTS

1988-1992

Prepared by

MT. NEBO SCIENTIFIC RESEARCH & CONSULTING
Post Office Box 337
Springville, Utah 84663
(801) 489-6937

Prepared for

VALLEY CAMP OF UTAH, INC.
Scofield Route
Helper, Utah 84526

Patrick Collins, Ph.D.

January 1993

INTRODUCTION

Following are fifth year results from vegetation monitoring of test plots for *Valley Camp of Utah*. The plots are located near Scofield, Utah. Quantitative data have been previously submitted in the years from 1988 through 1991 for the test plots. This report also contains a summary of the results for the five years of sampling.

The test plots were constructed in 1987 to test revegetation potential of available soil material on the mine area. The test plot design was developed by the State of Utah, Division of Oil, Gas & Mining (DOGM) and Valley Camp of Utah, Inc. Plot construction (layout and earthmoving work) was accomplished by (or under the direction of) *Valley Camp of Utah*. Seed, fertilizer and hydromulch by the specified design was applied by *Mt. Nebo Scientific* in October of 1987.

Two main areas were used as sites for the vegetation test plots. These areas were called the *Utah Plot* and the *Belina Plot*. The Utah Plot is located south of the truck load-out pad and east of the railroad tracks on an old coal storage area. The Belina Plot is on the slope south of the sediment pond.

Monitoring of the vegetation on the two sites was conducted by *Mt. Nebo Scientific* from 1988 through 1992.

METHODS

Quantitative and qualitative data were taken on each of the two sites. Bi-directional random placement of sampling plots were designed to provide unbiased accuracy of the data compiled. A randomized block design was implemented to insure adequate representation of the entire plot. On the Utah site, three 12.5 meter transects were regularly placed on the plot to adequately cover the entire plot. Twenty sample points were then placed every 1.5 meters along these transects. A one meter buffer strip was placed around the entire plot where sample points were avoided to limit sample bias. There was only one treatment to be monitored on this plot.

The Belina site, however, had four different treatments to be sampled. Therefore, a total of four areas or "subplots" were sampled. The subplots were labeled on the data summary tables by directional locations and treatments and are listed below:

1) **NE** Subplot, Light Soil A, Fertilized
2) **NW** Subplot, Light Soil A, Unfertilized
3) **SE** Subplot, Gray Soil B, Fertilized
4) **SW** Subplot, Gray Soil B, Unfertilized

Three transects were also placed on each of the subplots listed above. Eight sample locations were regularly placed on each treatment with a total of 40 samples for all treatments. A one meter buffer

strip was also placed around each of the treatments where quadrat placement was avoided.

Cover estimates were made using ocular methods with meter square quadrats. Species cover, total cover, composition and relative frequency were also assessed from the quadrats. Also recorded on data sheets were estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Density of woody species have been negligible, and therefore not sampled quantitatively. Productivity will be measured in a subsequent season if the data were determined to be meaningful by DOGM and a Valley Camp representative.

Sampling adequacy for cover on the Utah Site was achieved using formula suggested by DOGM. Sample number of the Belina Site was determined by L. Kunzler (Biologist, DOGM). All sample means, standard deviations, and sample sizes were included in this report to enable the reviewers to apply further statistical tests if desired.

Plant species nomenclature follows Welsh et al. (A Utah Flora. 1987. Great Basin Naturalist Memoir No. 9). Sample design and methodologies were approved by a representative of the State of Utah, DOGM (L. Kunzler, Reclamation Biologist). Mr. Kunzler was present on site upon initiation of the test plot sampling in 1988.

RESULTS

Summary Tables

All results of the vegetation sampling for 1992 are shown on the summary tables (Tables 1 - 10). Included in these tables are:

1) percent cover and standard deviations (total living cover, mulch & litter, bare ground, & rock),
2) composition (% shrubs, forbs, & grasses),
3) cover and frequency by species,
4) sample sizes.

Summary Figures

Graphs of each of the plots for both cover and composition by lifeform are shown on Figures 1 through 11. The data represents five (5) years of monitoring (1988-1992) and compares each year with one another.

COVER

Total living cover is compared for five years on each subplot at the Belina Plot (see Figures: 1, 3, 5, 7). Nearly without exception, the cover increases with each growing season, then levels off on the

fifth sampling year. Total cover is relatively high on the final year for each of the subplots (35%-40%).

Figure 11 overlays each of the four subplots on the Belina site. Each subplot represents a different treatment. The figure illustrates that the treads for each of the treatments are very similar. In other words, there is probably no significant difference between treatments.

The Utah Plot had similar results, but leveled off in 1991 and then increased again in 1992 (Figure 9).

COMPOSITION

Composition by lifeform is also compared for the five sampling years (see Figures 2, 4, 6, 8). The composition here is the percent of the total living cover represented by shrubs, forbs or grasses.

Grasses are by far, the most important lifeform for cover in all subplots. Woody species never did become well established in any of the treatments. The trends for forbs, however, were not the same for each treatment. In the NE subplot, forbs appear to be increasing (Figure 2). The forbs were more important by cover in the NW and SE subplots and seemed to have stabilized over the five-year sampling period (Figures 4 and 6, respectively). In the SW subplot, forbs appeared to have increased with each year, except for the final sample

year (Table 8).

On the Utah plot, all lifeforms are important by cover. Species diversity was greater on this plot. Forbs made the strongest representation, but decreased each year. Shrubs and grasses increased with nearly every growing season (Figure 10).

Nomenclature

Because the author decided to use more recent nomenclature for plant species for the summary tables, and because some of the species on the original seed mix list have been changed, a list is provided below showing the old and new scientific names.

Old Name (on seed mix lists)	New Name (Welsh 1987)
Shrubs	
Amelanchier alnifolia	Amelanchier alnifolia
Artemisia tridentata var. vaseyana	Artemisia tridentata vaseyana
Chrysothamnus nauseosus albicaulis	C. nauseosus albicaulis
Rosa woodsii	Rosa woodsii
Sambucus coerulea	Sambucus coerulea
Symphoricarpos oreophilus	Symphoricarpos oreophilus
Forbs	
Achillea millefolium	Achillea millefolium
Artemisia ludoviciana	Artemisia ludoviciana
Linum lewisii	Linum perenne ssp. lewisii
Hedysarum boreale	Hedysarum boreale
Medicago sativa	Medicago sativa
Melilotus officinalis	Melilotus officinalis
Penstemon strictus	Penstemon strictus
Grasses	
Agropyron dasystachyum	Elymus lanceolatus
Agropyron smithii	Elymus smithii
Bromus marginatus	Bromus carinatus
Poa canbyi	Poa canbyi
Poa pratensis	Poa pratensis

The test plots will continue to be monitored according to the schedule accepted by the State of Utah, DOGM.

TABLE 1: **1992 SAMPLING RESULTS - BELINA PLOT**
(NE Subplot, Light Soil A, Fertilized)

Total cover and composition for the revegetation test plots of Valley Camp of Utah. The table shows means, standard deviations and sample sizes.

COVER

	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE *
Total Living Cover	38.13	4.28	8
Litter	8.13	2.42	8
Bareground	10.63	1.65	8
Rock	43.13	6.58	8

COMPOSITION

	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE *
Shrubs	--	--	8
Forbs	8.21	8.61	8
Grasses	91.79	8.61	8

*Sample size was determined by Division of Oil, Gas & Mining (see METHODS).

TABLE 2: **1992 SAMPLING RESULTS - BELINA PLOT**
(NE Subplot, Light Soil A, Fertilized)

Mean percent cover, standard deviation, sample size and relative frequency by species for the revegetation test plots of Valley Camp of Utah.

COVER BY SPECIES

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
SHRUBS			
FORBS			
Circium sp.	1.25	2.17	8
Epilobium halleanum	.63	1.65	8
Urtica dioica	1.25	3.31	8
GRASSES			
Bromus carinatus	18.13	11.71	8
Dactylus glomeratus	3.13	5.56	8
Elymus smithii	8.75	4.84	8
Elymus spicatus	3.75	6.50	8
Poa pratensis	1.25	3.31	8

TABLE 3: **1992 SAMPLING RESULTS - BELINA PLOT**
(NW Subplot, Light Soil A, Unfertilized)

Total cover and composition for the revegetation test plots of Valley Camp of Utah. The table shows means, standard deviations and sample sizes.

COVER

	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE *
Total Living Cover	41.88	10.29	8
Litter	5.63	1.65	8
Bareground	9.38	3.00	8
Rock	43.13	10.59	8

COMPOSITION

	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE *
Shrubs	--	--	8
Forbs	13.51	12.77	8
Grasses	86.49	12.77	8

*Sample size was determined by Division of Oil, Gas & Mining (see METHODS).

TABLE 4: **1992 SAMPLING RESULTS - BELINA PLOT**
(NW Subplot, Light Soil A, Unfertilized)

Mean percent cover, standard deviation, sample size and relative frequency by species for the revegetation test plots of Valley Camp of Utah.

COVER BY SPECIES

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
SHRUBS			
FORBS			
Circium sp.	.63	1.65	8
Epilobium halleanum	1.88	3.48	8
Urtica dioica	2.50	3.54	8
Linum lewsii	.63	1.65	8
GRASSES			
Bromus carinatus	10.00	7.50	8
Dactylis glomerata	3.13	3.48	8
Elymus smithii	10.00	3.58	8
Elymus spicatus	5.00	7.07	8
Poa pratensis	8.13	14.78	8

TABLE 5: **1992 SAMPLING RESULTS - BELINA PLOT**
(SE Subplot, Gray Soil B, Fertilized)

Total cover and composition for the revegetation test plots of Valley Camp of Utah. The table shows means, standard deviations and sample sizes.

COVER

	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE *
Total Living Cover	43.13	8.99	8
Litter	7.50	2.50	8
Bareground	18.13	6.09	8
Rock	31.25	7.40	8

COMPOSITION

	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE *
Shrubs	--	--	8
Forbs	16.66	7.18	8
Grasses	83.34	7.18	8

*Sample size was determined by Division of Oil, Gas & Mining (see METHODS).

TABLE 6: **1992 SAMPLING RESULTS - BELINA PLOT**
(SE Subplot, Gray Soil B, Fertilized)

Mean percent cover, standard deviation, sample size and relative frequency by species for the revegetation test plots of Valley Camp of Utah.

COVER BY SPECIES

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
SHRUBS			
FORBS			
Epilobium halleanum	5.00	2.50	8
Medicago sativa	1.88	2.42	8
GRASSES			
Bromus carinatus	23.13	4.64	8
Dactylis glomerata	1.25	2.17	8
Elymus smithii	3.75	5.45	8
Elymus spicatus	4.38	4.64	8
Poa pratensis	23.13	15.19	8

TABLE 7: **1992 SAMPLING RESULTS - BELINA PLOT**
(SW Subplot, Gray Soil B, Unfertilized)

Total cover and composition for the revegetation test plots of Valley Camp of Utah. The table shows means, standard deviations and sample sizes.

COVER

	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE *
Total Living Cover	39.38	6.34	8
Litter	7.50	2.50	8
Bareground	9.38	3.90	8
Rock	43.75	7.81	8

COMPOSITION

	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE *
Shrubs	--	--	8
Forbs	17.22	13.99	8
Grasses	82.78	13.99	8

*Sample size was determined by Division of Oil, Gas & Mining (see METHODS).

TABLE 8: **1992 SAMPLING RESULTS - BELINA PLOT**
(SW Subplot, Gray Soil B, Unfertilized)

Mean percent cover, standard deviation, sample size and relative frequency by species for the revegetation test plots of Valley Camp of Utah.

COVER BY SPECIES

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
SHRUBS			
FORBS			
Epilobium halleanum	3.13	3.48	8
Linum lewsii	1.25	2.17	8
Medicago sativa	1.25	2.17	8
Urtica dioica	.63	1.65	8
GRASSES			
Bromus carinatus	8.75	5.99	8
Dactylis glomerata	5.00	6.17	8
Elymus lanceolatus	1.25	3.31	8
Elymus smithii	12.50	10.00	8
Elymus spicatus	4.38	3.90	8
Poa pratensis	1.25	2.17	8

TABLE 9: **1992 SAMPLING RESULTS - UTAH PLOT**
(Single plot design)

Total cover and composition for the revegetation test plots of Valley Camp of Utah. The table shows means, standard deviations and sample sizes.

COVER

	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE *
Total Living Cover	40.75	7.46	20
Litter	11.50	2.78	20
Bareground	38.25	11.32	20
Rock	9.50	6.87	20

COMPOSITION

	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	7.74	10.98	20
Forbs	38.92	16.00	20
Grasses	53.34	17.53	20

TABLE 10: **1992 SAMPLING RESULTS - UTAH PLOT**
(Single Plot Design)

Mean percent cover, standard deviation, sample size and relative frequency by species for the revegetation test plots of Valley Camp of Utah.

COVER BY SPECIES

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
SHRUBS			
Artemisia tridentata	3.40	4.00	20
FORBS			
Artemisia ludoviciana	1.00	3.00	20
Circium sp.	0.25	1.09	20
Linum perenne ssp. lewisii	5.25	2.95	20
Medicago sativa	0.50	1.50	20
Melilotus officinalis	7.50	6.61	20
Penstemon strictus	.75	1.79	20
Verbascum thapsus	1.00	2.00	20
GRASSES			
Bromus carinatus	.50	2.18	20
Elymus lanceolatus	10.00	5.92	20
Elymus smithii	11.00	7.00	20

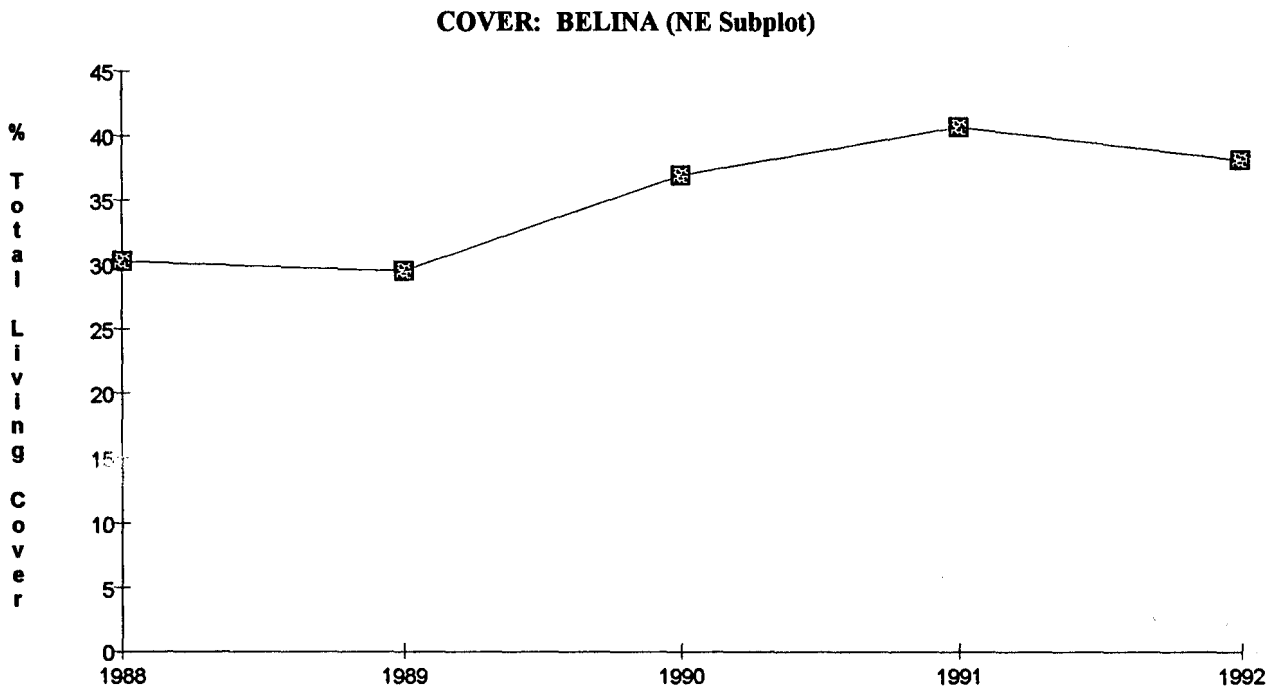
COVER: BELINA (NE Subplot)
% Total Living Cover
45
40
35
30
25
20
15
10
5
0
1988
1989
1990
1991
1992

FIGURE 1

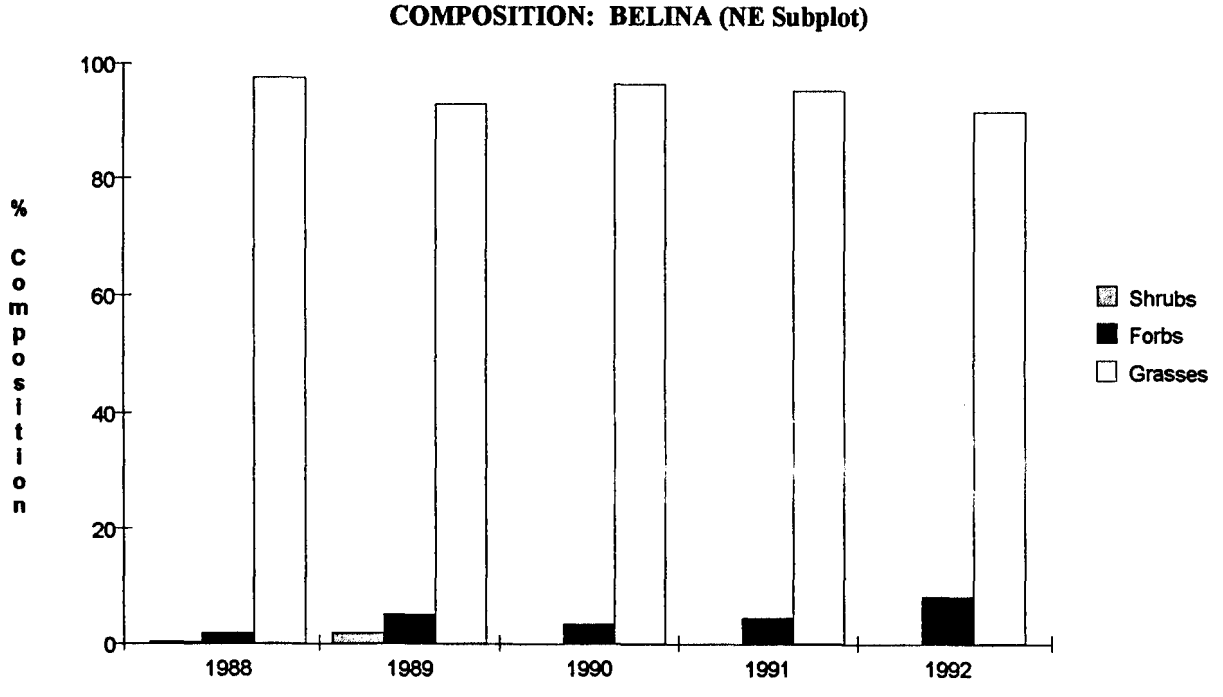
COMPOSITION: BELINA (NE Subplot)
% Composition
100
80
60
40
20
0
1988
1989
1990
1991
1992
Shrubs
Forbs
Grasses

FIGURE 2

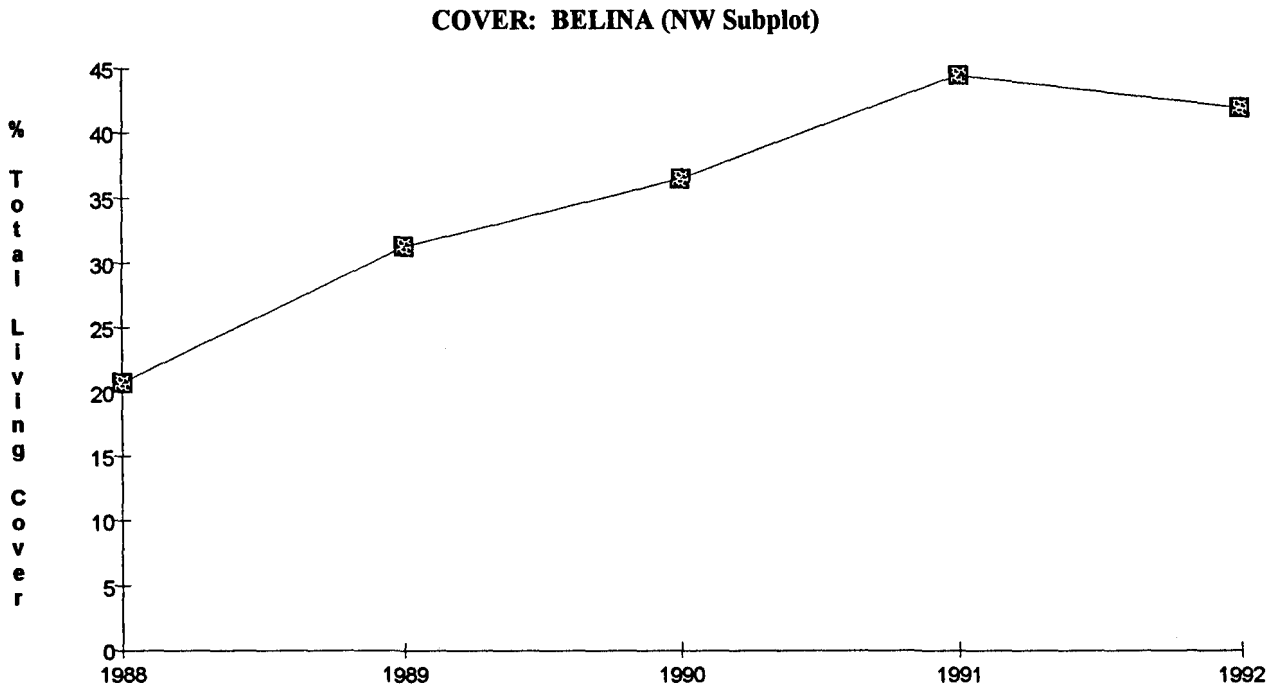
COVER: BELINA (NW Subplot)
% Total Living Cover
45
40
35
30
25
20
15
10
5
0
1988
1989
1990
1991
1992

FIGURE 3

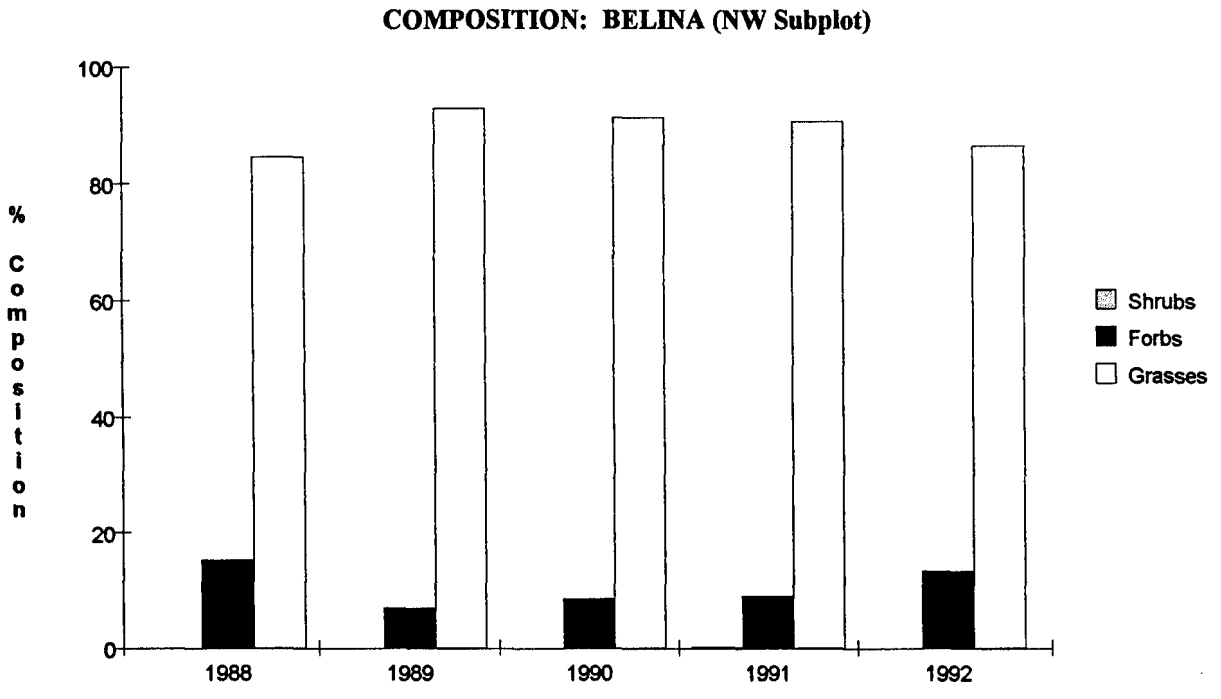
COMPOSITION: BELINA (NW Subplot)
% Composition
100
80
60
40
20
0
1988
1989
1990
1991
1992
Shrubs
Forbs
Grasses

FIGURE 4

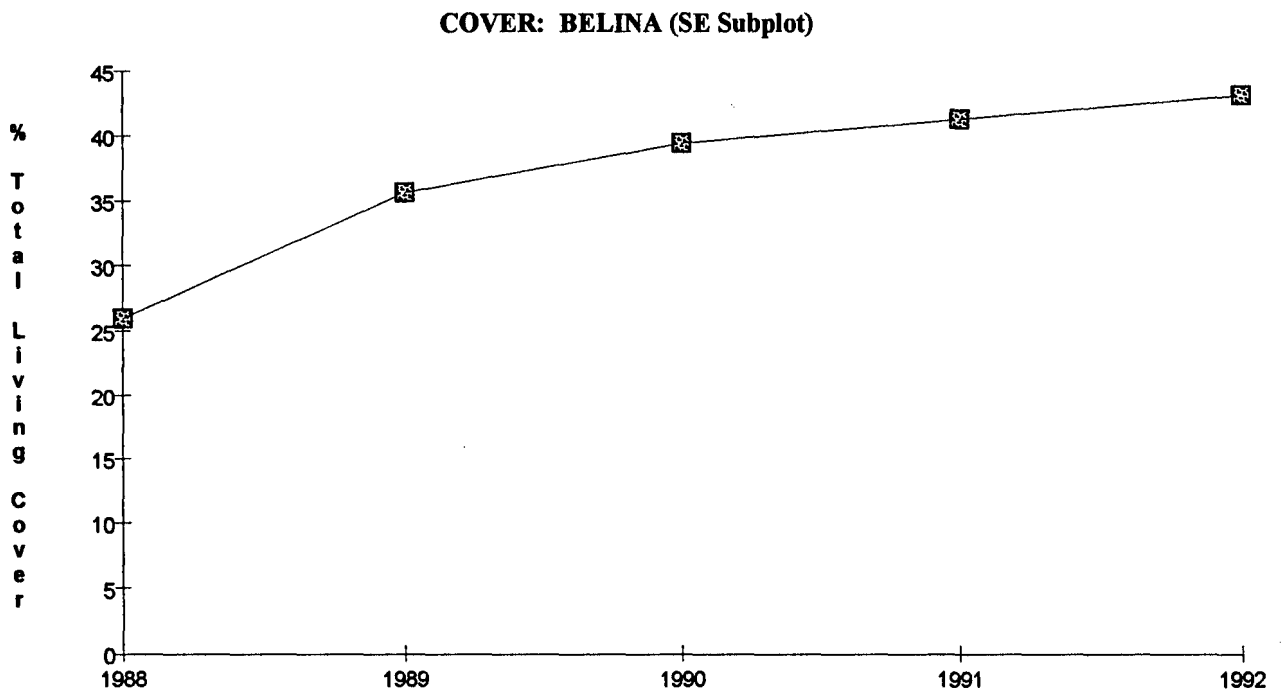
COVER: BELINA (SE Subplot)
% Total Living Cover
45
40
35
30
25
20
15
10
5
0
1988
1989
1990
1991
1992

FIGURE 5

COMPOSITION: BELINA (SE Subplot)

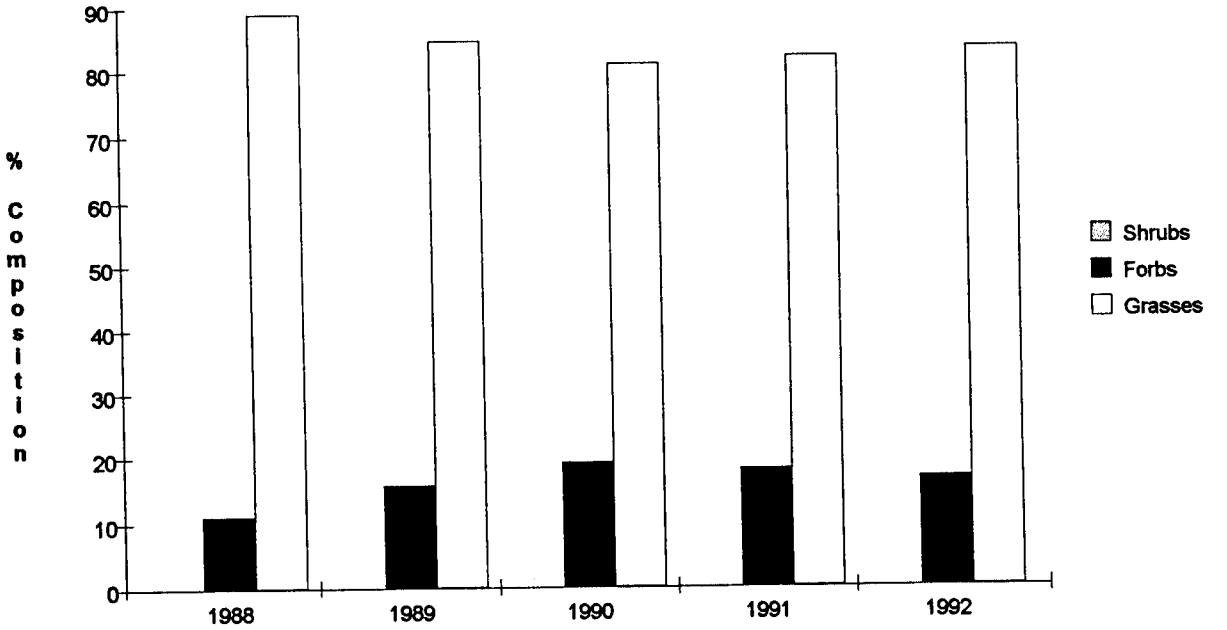

FIGURE 6

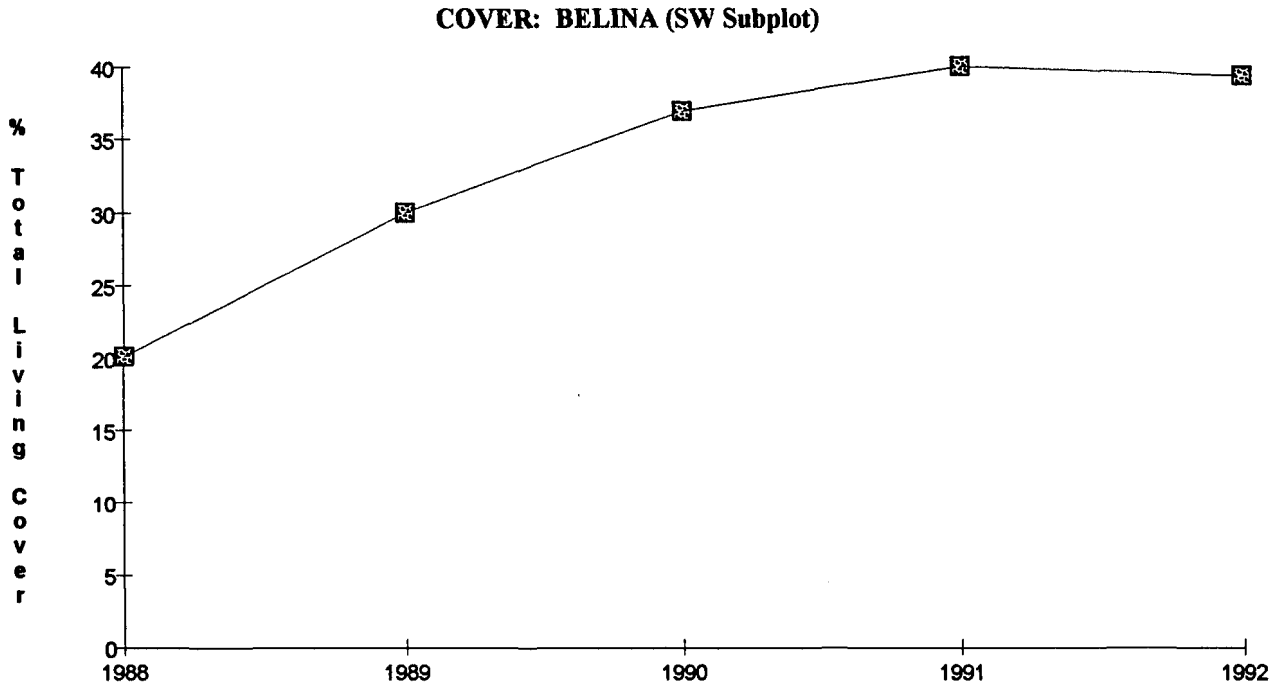
COVER: BELINA (SW Subplot)
% Total Living Cover
40
35
30
25
20
15
10
5
0
1988
1989
1990
1991
1992

FIGURE 7

COMPOSITION: BELINA (SW Subplot)

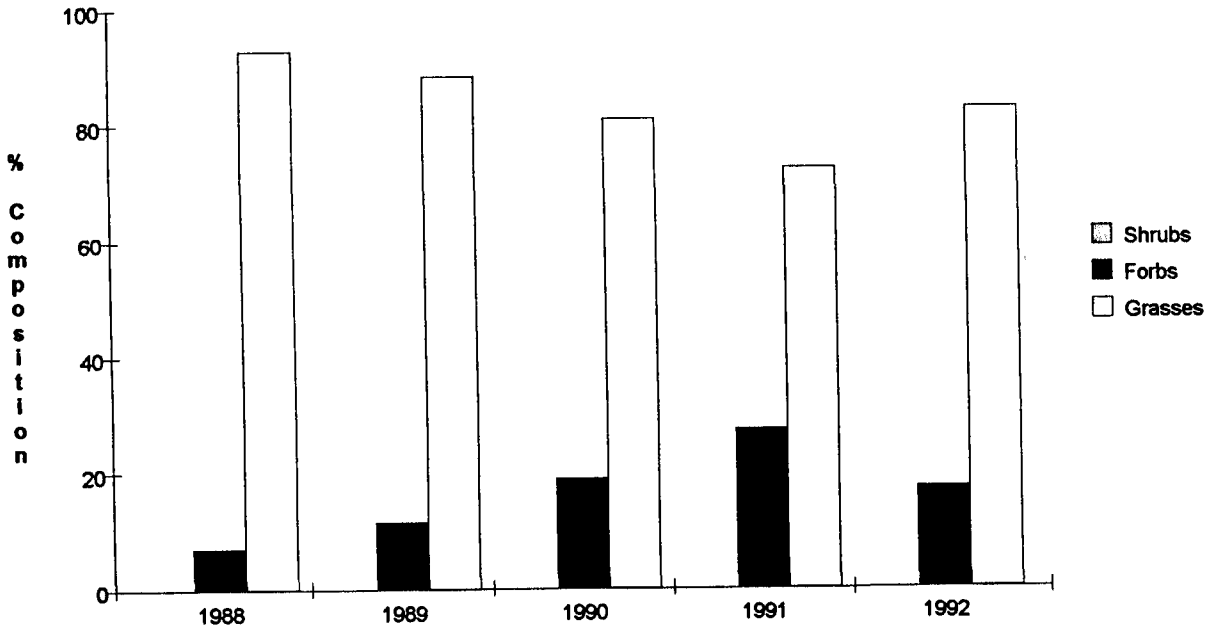

FIGURE 8

COVER: UTAH PLOT

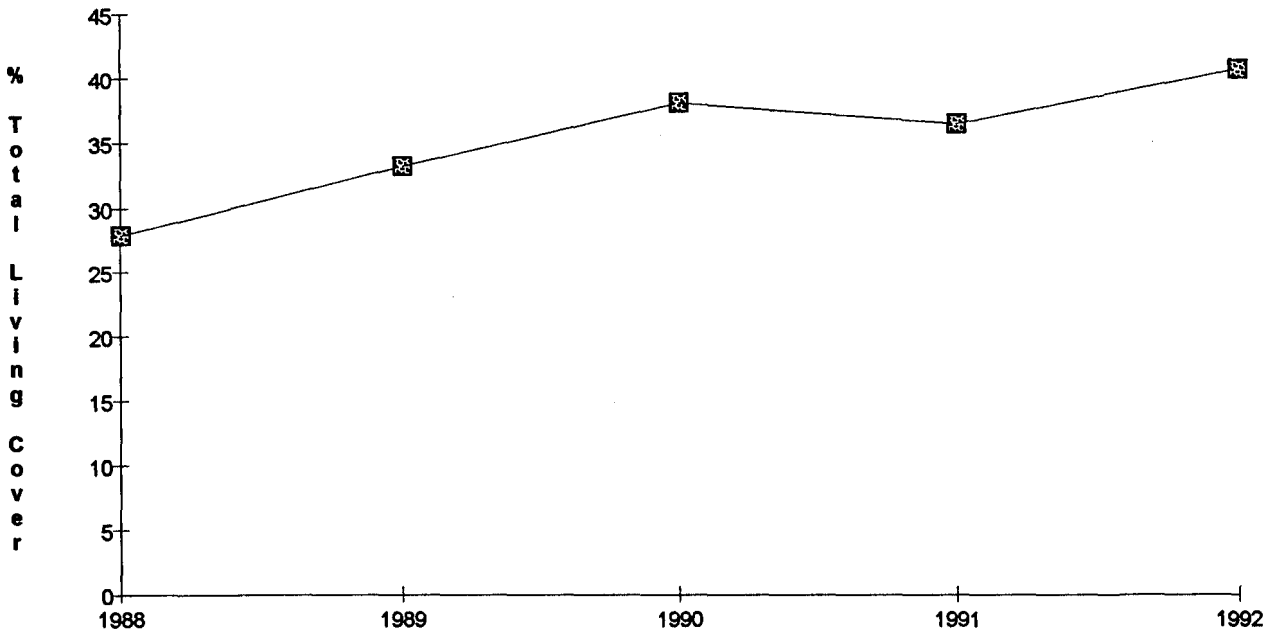

FIGURE 9

COMPOSITION: UTAH PLOT

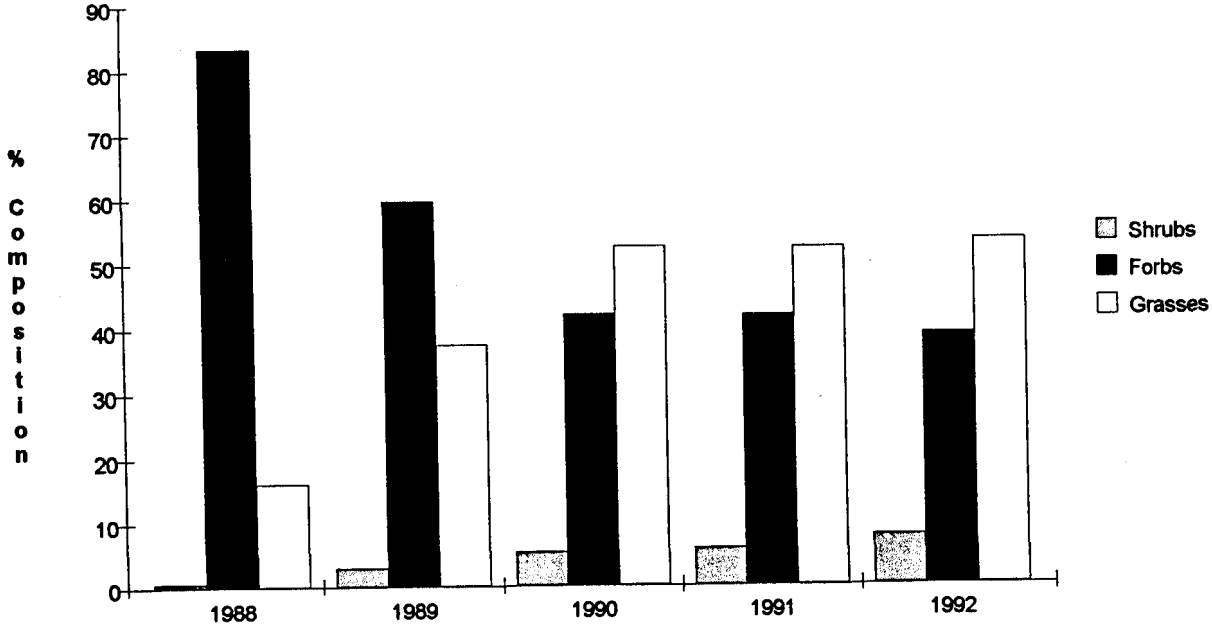

FIGURE 10

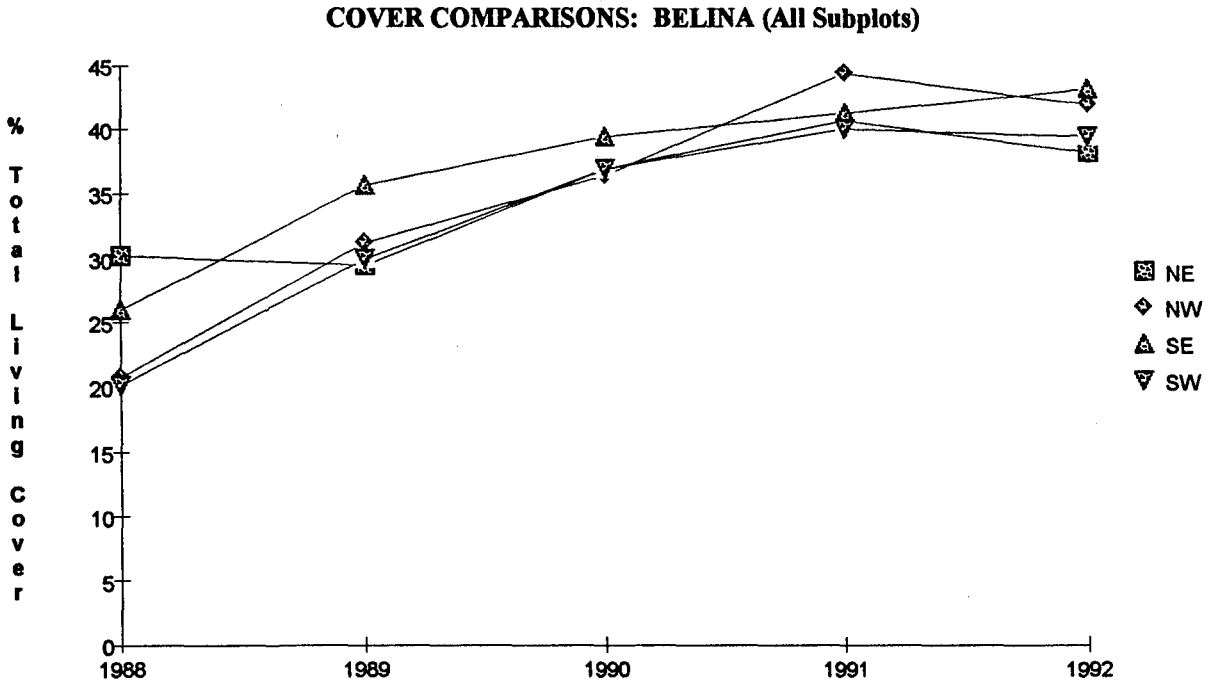
COVER COMPARISONS: BELINA (All Subplots)
% Total Living Cover
45
40
35
30
25
20
15
10
5
0
1988
1989
1990
1991
1992
NE
NW
SE
SW

FIGURE 11

m = an exponent dependent upon the steepness of slope (0.3 for slopes less than 0.5%, 0.5 for slopes 0.51% to 10%, and 0.6 for slopes greater than 10%).

Values for VM were determined from the Israelsen et al. (1984).

All four sediment ponds are capable of storing at least the three year accumulated sediment requirements, and are designed so as to be cleaned when 60% of the design storage volume has been reached. The design elevations for the 60% sediment cleanout requirements are shown on Figures R614-301-731.750a and R614-301-731.750b. Table R614-301-742.221a has been inserted to summarize the sediment storage volume requirements as well as the projected time to 60% cleanout. The last column in the table indicates the number of years projected before the 60% cleanout elevation is reached. This value was obtained by dividing the required 60% cleanout volume by the projected 1-year sediment volume shown in column three of the table.

Based upon data shown in Table R614-301-742.221a, the applicant agrees to survey the ponds contained within this permit renewal every two years, unless time projections indicate that the 60% sediment storage volume will be exceeded within the two year projection, whereupon the pond will be surveyed annually. Survey data obtained will indicate the required timing for cleaning of each respective pond. As an aid to determining sediment storage, the applicant will also provide an appropriate method of determining approximate sediment storage volume. Such aids may include (but not be limited to) markings on a standpipe spillway indicating depth to 60% sediment storage, or some other post or marker placed within or adjacent to the pond. Since pond conditions vary, the method of identifying the approximate estimate of cleanout elevation must be flexible.

TABLE R614-301-742.221a
TIME PROJECTIONS TO 60% SEDIMENT CLEANOUT VOLUME

Sed Pond No.	Three-Year Sediment Vol. Ac-Ft	One-Year Sediment Vol. Ac-Ft	Available Sediment Volume Ac-Ft	60% Sediment Volume Ac-Ft	Time to 60% Sediment Cleanout Years
001A	0.93	0.31	1.35	0.81	2.6
002A	0.10	0.033	0.30	0.18	5.5
003A	0.51	0.17	0.78	0.47	2.8
004A	0.75	0.25	1.81	1.09	4.4

VALLEY CAMP OF UTAH, INC.

1993 ANNUAL MAINTENANCE REPORT

STABILITY: There were no indications of instability, structural weaknesses or other hazardous conditions.

CAPACITY: 001A=2.52, 002A=0.48, 003A=2.35, 004A=11.20. and 005A=250gpm. There has been no discharge from these ponds this year.

MONITORING: As required by U.P.D.E.S.

OBSERVATIONS DURING INSPECTIONS: Embankment Seepage, Interior Erosion, Spillway Continuity, Inlet Erosion, Slope Movement, Dewatering Device For clogging.

At my request B. T. S. Ware, Registered Land Surveyor No. 4502, surveyed the sediment volumes of 001A through 004A this fall. The survey indicated the sediment volume in 004A is nearing the maximum sediment volume.

These facilities were also inspected by UDOGM also during the year with no apparent problems.

3/25/93

Edwin Brookshire Foust P.E.
License No. UT. 0532309110

VALLEY CAMP OF UTAH, INC.

1992 ANNUAL SEDIMENT AND FILTER POND CERTIFICATION

I hereby certify, in accordance with R645-301-514.310 through R645-301-514.313 and others applicable to the maintenance of Sediment Ponds 001A through 004A and Filter Pond 005A. I, or persons under my supervision, have conducted adequate inspections of the maintenance of the said structures; and the attached report is certified in accordance with the rules of professional conduct promulgated by the Utah Board of Examiners for Engineers.

Edwin Brookshire Foust P. E.
License No. 0532309110

Date: 3/25/93

REGISTERED PROFESSIONAL ENGINEER
No. 5328
EDWIN
BROOKSHIRE
FOUST
STATE OF UTAH

HANSEN ALLEN & LUCE inc

SALT LAKE AREA OFFICE
6771 South 900 East
Midvale, Utah 84047
Phone: (801) 566-5599

Mr. Steve Tanner
Valley Camp of Utah, Inc.
Scofield Route
Helper, Utah 84526

December 1, 1992

RE: 1992 Spring Depletion Analysis.

Dear Steve:

The annual spring depletion analysis has been completed for springs S7-11, S24-12, S25-13, S31-13, S36-17, S36-19, and S36-23 which we have monitored for Valley Camp of Utah. The locations of these springs are shown on Map R614-301-722.100a. Flow data for 1980 and from 1987 through 1992 have been plotted to show flow variation over a years time period where each years plot is superimposed on the same x-axis (see attached Figures 1 through 7). A second set of plots shows flows for the period of record as sequential time plots (see attached Figures 8 through 14). The plots were used in our analysis discussed herein of flow changes over time.

Since it is likely that there is correlation between spring flows and precipitation it was suggested that we present annual precipitation records for local gaging stations over the period of record. According to information available it appears that the closest gaging station is owned and operated by Utah Fuel Company in Eccles canyon. Records from this station are available since 1983 as shown in Table 1 below. The next closest precipitation station is owned by Cyprus Plateau Mining Company (CPMC) which is located at its mine site approximately 13 miles southeast of Valley Camp. Insufficient precipitation records are avaiable from CPMC to determine a long-term rainfall average.

TABLE 1. ANNUAL PRECIPITATION (INCHES)

Location	Recorded Precipitation Percent of Average											Average
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	
Utah Fuel	-	-	-	-	26.99 121	26.98 121	19.68 88	20.43 92	17.24 77	22.41 101	-	22.29*
CPMC	-	-	-	14.42 105	21.07 153	13.82 100	18.07 131	13.51 98	8.97 65	9.65 70	10.7 78	13.78*
Nephi	23.57 175	24.16 179	19.11 142	16.83 125	20.65 153	12.30 91	12.79 95	13.06 97	12.69 94	-	-	13.5**

Filename: DEH1 C:\WP51\FILES\VC\07SPRING.92

Location	Recorded Precipitation Percent of Average											Average
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	
Salt Lake	25.15 164	20.58 134	23.82 156	17.26 113	23.40 153	10.71 70	9.94 65	10.99 72	10.88 71	15.61 102	12.18 80	15.31**

* Based on Data shown in table.
** 1951 - 1980 Average

The closest U.S.G.S. rainfall gaging station to the Valley Camp mine area is located in Nephi which is about 34 miles west of the Belina mines. Average annual precipitation for the Nephi station is 13.50 inches per year. Table 1 provides a summary of total annual and percent of average precipitation for the Salt Lake City, Nephi, CPMC, and Utah Fuel stations. The average precipitation for the Salt Lake City is 15.31 inches per year. Precipitation values recorded at the Nephi gaging station have been plotted as dropped bars on Figures 8 through 14 in order to make a better correlation with recorded spring flows. The Nephi station was chosen for this comparison over the other stations shown because of its regional acceptance as a certified station. Similar correlations and comparisons could be made for any of the other three stations identified.

The records summarized in Table 1 show above average precipitation for the period of record from 1981 through 1985. Beginning in 1986 the precipitation is generally below average through 1991, except for 1990 in which the recorded Salt Lake City and Utah Fuel precipitation was 0.3 and 0.12 inches above average respectively. Below average precipitation in recent years can be used to explain decreases in spring flows which have been noted at some spring locations noted herein. However, dramatic decreases in spring flow over short time periods such as is noted for Spring S24-12 can not be explained using precipitation data alone.

Spring S7-11

Spring S7-11 is located near Monument Peak at the south edge of the mine permit boundary. Figure 1 shows monthly and annual fluctuations in flow from this spring. Two flow measurements are available for 1991. The first measurement taken in July recorded a flow of 0.0011 cfs and the second taken in October recorded a flow of 0.0006 cfs. A projection of 1992 flows for the month of July shows that there may have been a slight increase over 1991 corresponding flows, although the difference is well within the range of measurement error. Previous flows during the month of June have been projected to range between 0.0002 cfs to 0.003 cfs. Figure 8 shows the same recorded spring flows as Figure 1 except that the plot is extended into sequential time. As shown in Figure 8 little significant change in flow over time is noted. The location of Spring S7-11 is believed to be beyond expected impacts from mining.

Spring S24-12

Spring S24-12 is located in the South Fork of Eccles Creek along the northwestern mine permit boundary. Flow data for this spring are shown in Figures 2 and 9. No flows were detected during the 1992 monitoring period. During 1991 only minimal (0.0001 cfs) flow was recorded. It is probable that mining has impacted this spring. Figure 9 illustrates a fairly rapid and dramatic decrease in spring flows beginning in 1989 with some initial decrease in flows being possible as early as 1987 or 1988. It is important to note that no mining by Valley Camp has taken place in the area of this spring in several years.

If Spring S24-12 receives recharge from the west side of the fault it is possible that mining west of Valley Camp could be impacting the spring. Additional data related to adjacent mining operations (currently unavailable to Valley Camp) would be required to investigate this possibility more thoroughly.

Spring S25-13

Flow variations shown on Figures 3 and 10 for Spring S25-13 have remained relatively consistent throughout the years in spite of recent drought conditions. Although annual fluctuations have been relatively minor, seasonal variations are large, perhaps indicating a small recharge area. This is reasonable since the spring is located at a relatively high elevation west of the Belina Mine portals. Based on available data, normal seasonal variations ranging from 0.09 cfs to 0.0001 cfs are to be expected. The data for this spring do not appear to be trending.

Spring S31-13

Spring S31-13 is located in Finn Canyon along the eastern mine permit boundary near the old Black Diamond Mine. This spring exhibits only moderate annual or seasonal fluctuations in flow as shown in Figures 4 and 11. Flows measured in 1992 are down approximately 35 percent from those measured in 1991. The flow in July, 1991, was 0.0056 cfs while in July, 1992, it was 0.002 cfs. In September, 1991, the flow was 0.0029 cfs and in September, 1992, it was 0.001 cfs. A careful review of Figure 11 may indicate that a slight downward trend has been occuring since the 1986 or 1987 periods of time. This trend however is slight and does correspond to a similar decrease in local and regional precipitation data as discussed earlier in this report.

Spring S36-17

Flow data for Spring S36-17 are plotted in Figures 5 and 12 and show moderately wide annual as well as seasonal fluctuations. This spring is located in Boardinghouse Canyon well within the mine permit boundary. Although spring flows recorded in July of 1991 (0.0034 cfs) were found to be about twice those recorded during the same time period in 1992 (0.0014 cfs) there does not appear to be any significant long term trends in the data which would indicate that mining has impacted the spring. Any slight decrease in flow over time which may be noted in Figure 12 can easily be explained as the result of changing local precipitation patterns as discussed above.

Spring S36-19

Spring S36-19 is located in Coal Canyon near the southern permit boundary. It is not likely that mining will impact this spring for several years, if at all. As shown in Figures 6 and 13 flows recorded in 1992 are on the same order of magnitude as those recorded in 1991. The flow data for this spring do not appear to be showing any trend over the period of record.

Spring S36-23

Spring S36-23 is located in the Middle Fork of Burnout Canyon near the western permit boundary. The flow data for this spring appear to be quite uniform as can be seen in Figures 7 and 14, indicating that this spring likely has a large recharge area. Although no long term trend is clearly evident on Figure 14, two notations are made. The first is that flows recorded in 1992 appear to be slightly less than previous flows for the same time periods of previous years (July flows decreased from 0.0077 to 0.006 cfs while September flows decreased from 0.0084 to 0.004 cfs), and second there may be an overall slight decrease in flows which started to occur since 1990. The slight decrease in flows corresponds to the hypothesis that the spring receives water from a large recharge area, and is another evidence of the effects of decreased local precipitation.

Conclusion

The data gathered to date for the springs being monitored at Valley Camp of Utah generally do not appear to have established defineable trends of increasing or decreasing flows, with the exception of Spring S24-12. Variations in the data appear to be generally random with spring flows responding to natural flow factors, including 1) below average precipitation which has been experienced since the mid 1980's and 2) the delayed effects of large spring recharge areas. Additional data would be required from other mining operations before a more thorough analysis of Spring S24-12 could be made to determine the influence mining has had upon its flows.

Please feel free to contact me should you have any questions related to the material contained within this letter.

Sincerely,

David E. Hansen

David E. Hansen, Ph.D., P.E.
Principal

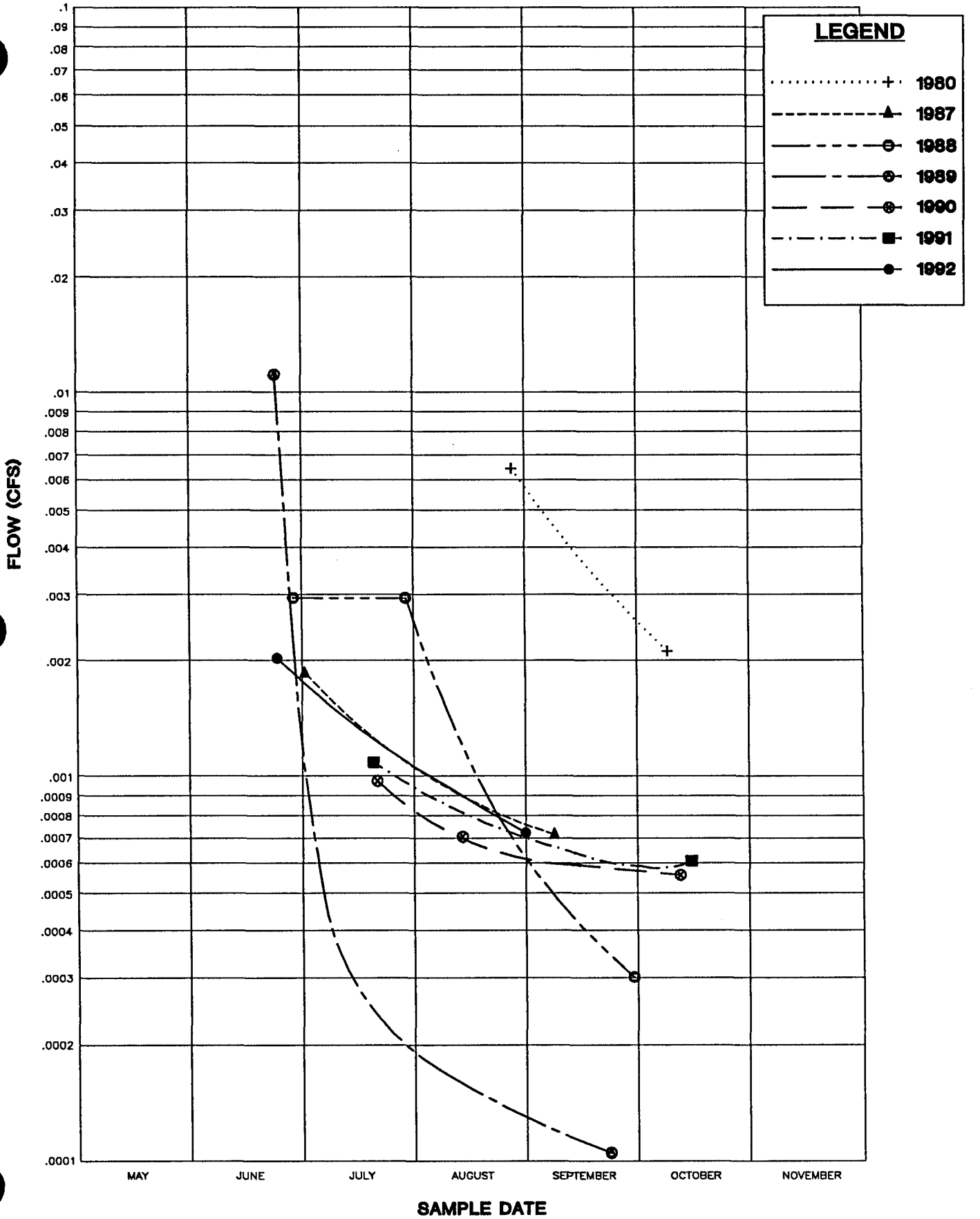

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FIGURE 1. SPRING S7-11 DEPLETION CURVE

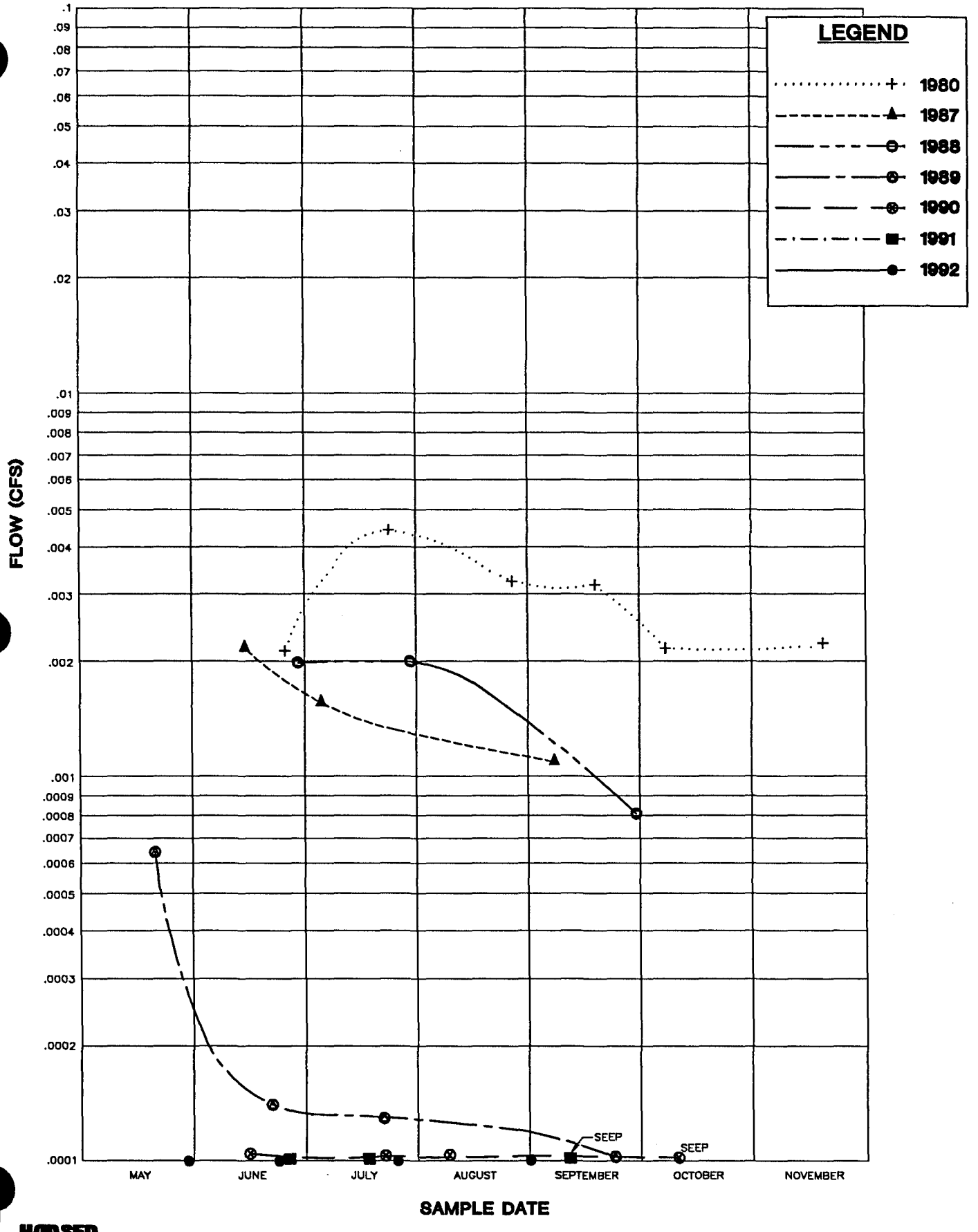

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FIGURE 2. SPRING S24-12 DEPLETION CURVE

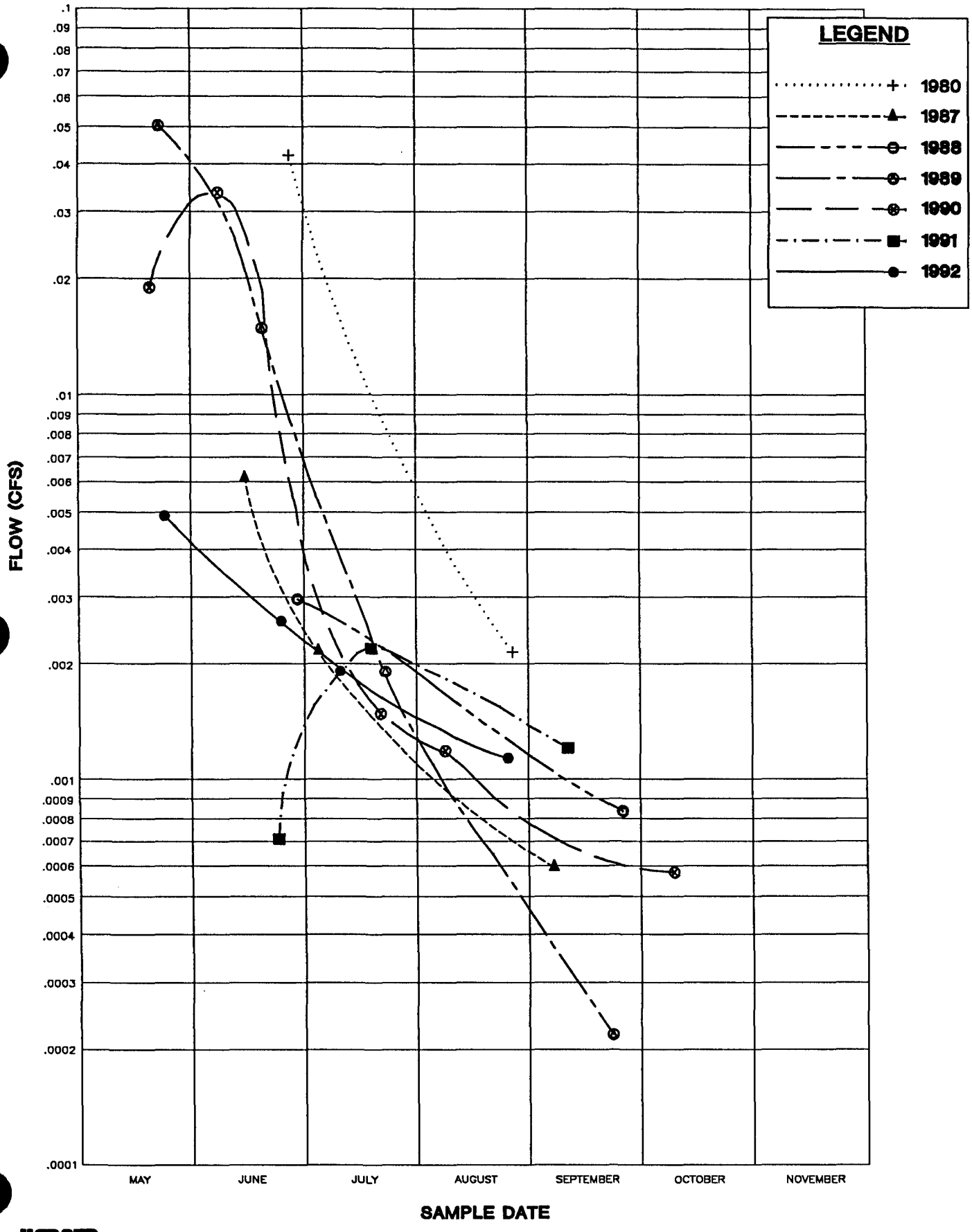

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FIGURE 3. SPRING S25-13 DEPLETION CURVE

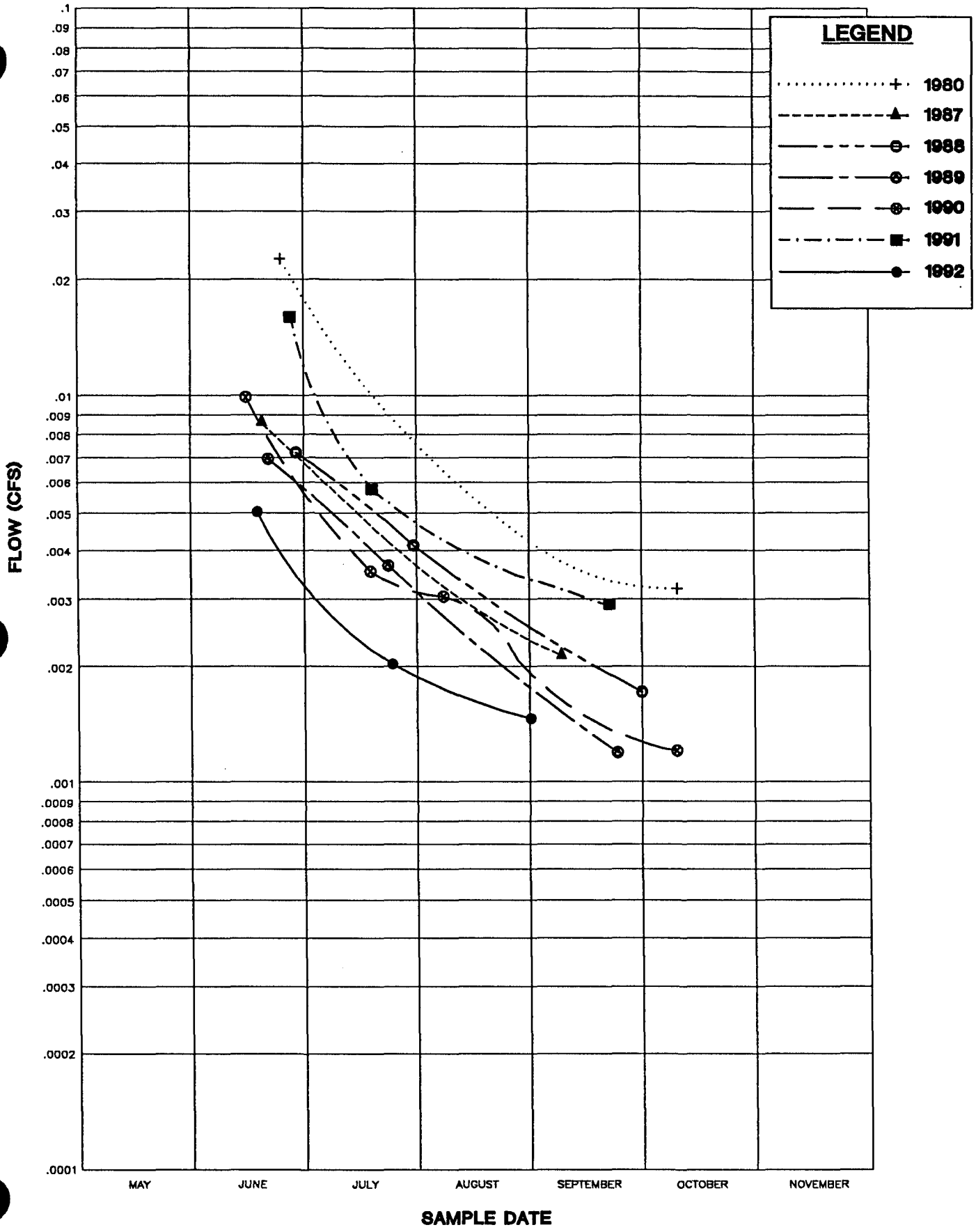

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FIGURE 4. SPRING S31-13 DEPLETION CURVE

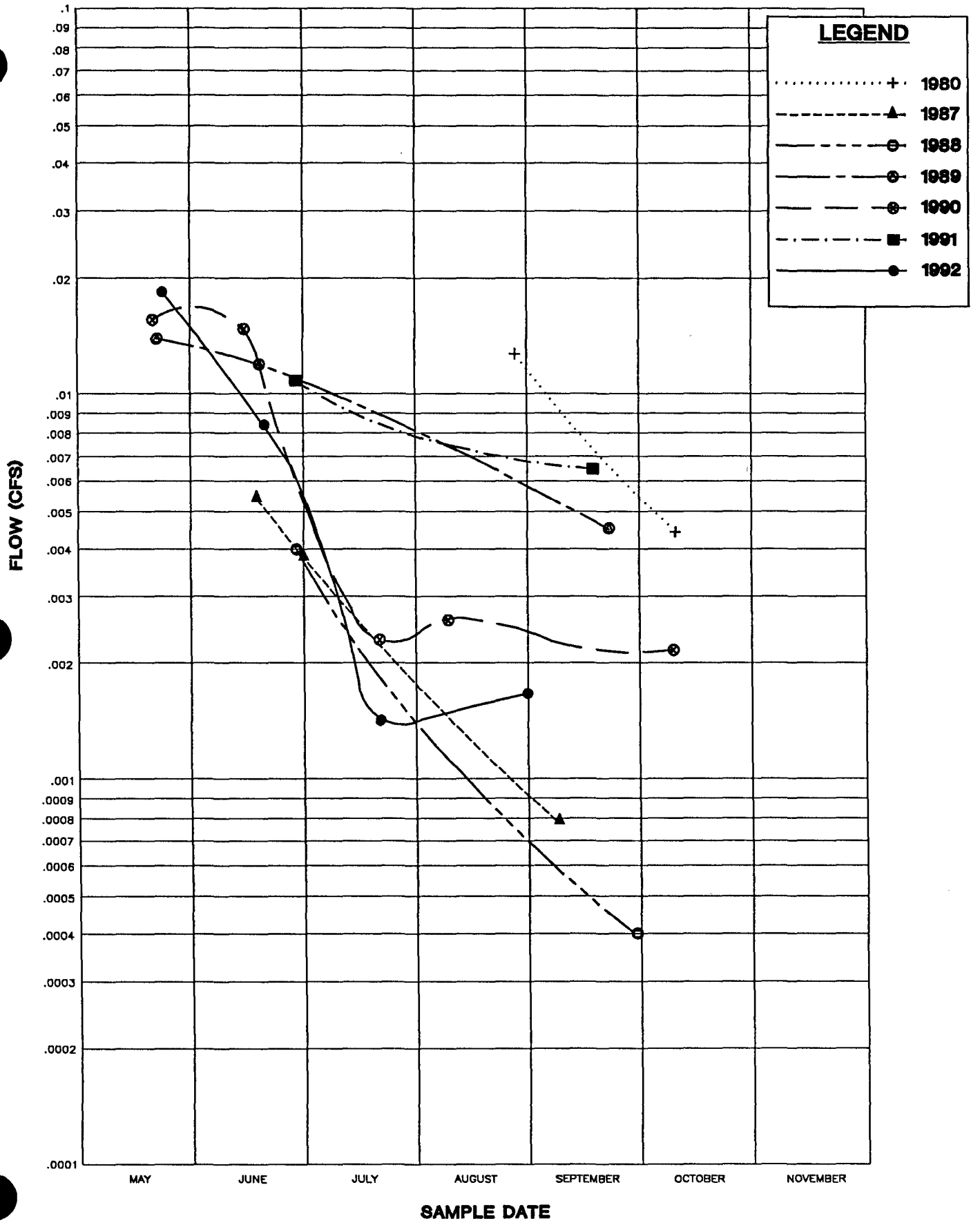

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FIGURE 5. SPRING S36-17 DEPLETION CURVE

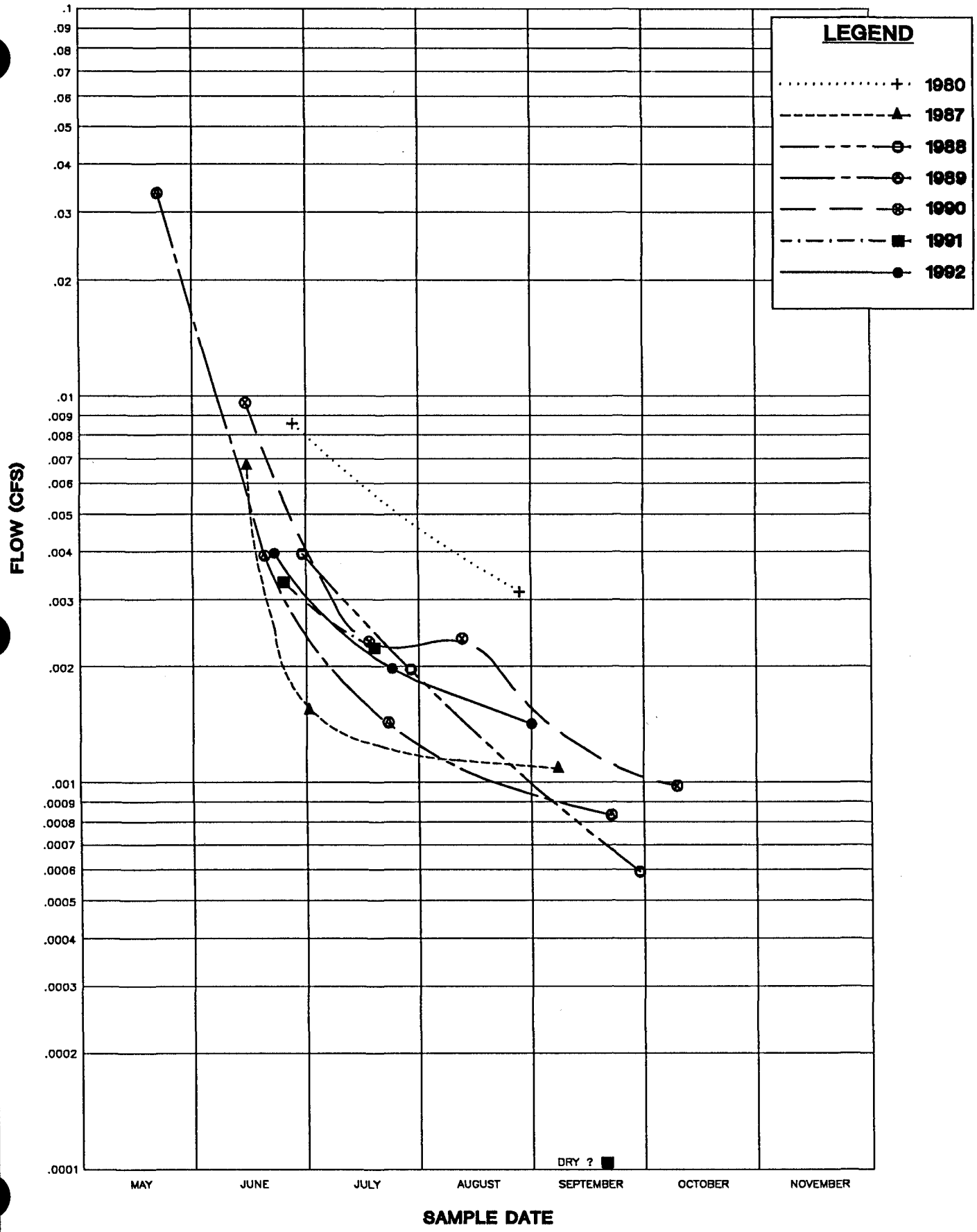

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FIGURE 6. SPRING S36-19 DEPLETION CURVE

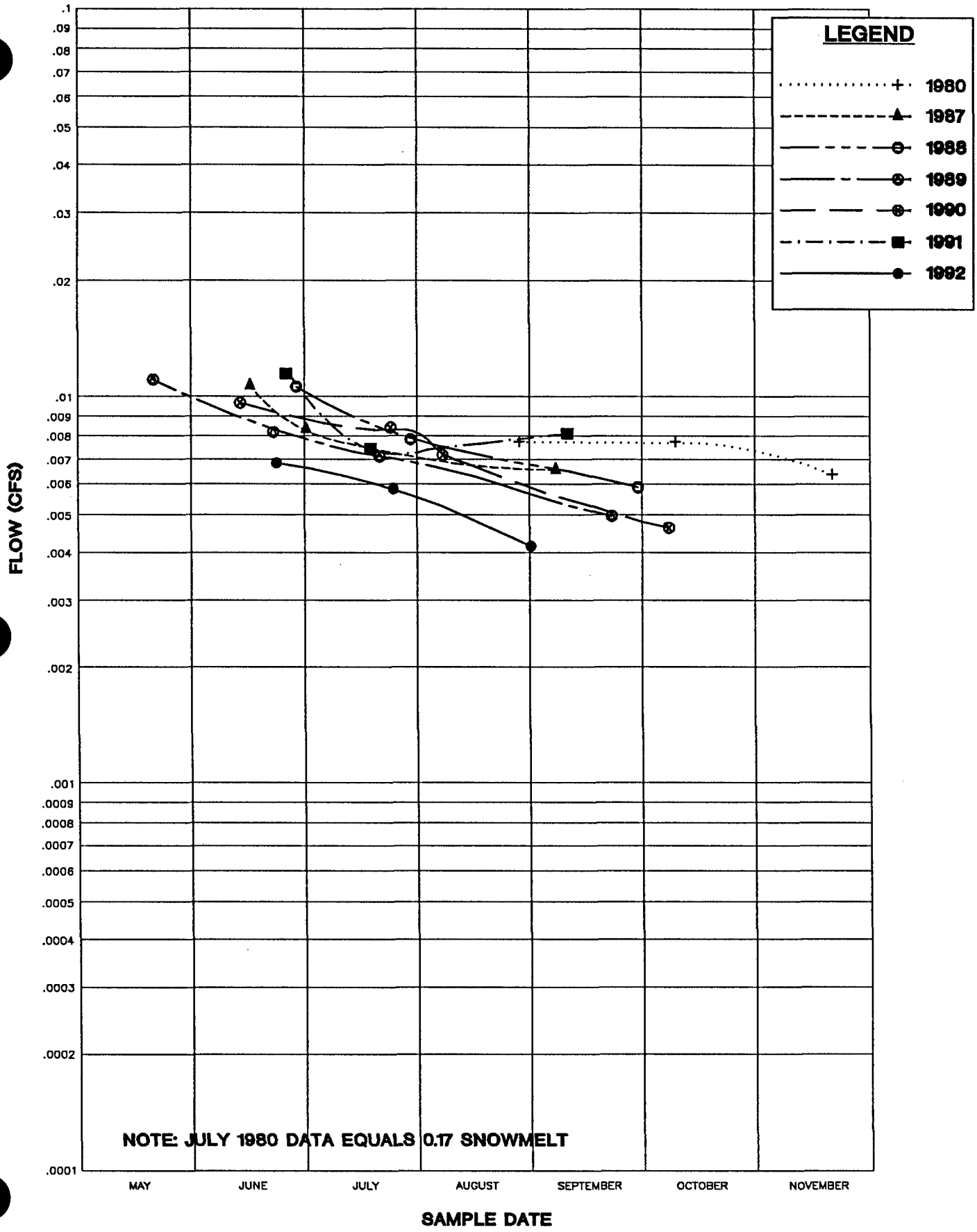

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FIGURE 7. SPRING S36-23 DEPLETION CURVE

Figure 8

S7-11 Flow History

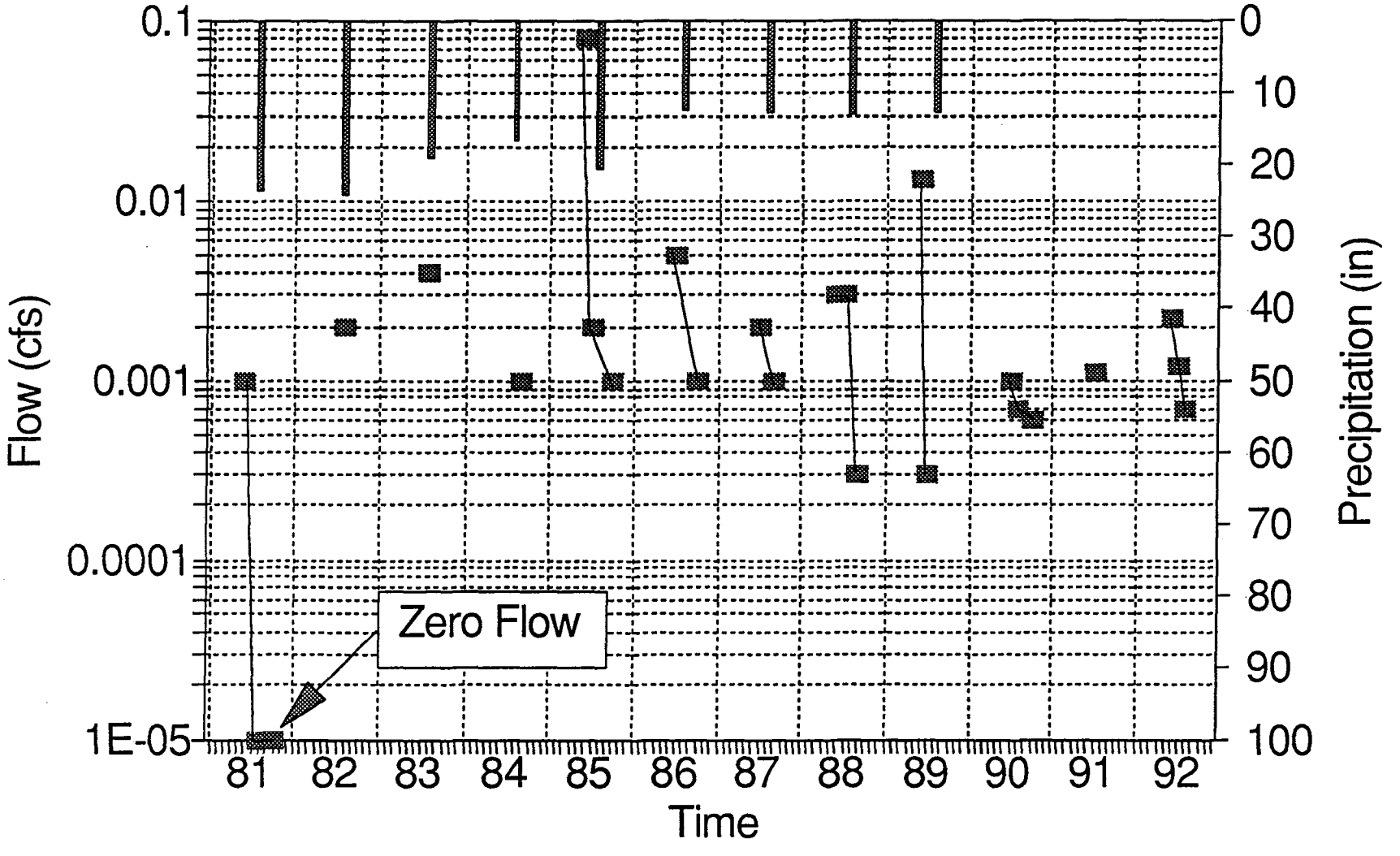


Figure 9

S24-12 Flow History

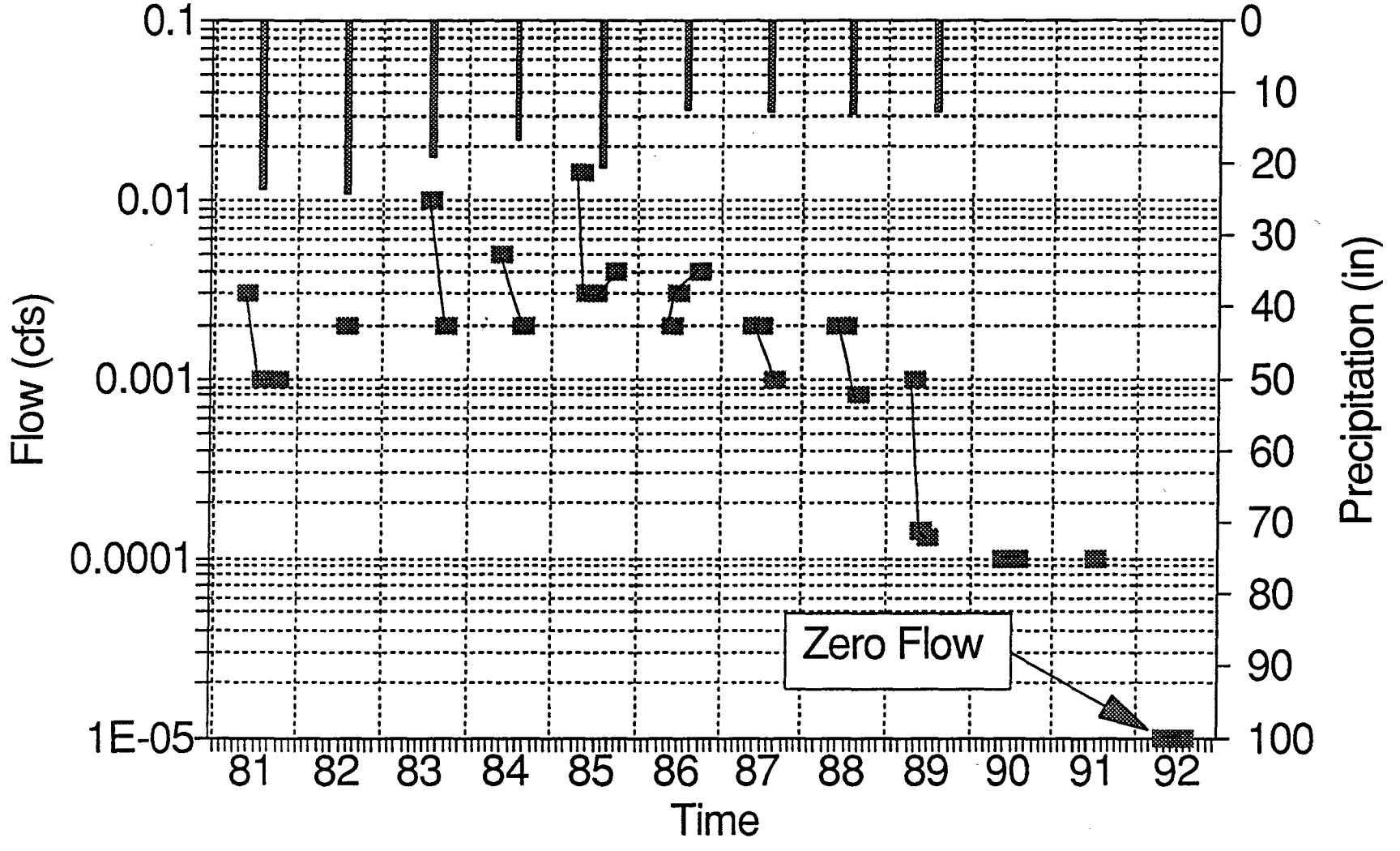


Figure 10

S25-13 Flow History

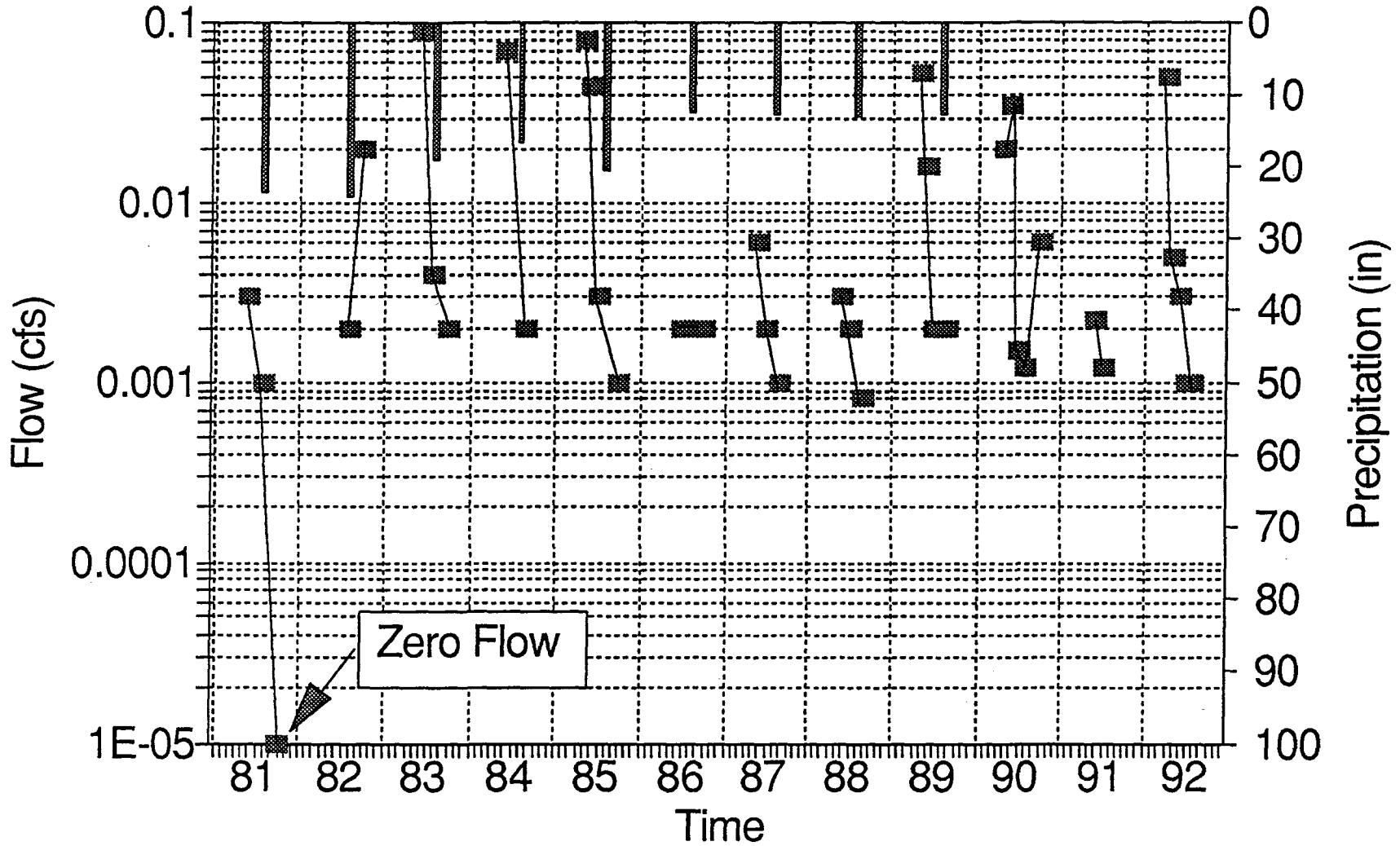


Figure 11

S31-13 Flow History

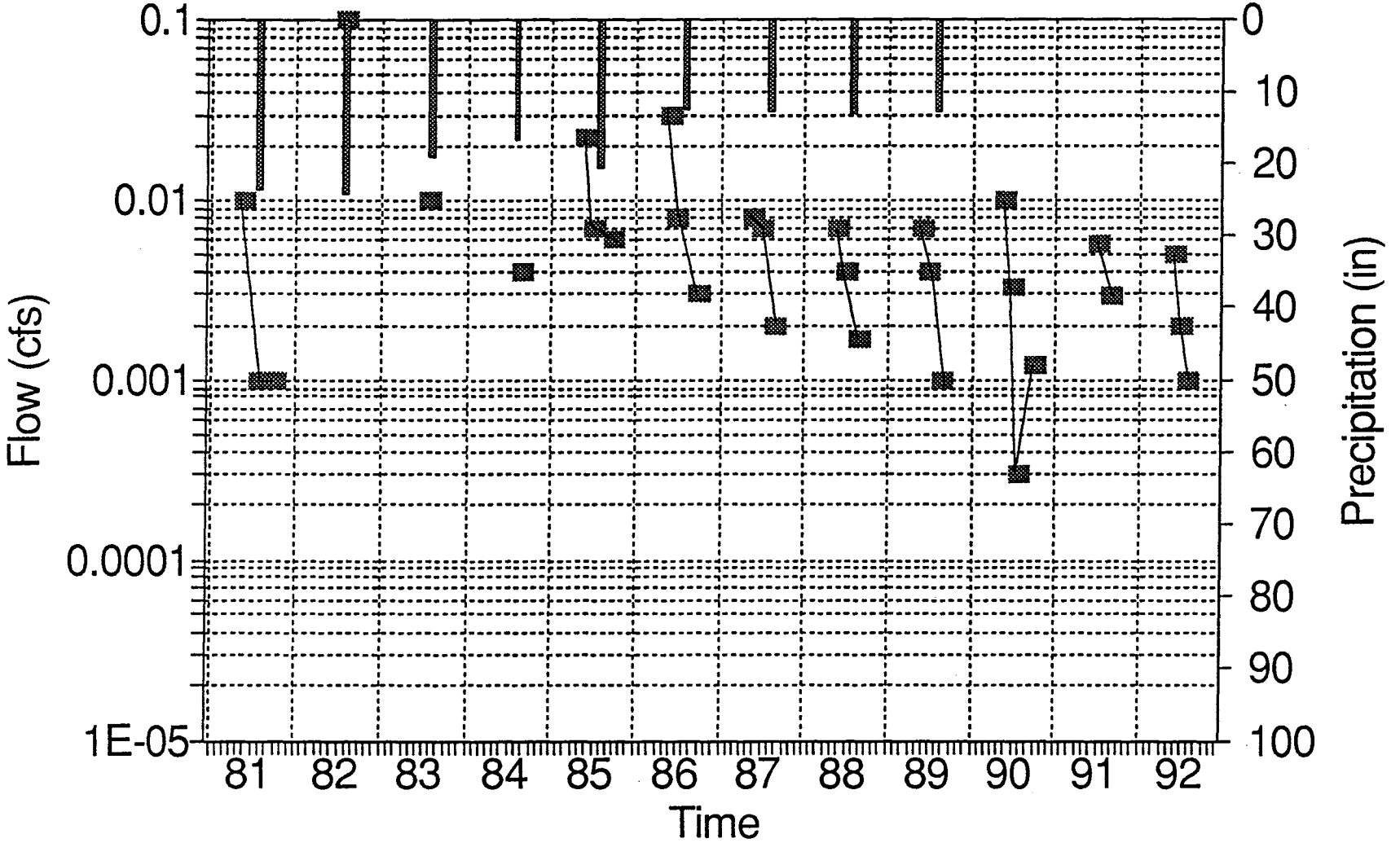


Figure 12

S36-17 Flow History

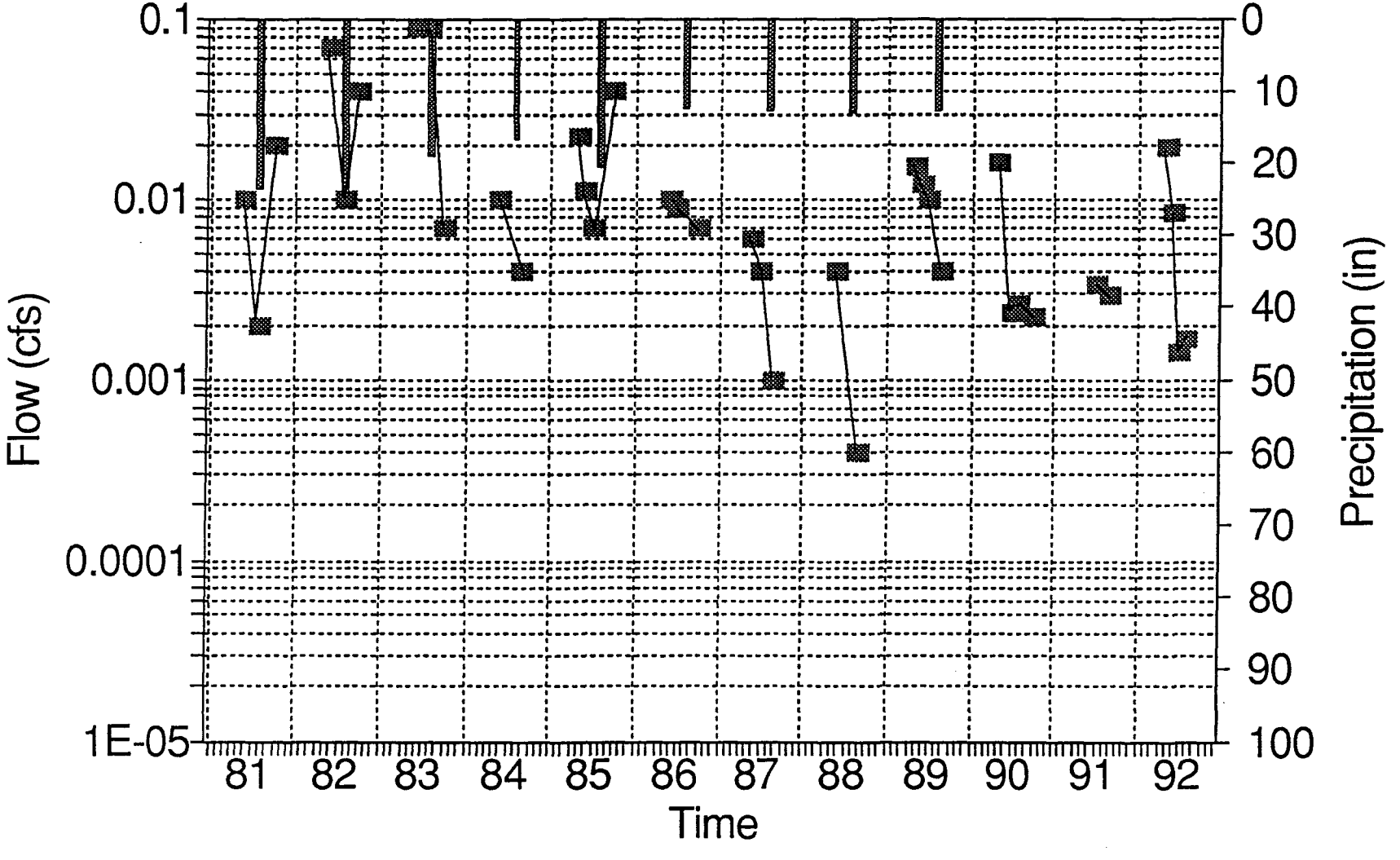


Figure 13

S36-19 Flow History

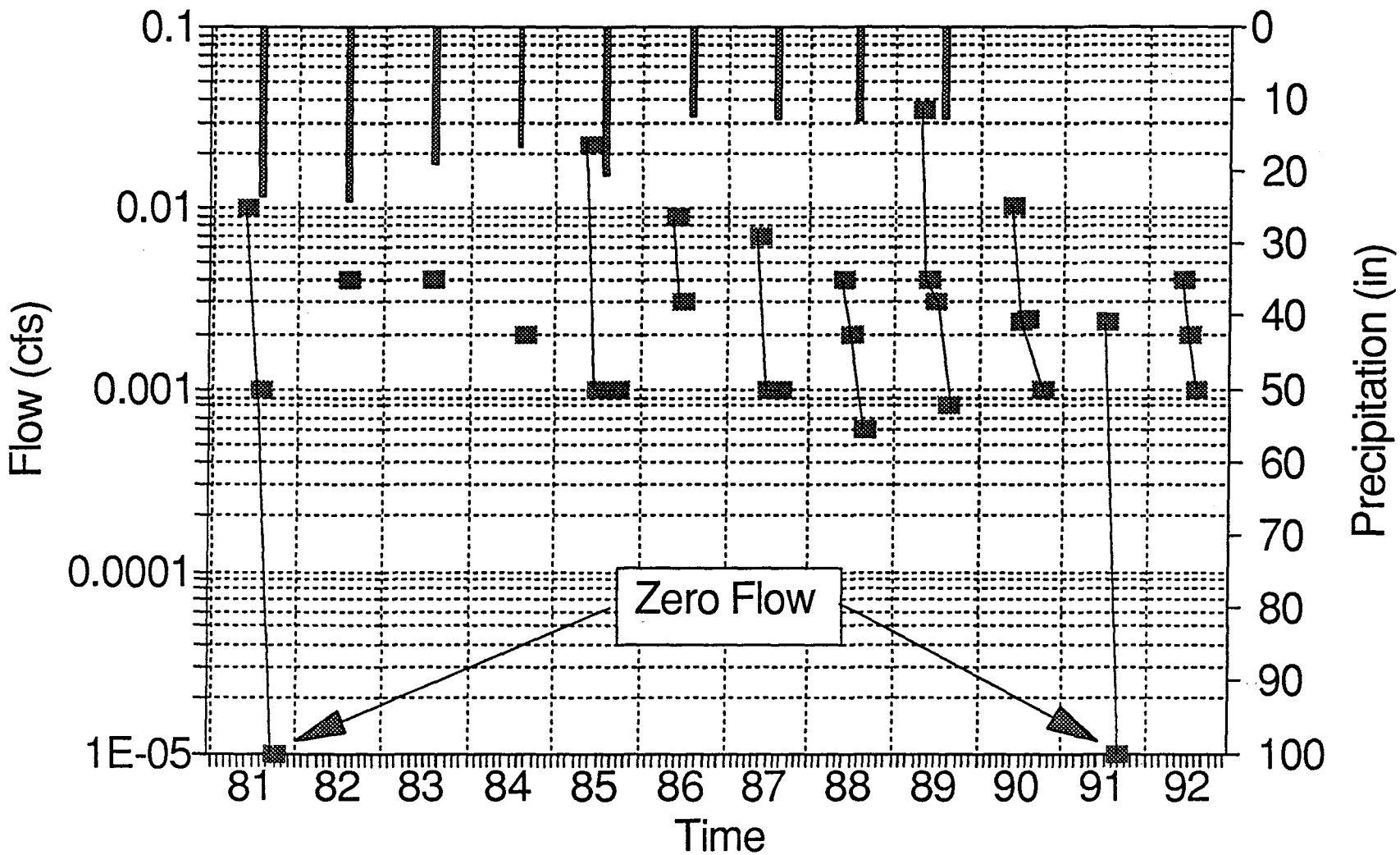
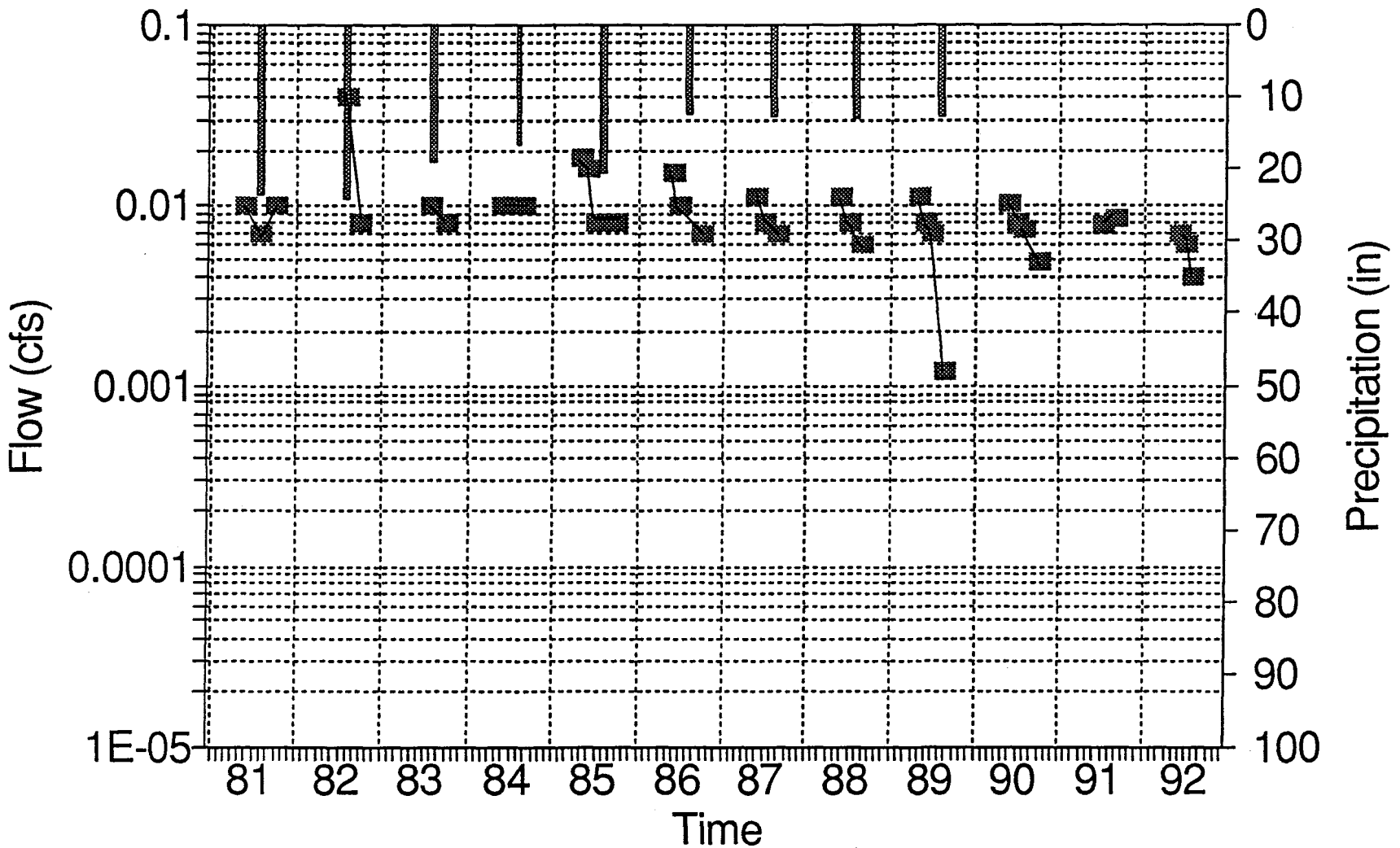


Figure 14

S36-23 Flow History



CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE INC
6771 SOUTH 900 EAST
P.O. BOX 21146
SALT LAKE CITY, UTAH 84121-0146
(801) 566-5599

October 14, 1992

Mr. Rick Summers
Utah State Department of Oil, Gas & Mining
3 Triad Center - Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

Dear Mr. Summers:

Attached are updated summaries of the water quality data collected for Valley Camp of Utah, Inc. through September, 1992.

Seven surface water monitoring sites were visited on the 31st of August. Surface water monitoring sites VC-4, VC-5 (Whiskey Canyon Creek above and below the Belina mine) and VC-12 (Finn Canyon Creek above Clear Creek) were dry. A water quality sample was collected at VC-1, VC-2, VC-10 and VC-11.

Eight ground water monitoring sites (springs) were also visited on August 31 and September 1, 1992. Spring S24-12 was dry. A water quality sample was collected at the other seven springs.

As you will notice, spring S36-7 has been added to Valley Camp's monitoring program. After reviewing identified springs and associated flow data for springs located in upper Boardinghouse Canyon it was determined that spring S36-7 would best represent the area for monitoring the effect on ground water, if any, of underground mining activities in upper Boardinghouse Canyon.

Please call if you have questions concerning the data or if we may be of other assistance.

Sincerely,

Jerry O Hansen SPD 10/28/92

Jerry Hansen

cc: Steve Tanner - Valley Camp of Utah, Inc.

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE INC
6771 SOUTH 900 EAST
P.O. BOX 21146
SALT LAKE CITY, UTAH 84121-0146
(801) 566-5599

August 25, 1992

Mr. Rick Summers
Utah State Department of Oil, Gas & Mining
3 Triad Center - Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

Dear Mr. Summers:

Attached are updated summaries of the water quality data collected for Valley Camp of Utah, Inc. through July 23, 1992.

All fourteen surface and ground water monitoring sites were visited on the 23rd of July. Surface water monitoring sites VC-4 and VC-5 (Whiskey Canyon Creek above and below the Belina mine) were both dry. Surface water monitoring site VC-12 (Finn Canyon Creek above Clear Creek) was also dry. One ground water monitoring site (S24-12) was also dry.

Please feel free to call if you have questions concerning the data or if we may be of other assistance.

Sincerely,

Jerry V Hansen

Jerry V. Hansen

Enclosure

cc: Steve Tanner - Valley Camp of Utah, Inc.

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station VC-1
Location Mud Creek below Utah #2 Mine

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL	NITROGEN AMMONIA as NH_3+N	NITROGEN NITRATE as NO_3+N	NITROGEN NITRITE as NO_2+N	NITROGEN TOTAL KJELDAHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4+P	PHOSPHATE ORTHO as PO_4+P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC COND.	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	ML/L	MG/L	MG/L	MG/L	µMHOS	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92	14:00	7.83	5	6	7.5							12.6	<0.5									135			20	<0.1	478			673		7.0	275		334	<10		
5-26-92	09:40	6.13	19	14	7.6							11.0	<0.5									106			28	<0.1	416			624		1.1	278					
6-18-92	10:10	5.01	19	8	7.4							10.4	<0.5									229			19	<0.1	615			1015		0	314					
7-23-92	16:10	4.08	20	20	8.5							9.3	<0.5									314			3.2	<0.1	730			1111		9.0	269					
8-31-92	09:40	3.84	13	10	7.5							9.5	<0.5									255			5.6	<0.1	640			980		0	326		419	<10		

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX. as CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92								84.0	33.1							0.175	0.788		35.3	0.093				4.6				48.9				9.006	8.985	2.979	
5-26-92								63.4	21.9										28.4					4.4				30.0				7.001	7.418	2.894	
6-18-92								90.0	22.3										45.2					8.5				58.2				10.960	10.543	1.936	
7-23-92								93.0	19.1										61.0					8.7				70.5				12.850	11.785	4.708	
8-31-92								88.5	18.8							0.090	0.242		52.2	0.042				19.4				64.0				11.998	11.183	3.519	

R-7-87

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 5-05-92

TO: Hansen, Allen & Luce
6771 So. 900 East
Midvale, Utah 84047

SAMPLE ID: Lab #U076613 - Valley Camp, VC-1 @ 1400, 4-15-92

DATE SUBMITTED: 4-16-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Acidity as $CaCO_3$, mg/l	<10
Bicarbonate as HCO_3, mg/l	275
Calcium as Ca (T), mg/l	84.0
Carbonate as CO_3, mg/l	7.0
Chloride as Cl, mg/l	33.1
Hardness as $CaCO_3$, mg/l	334
Magnesium as Mg (T), mg/l	35.3
Potassium as K (T), mg/l	4.6
Sodium as Na (T), mg/l	40.9
Sulfate as SO_4, mg/l	135
TDS, mg/l	478
Oil & Grease, mg/l	<.5
Settleable Solids, ml/l	<.1
TSS, mg/l	20
Iron as Fe (T), mg/l	0.788
Iron as Fe (Diss), mg/l	0.175
Manganese as Mn (T), mg/l	0.093

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 6-18-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 5-27-92 - Valley Camp Stream

DATE SAMPLED: 5-26-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-1		
LAB #:	U078127	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	278	RG	6-07-92 EPA 310.1
Carbonate as CO_3, mg/l	1.1	RG	6-07-92 EPA 310.1
Calcium as Ca, mg/l	63.4	AR	6-05-92 EPA 215.1
Chloride as Cl, mg/l	21.9	TM	5-28-92 EPA 325.3
Magnesium as Mg, mg/l	29.4	AR	6-05-92 EPA 242.1
Potassium as K, mg/l	4.4	AR	6-03-92 EPA 258.1
Sodium as Na, mg/l	30.0	AR	6-03-92 EPA 273.1
Sulfate as SO_4, mg/l	106	TM	5-28-92 EPA 375.4
TDS, mg/l	416	RG	5-28-92 EPA 160.1
Oil & Grease, mg/l	<.5	RG	6-03-92 EPA 413.1
TSS, mg/l	28	RG	5-28-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH	5-28-92 SM 208-F

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

RECEIVED
JUL 1 5 1992
HA&L

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-1	
LAB #:	U078871	ANALYST/DATE/METHOD
PARAMETER		
Bicarbonate as HCO_3, mg/l	314	RG 6-24/25 EPA 310.1
Carbonate as CO_3, mg/l	0	RG 6-28-92 EPA 310.1
Calcium as Ca, mg/l	90.0	AR 7-02-92 EPA 215.1
Chloride as Cl, mg/l	22.3	TM 6-19-92 EPA 325.3
Magnesium as Mg, mg/l	45.2	AR 7-02-92 EPA 242.1
Potassium as K, mg/l	8.5	AR 7-02-92 EPA 258.1
Sodium as Na, mg/l	58.2	AR 7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	229	TM 6-22/25 EPA 375.4
TDS, mg/l	615	RG 6-22-92 EPA 160.1
Oil & Grease, mg/l	<.5	RG 6-29-92 EPA 413.1
TSS, mg/l	19	RG 6-22-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH 6-19-92 SM 208-F

Rex Henderson

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DATE: 8-17-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

AUG 1 . 1992
HA&L

DATE SUBMITTED: 7-27-92 - Valley Camp Stream

DATE SAMPLED: 7-23-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-1	
LAB #:	U080070	ANALYST/DATE/METHOD
PARAMETER		
Bicarbonate as HCO_3, mg/l	269	RG 7-28-92 EPA 310.1
Carbonate as CO_3, mg/l	9.0	RG 7-28-92 EPA 310.1
Calcium as Ca, mg/l	93.0	AR 7-29-92 EPA 215.1
Chloride as Cl, mg/l	19.1	TM 7-27-92 EPA 325.3
Magnesium as Mg, mg/l	61.0	AR 7-31-92 EPA 242.1
pH Units	8.54	RG 7-28-92 EPA 150.1
Potassium as K, mg/l	8.7	AR 7-28-92 EPA 258.1
Sodium as Na, mg/l	70.5	AR 7-28-92 EPA 273.1
Sulfate as SO_4, mg/l	314	TM 7-27/28 EPA 375.4
TDS, mg/l	730	RG 7-27-92 EPA 160.1
Oil & Grease, mg/l	<.5	RG 8-04-92 EPA 413.1
TSS, mg/l	3.2	RG 7-27-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH 7-27-92 SM 208-F

Rex Henderson

CHEMTECH

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DATE: 10-06-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, Utah 84047

DATE SUBMITTED: 9-01-92 - Valley Camp

DATE SAMPLED: 8-31-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-1	
LAB:	U081295	
		ANALYST/DATE/METHOD
PARAMETER		
Acidity, mg/l	<10	RG 9-11-92 EPA 305.1
Bicarbonate as HCO_3, mg/l	326	RG 9-03-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG 9-03-92 EPA 310.1
Calcium as Ca, mg/l	88.5	AR 9-02-92 EPA 215.1
Chloride as Cl, mg/l	18.8	TM 9-01-92 EPA 325.3
Hardness as $CaCO_3$, mg/l	419	TM 9-01-92 EPA 130.2
Magnesium as Mg, mg/l	52.2	AR 9-02-92 EPA 242.1
Potassium as K, mg/l	19.4	AR 9-01-92 EPA 258.1
Sodium as Na, mg/l	64.0	AR 9-01-92 EPA 273.1
Sulfate as SO_4, mg/l	255	TM 9-02-92 EPA 375.4
TDS, mg/l	640	RG 9-02-92 EPA 160.1
Oil & Grease	<.5	RG 9-09-92 EPA 413.1
Settleable Solids, ml/l	<.1	RH 9-02-92 EPA 160.5
TSS, mg/l	5.6	RG 9-02-92 EPA 160.2
Iron as Fe (T), mg/l	0.242	AR 9-10-92 EPA 236.1
Manganese as Mn (T), mg/l	0.042	AR 9-11-92 EPA 243.1
Iron as Fe (Diss), mg/l	0.090	AR 9-10-92 EPA 236.1

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station VC-2
Location Mud Creek above Utah #2 Mine

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92	13:15	6.13	3	5	7.4							11.8		
5-26-92	08:35	5.51	14	11	7.3							11.4		
6-18-92	09:25	3.00	11	12	7.5							8.2		
7-23-92	17:40	3.26	21	19	8.4							8.7		
8-31-92	08:35	3.97	12	9	7.4							8.4		

DATE	NITROGEN AMMONIA as NH_3-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDAHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	ML/L	MG/L	MG/L	MG/L
4-15-92								121			35	<0.1	475		
5-26-92								114			34	<0.1	799		
6-18-92								216			15	<0.1	585		
7-23-92								236			8.0	<0.1	591		
8-31-92								241			22	<0.1	620		

DATE	SPECIFIC COND	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
	µMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92	670		5.8	275		334	<10		
5-26-92	634		1.1	282					
6-18-92	951		0	317					
7-23-92	999		5.0	276					
8-31-92	959		0	329		429	<10		

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEXAVALENT CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92								85.0	41.9					
5-26-92								65.4	22.5					
6-18-92								89.0	20.9					
7-23-92								90.0	19.1					
8-31-92								95.0	18.3					

DATE	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92		0.165	1.19		33.6	0.093				4.2				38.0	
5-26-92					30.3					4.5				34.8	
6-18-92					43.0					8.0				55.6	
7-23-92					52.0					7.1				52.9	
8-31-92		0.105	0.515		46.4	0.062				9.3				76.0	

DATE	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92			8.779	8.402	2.196	
5-26-92			7.386	7.667	1.867	
6-18-92			10.603	10.282	1.534	
7-23-92			11.253	10.143	5.189	
8-31-92			12.111	10.926	5.141	

R-7-87

CHEMTECH
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DATE: 5-05-92

TO: Hansen, Allen & Luce
6771 So. 900 East
Midvale, Utah 84047

SAMPLE ID: Lab #U076614 - Valley Camp, VC-2 @ 1315, 4-15-92

DATE SUBMITTED: 4-16-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Acidity as $CaCO_3$, mg/l	<10
Bicarbonate as HCO_3, mg/l	275
Calcium as Ca (T), mg/l	85.0
Carbonate as CO_3, mg/l	5.8
Chloride as Cl, mg/l	41.9
Hardness as $CaCO_3$, mg/l	334
Magnesium as Mg (T), mg/l	33.6
Potassium as K (T), mg/l	4.2
Sodium as Na (T), mg/l	38.0
Sulfate as SO_4, mg/l	121
TDS, mg/l	475
Settleable Solids, ml/l	<.1
TSS, mg/l	35
Iron as Fe (T), mg/l	1.19
Iron as Fe (Diss), mg/l	0.165
Manganese as Mn (T), mg/l	0.093

Rex Henderson

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DATE: 6-18-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 5-27-92 - Valley Camp Stream

DATE SAMPLED: 5-26-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-2	
LAB #:	U078123	ANALYST/DATE/METHOD
PARAMETER		
Bicarbonate as HCO_3, mg/l	282	RG 6-07-92 EPA 310.1
Carbonate as CO_3, mg/l	1.1	RG 6-07-92 EPA 310.1
Calcium as Ca, mg/l	65.4	AR 6-05-92 EPA 215.1
Chloride as Cl, mg/l	22.5	TM 5-28-92 EPA 325.3
Magnesium as Mg, mg/l	30.3	AR 6-05-92 EPA 242.1
Potassium as K, mg/l	4.5	AR 6-03-92 EPA 258.1
Sodium as Na, mg/l	34.8	AR 6-03-92 EPA 273.1
Sulfate as SO_4, mg/l	114	TM 5-28-92 EPA 375.4
TDS, mg/l	779	RG 5-28-92 EPA 160.1
TSS, mg/l	34	RG 5-28-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH 5-28-92 SM 208-F

Rex Henderson

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DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-2	
LAB #:	U078872	ANALYST/DATE/METHOD
PARAMETER		
Bicarbonate as HCO_3, mg/l	317	RG 6-24/25 EPA 310.1
Carbonate as CO_3, mg/l	0	RG 6-28-92 EPA 310.1
Calcium as Ca, mg/l	89.0	AR 7-02-92 EPA 215.1
Chloride as Cl, mg/l	20.9	TM 6-19-92 EPA 325.3
Magnesium as Mg, mg/l	43.0	AR 7-02-92 EPA 242.1
Potassium as K, mg/l	8.0	AR 7-02-92 EPA 258.1
Sodium as Na, mg/l	55.6	AR 7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	216	TM 6-22/25 EPA 375.4
TDS, mg/l	585	RG 6-22-92 EPA 160.1
TSS, mg/l	15	RG 6-22-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH 6-19-92 SM 208-F

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DATE: 8-17-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 7-27-92 - Valley Camp Stream

DATE SAMPLED: 7-23-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-2	
LAB #:	U080071	ANALYST/DATE/METHOD
PARAMETER		
Bicarbonate as HCO_3, mg/l	276	RG 7-28-92 EPA 310.1
Carbonate as CO_3, mg/l	5.0	RG 7-28-92 EPA 310.1
Calcium as Ca, mg/l	90.0	AR 7-29-92 EPA 215.1
Chloride as Cl, mg/l	19.1	TM 7-27-92 EPA 325.3
Magnesium as Mg, mg/l	52.0	AR 7-31-92 EPA 242.1
pH Units	8.44	RG 7-28-92 EPA 150.1
Potassium as K, mg/l	7.1	AR 7-28-92 EPA 258.1
Sodium as Na, mg/l	52.9	AR 7-28-92 EPA 273.1
Sulfate as SO_4, mg/l	236	TM 7-27/28 EPA 375.4
TDS, mg/l	591	RG 7-27-92 EPA 160.1
TSS, mg/l	8.0	RG 7-27-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH 7-27-92 SM 208-F

Rex Henderson

CHEMTECH

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DATE: 10-06-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, Utah 84047

DATE SUBMITTED: 9-01-92 - Valley Camp

DATE SAMPLED: 8-31-92

CERTIFICATE OF ANALYSIS

SAMPLE ID: VC-2
LAB: U081296

PARAMETER		ANALYST/DATE/METHOD
Acidity, mg/l	<10	RG 9-11-92 EPA 305.1
Bicarbonate as HCO_3, mg/l	329	RG 9-03-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG 9-03-92 EPA 310.1
Calcium as Ca, mg/l	95.0	AR 9-02-92 EPA 215.1
Chloride as Cl, mg/l	18.3	TM 9-01-92 EPA 325.3
Hardness as $CaCO_3$, mg/l	429	TM 9-01-92 EPA 130.2
Magnesium as Mg, mg/l	46.4	AR 9-02-92 EPA 242.1
Potassium as K, mg/l	9.3	AR 9-01-92 EPA 258.1
Sodium as Na, mg/l	76.0	AR 9-01-92 EPA 273.1
Sulfate as SO_4, mg/l	241	TM 9-02-92 EPA 375.4
TDS, mg/l	620	RG 9-02-92 EPA 160.1
Settleable Solids, ml/l	<.1	RH 9-02-92 EPA 160.5
TSS, mg/l	22	RG 9-02-92 EPA 160.2
Iron as Fe (T), mg/l	0.515	AR 9-10-92 EPA 236.1
Manganese as Mn (T), mg/l	0.062	AR 9-11-92 EPA 243.1
Iron as Fe (Diss), mg/l	0.105	AR 9-10-92 EPA 236.1

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE INC
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station VC-4
Location Whiskey Canyon Creek above Belina Mine

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92	11:35	0.05	2	4	7.8							11.5		
5-26-92	14:30	0.0143	12	14	7.6							10.2	<0.5	
6-18-92	13:00	0.002	13	15	7.4							8.0		
7-23-92	14:25	-0-												
8-31-92	12:45	-0-												

DATE	NITROGEN AMMONIA as NH_3-N	NITRATE as NO_3-N	NITRITE as NO_2-N	NITROGEN TOTAL KJELDHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92								<5		
5-26-92								<5		
6-18-92								1.8		
7-23-92										
8-31-92										

DATE	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC COND	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
	MG/L	ML/L	MG/L	MG/L	MG/L	µMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92	18	<0.1	91			114		0	67.3		61.1	<10		
5-26-92	121	0.1	95			137		0	78.4					
6-18-92	3.2	<0.1	154			260		1.2	164					
7-23-92														
8-31-92														

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX. as CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92								16.8	1.4							0.410	1.42		3.4	0.020				0.5				0.6				1.180	1.143	1.602	Light Snow fall
5-26-92								19.6	1.2										4.5					0.9				0.6				1.397	1.319	2.895	
6-18-92								44.9	1.1										9.2					0.8				1.1				2.066	2.796	4.596	
7-23-92																																			
8-31-92																																			

R-7-87

CHEMTECH
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6100 S. STRATLER
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PHONE: (801) 262-7299
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DATE: 5-05-92

TO: Hansen, Allen & Luce
6771 So. 900 East
Midvale, Utah 84047

SAMPLE ID: Lab #U076615 - Valley Camp, VC-4 @ 1135, 4-15-92

DATE SUBMITTED: 4-16-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Acidity as $CaCO_3$, mg/l	<10
Bicarbonate as HCO_3, mg/l	67.3
Calcium as Ca (T), mg/l	16.8
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	1.4
Hardness as $CaCO_3$, mg/l	61.1
Magnesium as Mg (T), mg/l	3.4
Potassium as K (T), mg/l	0.5
Sodium as Na (T), mg/l	0.6
Sulfate as SO_4, mg/l	<5
TDS, mg/l	91
Settleable Solids, ml/l	<.1
TSS, mg/l	18
Iron as Fe (T), mg/l	1.42
Iron as Fe (Diss), mg/l	0.410
Manganese as Mn (T), mg/l	0.020

Rex Henderson

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DATE: 6-18-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 5-27-92 - Valley Camp Stream

DATE SAMPLED: 5-26-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-4		
LAB #:	U078128	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	78.4	RG	6-07-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	6-07-92 EPA 310.1
Calcium as Ca, mg/l	19.6	AR	6-05-92 EPA 215.1
Chloride as Cl, mg/l	1.2	TM	5-28-92 EPA 325.3
Magnesium as Mg, mg/l	4.5	AR	6-05-92 EPA 242.1
Potassium as K, mg/l	0.9	AR	6-03-92 EPA 258.1
Sodium as Na, mg/l	0.6	AR	6-03-92 EPA 273.1
Sulfate as SO_4, mg/l	<.5	TM	5-28-92 EPA 375.4
TDS, mg/l	95	RG	5-28-92 EPA 160.1
Oil & Grease, mg/l	<.5	RG	6-03-92 EPA 413.1
TSS, mg/l	121	RG	5-28-92 EPA 160.2
Settleable Solids, ml/l	0.1	RH	5-28-92 SM 208-F

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-4		
LAB #:	U078873	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	164	RG	6-24/25 EPA 310.1
Carbonate as CO_3, mg/l	1.2	RG	6-28-92 EPA 310.1
Calcium as Ca, mg/l	44.9	AR	7-02-92 EPA 215.1
Chloride as Cl, mg/l	1.1	TM	6-19-92 EPA 325.3
Magnesium as Mg, mg/l	9.2	AR	7-02-92 EPA 242.1
Potassium as K, mg/l	0.8	AR	7-02-92 EPA 258.1
Sodium as Na, mg/l	1.1	AR	7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	1.8	TM	6-22/25 EPA 375.4
TDS, mg/l	154	RG	6-22-92 EPA 160.1
TSS, mg/l	3.2	RG	6-22-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH	6-19-92 SM 208-F

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station VC-5
Location Whiskey Canyon Creek below Belina Mine

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92	12:00	0.07	3	1	7.4							12.2	<0.5	
5-26-92	13:45	0.007	18	17	7.5									
6-17-92	13:20	-0-												
7-23-92	14:25	-0-												
8-31-92	12:57	-0-												

DATE	NITROGEN AMMONIA as NH_3-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC COND.	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO ACTIVITY
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	ML/L	MG/L	MG/L	MG/L	µMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92								25.1			15	<0.1	460			722		3.4	186		247	<10		
5-26-92								81			16	<0.1	556			905		4.4	217					
6-17-92																								
7-23-92																								
8-31-92																								

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX or CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92								73.4	139							0.328	0.618		18.9	0.025				2.2				65.3				8.133	7.609	3.331	Light Snow fall
5-26-92								88.0	135										22.8					3.6				69.0				9.361	9.198	0.878	
6-17-92																																			
7-23-92																																			
8-31-92																																			

R-7-87

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
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DATE: 5-05-92

TO: Hansen, Allen & Luce
6771 So. 900 East
Midvale, Utah 84047

SAMPLE ID: Lab #U076616 - Valley Camp, VC-5 @ 1200, 4-15-92

DATE SUBMITTED: 4-16-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Acidity as $CaCO_3$, mg/l	<10
Bicarbonate as HCO_3, mg/l	186
Calcium as Ca (T), mg/l	73.4
Carbonate as CO_3, mg/l	3.5
Chloride as Cl, mg/l	139
Hardness as $CaCO_3$, mg/l	247
Magnesium as Mg (T), mg/l	18.9
Potassium as K (T), mg/l	2.2
Sodium as Na (T), mg/l	65.3
Sulfate as SO_4, mg/l	25.1
TDS, mg/l	460
Oil & Grease, mg/l	<.5
Settleable Solids, ml/l	<.1
TSS, mg/l	15
Iron as Fe (T), mg/l	0.618
Iron as Fe (Diss), mg/l	0.328
Manganese as Mn (T), mg/l	0.025

Rex Henderson

CHEMTECH
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DATE: 6-18-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 5-27-92 - Valley Camp Stream

DATE SAMPLED: 5-26-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-5	
LAB #:	U078124	ANALYST/DATE/METHOD
PARAMETER		
Bicarbonate as HCO_3, mg/l	217	RG 6-07-92 EPA 310.1
Carbonate as CO_3, mg/l	4.4	RG 6-07-92 EPA 310.1
Calcium as Ca, mg/l	88.0	AR 6-05-92 EPA 215.1
Chloride as Cl, mg/l	135	TM 5-28-92 EPA 325.3
Magnesium as Mg, mg/l	22.8	AR 6-05-92 EPA 242.1
Potassium as K, mg/l	3.6	AR 6-03-92 EPA 258.1
Sodium as Na, mg/l	69.0	AR 6-03-92 EPA 273.1
Sulfate as SO_4, mg/l	81	TM 5-28-92 EPA 375.4
TDS, mg/l	556	RG 5-28-92 EPA 160.1
TSS, mg/l	16	RG 5-28-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH 5-28-92 SM 208-F

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station VC-10
Location South Fork Eccles Creek above Eccles Creek

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92	12:35	0.28	1	1	7.8							12.4		
5-30-92	10:30	0.147	11	9	7.4							8.8		
6-18-92	14:00	0.106	15	11	7.2							8.2		
7-23-92	13:55	0.049	22	14	8.4							7.2		
8-31-92	14:20	0.058	15	10	8.1							7.5		

DATE	NITROGEN AMMONIA as NH_3-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92								88.9		
5-30-92								76		
6-18-92								95		
7-23-92								129		
8-31-92								170		

DATE	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC COND.	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
	MG/L	ML/L	MG/L	MG/L	MG/L	µMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92	6.8	<0.1	334			516		3.5	252		312	<10		
5-30-92	7.2	<0.1	335			503		4.4	245					
6-18-92	2.0	<0.1	360			585		3.5	259					
7-23-92	8.4	<0.1	402			643		2.0	259					
8-31-92	9.6	<0.1	456			687		0	260		381	<10		

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX as CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92								87.0	3.4					
5-30-92								67.4	3.4					
6-18-92								84.3	2.8					
7-23-92								104	3.4					
8-31-92								100	4.9					

DATE	MANGANESE TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92		0.535	0.838		28.2	0.015				1.9				5.3				6.970	6.194	5.899	Light Snow fall
5-30-92					26.2					1.8				2.06				5.655	5.840	1.614	
6-18-92					27.5					2.0				2.4				6.625	6.419	1.584	
7-23-92					35.3					2.3				2.8				8.275	7.093	7.689	
8-31-92		0.160	0.355		40.7	0.060				2.8				2.7				8.539	7.939	3.641	

R-7-87

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 5-05-92

TO: Hansen, Allen & Luce
6771 So. 900 East
Midvale, Utah 84047

SAMPLE ID: Lab #U076617 - Valley Camp, VC-10 @ 1235, 4-15-92

DATE SUBMITTED: 4-16-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Acidity as $CaCO_3$, mg/l	<10
Bicarbonate as HCO_3, mg/l	252
Calcium as Ca (T), mg/l	87.0
Carbonate as CO_3, mg/l	3.5
Chloride as Cl, mg/l	3.4
Hardness as $CaCO_3$, mg/l	312
Magnesium as Mg (T), mg/l	28.2
Potassium as K (T), mg/l	1.9
Sodium as Na (T), mg/l	5.3
Sulfate as SO_4, mg/l	88.9
TDS, mg/l	334
Settleable Solids, ml/l	<.1
TSS, mg/l	6.8
Iron as Fe (T), mg/l	0.838
Iron as Fe (Diss), mg/l	0.535
Manganese as Mn (T), mg/l	0.015

Rex Henderson

CHEMTECH
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6100 S. STRATLER
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DATE: 6-18-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 5-29-92 - Valley Camp Stream

DATE SAMPLED: 5-29-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-10		
LAB #:	U078228	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	245	RG	6-07-92 EPA 310.1
Carbonate as CO_3, mg/l	4.4	RG	6-07-92 EPA 310.1
Calcium as Ca, mg/l	67.4	AR	6-05-92 EPA 215.1
Chloride as Cl, mg/l	3.4	TM	6-01-92 EPA 325.3
Magnesium as Mg, mg/l	26.2	AR	6-05-92 EPA 242.1
Potassium as K, mg/l	1.8	AR	6-03-92 EPA 258.1
Sodium as Na, mg/l	2.06	AR	6-03-92 EPA 273.1
Sulfate as SO_4, mg/l	76	TM	6-04-92 EPA 375.4
TDS, mg/l	335	RG	6-01-92 EPA 160.1
TSS, mg/l	7.2	RG	6-01-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH	6-01-92 SM 208-F

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
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PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-10		
LAB #:	U078874	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	259	RG	6-24/25 EPA 310.1
Carbonate as CO_3, mg/l	3.5	RG	6-28-92 EPA 310.1
Calcium as Ca, mg/l	84.3	AR	7-02-92 EPA 215.1
Chloride as Cl, mg/l	2.8	TM	6-19-92 EPA 325.3
Magnesium as Mg, mg/l	27.5	AR	7-02-92 EPA 242.1
Potassium as K, mg/l	2.0	AR	7-02-92 EPA 258.1
Sodium as Na, mg/l	2.4	AR	7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	95	TM	6-22/25 EPA 375.4
TDS, mg/l	360	RG	6-22-92 EPA 160.1
TSS, mg/l	2.0	RG	6-22-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH	6-19-92 SM 208-F

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
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DATE: 8-17-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 7-27-92 - Valley Camp Stream

DATE SAMPLED: 7-23-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-10		
LAB #:	U080072	ANALYST/DATE/METHOD	
PARAMETER			
Acidity as $CaCO_3$, mg/l	48	RG	7-29-92 EPA 310.1
Bicarbonate as HCO_3, mg/l	259	RG	7-28-92 EPA 310.1
Carbonate as CO_3, mg/l	2.0	RG	7-28-92 EPA 310.1
Calcium as Ca, mg/l	104	AR	7-29-92 EPA 215.1
Chloride as Cl, mg/l	3.4	TM	7-27-92 EPA 325.3
Magnesium as Mg, mg/l	35.3	AR	7-31-92 EPA 242.1
pH Units	8.36	RG	7-28-92 EPA 150.1
Potassium as K, mg/l	2.3	AR	7-28-92 EPA 258.1
Sodium as Na, mg/l	2.8	AR	7-28-92 EPA 273.1
Sulfate as SO_4, mg/l	129	TM	7-27/28 EPA 375.4
TDS, mg/l	402	RG	7-27-92 EPA 160.1
TSS, mg/l	8.4	RG	7-27-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH	7-27-92 SM 208-F

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
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PHONE: (801) 262-7299
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DATE: 10-06-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, Utah 84047

DATE SUBMITTED: 9-01-92 - Valley Camp

DATE SAMPLED: 8-31-92

CERTIFICATE OF ANALYSIS

SAMPLE ID: VC-10
LAB: U081297

PARAMETER		ANALYST/DATE/METHOD
Acidity, mg/l	<10	RG 9-11-92 EPA 305.1
Bicarbonate as HCO_3, mg/l	260	RG 9-03-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG 9-03-92 EPA 310.1
Calcium as Ca, mg/l	100	AR 9-02-92 EPA 215.1
Chloride as Cl, mg/l	4.9	TM 9-01-92 EPA 325.3
Hardness as $CaCO_3$, mg/l	381	TM 9-01-92 EPA 130.2
Magnesium as Mg, mg/l	40.7	AR 9-02-92 EPA 242.1
Potassium as K, mg/l	2.8	AR 9-01-92 EPA 258.1
Sodium as Na, mg/l	2.7	AR 9-01-92 EPA 273.1
Sulfate as SO_4, mg/l	170	TM 9-02-92 EPA 375.4
TDS, mg/l	456	RG 9-02-92 EPA 160.1
Settleable Solids, ml/l	<.1	RH 9-02-92 EPA 160.5
TSS, mg/l	9.6	RG 9-02-92 EPA 160.2
Iron as Fe (T), mg/l	0.355	AR 9-10-92 EPA 236.1
Manganese as Mn (T), mg/l	0.060	AR 9-11-92 EPA 243.1
Iron as Fe (Diss), mg/l	0.160	AR 9-10-92 EPA 236.1

Rex Henderson

CHEMTECH
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FAX: (801) 262-7378

DATE: 5-05-92

TO: Hansen, Allen & Luce
6771 So. 900 East
Midvale, Utah 84047

SAMPLE ID: Lab #U076618 - Valley Camp, VC-11 @ 1000, 4-15-92

DATE SUBMITTED: 4-16-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Acidity as $CaCO_3$, mg/l	<10
Bicarbonate as HCO_3, mg/l	203
Calcium as Ca (T), mg/l	58.3
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	3.4
Hardness as $CaCO_3$, mg/l	189
Magnesium as Mg (T), mg/l	16.3
Potassium as K (T), mg/l	1.3
Sodium as Na (T), mg/l	2.2
Sulfate as SO_4, mg/l	39.0
TDS, mg/l	194
Settleable Solids, ml/l	<.1
TSS, mg/l	21
Iron as Fe (T), mg/l	0.615
Iron as Fe (Diss), mg/l	0.575
Manganese as Mn (T), mg/l	0.015

Rex Henderson

CHEMTECH
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DATE: 6-18-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 5-27-92 - Valley Camp Stream

DATE SAMPLED: 5-26-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-11		
LAB #:	U078125	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	218	RG	6-07-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	6-07-92 EPA 310.1
Calcium as Ca, mg/l	52.0	AR	6-05-92 EPA 215.1
Chloride as Cl, mg/l	2.7	TM	5-28-92 EPA 325.3
Magnesium as Mg, mg/l	15.9	AR	6-05-92 EPA 242.1
Potassium as K, mg/l	1.3	AR	6-03-92 EPA 258.1
Sodium as Na, mg/l	1.8	AR	6-03-92 EPA 273.1
Sulfate as SO_4, mg/l	22	TM	5-28-92 EPA 375.4
TDS, mg/l	217	RG	5-28-92 EPA 160.1
TSS, mg/l	20	RG	5-28-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH	5-28-92 SM 208-F

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station VC-11
Location Boardinghouse Creek above spring houses

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL	NITROGEN AMMONIA as NH_3-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC COND	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	ML/L	MG/L	MG/L	MG/L	μMHOS@	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92	10:00	0.60	5	3	7.5							11.4										39.0			21	<0.1	194			317		0	203		189	<10		
5-26-92	11:55	0.324	18	15	7.3							9.6										22			20	<0.1	217			289		0	218					
6-18-92	11:30	0.233	23	13	7.4							8.6										22			8.4	<0.1	263			429		2.4	271					
7-23-92	15:30	0.058	29	16	8.4							8.5										34			3.2	<0.1	281			539		3.0	299					
8-31-92	10:45	0.072	12	9	7.8							8.2										31			3.2	<0.1	301			534		2.4	309		283	<10		

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX as CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92								58.3	3.4							0.575	0.615		16.3	0.015				1.3				2.2				4.411	4.235	2.034	Light Snow fall
5-26-92								52.0	2.7										15.9					1.3				1.8				4.015	4.107	1.138	
6-18-92								68.0	2.9										20.1					1.4				2.4				5.187	5.062	1.229	
7-23-92								90.0	4.1										25.4					1.9				2.8				6.752	5.824	7.375	
8-31-92								81.0	4.2							0.050	0.105		26.9	<0.01				2.0				3.1				6.444	5.908	4.337	

R-7-87

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-11		
LAB #:	U078875	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	271	RG	6-24/25 EPA 310.1
Carbonate as CO_3, mg/l	2.4	RG	6-28-92 EPA 310.1
Calcium as Ca, mg/l	68.0	AR	7-02-92 EPA 215.1
Chloride as Cl, mg/l	2.9	TM	6-19-92 EPA 325.3
Magnesium as Mg, mg/l	20.1	AR	7-02-92 EPA 242.1
Potassium as K, mg/l	1.4	AR	7-02-92 EPA 258.1
Sodium as Na, mg/l	2.4	AR	7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	22	TM	6-22/25 EPA 375.4
TDS, mg/l	263	RG	6-22-92 EPA 160.1
TSS, mg/l	8.4	RG	6-22-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH	6-19-92 SM 208-F

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 8-17-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 7-27-92 - Valley Camp Stream

DATE SAMPLED: 7-23-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-11		
LAB #:	U080073	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	299	RG	7-28-92 EPA 310.1
Carbonate as CO_3, mg/l	3.0	RG	7-28-92 EPA 310.1
Calcium as Ca, mg/l	90.0	AR	7-29-92 EPA 215.1
Chloride as Cl, mg/l	4.1	TM	7-27-92 EPA 325.3
Magnesium as Mg, mg/l	25.4	AR	7-31-92 EPA 242.1
pH Units	8.41	RG	7-28-92 EPA 150.1
Potassium as K, mg/l	1.9	AR	7-28-92 EPA 258.1
Sodium as Na, mg/l	2.8	AR	7-28-92 EPA 273.1
Sulfate as SO_4, mg/l	34	TM	7-27/28 EPA 375.4
TDS, mg/l	281	RG	7-27-92 EPA 160.1
TSS, mg/l	3.2	RG	7-27-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH	7-27-92 SM 208-F

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 10-06-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, Utah 84047

DATE SUBMITTED: 9-01-92 - Valley Camp

DATE SAMPLED: 8-31-92

CERTIFICATE OF ANALYSIS

SAMPLE ID: VC-11
LAB: U081298

PARAMETER		ANALYST/DATE/METHOD
Acidity, mg/l	<10	RG 9-11-92 EPA 305.1
Bicarbonate as HCO_3, mg/l	309	RG 9-03-92 EPA 310.1
Carbonate as CO_3, mg/l	2.4	RG 9-03-92 EPA 310.1
Calcium as Ca, mg/l	81.0	AR 9-02-92 EPA 215.1
Chloride as Cl, mg/l	4.2	TM 9-01-92 EPA 325.3
Hardness as $CaCO_3$, mg/l	283	TM 9-01-92 EPA 130.2
Magnesium as Mg, mg/l	26.9	AR 9-02-92 EPA 242.1
Potassium as K, mg/l	2.0	AR 9-01-92 EPA 258.1
Sodium as Na, mg/l	3.1	AR 9-01-92 EPA 273.1
Sulfate as SO_4, mg/l	31	TM 9-02-92 EPA 375.4
TDS, mg/l	301	RG 9-02-92 EPA 160.1
Settleable Solids, ml/l	<.1	RH 9-02-92 EPA 160.5
TSS, mg/l	3.2	RG 9-02-92 EPA 160.2
Iron as Fe (T), mg/l	0.105	AR 9-10-92 EPA 236.1
Manganese as Mn (T), mg/l	<.01	AR 9-11-92 EPA 243.1
Iron as Fe (Diss), mg/l	0.050	AR 9-10-92 EPA 236.1

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station VC-12
Location Finn Canyon Creek above Clear Creek

DATE	TIME	FLOW CFS	TEMPERATURE AIR °C	TEMPERATURE WATER °C	pH	COLIFORM TOTAL MPN	COLIFORM FECAL MPN	FECAL STREP. MPN	C.O.D. MG/L	B.O.D. MG/L	T.O.C. MG/L	DISSOLVED OXYGEN MG/L	OIL & GREASE MG/L	PHENOL MG/L	NITROGEN AMMONIA as NH_3-N MG/L	NITROGEN NITRATE as NO_3-N MG/L	NITROGEN NITRITE as NO_2-N MG/L	NITROGEN TOTAL KJELDAHL MG/L	NITROGEN ORGANIC MG/L	PHOSPHATE TOTAL as PO_4-P MG/L	PHOSPHATE ORTHO as PO_4-P MG/L	SULFATE as SO_4 MG/L	HYDROXIDE as OH MG/L	SURFACTANT as MBAS MG/L	SOLIDS TSS MG/L	SOLIDS TOTAL SETTLEABLE SOLIDS ML/L	SOLIDS T.D.S. MG/L	SOLIDS TOTAL SOLIDS MG/L	SOLIDS TOTAL VOLATILE SOLIDS MG/L	SPECIFIC COND. µMHOS/CM	TURBIDITY FTU	CARBONATE ALK. as CO_3 MG/L	BI-CARBONATE ALK. as HCO_3 MG/L	TOTAL ALK. as $CaCO_3$ MG/L	TOTAL HARDNESS as $CaCO_3$ MG/L	ACIDITY as $CaCO_3$ MG/L	ALPHA RADIO-ACTIVITY pCi/L	BETA RADIO-ACTIVITY pCi/L
4-15-92	9:35	0.004	6	3	7.4							6.8										37.2			14	<0.1	307			528		0	302		294	<10		
5-26-92	11:20	0.019	15	9	7.5							9.2										3.4			16	<0.1	185			320		0	192					
6-18-92	11:00	0.004	21	11	7.6							5.6										18			12	<0.1	273			392		0	260					
7-23-92	16:00	-0-																																				
8-31-92	10:30	-0-																																				

DATE	ALUMINUM TOTAL MG/L	ANTIMONY TOTAL MG/L	ARSENIC TOTAL MG/L	BARIUM TOTAL MG/L	BERYLLIUM TOTAL MG/L	BORON TOTAL MG/L	CADMIUM TOTAL MG/L	CALCIUM TOTAL MG/L	CHLORIDE DISS. MG/L	CHROMIUM HEX as CR MG/L	COBALT TOTAL MG/L	COPPER TOTAL MG/L	CYANIDE as CN MG/L	FLUORIDE DISS. MG/L	GERMANIUM TOTAL MG/L	IRON DISS. MG/L	IRON TOTAL MG/L	LEAD TOTAL MG/L	MAGNESIUM TOTAL MG/L	MANGANESE TOTAL MG/L	MERCURY TOTAL MG/L	MOLYBDENUM TOTAL MG/L	NICKEL TOTAL MG/L	POTASSIUM TOTAL MG/L	SELENIUM TOTAL MG/L	SILICA as SiO_2 MG/L	SILVER TOTAL MG/L	SODIUM TOTAL MG/L	ZINC TOTAL MG/L	VANADIUM TOTAL MG/L	SULFIDE as S MG/L	MAJOR CATIONS MEQ/L	MAJOR ANIONS MEQ/L	$\frac{C-A}{C+A}=100$	COMMENTS
4-15-92								63.3	3.1							0.218	0.243		29.6	0.028				2.6				6.4				5.952	5.822	1.104	
5-26-92								43.9	1.6										13.4					1.1				1.8				3.400	3.213	2.055	
6-18-92								59.3	2.6										20.0					2.0				2.6				4.769	4.707	0.659	
7-23-92																																				
8-31-92																																				

R-7-87

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 5-05-92

TO: Hansen, Allen & Luce
6771 So. 900 East
Midvale, Utah 84047

SAMPLE ID: Lab #U076619 - Valley Camp, VC-12 @ 0935, 4-15-92

DATE SUBMITTED: 4-16-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Acidity as $CaCO_3$, mg/l	<10
Bicarbonate as HCO_3, mg/l	302
Calcium as Ca (T), mg/l	63.3
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	3.1
Hardness as $CaCO_3$, mg/l	294
Magnesium as Mg (T), mg/l	29.6
Potassium as K (T), mg/l	2.6
Sodium as Na (T), mg/l	6.4
Sulfate as SO_4, mg/l	37.2
TDS, mg/l	307
Settleable Solids, ml/l	<.1
TSS, mg/l	14
Iron as Fe (T), mg/l	0.243
Iron as Fe (Diss), mg/l	0.218
Manganese as Mn (T), mg/l	0.028

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 6-18-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 5-27-92 - Valley Camp Stream

DATE SAMPLED: 5-26-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-12		
LAB #:	U078126	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	192	RG	6-07-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	6-07-92 EPA 310.1
Calcium as Ca, mg/l	43.9	AR	6-05-92 EPA 215.1
Chloride as Cl, mg/l	1.6	TM	5-28-92 EPA 325.3
Magnesium as Mg, mg/l	13.4	AR	6-05-92 EPA 242.1
Potassium as K, mg/l	1.1	AR	6-03-92 EPA 258.1
Sodium as Na, mg/l	1.8	AR	6-03-92 EPA 273.1
Sulfate as SO_4, mg/l	3.4	TM	5-28-92 EPA 375.4
TDS, mg/l	185	RG	5-28-92 EPA 160.1
TSS, mg/l	16	RG	5-28-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH	5-28-92 SM 208-F

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
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FAX: (801) 262-7378

DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	VC-12		
LAB #:	U078876	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	260	RG	6-24/25 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	6-28-92 EPA 310.1
Calcium as Ca, mg/l	59.3	AR	7-02-92 EPA 215.1
Chloride as Cl, mg/l	2.5	TM	6-19-92 EPA 325.3
Magnesium as Mg, mg/l	20.0	AR	7-02-92 EPA 242.1
Potassium as K, mg/l	2.0	AR	7-02-92 EPA 258.1
Sodium as Na, mg/l	2.6	AR	7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	18	TM	6-22/25 EPA 375.4
TDS, mg/l	273	RG	6-22-92 EPA 160.1
TSS, mg/l	12	RG	6-22-92 EPA 160.2
Settleable Solids, ml/l	<.1	RH	6-19-92 SM 208-F

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station S 7-11
Location

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL	NITROGEN AMMONIA as NH_3-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDAL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC COND.	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	μMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92	Inaccessible																																						
5-30-92	Inaccessible																																						
6-18-92	15:00	0.0022	14	10	7.4																	18					201			55		2.4	190		190			
7-23-92	10:40	0.0012	15	11	8.4																	26					263			505		2.0	250					
8-31-92	15:20	0.0007	16	10	8.2																	25					269			509		0	268		251			

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX. as CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92																																			
5-30-92																																			
6-18-92								58.4	14.6							0.188			11.6	<0.01				0.5				3.5				4.044	3.981	0.787	
7-23-92								94.0	15.4										13.8					0.2				4.0				6.005	5.140	7.765	
8-31-92								91.5	16.4							0.24			15.1	0.03				0.5				3.5				5.987	5.376	5.384	

R-7-87

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S7-11		
LAB #:	U078882	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	190	RG	6-25-92 EPA 310.1
Carbonate as CO_3, mg/l	2.4	RG	6-25-92 EPA 310.1
Calcium as Ca, mg/l	58.4	AR	7-02-92 EPA 215.1
Chloride as Cl, mg/l	14.6	TM	6-19-92 EPA 325.3
Hardness as $CaCO_3$, mg/l	190	TM	6-22-92 EPA 130.2
Magnesium as Mg, mg/l	11.6	AR	7-02-92 EPA 242.1
Potassium as K, mg/l	0.5	AR	7-02-92 EPA 258.1
Sodium as Na, mg/l	3.5	AR	7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	18	TM	6-25-92 EPA 375.4
TDS, mg/l	201	RG	6-22-92 EPA 160.1
Manganese as Mn (T), mg/l	<.01	AR	6-29-92 EPA 243.1
Iron as Fe (Diss), mg/l	0.188	AR	6-29-92 EPA 236.1

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
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PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 8-17-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 7-27-92 - Valley Camp Stream

DATE SAMPLED: 7-23-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S7-11		
LAB #:	U080074	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	250	RG	7-28-92 EPA 310.1
Carbonate as CO_3, mg/l	2.0	RG	7-28-92 EPA 310.1
Calcium as Ca, mg/l	94.0	AR	7-29-92 EPA 215.1
Chloride as Cl, mg/l	15.4	TM	7-27-92 EPA 325.3
Magnesium as Mg, mg/l	13.8	AR	7-31-92 EPA 242.1
pH Units	8.36	RG	7-28-92 EPA 150.1
Potassium as K, mg/l	0.2	AR	7-28-92 EPA 258.1
Sodium as Na, mg/l	4.0	AR	7-28-92 EPA 273.1
Sulfate as SO_4, mg/l	26	TM	7-27/28 EPA 375.4
TDS, mg/l	263	RG	7-27-92 EPA 160.1

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

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DATE: 10-06-92

RECEIVED
OCT 16 1992

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, Utah 84047

DATE SUBMITTED: 9-01-92 - Valley Camp

DATE SAMPLED: 8-31-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S7-11	
LAB:	U081292	
		ANALYST/DATE/METHOD
PARAMETER		
Bicarbonate as HCO_3, mg/l	268	RG 9-02-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG 9-02-92 EPA 310.1
Calcium as Ca, mg/l	91.5	AR 9-02-92 EPA 215.1
Chloride as Cl, mg/l	16.4	TM 9-01-92 EPA 325.3
Hardness as $CaCO_3$, mg/l	251	TM 9-01-92 EPA 130.2
Magnesium as Mg, mg/l	15.1	AR 9-02-92 EPA 242.1
Potassium as K, mg/l	0.5	AR 9-01-92 EPA 258.1
Sodium as Na, mg/l	3.5	AR 9-01-92 EPA 273.1
Sulfate as SO_4, mg/l	25	TM 9-10-92 EPA 375.4
TDS, mg/l	269	RG 9-02-92 EPA 160.1
Iron as Fe (Diss), mg/l	0.24	AR 9-10-92 EPA 236.1
Manganese as Mn (T), mg/l	0.03	AR 9-11-92 EPA 243.1

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station S 24-12
Location

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL	NITROGEN AMMONIA as NH_3-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC COND.	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	ML/L	MG/L	MG/L	MG/L	μMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92	Inaccessible																																						
5-30-92	11:20	-0-																																					
6-18-92	13:40	-0-																																					
7-23-92	13:30	-0-																																					
8-31-92	13:55	-0-																																					

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX as CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92																																			
5-30-92																																			
6-18-92																																			
7-23-92																																			
8-31-92																																			

R-7-87

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station S 25-13
Location

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL	NITROGEN AMMONIA as NH_3-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC COND.	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	ML/L	MG/L	MG/L	MG/L	µMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92	11:15	0.05	2	3	7.7																	1.3					93			107		0	61.4		55.0			
5-26-92	14:42	0.005	10	9	7.6										<0.2	0.072	0.009			0.174		<1					104			122		0	67.2		58			
6-18-92	12:45	0.003	13	16	7.5																	6.5					100			180		0	122					
7-23-92	14:30	0.001	21	17	8.3																	14					150			237		0	148					
8-31-92	12:30	0.001	11	11	7.6																	14					128			287		0	155		135			

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX. as CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	C-A / C+A ×100	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92								16	1.5							0.393			3.4	0.015				0.8				0.8				1.155	1.076	3.558	
5-26-92	1.89		<0.05	0.020		<0.05	<0.01	18.2	1.4	<0.01		<0.01		0.17		0.195		<0.01	3.3	0.052	<0.0005	<0.01	<0.01	0.6	<0.005			0.7	0.015		<2	1.238	1.151	3.637	
6-18-92								36.0	1.5										5.6					0.4				1.1				2.311	2.177	2.980	
7-23-92								50.5	1.2										5.4					0.4				1.0				3.018	2.751	4.628	
8-31-92								52.6	1.3							0.045			6.1	<0.01				0.5				1.1				3.190	2.869	5.301	

R-7-87

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 5-05-92

TO: Hansen, Allen & Luce
6771 So. 900 East
Midvale, Utah 84047

RECEIVED
MAY 1 1992
HA&L

SAMPLE ID: Lab #U076612 - Valley Camp, S25-13 @ 1115, 4-15-92

DATE SUBMITTED: 4-16-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Bicarbonate as HCO_3, mg/l	61.4
Calcium as Ca (T), mg/l	16.0
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	1.5
Hardness as $CaCO_3$, mg/l	55.0
Magnesium as Mg (T), mg/l	3.4
Potassium as K (T), mg/l	0.8
Sodium as Na (T), mg/l	0.8
Sulfate as SO_4, mg/l	1.3
TDS, mg/l	93
Iron as Fe (Diss), mg/l	0.393
Manganese as Mn (T), mg/l	0.015

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 6-18-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 5-27-92 - Valley Camp Stream

DATE SAMPLED: 5-26-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S25-13	
LAB #:	U078129	ANALYST/DATE/METHOD
PARAMETER		
Aluminum as Al (T), mg/l	1.89	ICP 6-08-92 EPA 200.7
Arsenic as As (T), mg/l	<.05	ICP 6-08-92 EPA 200.7
Barium as Ba (T), mg/l	0.020	ICP 6-08-92 EPA 200.7
Boron as B (T), mg/l	<.05	ICP 6-08-92 EPA 200.7
Cadmium as Cd (T), mg/l	<.01	ICP 6-08-92 EPA 200.7
Chromium as Cr (T), mg/l	<.01	ICP 6-08-92 EPA 200.7
Copper as Cu (T), mg/l	<.01	ICP 6-08-92 EPA 200.7
Lead as Pb (T), mg/l	<.01	ICP 6-08-92 EPA 200.7
Manganese as Mn (T), mg/l	0.052	ICP 6-08-92 EPA 200.7
Mercury as Hg (T), mg/l	<.0005	AA 6-03-92 EPA 245.2
Molybdenum as Mo (T), mg/l	<.01	ICP 6-08-92 EPA 200.7
Nickel as Ni (T), mg/l	<.01	ICP 6-08-92 EPA 200.7
Selenium as Se (T), mg/l	<.005	ICP 6-08-92 EPA 200.7
Zinc as Zn (T), mg/l	0.015	ICP 6-08-92 EPA 200.7
Iron as Fe (D), mg/l	0.195	AA 6-16-92 EPA 236.1

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
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DATE: 6-18-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

RECEIVED
JUN 1 5 1992
HA&L

DATE SUBMITTED: 5-27-92 - Valley Camp Stream

DATE SAMPLED: 5-26-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S25-13		
LAB #:	U078129	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	67.2	RG	6-07-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	6-07-92 EPA 310.1
Calcium as Ca, mg/l	18.2	AR	6-05-92 EPA 215.1
Chloride as Cl, mg/l	1.4	TM	5-28-92 EPA 325.3
Flouride as F, mg/l	0.17	TM	5-29-92 EPA 340.1
Hardness as $CaCO_3$, mg/l	58	TM	6-01-92 EPA 130.2
Magnesium as Mg, mg/l	3.3	AR	6-05-92 EPA 242.1
Potassium as K, mg/l	0.6	AR	6-03-92 EPA 258.1
Sodium as Na, mg/l	0.7	AR	6-03-92 EPA 273.1
Sulfate as SO_4, mg/l	85	TM	5-28-92 EPA 375.4
TDS, mg/l	104	RG	5-28-92 EPA 160.1
Ammonia as NH_3-N, mg/l	<.2	TH	5-27-92 EPA 350.3
Nitrate as NO_3-N, mg/l	0.072	BW	6-01-92 EPA 352.1
Nitrite as NO_2-N, mg/l	0.009	TM	5-28-92 EPA 354.1
Phosphate as PO_4-P (T), mg/l	0.174	TM	6-04-92 EPA 365.2
Sulfide as S, mg/l	<2	TM	5-29-92 EPA 376.1

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S25-13		
LAB #:	U078880	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	122	RG	6-25-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	6-25-92 EPA 310.1
Calcium as Ca, mg/l	36.0	AR	7-02-92 EPA 215.1
Chloride as Cl, mg/l	1.5	TM	6-19-92 EPA 325.3
Magnesium as Mg, mg/l	5.6	AR	7-02-92 EPA 242.1
Potassium as K, mg/l	0.4	AR	7-02-92 EPA 258.1
Sodium as Na, mg/l	1.0	AR	7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	6.5	TM	6-25-92 EPA 375.4
TDS, mg/l	100	RG	6-22-92 EPA 160.1

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 8-17-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 7-27-92 - Valley Camp Stream

DATE SAMPLED: 7-23-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S25-13		
LAB #:	U080075	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	148	RG	7-28-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	7-28-92 EPA 310.1
Calcium as Ca, mg/l	50.5	AR	7-29-92 EPA 215.1
Chloride as Cl, mg/l	1.2	TM	7-27-92 EPA 325.3
Magnesium as Mg, mg/l	5.4	AR	7-31-92 EPA 242.1
pH Units	8.33	RG	7-28-92 EPA 150.1
Potassium as K, mg/l	0.4	AR	7-28-92 EPA 258.1
Sodium as Na, mg/l	1.0	AR	7-28-92 EPA 273.1
Sulfate as SO_4, mg/l	14	TM	7-27/28 EPA 375.4
TDS, mg/l	150	RG	7-27-92 EPA 160.1

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 10-06-92

RECEIVED
OCT 16 1992

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, Utah 84047

DATE SUBMITTED: 9-01-92 - Valley Camp

DATE SAMPLED: 8-31-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S25-13	
LAB:	U081294	ANALYST/DATE/METHOD
PARAMETER		
Bicarbonate as HCO_3, mg/l	155	RG 9-02-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG 9-02-92 EPA 310.1
Calcium as Ca, mg/l	52.6	AR 9-02-92 EPA 215.1
Chloride as Cl, mg/l	1.3	TM 9-01-92 EPA 325.3
Hardness as $CaCO_3$, mg/l	135	TM 9-01-92 EPA 130.2
Magnesium as Mg, mg/l	6.1	AR 9-02-92 EPA 242.1
Potassium as K, mg/l	0.5	AR 9-01-92 EPA 258.1
Sodium as Na, mg/l	1.1	AR 9-01-92 EPA 273.1
Sulfate as SO_4, mg/l	14	TM 9-10-92 EPA 375.4
TDS, mg/l	128	RG 9-02-92 EPA 160.1
Iron as Fe (Diss), mg/l	0.045	AR 9-10-92 EPA 236.1
Manganese as Mn (T), mg/l	<.01	AR 9-11-92 EPA 243.1

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE INC
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station 531-13
Location

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL	NITROGEN AMMONIA as NH_3-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDAHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC COND.	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	ML/L	MG/L	MG/L	MG/L	µMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92	Inaccessible																																						
5-30-92	Inaccessible																																						
6-18-92	15:45	0.005	18	6	7.5																	18					253			529		0	270		241			
7-23-92	11:20	0.002	19	9	7.8																	34					283			550		0	296					
9-1-92	11:10	0.001	14	10	7.6																	35.8					298			323		0	309		289			

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX as CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92																																			
5-30-92																																			
6-18-92								73.0	1.8							0.158			16.6	<0.01				1.0				1.4				5.104	4.851	2.540	
7-23-92								98.8	1.4										18.8					0.9				1.6				6.570	5.563	8.296	
9-1-92								94.0	1.8							0.08			21.4	<0.01				1.0				1.5				6.547	5.861	5.530	

R-7-87

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S31-13		
LAB #:	U078881	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	270	RG	6-25-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	6-25-92 EPA 310.1
Calcium as Ca, mg/l	73.0	AR	7-02-92 EPA 215.1
Chloride as Cl, mg/l	1.8	TM	6-19-92 EPA 325.3
Hardness as $CaCO_3$, mg/l	241	TM	6-22-92 EPA 130.2
Magnesium as Mg, mg/l	16.6	AR	7-02-92 EPA 242.1
Potassium as K, mg/l	1.0	AR	7-02-92 EPA 258.1
Sodium as Na, mg/l	1.4	AR	7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	18	TM	6-25-92 EPA 375.4
TDS, mg/l	253	RG	6-22-92 EPA 160.1
Manganese as Mn (T), mg/l	<.01	AR	6-29-92 EPA 243.1
Iron as Fe (Diss), mg/l	0.158	AR	6-29-92 EPA 236.1

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 8-17-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 7-27-92 - Valley Camp Stream

DATE SAMPLED: 7-23-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S31-13		
LAB #:	U080076	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	296	RG	7-28-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	7-28-92 EPA 310.1
Calcium as Ca, mg/l	98.8	AR	7-29-92 EPA 215.1
Chloride as Cl, mg/l	1.4	TM	7-27-92 EPA 325.3
Magnesium as Mg, mg/l	18.8	AR	7-31-92 EPA 242.1
pH Units	7.84	RG	7-28-92 EPA 150.1
Potassium as K, mg/l	0.9	AR	7-28-92 EPA 258.1
Sodium as Na, mg/l	1.6	AR	7-28-92 EPA 273.1
Sulfate as SO_4, mg/l	34	TM	7-27/28 EPA 375.4
TDS, mg/l	283	RG	7-27-92 EPA 160.1

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 9-30-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 9-01-92 - Valley Camp Stream

DATE SAMPLED: 9-01-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S31-13		
LAB #:	U081331	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	309	RG 9-03-92	EPA 310.1
Carbonate as CO_3, mg/l	0	RG 9-03-92	EPA 310.1
Calcium as Ca, mg/l	94.0	AR 9-29/9-17	EPA 215.1
Chloride as Cl, mg/l	1.8	TM 9-03-92	EPA 325.3
Hardness as $CaCO_3$, mg/l	289	TM 9-03-92	EPA 130.2
Magnesium as Mg, mg/l	21.4	AR 9-17-92	EPA 242.1
Potassium as K, mg/l	1.0	AR 9-21-92	EPA 258.1
Sodium as Na, mg/l	1.5	AR 9-15-92	EPA 273.1
Sulfate as SO_4, mg/l	35.8	TM 9-10-92	EPA 375.4
TDS, mg/l	298	RG 9-02-92	EPA 160.1
Iron as Fe (Diss), mg/l	0.08	AR 9-23-92	EPA 236.1
Manganese as Mn (T), mg/l	<.01	AR 9-11-92	EPA 243.1

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station S36-7
Location

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL	NITROGEN AMMONIA as NH_4-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDAHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC COND.	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	µMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
9-1-92	13:25	0.001	13	10	7.3																	1.1					189			363		0	208		178			

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX as CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
9-1-92								59.0	1.9							0.02			9.0	<0.01				0.83				1.6				3.777	3.486	4.007	

R-7-87

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 9-30-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 9-01-92 - Valley Camp Stream

DATE SAMPLED: 9-01-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S36-7		
LAB #:	U081332	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	208	RG 9-03-92	EPA 310.1
Carbonate as CO_3, mg/l	0	RG 9-03-92	EPA 310.1
Calcium as Ca, mg/l	59.0	AR 9-29/9-17	EPA 215.1
Chloride as Cl, mg/l	1.9	TM 9-03-92	EPA 325.3
Hardness as $CaCO_3$, mg/l	178	TM 9-03-92	EPA 130.2
Magnesium as Mg, mg/l	9.0	AR 9-17-92	EPA 242.1
Potassium as K, mg/l	0.83	AR 9-21-92	EPA 258.1
Sodium as Na, mg/l	1.6	AR 9-15-92	EPA 273.1
Sulfate as SO_4, mg/l	1.1	TM 9-10-92	EPA 375.4
TDS, mg/l	189	RG 9-02-92	EPA 160.1
Iron as Fe (Diss), mg/l	0.02	AR 9-23-92	EPA 236.1
Manganese as Mn (T), mg/l	<.01	AR 9-11-92	EPA 243.1

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station S 36-17
Location

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL	NITROGEN AMMONIA as NH_3-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDAHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC CONO.	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	ML/L	MG/L	MG/L	MG/L	µMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92	Inaccessible																																						
5-26-92	12:50	0.0192	15	18	7.7										0.64	0.027	<0.005			2.34		<1					232			382		0	232		173			
6-18-92	12:00	0.0084	14	12	7.5																	7.7					250			358		0	281					
7-23-92	15:00	0.0014	20	19	8.4																	0.6					236			431		4.0	260					
8-31-92	11:30	0.0017	10	10	7.5																	<1.0					228			444		2.4	264		224			

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX. or CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92																																			
5-26-92	8.23		<0.05	0.147		<0.05	<0.01	50.8	1.9	0.011		0.027		0.24		0.160		0.032	14.5	0.399	<0.0005	<0.01	0.027	1.0	0.044			1.8	0.080		<2	3.893	3.869	0.306	
6-18-92								88.0	1.5										13.4					0.5				1.8				5.585	4.808	7.474	
7-23-92								69.1	1.2										12.9					0.4				1.8				4.598	4.441	1.738	
8-31-92								73.8	1.7							0.052			14.3	<0.1				0.7				2.0				4.967	4.455	5.436	

R-7-87

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 6-18-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 5-27-92 - Valley Camp Stream

DATE SAMPLED: 5-26-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S36-17	
LAB #:	U078130	ANALYST/DATE/METHOD
PARAMETER		
Bicarbonate as HCO_3 (T), mg/l	549	RG 6-07-92 EPA 310.1
Bicarbonate as HCO_3 (Diss), mg/l	232	RG 6-07-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG 6-07-92 EPA 310.1
Calcium as Ca, mg/l	66.0	AR 6-05-92 EPA 215.1
Chloride as Cl, mg/l	1.9	TM 5-28-92 EPA 325.3
Flouride as F, mg/l	0.24	TM 5-29-92 EPA 340.1
Hardness as $CaCO_3$, mg/l	173	TM 6-01-92 EPA 130.2
Magnesium as Mg, mg/l	14.5	AR 6-05-92 EPA 242.1
Potassium as K, mg/l	1.0	AR 6-03-92 EPA 258.1
Sodium as Na, mg/l	1.8	AR 6-03-92 EPA 273.1
Sulfate as SO_4, mg/l	97	TM 5-28-92 EPA 375.4
TDS, mg/l	232	RG 5-28-92 EPA 160.1
Ammonia as NH_3-N, mg/l	0.64	TH 5-27-92 EPA 350.3
Nitrate as NO_3-N, mg/l	0.027	BW 6-01-92 EPA 352.1
Nitrite as NO_2-N, mg/l	<.005	TM 5-28-92 EPA 354.1
Phosphate as PO_4-P (T), mg/l	2.34	TM 6-04-92 EPA 365.2
Sulfide as S, mg/l	<2	TM 5-29-92 EPA 376.1

Rex Henderson

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DATE: 6-18-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 5-27-92 - Valley Camp Stream

DATE SAMPLED: 5-26-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S36-17	
LAB #:	U078130	ANALYST/DATE/METHOD
PARAMETER		
Aluminum as Al (T), mg/l	8.23	ICP 6-08-92 EPA 200.7
Arsenic as As (T), mg/l	<.05	ICP 6-08-92 EPA 200.7
Barium as Ba (T), mg/l	0.147	ICP 6-08-92 EPA 200.7
Boron as B (T), mg/l	<.05	ICP 6-08-92 EPA 200.7
Cadmium as Cd (T), mg/l	<.01	ICP 6-08-92 EPA 200.7
Chromium as Cr (T), mg/l	0.011	ICP 6-08-92 EPA 200.7
Copper as Cu (T), mg/l	0.027	ICP 6-08-92 EPA 200.7
Lead as Pb (T), mg/l	0.032	ICP 6-08-92 EPA 200.7
Manganese as Mn (T), mg/l	0.399	ICP 6-08-92 EPA 200.7
Mercury as Hg (T), mg/l	<.0005	AA 6-03-92 EPA 245.2
Molybdenum as Mo (T), mg/l	<.01	ICP 6-08-92 EPA 200.7
Nickel as Ni (T), mg/l	0.027	ICP 6-08-92 EPA 200.7
Selenium as Se (T), mg/l	0.044	ICP 6-08-92 EPA 200.7
Zinc as Zn (T), mg/l	0.080	ICP 6-08-92 EPA 200.7
Iron as Fe (D), mg/l	0.160	AA 6-16-92 EPA 236.1

Rex Henderson

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DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S36-17		
LAB #:	U078879	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	281	RG	6-25-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	6-25-92 EPA 310.1
Calcium as Ca, mg/l	88.0	AR	7-02-92 EPA 215.1
Chloride as Cl, mg/l	1.5	TM	6-19-92 EPA 325.3
Magnesium as Mg, mg/l	13.4	AR	7-02-92 EPA 242.1
Potassium as K, mg/l	0.5	AR	7-02-92 EPA 258.1
Sodium as Na, mg/l	1.8	AR	7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	7.7	TM	6-25-92 EPA 375.4
TDS, mg/l	250	RG	6-22-92 EPA 160.1

Rex Henderson

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ANALYTICAL LABORATORY
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PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 8-17-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 7-27-92 - Valley Camp Stream

DATE SAMPLED: 7-23-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S36-17		
LAB #:	U080077	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	260	RG	7-28-92 EPA 310.1
Carbonate as CO_3, mg/l	4.0	RG	7-28-92 EPA 310.1
Calcium as Ca, mg/l	69.1	AR	7-29-92 EPA 215.1
Chloride as Cl, mg/l	1.2	TM	7-27-92 EPA 325.3
Magnesium as Mg, mg/l	12.9	AR	7-31-92 EPA 242.1
pH Units	8.43	RG	7-28-92 EPA 150.1
Potassium as K, mg/l	0.4	AR	7-28-92 EPA 258.1
Sodium as Na, mg/l	1.8	AR	7-28-92 EPA 273.1
Sulfate as SO_4, mg/l	0.6	TM	7-27/28 EPA 375.4
TDS, mg/l	236	RG	7-27-92 EPA 160.1

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
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PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 10-06-92

RECEIVED
OCT 16 1992

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, Utah 84047

DATE SUBMITTED: 9-01-92 - Valley Camp

DATE SAMPLED: 8-31-92

CERTIFICATE OF ANALYSIS

SAMPLE ID: S36-17
LAB: U081293

PARAMETER		ANALYST/DATE/METHOD
Bicarbonate as HCO_3, mg/l	264	RG 9-02-92 EPA 310.1
Carbonate as CO_3, mg/l	2.4	RG 9-02-92 EPA 310.1
Calcium as Ca, mg/l	73.8	AR 9-02-92 EPA 215.1
Chloride as Cl, mg/l	1.7	TM 9-01-92 EPA 325.3
Hardness as $CaCO_3$, mg/l	224	TM 9-01-92 EPA 130.2
Magnesium as Mg, mg/l	14.3	AR 9-02-92 EPA 242.1
Potassium as K, mg/l	0.7	AR 9-01-92 EPA 258.1
Sodium as Na, mg/l	2.0	AR 9-01-92 EPA 273.1
Sulfate as SO_4, mg/l	<1.0	TM 9-10-92 EPA 375.4
TDS, mg/l	228	RG 9-02-92 EPA 160.1
Iron as Fe (Diss), mg/l	0.052	AR 9-10-92 EPA 236.1
Manganese as Mn (T), mg/l	<.01	AR 9-11-92 EPA 243.1

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station S 36-19
Location

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92	Inaccessible													
5-30-92	Inaccessible													
6-18-92	16:20	0.004	13	6	7.1									
7-23-92	17:15	0.002	18	9	8.3									
9-1-92	11:55	0.001	15	12	7.6									

DATE	NITROGEN AMMONIA as NH_3-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDAHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	ML/L	MG/L	MG/L	MG/L
4-15-92															
5-30-92															
6-18-92								1.1					127		
7-23-92								<0.5					164		
9-1-92								1.9					170		

DATE	SPECIFIC COND.	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
	µMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92									
5-30-92									
6-18-92	302		0	140		117			
7-23-92	299		0	167					
9-1-92	319		0	183		152			

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEXAVALENT CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92														
5-30-92														
6-18-92								42.0	1.4					
7-23-92								56.3	1.1					
9-1-92								53.0	1.1					

DATE	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92															
5-30-92															
6-18-92		0.045			5.6	0.038				0.4				1.1	
7-23-92					5.0					0.3				1.1	
9-1-92		0.09			6.1	<0.01				1.7				1.2	

DATE	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} \times 100$	COMMENTS
	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92						
5-30-92						
6-18-92			2.617	2.357	5.230	
7-23-92			3.276	2.768	8.407	
9-1-92			3.247	3.070	2.806	

R-7-87

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S36-19		
LAB #:	U078878	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	140	RG	6-25-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	6-25-92 EPA 310.1
Calcium as Ca, mg/l	42.0	AR	7-02-92 EPA 215.1
Chloride as Cl, mg/l	1.4	TM	6-19-92 EPA 325.3
Hardness as $CaCO_3$, mg/l	117	TM	6-22-92 EPA 130.2
Magnesium as Mg, mg/l	5.6	AR	7-02-92 EPA 242.1
Potassium as K, mg/l	0.4	AR	7-02-92 EPA 258.1
Sodium as Na, mg/l	1.1	AR	7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	1.1	TM	6-25-92 EPA 375.4
TDS, mg/l	127	RG	6-22-92 EPA 160.1
Manganese as Mn (T), mg/l	0.038	AR	6-29-92 EPA 243.1
Iron as Fe (Diss), mg/l	0.045	AR	6-29-92 EPA 236.1

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 8-17-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 7-27-92 - Valley Camp Stream

DATE SAMPLED: 7-23-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S36-19		
LAB #:	U080078	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	167	RG	7-28-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	7-28-92 EPA 310.1
Calcium as Ca, mg/l	56.3	AR	7-29-92 EPA 215.1
Chloride as Cl, mg/l	1.1	TM	7-27-92 EPA 325.3
Magnesium as Mg, mg/l	5.0	AR	7-31-92 EPA 242.1
pH Units	8.31	RG	7-28-92 EPA 150.1
Potassium as K, mg/l	0.3	AR	7-28-92 EPA 258.1
Sodium as Na, mg/l	1.1	AR	7-28-92 EPA 273.1
Sulfate as SO_4, mg/l	<.5	TM	7-27/28 EPA 375.4
TDS, mg/l	164	RG	7-27-92 EPA 160.1

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 9-30-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 9-01-92 - Valley Camp Stream

DATE SAMPLED: 9-01-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S36-19		
LAB #:	U081333	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	183	RG 9-03-92	EPA 310.1
Carbonate as CO_3, mg/l	0	RG 9-03-92	EPA 310.1
Calcium as Ca, mg/l	53.0	AR 9-29/9-17	EPA 215.1
Chloride as Cl, mg/l	1.1	TM 9-03-92	EPA 325.3
Hardness as $CaCO_3$, mg/l	152	TM 9-03-92	EPA 130.2
Magnesium as Mg, mg/l	6.1	AR 9-17-92	EPA 242.1
Potassium as K, mg/l	1.7	AR 9-21-92	EPA 258.1
Sodium as Na, mg/l	1.2	AR 9-15-92	EPA 273.1
Sulfate as SO_4, mg/l	1.9	TM 9-10-92	EPA 375.4
TDS, mg/l	170	RG 9-02-92	EPA 160.1
Iron as Fe (Diss), mg/l	0.09	AR 9-23-92	EPA 236.1
Manganese as Mn (T), mg/l	<.01	AR 9-11-92	EPA 243.1

Rex Henderson

CONSULTANTS/ENGINEERS
HANSEN ALLEN & LUCE inc
SALT LAKE CITY, UTAH

WATER QUALITY DATA

Station S 36-23
Location

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP.	C.O.D.	B.O.D.	T.O.C.	DISSOLVED OXYGEN	OIL & GREASE	PHENOL
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92	Inaccessible													
5-30-92	Inaccessible													
6-18-92	16:55	0.007	16	9	7.5									
7-23-92	10:05	0.006	13	5	8.0									
9-1-92	13:50	0.004	17	5	7.3									

DATE	NITROGEN AMMONIA as NH_3-N	NITROGEN NITRATE as NO_3-N	NITROGEN NITRITE as NO_2-N	NITROGEN TOTAL KJELDAHL	NITROGEN ORGANIC	PHOSPHATE TOTAL as PO_4-P	PHOSPHATE ORTHO as PO_4-P	SULFATE as SO_4	HYDROXIDE as OH	SURFACTANT as MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SPECIFIC COND.	TURBIDITY	CARBONATE ALK. as CO_3	BI-CARBONATE ALK. as HCO_3	TOTAL ALK. as $CaCO_3$	TOTAL HARDNESS as $CaCO_3$	ACIDITY as $CaCO_3$	ALPHA RADIO-ACTIVITY	BETA RADIO-ACTIVITY
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	ML/L	MG/L	MG/L	MG/L	µMHOS/CM	FTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
4-15-92																								
5-30-92																								
6-18-92								0.9					222			398		0	254		212			
7-23-92								<0.5					244			344		0	267					
9-1-92								<1.0					229			462		0	268		225			

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS.	CHROMIUM HEX as CR	COBALT TOTAL	COPPER TOTAL	CYANIDE as CN	FLUORIDE DISS.
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4-15-92														
5-30-92														
6-18-92								74.5	1.8					
7-23-92								71.8	1.2					
9-1-92								76.1	1.1					

DATE	GERMANIUM TOTAL	IRON DISS.	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA as SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	SULFIDE as S	MAJOR CATIONS	MAJOR ANIONS	$\frac{C-A}{C+A} = 100$	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MEQ/L	MEQ/L		
4-15-92																					
5-30-92																					
6-18-92		0.058			9.9	<0.01				0.5				1.6				4.618	4.233	4.352	
7-23-92					9.5					0.4				1.7				4.449	4.410	0.438	
9-1-92		0.05			9.8	<0.01				0.42				1.6				4.687	4.424	2.890	

R-7-87

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 7-10-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 6-19-92 - Valley Camp Stream

DATE SAMPLED: 6-18-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S36-23		
LAB #:	U078877	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	254	RG	6-25-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	6-25-92 EPA 310.1
Calcium as Ca, mg/l	74.5	AR	7-02-92 EPA 215.1
Chloride as Cl, mg/l	1.8	TM	6-19-92 EPA 325.3
Hardness as $CaCO_3$, mg/l	212	TM	6-22-92 EPA 130.2
Magnesium as Mg, mg/l	9.9	AR	7-02-92 EPA 242.1
Potassium as K, mg/l	0.5	AR	7-02-92 EPA 258.1
Sodium as Na, mg/l	1.6	AR	7-01-92 EPA 273.1
Sulfate as SO_4, mg/l	0.9	TM	6-25-92 EPA 375.4
TDS, mg/l	222	RG	6-22-92 EPA 160.1
Manganese as Mn (T), mg/l	<.01	AR	6-29-92 EPA 243.1
Iron as Fe (Diss), mg/l	0.058	AR	6-29-92 EPA 236.1

Rex Henderson

CHEMTECH
ANALYTICAL LABORATORY
6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 8-17-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 7-27-92 - Valley Camp Stream

DATE SAMPLED: 7-23-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S36-23		
LAB #:	U080079	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	267	RG	7-28-92 EPA 310.1
Carbonate as CO_3, mg/l	0	RG	7-28-92 EPA 310.1
Calcium as Ca, mg/l	71.8	AR	7-29-92 EPA 215.1
Chloride as Cl, mg/l	1.2	TM	7-27-92 EPA 325.3
Magnesium as Mg, mg/l	9.5	AR	7-31-92 EPA 242.1
pH Units	8.00	RG	7-28-92 EPA 150.1
Potassium as K, mg/l	0.4	AR	7-28-92 EPA 258.1
Sodium as Na, mg/l	1.7	AR	7-28-92 EPA 273.1
Sulfate as SO_4, mg/l	<.5	TM	7-27/28 EPA 375.4
TDS, mg/l	244	RG	7-27-92 EPA 160.1

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 9-30-92

TO: Hansen, Allen & Luce
6771 South 900 East
Midvale, UT 84047

DATE SUBMITTED: 9-01-92 - Valley Camp Stream

DATE SAMPLED: 9-01-92

CERTIFICATE OF ANALYSIS

SAMPLE ID:	S36-23		
LAB #:	U081334	ANALYST/DATE/METHOD	
PARAMETER			
Bicarbonate as HCO_3, mg/l	268	RG 9-03-92	EPA 310.1
Carbonate as CO_3, mg/l	0	RG 9-03-92	EPA 310.1
Calcium as Ca, mg/l	76.1	AR 9-29/9-17	EPA 215.1
Chloride as Cl, mg/l	1.1	TM 9-03-92	EPA 325.3
Hardness as $CaCO_3$, mg/l	225	TM 9-03-92	EPA 130.2
Magnesium as Mg, mg/l	9.8	AR 9-17-92	EPA 242.1
Potassium as K, mg/l	0.42	AR 9-21-92	EPA 258.1
Sodium as Na, mg/l	1.6	AR 9-15-92	EPA 273.1
Sulfate as SO_4, mg/l	<1.0	TM 9-10-92	EPA 375.4
TDS, mg/l	229	RG 9-02-92	EPA 160.1
Iron as Fe (Diss), mg/l	0.05	AR 9-23-92	EPA 236.1
Manganese as Mn (T), mg/l	<.01	AR 9-11-92	EPA 243.1

Rex Henderson

HANSEN ALLEN & LUCE inc

SALT LAKE AREA OFFICE
6771 South 900 East
Midvale, Utah 84047
Phone: (801) 566-5599

Mr. Steve Tanner
Valley Camp of Utah, Inc.
Scofield Route
Helper, Utah 84526

September 25, 1992

Re: 1992 Subsidence Map Update.

Dear Steve:

Enclosed please find a copy of the revised Subsidence Map for your review which was prepared based upon our pedestrian surveys completed on August 25th and 26th with some additional verifications being made on September 16th. As will be noted from the table shown on the map, little overall change was found between the 1991 and 1992 subsidence surveys except for the discovery of a couple of old subsidence features previously undetected and the weathering of historic features. One improvement undertaken this year over previous studies was the implementation and use of a GPS location system. In many instances we were able to use our "Magellan NAV 5000 Pro's" satellite locators to help document more accurately subsidence features. Information believed reliable is shown in the following table as well as on Map R645-301-728.100a. Subsidence features not believed to be located accurately this year with the Magellan units has been shown with a "N/A" designation in the table. Attempts will again be made to locate these features more accurately next year.

Comments relative to each subsidence location noted on the map over those documented in 1991 are summarized in the following table. Note that features which were changed from a letter to a number designation, new features not previously identified, clarified features, or features with a marked change of major importance over last years effort are highlighted in the table. Also note that the vast majority of subsidence appears to be healing through erosional filling or natural re-vegetation.

1992 SUBSIDENCE SURVEY LOG
TAGGED SITES

TAG NUMBER	DATE	COMMENT	LOCATION[1]	
			LAT	LONG
1	9/26/92	NO CHANGE. BELIEVED TO BE NON SUBSIDENCE RELATED.	39'52.726"	11'54.631"
2	9/26/92	HOLE IS WELL WEATHERED AND VEGETATED.	40'01.650"	11'54.159"
3	9/26/92	SMALL CRACKS ARE HIGHLY WEATHERED WITH ESTABLISHED VEGETATIVE GROWTH.	N/A	N/A
4	9/26/92	CRACKS APPEAR TO BE HEALING, ESPECIALLY ON NORTHEAST END.	39'42.616"	11'10.749"
5	9/26/92	CRACKS WEATHERING AND FILLING IN.	N/A	N/A
6	9/26/92	NOT MUCH NEW ACTIVITY ALTHOUGH WEATHERING CONTINUES.	39'22.445"	11'20.087"
16	9/26/92	CRACKS WEATHERING AND FILLING IN SLIGHTLY.	39'46.527"	11'46.804"
17	9/26/92	CRACKS CONTINUE TO WEATHER AND FILL IN.	39'47.441"	11'48.210"
18	9/25/92	CRACKS CONTINUE TO WEATHER AND FILL IN.	N/A	N/A
19	9/26/92	SMALL AMOUNT OF WATER STARTING TO POND IN BOTTOM OF SINK HOLE.	39'05.618"	11'46.506"
20	9/25/92	VEGETATION IS BECOMING WELL ESTABLISHED.	N/A	N/A
21	9/26/92	CRACKS WEATHERING AND HEALING.	N/A	N/A
22	9/25/92	NO SIGNIFICANT CHANGE OVER PREVIOUS OBSERVATIONS.	N/A	N/A
23	9/25/92	STANDING WATER IN BOTTOM, BOTTOM HAS SEALED, VEGETATION STARTING TO GROW.	39'03.614"	11'32.964"
24	9/25/92	DEPTH OF HOLE IS DECREASING.	39'02.788"	11'14.970"
25	9/26/92	SLIGHT EROSIONAL HEALING NOTED.	39'35.307"	11'10.981"
26	9/26/92	CRACKS ARE HEALING WITH SUBSTANTIAL VEGETATION GROWTH.	39'35.794"	11'17.138"
27	9/26/92	CRACK DEPTHS APPEAR TO BE DECREASING AS A RESULT OF WEATHERING.	39'40.614"	11'24.120"
28	9/26/92	CRACK WIDTH AND DEPTH DECREASED BY 50 PERCENT.	39'39.304"	11'09.672"
29	9/26/92	AREA STARTING TO HEAL THROUGH VEGETATION GROWTH AND EROSION.	39'42.356"	11'09.083"
30	9/26/92	DROP IS WEATHERING AND BECOMING MORE OBSCURE.	N/A	N/A
31	9/26/92	CRACKS WELL WEATHERED WITH LUSH VEGETATIVE GROWTH.	N/A	N/A
32	9/26/92	WELL WEATHERED WITH APPARENT HEALING.	39'47.184"	11'25.196"
33	9/26/92	CRACKS ARE WEATHERING AND HEALING.	39'42.539"	11'25.167"
34	9/26/92	CRACKS ARE HEALING WITH SUBSTANTIAL VEGETATIVE GROWTH.	39'39.189"	11'21.319"
35	9/26/92	CRACKS BECOMING OBSCURE, FILLING IN AND HARD TO FIND.	N/A	N/A

1992 SUBSIDENCE SURVEY LOG
TAGGED SITES - (Continued)

TAG NUMBER	DATE	COMMENT	LOCATION[1]	
			LAT	LONG
36	9/26/92	CRACKS CONTINUE TO FILL IN.	N/A	N/A
37	9/25/92	NO APPRECIABLE CHANGE.	N/A	N/A
38	9/26/92	HOLE IS WEATHERING AND IS BECOMING WELL GRASSED.	39'49.256"	11'21.361"
39	9/26/92	LITTLE OVERALL CHANGE NOTED.	39'27.855"	11'22.084"
40	9/25/92	AREA APPEARS TO BE HEALING, CRACKS NOT AS WIDE AS NOTED EARLIER.	39'11.679"	11'32.604"
41	9/25/92	VEGETATION CONTINUES TO RECLAIM DEPRESSION.	N/A	N/A
42	9/26/92	CRACK PERPENDICULAR TO CONTOUR 6 - 12 IN. WIDE, 4 - 7 IN. DEEP, 40 FT LONG.	N/A	N/A
43	9/26/92	CRACK IS WELL WEATHERED 100 FT LONG, 6 - 10 IN WIDE, 3 - 9 IN. DEEP.	39'55.119"	11'49.401"
44	9/26/92	FEATURE IS HARD TO FIND AND IS FILLING IN.	39'52.959"	11'48.144"
47	9/26/92	CRACK IS WELL WEATHERED WITH HEAVY VEGETATION.	N/A	N/A
49	9/25/92	WEATHERED CRACKS 4 - 6 IN. WIDE, 1 1/2 - 2 1/2 FT DEEP.	N/A	N/A
51	9/25/92	OLD HOLE, 7 FT WIDE, 3 1/2 FT DEEP.	N/A	N/A
52	9/26/92	FILLING IN AND HEALING CONTINUES.	N/A	N/A

N/A - NOT AVAILABLE.
1 - LATITUDES ARE ALL AT 39°, LONGITUDES ARE ALL AT 111°.

SUBSIDENCE SURVEY LOG
NONTAGGED SITES

SITE NUMBER	DATE	COMMENT	LOCATION[1]	
			LAT	LONG
A	9/26/92	COULD NOT LOCATE.	N/A	N/A
B	9/26/92	COULD NOT LOCATE.	N/A	N/A
G	9/26/92	CRACK IS HEALING, ONLY A SMALL HOLE NOTED TO REMAIN.	N/A	N/A
J	9/26/92	COULD NOT LOCATE.	N/A	N/A
K	9/26/92	NO APPRECIABLE CHANGE.	39'40.101"	11'12.642"
M	9/26/92	COULD NOT LOCATE.	N/A	N/A
P	9/25/92	APPEARS TO BE NON SUBSIDENCE RELATED.	N/A	N/A

N/A - NOT AVAILABLE.
1 - LATITUDES ARE ALL AT 39°, LONGITUDES ARE ALL AT 111°.

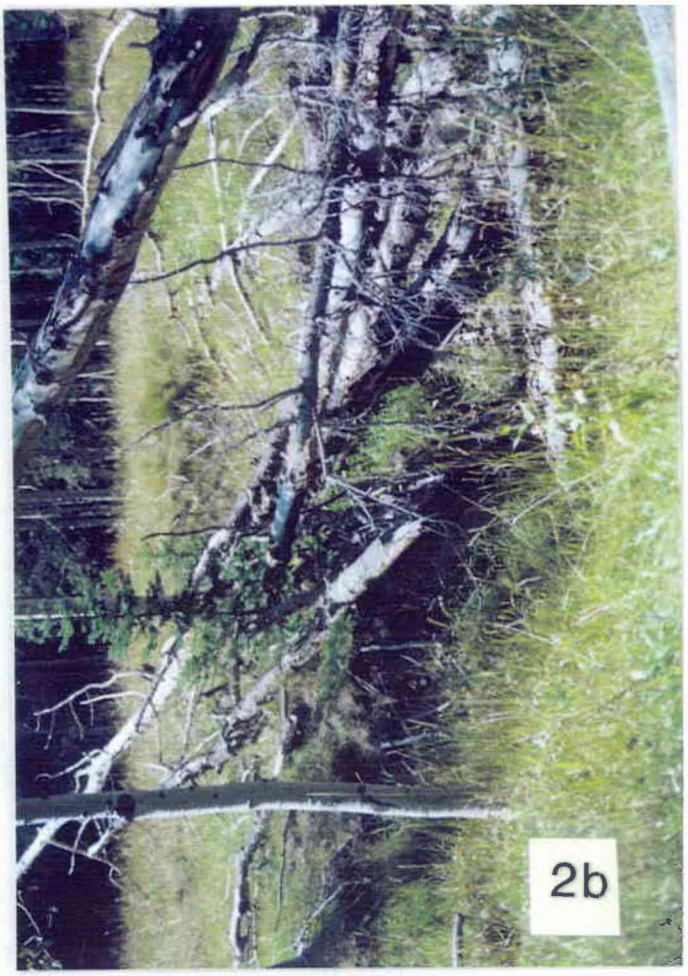
Upon your review and approval we will submit the desired number of copies of Map R645-301-728.100a with an appropriate cover letter to UDOGM. Should you have any questions or comments, please call.

Sincerely,

David E. Hansen

David E. Hansen, Ph.D., P.E.
Principal

2a


2b

3

X2 15:39 39° 40' 0165 ELEV
111° 11' 516 8507

. VERY WEATHERED & VEGITATED
. LOOKING SOUTH AT LARGEST HOLE

8/26/92
1 of 2

X3 11:33 39° 39' 4941
111° 11' 2741

. SMALL CRACKING HIGHLY WEATHERED
. VEGITATED

LOOKS N.W

8/26/92
1 of 1

X2

. LOOKING WEST AT LARGEST HOLE

8/26/92
2 of 2

8 26 '92
4a

8 26 '92
4b

5a

5b

X4

. LOOKING N.E. AT CRACK

8/26/92
2 of 2

X4 10:15 39°39'4060
111° 11' 1238

. HEALING & WEATHERING
. LOOKING SOUTH WEST AT CRACK
. FIX AT MID POINT APPROX 75' LONG
. MOST APPARENT ON S.W. END TO MOSTLY HEALED ON N.E. END

8/26/92
1 of 2

X5

. LOOKING SOUTH AT CRACK

8/26/92
2 of 2

X5 12:48 39°39' 4887
111° 11' 2815

. WEATHERING - FILLING IN
. LOOKING NORTH AT CRACK

8/26/92
1 of 2

6a

6b

19a

19b

X6

. LOOKING ~~WEST~~ EAST INTO CRACK

8/26/92
2 of 2

X19 15:25 39° 40' 0562 ELEV 8839
111° 11' 4651

. WEATHERED
. GOOD VEGETATION
. LOCATED AT 2ND GROUP OF QUAKIES DOWN HILL
. LOOKING SOUTH INTO CRACK

8/26/92
1 of 2

X6 14:45 39° 39' 2288
111° 11' 2320

. CONTINUES TO WEATHER SLOWLY
. NO NEW ACTIVITY
. LOOKING ~~EAST~~ WEST INTO CRACK

8/26/92

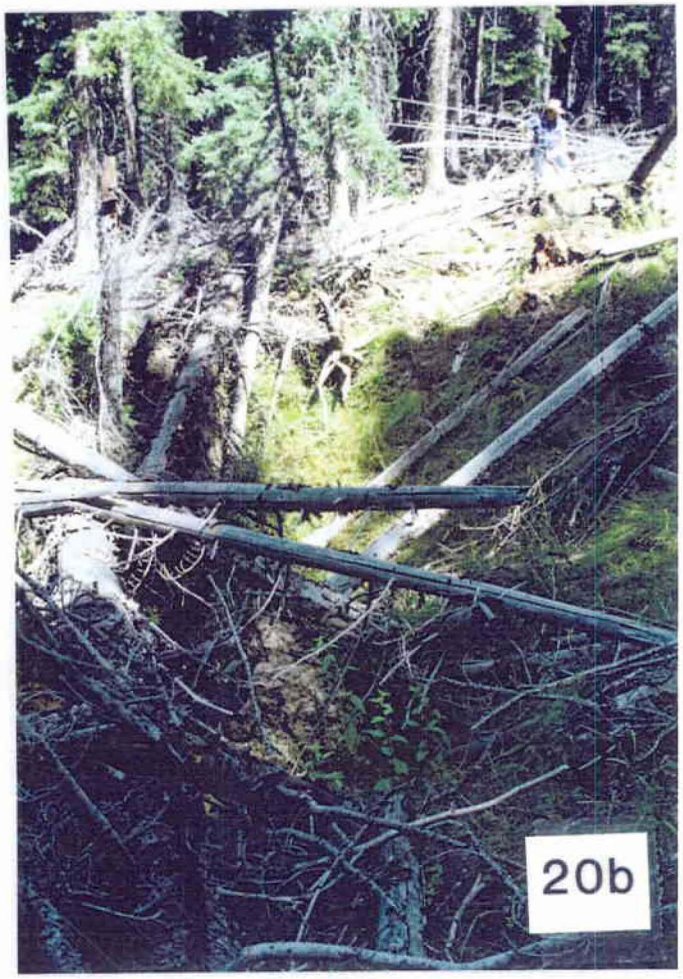
1 of 2

X19

. LOOKING NORTH AT DEEPEST SINK HOLE

8/26/92
2 of 2

20a



20b

21a

21b

~~X6 14:45 39°39' 3288~~
~~111° 11' 2320~~

X20 39°39' 4926
111° 11' ~~[illegible]~~
2136 ~~[illegible]~~

. ~~CONTINUES TO WEATHER SLOWLY~~

~~NO NEW ACTIVITY~~

. ~~LOOKING EAST~~

. BETWEEN X38 X20
USING SAME COORDINATES

8/26/92
~~[illegible]~~ 181

X20
39°39.4926
111° 11' 2136

. LOOKING S.W AT SINK HOLE

8/26/92
181

X21

. LOOKING NORTHEAST INTO CRACK

8/26/92
282

~~X32 11:40 39°39' 4918~~
~~111° 11' 2520~~

X21

~~WELL WEATHER & HEALING~~
~~. WESTERN BOUNDRY OF CRACKING~~

. LOOKING NORTHEAST INTO CRACK

8/26/92
182

22a

22b

22c

22d

XA22 ~14:10 39° 39' 0980 ELEV
111° 11' 5078 9272

· SLOPE FAILURE
· LOOKING SOUTH AT BASIN

8/25/92

1 of 2

XA22

22B

· SLOPE FAILURE
LOOKING NORTH AT SLOPE

8/25/92
2 of 2

X22A 14:12 39° 39' 0447 111° 11' 4875

SMALL SINK AREA - WELL WEATHERED
NEAR STREAM BOTTOM

· LOOKING WEST INTO DEPRESSED AREA
SOUTH OF MAIN DRAINAGE

8/25/92 1 OF 2

X22A

LOOKING NORTH INTO DEPRESSED
AREA SOUTH OF MAIN DRAINAGE

8/25/92 2 OF 2

23a

23b

23c

X23 1435 39° 39' 0346 111° 11' 36006

BOTTOM SEALED WITH WATER STANDING -
VEGETATION STARTING

- PHOTO LOOKING NORTH INTO SINKHOLE

8/25/92 1 OF 3

X23

- LOOKING SOUTH INTO SINK HOLE
MATCHES PHOTO 23C

8/25/92
2 of 3

X23

- LOOKING SOUTH INTO SINKHOLE
MATCHES PHOTO 23B

8/25/92
3 of 3

24a

24b

25a

25b

X24

·SINK HOLE - LOOKING DOWN HOLE

8/25/92
2 OF 2

X24 16:20 39° 39' 0431 ELEV
111° 12' 1794 9419

· 5.5' ROUND 3.5' DEEP
SINK HOLE · LOOKING SOUTH AT HOLE

8/25/92
1 of 2

X25

·LOOKING EAST INTO CRACK

8/26/92
2 of 2

X25 9:08 39° 39' 3537
111° 11' 1372

CRACK SHOWS SLIGHT EROSION
HEALING

·LOOKING ~~EAST~~ WEST INTO CRACK

8/26/92
1 of 2

26a

26b

26c

26d

~~8:51 39°39' 3620 111° 11' 2150~~

26

SOUTH EDGE OF SUBSIDENCE - WEATHERING

· LOOKING ~~EAST~~ WEST ALONG CRACK

[redacted] AT TAG #26

8/26/92

1 OF 2

~~9:03 39°39' 3620 111° 11' 2150~~

26

CRACK FILLING IN

LOOKING WEST ALONG CRACK

EAST OF TAG #26

8/26/92

1 OF 2

26

· LOOKING EAST ALONG CRACK AT TAG #26

8/26/92

2 of 2

26

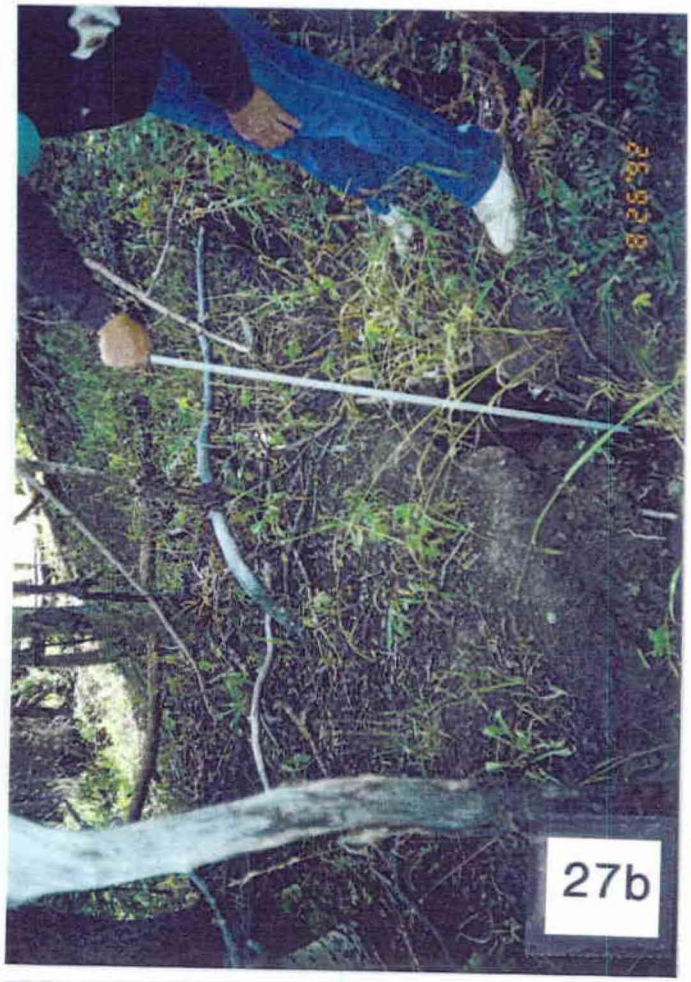
· LOOKING EAST ALON CRACK

AT TAG #26

8/26/92

2 of 2

27a



27b

28a

~~X26 09:35 39° 39' 4220~~
~~111° 11' 2268~~

27

~~HEALING PROCESS WELL ALONG~~
~~CRACK ~2"~~

· LOOKING NORTH INTO CRACK

8/26/92
1 of 2

28 9:24

SMALL CRACK 1-2" WIDE
APPROX 15' EAST OF TAGGED
TREE. DEPTH ~1'
HEALING. COULDN'T LOCATE
OTHER CRACKS
· LOOKING SOUTHWEST INTO
CRACK

8/26/92
1 of 1

X27 0943 39° 39' 4273
111° 11' 2290

· HEALING PROCESS WELL ALONG
· LOOKING ~~NORTH~~ EAST INTO CRACK 3' DEEP
JUST SOUTH OF PHOTO #27A

8/26/92
1 OF

29a

29b

30a

30b

X29
8/26/92

. LOOKING SOUTH INTO SOUTH FARTHER DOWN GRADIENT

. DEPTHS TO 2.0'

2 of 2

X29 9:45 39° 39' 2335
111° 12' 0466
8/26/92

. LOOKING SOUTH INTO CRACK

WIDTH ~ 1-1½"

DEPTH ~ 1.0'

1 of 2

X30

. LOOKING NORTH INTO CRACK

8/26/92
2 of 2

X30 10:34 39° 39' 4429
111° 11' 1443

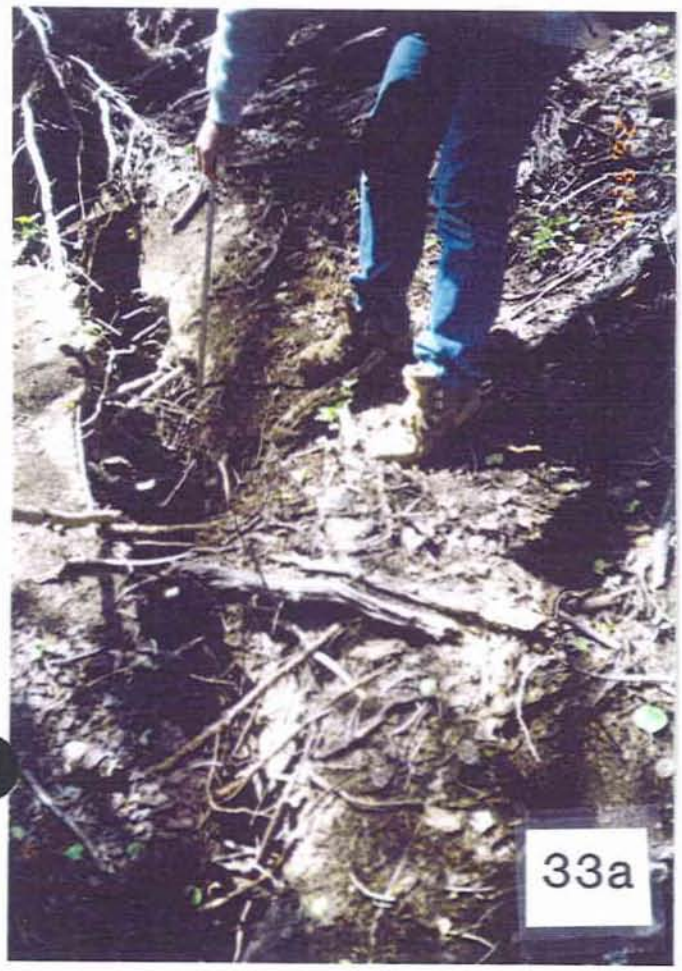
. CRACKS WEATHERED & HEALING EASTERN BOUNDRY

. LOOKING SOUTH INTO CRACK

8/26/92
1 of 2

31a

31b



33a

33b

X31

. LOOKING SOUTH INTO CRACK

8/26/92
2 of 2

X31 10:43 39° 39' 4802
111° 11' 1145

. LUSH VEGETATION
. CRACK WELL WEATHERED AND HEALING
. LOOKING NORTH INTO CRACK

8/26/92
1 of 2

X33

. LOOKING SOUTH INTO CRACK
. 2' DEEP w/ TAPE

8/26/92
2 of 2

X33 11:18 39° 39' 2517
111° 11' 2517

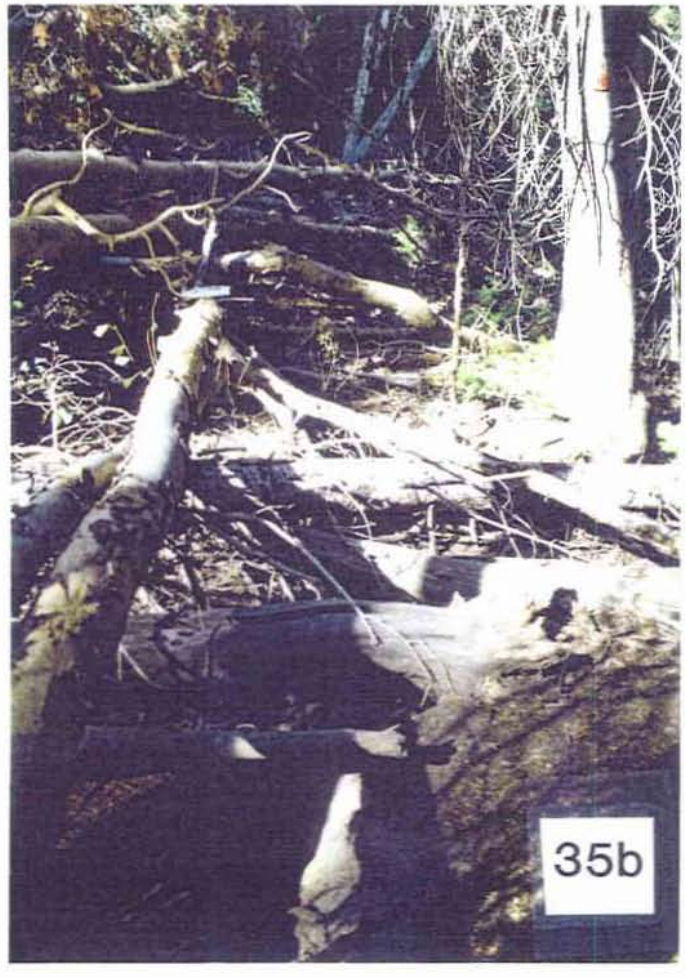
. WEATHERED & HEALING
. TAGS ON FALLEN QUAKIE

. LOOKING SOUTH INTO CRACK
. DUP OF 17

8/26/92
1 of 2

34a

35a


35b

X34

8/26/92

. LOOKING NORTH INTO CRACK

X35

. LOOKING WESTERLY INTO CRACK

8/26/92

2 of 2

X35 10:50 39° 39' 50.04"

8/26/92 111° 11' 08.47"

. LOOKING EASTERLY INTO CRACK

. CONTINUES TO FILL IN

. BECOMING OBSCURE

8/26/92

1 of 2

36a

36b

38a

X36

LOOKING N. EASTERLY AT CRACK

NE OF TAG #36

8/26/92

2 of 2

X36 10:54 39°39.4949 111°11.1199

- LOOKING EASTERLY AT CRACK - WEST OF TAG # 36
- BOTTOM FILLING IN

8/26/92

1 of 2

X38 13:03 39°39' 4926
111° 11' 2136

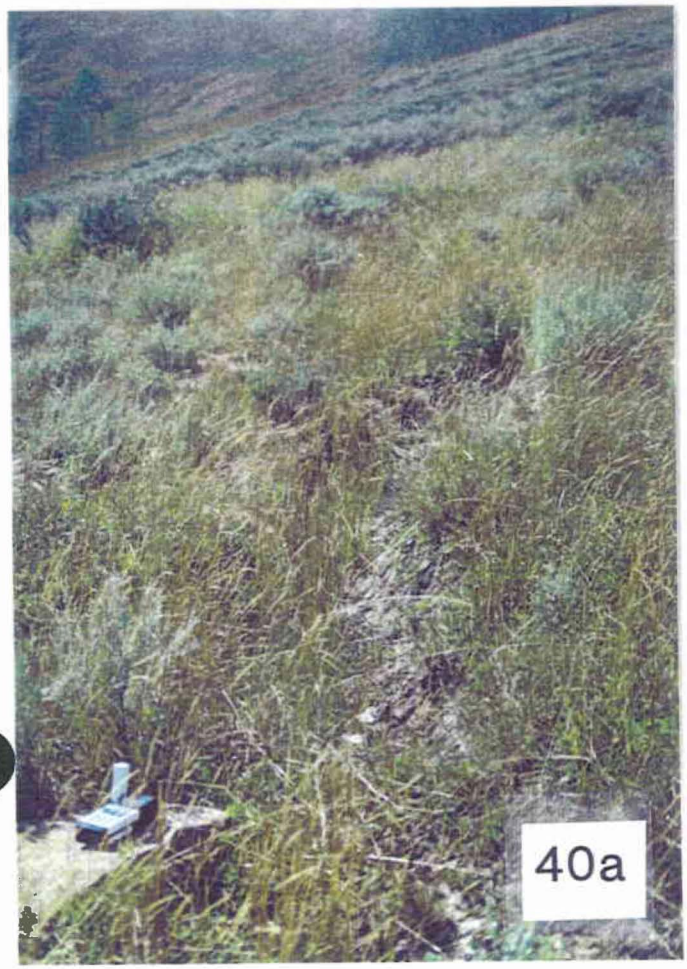
- LOOKING WESTWARD INTO HOLE NEAR CHANNEL BOTTOM
- WEATHERING - GRASSED

8/26/92

1 of 1

39a

39b


40a

40b

X39
8/26/92
2 of 2

- LOOKING NORTHWEST INTO DEPRESSION

X39 14:28 39° 39' 28.7"
111° 11' 26.7"

CONTINUES TO WEATHER - LITTLE OVERALL CHANGE

LOOKING [redacted]. N.E. INTO DEPRESSION

8/26/92
1 of 2

~~X FOR~~
406

- LOOKING EAST AT CRACK

8/25/92
2 OF 2

~~X FOR 14:48 39° 39' 0.320~~
~~111° 11' 24.93~~
40[redacted]A

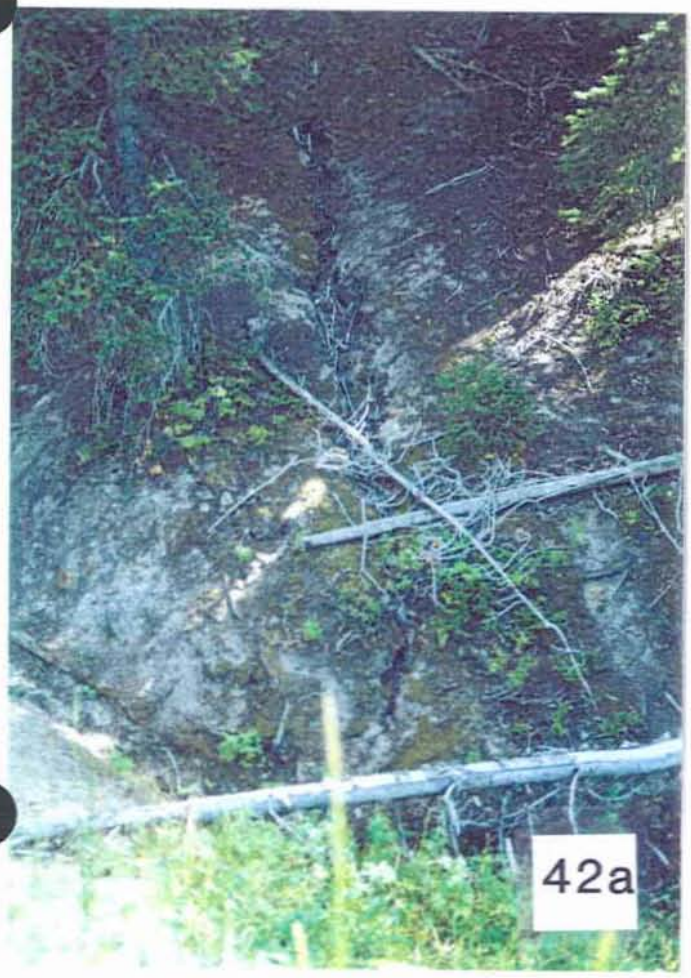
~~FOREST SERVICE BOUNDRY~~
~~ON O'CONNOR MINE ROAD~~
~~NORTH SIDE NEAR BEND~~

- LOOKING WEST AT CRACK

8/25/92
1 OF 2

41a

41b



42a

X41 16:16 39° 39' 0274 111° 11' 2535

VEG GROWTH CONTINUES TO RECLAIM DEPRESSION

· LOOKING WEST AT ~~CREEK~~ DEPRESSION

8/25/92 1 OF 2

X41

· LOOKING EAST AT CRACK

8/25/92
2 OF 2

X42 15:55 39° 39' 5722
111° 11' 5705

· CRACK RUNS ABOUT PERPENDICULAR TO SLOPE FROM CHANNEL BOTTOM TO 40' UP SLOPE

· CRACK WEATHERED 6-12" WIDE
4-7" DEEP

· LOOKING S.W. INTO CRACK

· (SAME AS POINT 8)

8/20/92
1 of 1

43a

43b

44a

44b

X43

· LOOKING S.W. INTO CRACK

8/26/92
2 of 2

X43 16:25 39° 39' 5512
111° 11' 4940

ELEV. 8916

· CRACK RUNS SLIGHTLY UPSLOPE
· 100' LONG
· 6-10" WIDE
· 3-9" DEEP
· AT EDGE OF PINES

· LOOKING N.E INTO CRACK

8/26/92
1 of 2

X44
8/26/92
2 of 2

· LOOKING S.W. INTO CRACK

X44 16:55 39° 39' 5296
111° 11' 4814

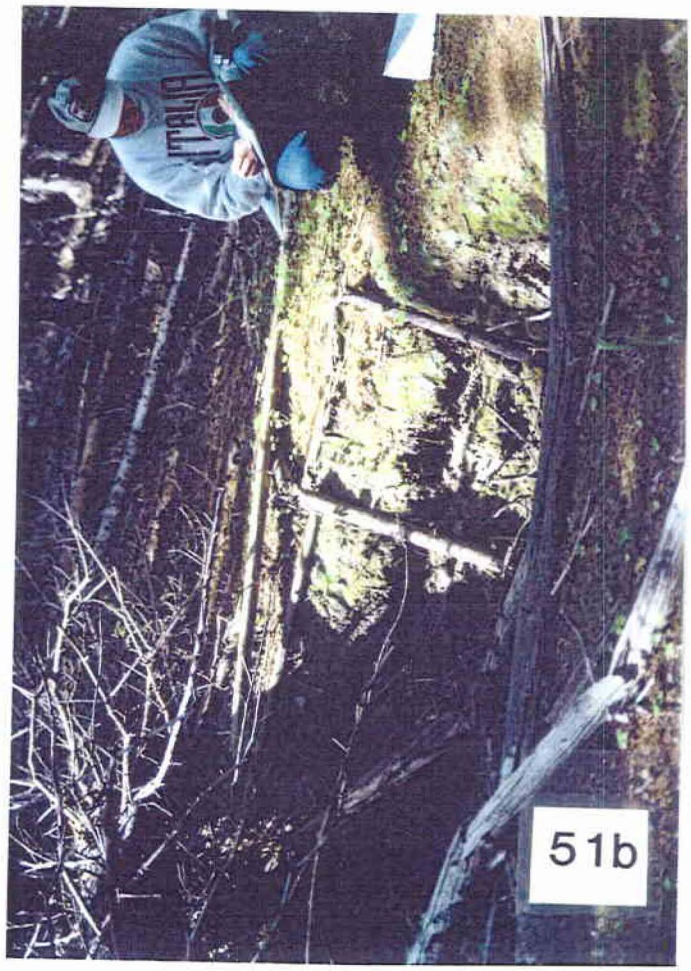
· HARD TO FIND.
· WEATHERING IN
· CRACK CONTINUES N.E. APPROX 100'

· LOOKING N.E INTO CRACK

8/26/92
1 of 2

49a

51a



51b

~~X21 12:00 39°39' 5860~~
~~110° 11' 2982~~
~~499~~
~~LOOKING N.E. AT CRACK~~
~~CRACKING WELL WEATHERED~~
~~AND HEALING~~
~~TAPE 2-3' DEEP~~
~~SERIES OF 4 CRACKS~~

~~8/20/92~~
~~2 of 2~~

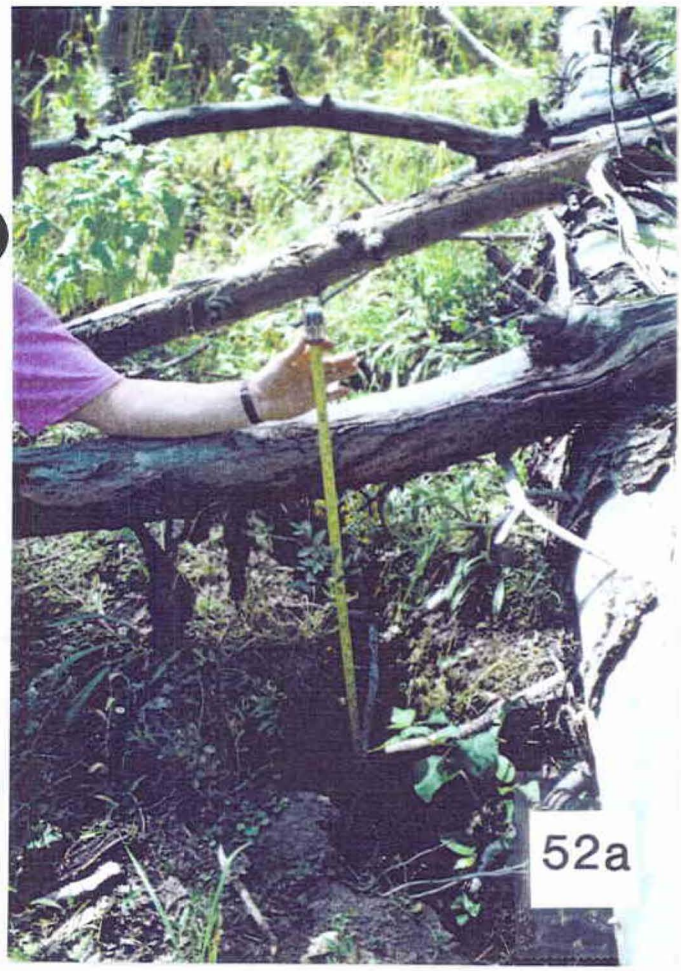
X L51 12:00 39° 38' 5201 111° 11' 2152

APPROX 100' NORTH OF POSITION - IN TREES
OLD HOLE 7' WIDE 3½' DEEP - OLD -
NORTH & WEST OF ROAD CUTS
LOOKING ~~EASTERLY~~ WESTERLY INTO OLD SINK HOLE

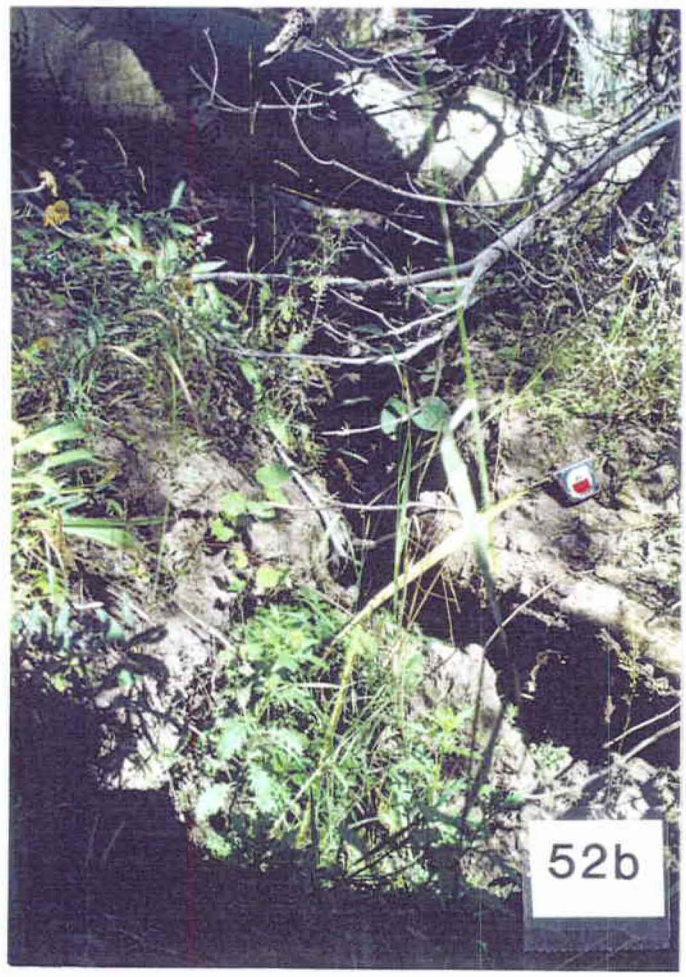
8/25/92 2 OF 2

X L51 12:00 39° 38' 5201 111° 11' 2152
8/25/92
APPROX 100' NORTH OF POSITION - IN TREES
OLD HOLE 7' WIDE 3½' DEEP - OLD -
NORTH & WEST OF ROAD CUTS - LOOKING
~~WESTERLY~~ EASTERLY INTO OLD SINKHOLE

1 OF 2



52a



52b

XR52

· LOOKING N. AT EAST CRACK

8/26/92
2 of 2

XR52 10:55

· NEW TAG #52

SOME FILLING/HEALING OCCURED

· LOOKING SOUTH AT WEST CRACK

8/26/92
2 of 2